NATURAL RESOURCES TECHNICAL REPORT

Complete 540 - Triangle Expressway Southeast Extension
Wake and Johnston Counties, North Carolina

TIP R-2721, R-2828, and R-2829
Federal Aid Project Nos. STP-0540(19), STP-0540(20), and STP-0540(21)
WBS Element Nos. 37673.1.TA2, 35516.1.TA2, and 35517.1.TA1

THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Project Development and Environmental Analysis Branch
Natural Environment Section

August 2014

TABLE OF CONTENTS

LIST OF TABLES

1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT), in cooperation with the Federal Highway Administration (FHWA), proposes transportation improvements in the project study area (Figure 1) and surrounding region to address transportation needs as defined in the project's Purpose and Need Statement (Lochner, 2011). The focus of these improvements includes the potential extension of the Triangle Expressway (NC 540) from NC 55 Bypass in Apex to the US 64/US 264 Bypass in Knightdale. This project is designated as three projects in the NCDOT 2012-2018 State Transportation Improvement Program (STIP): R-2721, R-2828, and R-2829. Together, these STIP projects would combine to complete the 540 Outer Loop around the Raleigh metropolitan area. In some instances for the ease of discussing the project, the project is referred to as having two phases: Phase I is the western portion of the study area between NC 55 Bypass in Apex and I-40 near the Wake/Johnston County line; Phase II is the eastern portion of the study area between I-40 and US 64/US 264 Bypass in Knightdale. NCDOT established a protected corridor for the project between NC 55 Bypass and I-40 in 1996 and 1997. For purposes of meeting the requirements of the National Environmental Policy Act (NEPA), both phases are being examined in the current study as a single and complete project. It is likely that the project would be constructed in phases, but depending on the availability of funding, may or may not be consistent with the current phase descriptions noted. The following Natural Resources Technical Report (NRTR) has been prepared to assist in the preparation of an Environmental Impact Statement (EIS) for the proposed project. This report assesses the following preliminary corridor alternatives that combine to make up the Detailed Study Alternatives (DSAs) under consideration for the project:

- Southern Section
  - Orange Corridor
  - Red Corridor
  - Lilac Corridor
  - Purple Corridor
  - Blue Corridor
- Eastern Section
  - Green Corridor
  - Brown Corridor
  - Mint Corridor
  - Tan Corridor
  - Teal Corridor

2.0 METHODOLOGY AND QUALIFICATIONS

All work was conducted in accordance with the NCDOT Natural Environment Section (NES) standard operating procedures and December 2010 NRTR template. Field work was conducted January 2010 through August 2011 and new areas investigated June 2013 through June 2014. Jurisdictional areas identified in the study area were verified by Eric Alsmeyer of the U.S. Army Corps of Engineers (USACE) along with Brian Wrenn and Rob Ridings of North Carolina Division of Water Resources (NCDWR). Verification meetings were held almost monthly between July 2010 through September 2011, February 2013 and March 2013, and September 2013 through July 2014. Documentation of this jurisdictional determination has not yet been received. The principal personnel contributing to this document were:

Principal Investigator:	Wendee B. Smith, PWS
Education:	B.S. Natural Resources Ecosystem Assessment, 1999 Minor - Environmental Science, 1999
Experience:	Principal, Mulkey, Inc., 2005 - Present Hayes, Seay, Mattern & Mattern, 2002 - 2005 Landmark Design Group, 1999 – 2002
Responsibilities:	Wetland and stream delineations, stream assessment, GPS, natural community assessment; protected species surveys; document preparation

Investigator:	Thomas B. Barrett, RF
Education:	M.S. Forest Management, 2004 M.S. Environmental Health, 1997 B.S. Forest Management, 1995
Experience:	Senior Scientist, Mulkey, Inc., 2002 - Present Scientist, ARCADIS, 2001 - 2002
Responsibilities:	Wetland and stream delineations, stream assessment, GPS, natural community assessment; protected species surveys

Additional personnel who contributed to portions of the field work and/or documentation for this project were Brian Dustin, Mark Mickley, Cindy Carr, Christopher Dustin, Todd Preuninger, Sam Beavans, Logan Williams, and William Wollman. Appendix D lists the qualifications of these contributors.

3.0 PHYSICAL RESOURCES

The study area lies in the piedmont physiographic region of North Carolina (Figure 2). Topography in the project vicinity is comprised of gently rolling hills with narrow, level floodplains along streams. Elevations in the study area range from 140 to 460 feet above mean sea level. Land use in the project vicinity consists primarily of forestland interspersed with residential development and agriculture.

3.1 Soils

The Wake and Johnston County Soil Surveys identify 52 soil types within the study area (Table 1).

Table 1. Soils in the study area.

Soil Series	Mapping Unit [1]	Drainage Class	Hydric Status
Altavista fine sandy loam	Aa (J) Af (W)	Moderately Well Drained	Hydric[2]
Appling gravelly sandy loam	Ag	Well Drained	Non-hydric
Appling sandy loam	Ap		
Appling fine sandy loam	As	Well Drained	Non-hydric
Appling-Marlboro complex	Am	Well drained	Non-hydric
Augusta fine sandy loam	Au	Somewhat Poorly Drained	Hydric[2]
Bibb sandy loam, frequently flooded	Bb	Poorly Drained	Hydric
Buncombe soils	Bu	Somewhat Excessively Drained	Hydric[2]
Cecil sandy loam	Ce	Well Drained	Non-hydric
Cecil gravelly sandy loam	Cg	Well Drained	Non-hydric
Cecil clay loam	Cl	Well Drained	Non-hydric
Chewacla sandy loam	Cm	Somewhat Poorly Drained	Hydric[2]
Colfax sandy loam	Cn	Somewhat Poorly Drained	Hydric[2]
Congaree fine sandy loam	Co (W)	Well Drained	Hydric[2]
Congaree silt loam	Cp	Well Drained	Hydric[2]
Cowarts loamy sand	Co (J)	Well Drained	Non-hydric
Creedmoor sandy loam	Cr	Moderately Well Drained	Non-hydric
Creedmoor silt loam	Ct	Moderately Well Drained/Somewhat Poorly Drained	Non-hydric
Durham loamy sand	Du	Well Drained	Non-hydric
Enon fine sandy loam	En	Well Drained	Non-hydric
Faceville sandy loam	Fa	Well Drained	Non-hydric
Fuquay sand	Fu	Well Drained	Non-hydric
Georgeville silt loam	Ge	Well Drained	Non-hydric
Goldsboro sandy loam	Go	Moderately Well Drained	Hydric[2]
Helena sandy loam	He	Moderately Well Drained	Hydric[2]
Herndon silt loam	Hr	Well Drained	Non-hydric
Lloyd loam	Ld	Well Drained	Non-hydric
Louisburg loamy sand	Lo	Somewhat Excessively Drained	Non-hydric
Continues			

Table 1 Continued			
Soil Series	**Mapping Unit** [1]	**Drainage Class**	**Hydric Status**
Louisburg-Wedowee complex	Lw	Somewhat Excessively Drained	Non-hydric
Lynchburg sandy loam	Ly	Somewhat Poorly Drained	Hydric[2]
Madison sandy loam	Md	Well Drained	Non-hydric
Mantachie soils	Me	Somewhat Poorly Drained	Hydric[2]
Nankin fine sandy loam	Nk (J)	Well Drained	Non-hydric
Norfolk loamy sand	No	Well Drained	Non-hydric
Orangeburg loamy sand	Or	Well Drained	Non-hydric
Plummer sand	Ps	Poorly Drained	Hydric
Rains fine sandy loam	Ra	Poorly Drained	Hydric
Rion sandy loam	Rn	Well Drained	Non-hydric
Roanoke fine sandy loam	Ro	Poorly Drained	Hydric
Tomotley sandy loam	To	Poorly Drained	Hydric
Uchee loamy coarse sand	Uc	Well Drained	Non-hydric
Vance sandy loam	Va	Well Drained	Non-hydric
Varina loamy sand	Vr	Well Drained	Non-hydric
Wagram loamy sand	Wa	Somewhat Excessively Drained	Non-hydric
Wagram-Troup sands	Wg	Somewhat Excessively Drained/Well Drained	Non-hydric
Wahee fine sandy loam	Wh	Somewhat Poorly Drained	Hydric[2]
Wake soils	Wk	Somewhat Excessively Drained	Non-hydric
Wedowee sandy loam	Wo (J) Wm (W)	Well Drained	Non-hydric
Wehadkee loam, silt loam	Wt (J) Wn (W)	Poorly Drained	Hydric
Wehadkee and Bibb soils	Wo (W)	Poorly Drained	Hydric
Wilkes soils	Ww (W)	Well Drained	Non-hydric
Worsham sandy loam	Wy	Poorly Drained	Hydric

[1] - Soil mapping unit designations differing between counties noted as (J) for Johnston County, (W) for Wake County.
[2] - Soils which are primarily non-hydric, but which may contain hydric inclusions

3.2 Water Resources

Water resources in the study area are part of the Neuse River and Cape Fear River basins [U.S. Geological Survey (USGS) Hydrologic Units 03020201 and 03030004]. A total of 445 jurisdictional streams were identified in the study area (Table 2, Appendix G). The location of each water resource is shown in Figures 3-1 through 3-95. The physical characteristics of these streams are provided in Table 3a (Appendix G).

One hundred five (105) ponds are located in the study area (Figures 3-1 through 3-95). Table 3b (Appendix G) describes the characteristics of each pond including size, surface water connections, and whether or not it is subject to buffers.

The reach of the Neuse River within the project study area has been identified as a NC Wildlife Resources Commission (NCWRC) anadromous fish spawning area (AFSA) and a Primary Nursery Area (PNA). As a result, a construction moratorium will be in effect from February 15 through September 30 (T. Wilson, personal communication, August 25, 2014). There are no designated NCWRC trout waters present in the study area.

There are no designated Outstanding Resource Waters (ORW), High Quality Waters (HQW) or water supply watersheds (WS-I or WS-II) within 1.0 mile downstream of the study area. The North Carolina 2012 Final 303(d) list of impaired waters identifies the Neuse River and Middle Creek within the project study area as impaired due to turbidity. There are several streams in the project study area that are listed on the 303(d) list for reasons others than sedimentation and turbidity.

Fourteen benthic monitoring stations are within 1.0 mile of the study area. The stations are identified below along with the most recent water quality designation.

- Neuse River at SR 2509 with a rating of “Good-Fair” on June 30, 1987
- Neuse River at SR 2555 with a rating of “Good-Fair” on June 30, 1987.
- Swift Creek at NC 42 with a rating of “Fair” on July 11, 1986 and July 21, 1991.
- Two stations along UT to Big Branch at I-40 are “not rated” on April 20, 1989.
- Two stations along UT to Swift Creek north of Benson Road with a rating of “Good-Fair” on March 24, 1987.
- UT to Swift Creek at Seastone Street (residential street off of Old Stage Road) is a control site that was “not rated” June 13, 1997.
- UT to Swift Creek at Seastone Street (residential street off of Old Stage Road) is a developed area that was “not rated” from June 13, 1997.
- Walnut Creek at SR 2551 with a rating of “Good-Fair” on July 27, 2000.
- Middle Creek near airport with a rating of “Good on June 21, 2986.
- Middle Creek at SR 1301 with a rating of “Fair” on May 29, 1986.
- Middle Creek at SR 2739 with a rating of “Fair” on June 2, 1986.
- Middle Creek at Tallicud Road with a rating of “Fair” on May 30, 1986.

Fish monitoring data has been collected at one location within 1.0 mile of the study area. This data was collected along Middle Creek near SR 1404 on June 4, 1991 and April 27, 1995 and received a NCIBI rating of “Good”.

4.0 BIOTIC RESOURCES

4.1 Terrestrial Communities

Thirteen (13) terrestrial communities were identified in the study area: maintained/disturbed, agriculture/pasture, cutover/early successional, pine plantation, floodplain pool, non-tidal freshwater marsh, basic mesic forest, mesic mixed hardwood forest, piedmont/mountain bottomland forest, dry oak-hickory forest, dry-mesic oak-hickory forest, piedmont/low mountain alluvial forest, non-riverine swamp forest. Figures 4-1 through 4-95 show the location and extent of these terrestrial communities in the study area. A brief description of each community type follows. Scientific names of all species identified are included in Appendix B. Table 6 in Appendix G notes the community type for each wetland.

4.1.1 Maintained/Disturbed

Maintained/disturbed areas are scattered throughout the study area in places where the vegetation is periodically mowed, such as roadside shoulders and residential lawns. The vegetation in this community is comprised of mostly of vines and low growing grasses and herbs, including fescue, shrub lespedeza, clover, wild garlic, wild onion, plantain, broomsedge, kudzu, yellow jessamine, English ivy, common ragweed, nightshade, Queen Anne's lace, and henbit. Trees and shrubs include mimosa, tree-of-heaven, autumn olive, and Chinaberry. There are wetlands included in this community classified as headwater forest and non-tidal freshwater marsh using the North Carolina Wetland Assessment Method (NCWAM) classification. Headwater forests within the maintained/disturbed community consist mostly of herbaceous species. Dominant wetland herbaceous species consist of soft rush and sedges. The non-tidal freshwater marsh wetlands within this community are sparsely vegetated and predominantly herbaceous dominated by sedges, soft rush, and smartweed.

4.1.2 Agriculture/Pasture

The agriculture/pasture community occurs scattered throughout the study area. This community includes land used to cultivate tobacco, corn, soybeans, pumpkins, and various other commodities. This land use also includes pasture used to sustain livestock which typically is comprised of grasses and herbs similar to those in the maintain/disturbed community such as fescue, clover, wild garlic, wild onion, Johnson grass, broomsedge, common ragweed, nightshade, Queen Anne's lace, and henbit.

4.1.3 Cutover/Early Successional

This community consists of areas that have been logged within five years and are in early forest succession. Small loblolly pine, sweet gum, red maple, and yellow poplar are common pioneer tree/sapling species. Other dominant species include common greenbrier, blackberry, Japanese honeysuckle, broomsedge, and goldenrod. There are wetlands included in this community classified as headwater forest and non-tidal freshwater marsh using the NCWAM classification. Headwater forests within the cutover/early successional community consist mostly of sapling, shrub, and herbaceous species. The sapling and shrub layer is not typically diverse, with dominant species consisting of yellow poplar, sweet gum, spicebush, and black willow.

Dominant wetland herbaceous species consist of soft rush and sedges. The non-tidal freshwater marsh wetlands are sparsely vegetated and predominantly herbaceous dominated by lizard's tail, soft rush, duck potato, smartweed, and sedges.

4.1.4 Pine Plantation

These areas occur intermittently throughout the project study area and are characterized mostly by planted loblolly pine in the overstory, along with sweet gum and red maple in the sapling/shrub layer. Dominant shrubs, herbs and vines that also occur in this community include blackberry, giant cane, common greenbrier, Virginia creeper, and Japanese honeysuckle. There are wetlands included in this community classified as headwater forest using the NCWAM classification. Headwater forest within the pine plantation community are characterized by the presence of loblolly pine in the overstory, along with a sparse shrub and a herbaceous layer dominated by giant cane, soft rush, and multiflora rose.

4.1.5 Floodplain Pool

The floodplain pool community, as classified by NCWAM, exists as localized depressions and/or geomorphic floodplains. Vegetation in this community is sparse due to the frequent inundation. Vegetation where it exists consists mostly of herbs including Virginia chain-fern, netted chain-fern, sedges, and soft rush

4.1.6 Non-Tidal Freshwater Marsh

The non-tidal freshwater marsh typically exists in a geomorphic floodplain (Cowardin et al. 1979). These wetlands occur on mineral or organic soils and are subject to semi-permanent inundation or saturation (NCWAM, 2010). Vegetation where it exists is predominantly herbaceous with the most common species being cattails, arrow arum, smartweed, sedges, hydrilla, and rushes.

4.1.7 Basic Mesic Forest

The basic mesic forest is found on lower slopes and ravines, usually upslope of bottomland and alluvial forests. This community is characterized by uneven-aged stands with evidence of historical logging and/or agriculture.

Dominant canopy species include loblolly pine, sweet gum, yellow poplar, northern red oak, eastern red cedar, and red maple. Species such as redbud, musclewood, pawpaw, slippery elm, deerberry, golden bamboo, and spicebush occur in the shrub and sapling layer. The herbaceous layer is generally dense and diverse with dominant species of Christmas fern and heartleaf.

4.1.8 Mesic Mixed Hardwood Forest

The mesic mixed hardwood forest community exists along slopes and in ravines, in well-drained, somewhat acidic soils (Schafale and Weakley, 1990). Dominant species in this community include American beech, red maple, yellow poplar, and northern red oak in the overstory, and flowering dogwood, viburnum, and Christmas fern in the shrub and ground layers. There are wetlands included in this community classified as headwater forest using the NCWAM classification. Headwater forest within the mesic mixed hardwood community is characterized by the presence of yellow poplar, red maple, and American elm in the overstory. Common saplings and shrubs within the headwater wetlands include musclewood and giant cane. The herbaceous layer is dominated by netted chain-fern, Japanese grass, and blackberry.

4.1.9 Piedmont/Mountain Bottomland Forest

The piedmont/mountain bottomland forest community exists along floodplain ridges and terraces. Dominant canopy species in this community include yellow poplar, sweet gum, American elm, green ash, loblolly pine, and swamp chestnut oak. Understory trees and shrubs include musclewood, flowering dogwood, American holly, strawberry bush, Chinese privet, and giant cane. Dominant herbs and vines include false nettle, Christmas fern, poison ivy, Virginia creeper, and muscadine. There are wetlands included in this community classified as headwater forest, bottomland hardwood forest, and non-tidal freshwater marsh using the NCWAM classification. Headwater forest wetlands within the piedmont/mountain bottomland hardwood community are dominated by swamp chestnut oak, yellow poplar, and red maple trees. Dominant saplings and shrubs consist of red maple, spicebush, multiflora rose, blackberry, and giant cane. Bottomland hardwood forest wetlands are dominated by such tree species as red maple, green ash, sycamore, American elm, and sweet gum. Saplings of the dominant trees exist and shrubs are sparse dominated by giant cane. The herbaceous layer primarily consists of cinnamon fern, netted chain-fern, false nettle, and soft rush. Non-tidal freshwater marsh within this community is dominated by herbaceous species such as lizard’s tail, duck potato, sedges, smartweed, and soft rush.

4.1.10 Dry Oak-Hickory Forest

The dry oak-hickory forest typically occurs on ridgetops and upper slopes on acidic soils (Schafale and Weakley, 1990). The forest is dominated by white oak, black oak, pignut hickory, and loblolly pine in the canopy, and sourwood, red maple, black gum, and flowering dogwood in the understory. The shrub layer consists of a variety of ericaceous species, including deerberry and high-bush blueberry. The vine layer is dominated by wisteria, muscadine, and poison ivy. The herbaceous layer is sparse with common species including heartleaf and violet.

4.1.11 Dry-Mesic Oak-Hickory Forest

The dry-mesic oak-hickory forest typically occurs on mid-slopes, low ridges, or upland flats on a variety of upland soils (Schafale and Weakley, 1990). The forest is dominated by white oak, northern red oak, pignut hickory, mockernut hickory, yellow poplar, red maple, sweet gum, and loblolly pine in the canopy. The shrub and sapling layer is dominated by sourwood, red maple, flowering dogwood, American holly, and deerberry. The herbaceous layer is sparse with common species consisting of heartleaf and rattlesnake plantain.

4.1.12 Piedmont/Low Mountain Alluvial Forest

The piedmont/low mountain alluvial forest community occurs along river and stream floodplains on various alluvial soils. This community is dominated by red maple, sweet gum, American elm, and sycamore in the canopy. Species present in the sapling and shrub layer include river birch, eastern red cedar, yellow poplar, musclewood, black cherry, sweet gum, black walnut, black gum, redbud, flowering dogwood, green ash, persimmon, shagbark hickory, spicebush, and common greenbrier. The herbaceous and vine layers typically contain more grasses, especially Japanese grass, sedges, Christmas fern, Virginia creeper, and muscadine.

There are wetlands included in this community classified as Headwater Forest using the NCWAM classification. Headwater forest wetlands within the piedmont/low mountain alluvial forest community include tree species such as of swamp chestnut oak, yellow poplar, and American elm. The sapling and shrub layer is dominated by sweet gum, river birch, spicebush, and Chinese privet. Common herbs and vines include Japanese grass, soft rush, sedges, and poison ivy.

4.1.13 Non-Riverine Swamp Forest

Non-riverine swamp forests occur on poorly drained, interstream flats not contiguous with steams or rivers (NCWAM, 2010). The canopy is characterized by black gum and red maple. The understory is sparse to absent with red maple, sweet-pepperbush, and giant cane. Additionally, the herbaceous layer is also sparse and dominated by netted chain fern.

4.1.14 Terrestrial Community Impacts

Terrestrial communities in the study area may be impacted by project construction as a result of grading and paving of portions of the study area. At this time, decisions regarding the final location and design of roadway have not been made. Therefore, community data are presented in the context of total coverage of each type within the study area (Table 4). Once a final alignment and preliminary design have been determined, probable impacts to each community type will be calculated.

Table 4. Coverage of terrestrial communities in the study area.

Community	Coverage (ac)									
	Southern Section Alternative					Eastern Section Alternatives				
	Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
Maintained/Disturbed	1203	986	896	247	510	466	278	51	221	117
Agriculture/Pasture	433	409	254	73	451	282	385	133	172	88
Cutover/Early Successional	133	28	38	-	46	67	24	7	3	6
Pine Plantation	408	423	145	92	44	187	167	86	81	97
Floodplain Pool	-	1	-	-	-	2	<1	1	3	-
Non-Tidal Freshwater Marsh	42	43	12	13	12	-	-	2	-	-
Basic Mesic Forest	6	78	9	-	-	31	6	20	-	15
Mesic Mixed Hardwood Forest	446	573	208	183	125	284	195	70	133	76
Piedmont/Mountain Bottomland Forest	336	3	146	40	60	147	51	9	16	4
Dry Oak-Hickory Forest	8	151	54	54	38	132	8	27	6	13
Dry-Mesic Oak-Hickory Forest	616	294	387	135	203	207	146	71	86	65
Piedmont/Low Mountain Alluvial Forest	42	33	36	24	56	50	63	61	81	19
Non-Riverine Swamp Forest	-	-	<1	-	-	-	-	-	-	-
Total[1,2]	**3673**	**3022**	**2186**	**861**	**1545**	**1855**	**1324**	**538**	**802**	**500**

[1] - Impervious areas were not calculated
[2] - Open water accounts for 195 acres

4.2 Terrestrial Wildlife

Terrestrial communities in the study area are comprised of both natural and disturbed habitats that may support a diversity of wildlife species (those species actually observed are indicated with *). Mammal species that commonly exploit forested habitats and stream corridors found within the study area include species such as eastern cottontail*, raccoon, white-footed mouse, gray squirrel*, Virginia opossum*, bobcat*, beaver*, gray fox*, woodchuck, striped skunk*, coyote*, and white-tailed deer*. Birds that commonly use forest and forest edge habitats include the American crow*, blue jay*, Carolina chickadee*, northern cardinal*, Carolina wren*, northern flicker, downy woodpecker, tufted titmouse*, mourning dove*, northern bobwhite, barred owl*, Cooper's hawk, red-shouldered hawk, American robin*, American woodcock, northern mockingbird*, red-bellied woodpecker*, white-breasted nuthatch, wild turkey*, wood thrush, and yellow-rumped warbler. Birds that may use the open habitat or water bodies within the study area include eastern bluebird*, red-tailed hawk*, mallard*, great blue heron*, wood duck*, Canada goose*, red-winged blackbird, and turkey vulture*. Reptile and amphibian species that may use terrestrial communities located in the study area include the green tree frog*, eastern box turtle*, eastern fence lizard*, five-lined skink*, black racer*, brown water snake*, copperhead*, eastern king snake, rat snake*, rough green snake*, and spring peeper*.

4.3 Aquatic Communities

Aquatic communities in the study area consist of a multitude of piedmont streams ranging from small ephemeral channels to the Neuse River, as well as still water ponds. Perennial streams in the study area could support banded water snake, eastern mosquito-fish, redear sunfish, pumpkinseed sunfish, warmouth, and redbreast sunfish. Intermittent streams in the study area are relatively small in size and would support aquatic communities of crayfish and various benthic macroinvertebrates. Pond habitats could support bluegill, bullhead catfish, bullfrog*, snapping turtle*, yellowbelly slider*, and southern toad.

4.4 Invasive Species

Fifteen species from the NCDOT Invasive Exotic Plant List for North Carolina were found to occur in the study area. The species identified were English ivy (Moderate Threat), Chinese privet (Threat), kudzu (Threat), Japanese grass (Threat), multiflora rose (Threat), tree-of-heaven (Threat), hydrilla (Threat), Johnson grass (Moderate Threat), mimosa (Moderate Threat), shrub lespedeza (Moderate Threat), wisteria (Moderate Threat), golden bamboo (Moderate Threat), Chinaberry (Watch List), Japanese honeysuckle (Moderate Threat), and autumn olive (Moderate Threat). NCDOT will manage invasive plant species as appropriate.

5.0 JURISDICTIONAL ISSUES

5.1 Clean Water Act Waters of the U.S.

Four hundred forty-five (445) jurisdictional streams were identified in the study area (Table 3a, Appendix G). The locations of these streams are shown on Figures 3-1 through 3-95. All streams in the study area are within Neuse River and Cape Fear River basins (USGS Hydrologic Units 03020201 and 03030004). USACE and NCDWQ stream delineation forms are included in Appendix C. The physical characteristics and water quality designations of each jurisdictional stream are detailed in Section 3.2 and Table 3a Appendix G. All jurisdictional streams in the study area have been designated as warm water streams for the purposes of stream mitigation.

One hundred five (105) jurisdictional ponds were identified in the project study area (Table 3b, Appendix G). Seventy seven (77) total ponds within the project study area are subject to Neuse River Buffer Rules. Pond size and characteristics are noted in Table 3b, located within Appendix G. All ponds within the study area, except for one, are located within Neuse River basin (USGS Hydrologic Units 03020201); Pond "PA" is located in the Cape Fear River basin (USGS Hydrologic Units 03030004).

Five hundred forty three (543) jurisdictional wetlands were identified within the study area (Figures 3-1 through 3-95). Wetland classification, quality rating data, and natural community type are presented in Table 6 (Appendix G). All wetlands in the study area are within Neuse River and Cape Fear River basins (USGS Hydrologic Units 03020201 and 03030004). USACE wetland delineation forms and NCDWQ wetland rating forms for each site are included in Appendix C. Descriptions of the terrestrial communities are presented in Section 4.1.

Additionally, it is important to note that the Underhill Mitigation Site is located within the Orange (A) corridor which affects all alternatives currently under consideration. This site was developed to mitigate for impacts associated with Section B of the Northern Wake Expressway (R-2000B).

5.2 Clean Water Act Permits

The proposed project has been designated as an EIS for the purposes of NEPA documentation. Due to the size of the project and potential impacts an Individual Permit (IP) is anticipated. The USACE holds the final discretion as to what permit will be required to authorize project construction. If a Section 404 permit is required then a Section 401 Water Quality Certification (WQC) from the NCDWR will be needed. Additionally, it was determined through coordination with the US Coast Guard (Appendix F) that there are no waters within the project study area that are subject to the Coast Guard Authorization Act; therefore no bridge crossings, including the one over the Neuse River will require a Coast Guard Bridge Permit.

5.3 Coastal Area Management Act Areas of Environmental Concern

The project study area is not in a Coastal Area Management Act (CAMA) county and therefore this project will not require a CAMA permit.

5.4 Construction Moratoria

The reach of the Neuse River within the project study area has been identified as a NC Wildlife Resources Commission (NCWRC) anadromous fish spawning area (AFSA) and a Primary Nursery Area (PNA). As a result, a construction moratorium will be in effect from February 15 through September 30.

5.5 N.C. River Basin Buffer Rules

Streamside riparian zones within the Neuse River basin portion of the study area are protected under provisions of the Neuse River Buffer Rules administered by NCDWR. Table 5 indicates which streams are subject to buffer rule protection and Table 3b indicates which ponds are subject to buffer rule protection. Potential impacts to protected buffers will be determined once a final alignment and design have been determined.

5.6 Rivers and Harbors Act Section 10 Navigable Waters

There are no streams in the project study area that have been designated by the USACE as Navigable Waters under Section 10 of the Rivers and Harbors Act.

5.7 Wetland and Stream Mitigation

5.7.1 Avoidance and Minimization of Impacts

A review of the North Carolina Draft 2014 303(d) List indicates that there are no streams within the project study area that are impaired due to sedimentation or turbidity. However, there are several streams in the project study area that are listed on the 303(d) list for reasons others than sedimentation and turbidity. These streams include:

Neuse River (27-(22.5)c) – From Crabtree Creek to Auburn Knightdale Road (PCB Fish Tissue Advisory
Beddingfield Creek (27-37) – From source to Neuse River (Benthos Fair)
Swift Creek (27-43-(1)d) – From Lake Wheeler Dam to a point 0.6 mile upstream of Wake County SR 1006
UT to Swift Creek (Lake Benson) (27-43-(5.5) – From source to Lake Benson (Benthos Fair)
Little Creek (27-43-12) – From source to Swift Creek (Benthos Fair)
Middle Creek (27-43-15-(1)b1 – From 0.8 mile south of US 1 to UT on west of creek 3.0 miles downstream (Benthos Fair)
Middle Creek (27-4315-(4)a1) – From dam at Sunset Lake to small impoundment upstream of US 401 (Fish Community Poor)
Terrible Creek (27-43-15-8-(2)) – From dam at Johnsons Pond To Middle Creek

These streams are listed as impaired, however since none of the impairments are related to sedimentation or turbidity Design Standards for Sensitive Watersheds are not required to be implemented during project construction for these streams or their tributaries. Riparian buffers will be required along all jurisdictional streams, ponds, and beaver impoundments subject to Neuse River Buffer Rules.

The NCDOT will attempt to avoid and minimize impacts to streams and wetlands to the greatest extent practicable in choosing a preferred alternative and during project design. At this time, no final decisions have been made with regard to the location or design of the preferred alternative.

5.7.2 Compensatory Mitigation of Impacts

Potential on-site stream and wetland mitigation opportunities will be investigated once a final decision has been rendered on the location of the preferred alternative. If on-site mitigation is not feasible, mitigation will be provided by North Carolina Department of Environment and Natural Resources (NCDENR) Ecosystem Enhancement Program (EEP).

5.8 Endangered Species Act Protected Species

As of January 22, 2014, the United States Fish and Wildlife (USFWS) lists three federally protected species for Wake County and four federally protected species for Johnston County (Table 7). A brief description of each species' habitat requirements follows, along with the Biological Conclusion rendered based on survey results in the study area. Habitat requirements for each species are based on the current best available information from referenced literature and/or USFWS.

Table 7. Federally protected species listed for Wake and Johnston Counties.

Scientific Name	Common Name	County	Federal Status	Habitat Present	Biological Conclusion
Picoides borealis	Red-cockaded woodpecker	Wake/ Johnston	E	No	No Effect
Alasmidonta heterodon	Dwarf wedgemussel	Wake/ Johnston	E	Yes	LAA
Elliptio steinstansana	Tar River spinymussel	Johnston	E	Yes	MA - NLAA
Rhus michauxii	Michaux's sumac	Wake/ Johnston	E	Yes	No Effect
Myotis septentrionalis	Northern long-eared bat	Wake	P	Yes	Undetermined

E – Endangered
P - Proposed
LAA – Likely to Adversely Affect
MA - NLAA - May Affect, Not Likely to Adversely Affect

Red-cockaded woodpecker
USFWS Recommended Survey Window: year round; November-early March (optimal)

Habitat Description: The red-cockaded woodpecker (RCW) typically occupies open, mature stands of southern pines, particularly longleaf pine, for foraging and nesting/roosting habitat. The RCW excavates cavities for nesting and roosting in living pine trees, aged 60 years or older, which are contiguous with pine stands at least 30 years of age to provide foraging habitat. The foraging range of the RCW is normally no more than 0.5 mile.

Biological Conclusion: No Effect
Suitable foraging habitat for the red cockaded woodpecker consisting of pine and mixed pine stands greater than 30 years old does exist within the study area. Since foraging habitat was

identified in the study area, half mile nesting surveys were conducted. No RCW trees were observed during these half mile surveys. A review of North Carolina Natural Heritage Program (NCNHP) records, updated April 2014, indicates no known RCW occurrence within 1.0 mile of the study area.

Dwarf wedgemussel
USFWS optimal survey window: year round

Habitat Description: In North Carolina, the dwarf wedgemussel is known from the Neuse and Tar River drainages. The mussel inhabits creek and river areas with a slow to moderate current and sand, gravel, or firm silt bottoms. Water in these areas must be well oxygenated. Stream banks in these areas are generally stable with extensive root systems holding soils in place.

Biological Conclusion: Likely to Adversely Affect
A thorough description of the habitat assessment and survey results for the dwarf wedgemussel is included in Appendix E, along with the rationale for the biological conclusion rendered.

Tar River spinymussel
USFWS Recommended Survey Window: year round

Habitat Description: The Tar River spinymussel is endemic to the Tar and Neuse River drainage basins in North Carolina. This mussel requires a stream with fast flowing, well-oxygenated, circumneutral pH water. The bottom should be composed of unconsolidated gravel and coarse sand. The water needs to be relatively silt-free, and stream banks should be stable, typically with many roots from adjacent riparian trees and shrubs.

Biological Conclusion: May Affect – Not Likely to Adversely Affect
A thorough description of the habitat assessment and survey results for the Tar River spinymussel is included in Appendix E, along with the rationale for the biological conclusion rendered.

Michaux's sumac
USFWS optimal survey window: May-October

Habitat Description: Michaux's sumac, endemic to the inner Coastal Plain and lower Piedmont, grows in sandy or rocky, open, upland woods on acidic or circumneutral, well-drained sands or sandy loam soils with low cation exchange capacities. The species is also found on sandy or submesic loamy swales and depressions in the fall line Sandhills region as well as in openings along the rim of Carolina bays; maintained railroad, roadside, power line, and utility rights-of-way; areas where forest canopies have been opened up by blow-downs and/or storm damage; small wildlife food plots; abandoned building sites; under sparse to moderately dense pine or pine/hardwood canopies; and in and along edges of other artificially maintained clearings undergoing natural succession. In the central Piedmont, it occurs on clayey soils derived from mafic rocks. The plant is shade intolerant and, therefore, grows best where disturbance (*e.g.*, mowing, clearing, grazing, periodic fire) maintains its open habitat.

Biological Conclusion: No Effect
Suitable habitat for Michaux's sumac is present in the study area along roadside shoulders, agricultural field edges, and utility easements. Surveys were conducted by Mulkey biologists throughout areas of suitable habitat within the optimal survey window in 2013. No individuals of Michaux's sumac were observed. A review of NCNHP records, updated April 2014, indicates one known occurrences within 1.0 mile of the study area.

Northern long-eared bat
A USFWS proposal for listing the Northern Long-eared Bat (*Myotis septentrionalis*) as an Endangered species was published in the Federal Register in October 2013. The listing will become effective on or before April, 2015. Furthermore, this species is included in USFWS's current list of protected species for Wake County. NCDOT is working closely with the USFWS to understand how this proposed listing may impact NCDOT projects. NCDOT will continue to coordinate appropriately with USFWS to determine if this project will incur potential effects to the Northern long-eared bat, and how to address these potential effects, if necessary.

5.9 Bald Eagle and Golden Eagle Protection Act

Habitat for the bald eagle primarily consists of mature forest in proximity to large bodies of open water for foraging. Large dominant trees are utilized for nesting sites, typically within 1.0 mile of open water.

A desktop-GIS assessment of the project study area, as well as the area within a 1.13-mile radius (1.0 mile plus 660 feet) of the project limits, was performed on June 30, 2014 using 2010 color aerials. The Neuse River and Lake Benson are the only water bodies large enough or sufficiently open to be considered a potential feeding source. A survey of the area within 660 feet of the project limits was conducted and no nests were observed. Also, during project-wide natural resource investigations biologists did not note the presence of nests or eagles. However, a review of the NCNHP database updated April 2014 revealed one known occurrence of this species within 1.0 mile of the project study area. Due to minimal habitat and minimal impact anticipated for this project, it has been determined that this project will not affect this species.

5.10 Endangered Species Act Candidate Species

As of January 22, 2014 the USFWS lists no Candidate species for Wake or Johnston Counties.

5.11 Essential Fish Habitat

The National Marine Fisheries Service (NMFS) has not identified any streams within the project study area as an Essential Fish Habitat.

6.0 REFERENCES

Catena Group, The. Freshwater Mussel Report, Triangle Expressway Southeast Extension, 2011. Unpublished.

Conant, R. and J.T. Collins. 1991. A Field Guide to Reptiles and Amphibians (Eastern and Central North America). 3rd ed. Boston: Houghton Mifflin. 450 pp.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service. U.S. Government Printing Office, Washington D.C.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U. S. Army Engineer Waterways Experiment Station. Vicksburg, Mississippi.

Environmental Laboratory. 1992. Clarification and Interpretation of the 1987 Manual, memorandum from Major General Arthur E. Williams.

Martof, B.S., W.M. Palmer, J.R. Bailey, and J.R. Harrison III. 1980. Amphibians and Reptiles of the Carolinas and Virginia. Chapel Hill: The University of North Carolina Press. 264 pp.

National Geographic. 1999. Field Guide to the Birds of North America. 3rd ed. Washington, D.C. National Geographic Society.

NatureServe. 2010. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: December 14, 2010)

North Carolina Department of Environment and Natural Resources, Division of Water Quality. 1995. Guidance for Rating the Values of Wetlands in North Carolina. Fourth version.

North Carolina Department of Environment and Natural Resource, Division of Water Quality. 1999. Internal Guidance Manual - North Carolina. Division of Water Quality Stream Classification Method.

North Carolina Department of Environment and Natural Resources, Division of Water Quality. 2003. Surface Waters and Wetland Standards. 15 NCAC 02B. 0100 & .0200.

North Carolina Department of Environment and Natural Resources, Division of Water Quality. 2009. Neuse River Basinwide Water Quality Plan http://h2o.enr.state.nc.us/basinwide/Neuse/2008/documents/NRBasinwidePlan-Final.pdf

North Carolina Department of Environment and Natural Resources, Division of Water Quality. 2010a. North Carolina Wetland Assessment Method (NC WAM). Version 4.1.

North Carolina Department of Environment and Natural Resources, Division of Water Quality. 2010b. Basinwide Information Management System: Water Body Reports. http://h2o.enr.state.nc.us/bims/Reports/reportsWB.htm

North Carolina Department of Environment and Natural Resources, Division Water Resources. 2012. Water Quality Assessment – 303(d) List (2012 Final Category 5 Water Quality Assessments - 303(d) List. http://portal.ncdenr.org/c/document_library/get_file?uuid=9d45b3b4-d066-4619-82e6-ea8ea0e01930&groupId=38364

North Carolina Department of Environment and Natural Resources, Division of Water Quality. 2011a. North Carolina Waterbodies Report, Neuse River Basin. Raleigh, North Carolina. http://h2o.enr.state.nc.us/bims/reports/basinsandwaterbodies/hydroNeuse.pdf

North Carolina Department of Environment and Natural Resources, Division of Water Quality. 2011b. North Carolina Waterbodies Report, Cape Fear River Basin. Raleigh, North Carolina. http://h2o.enr.state.nc.us/bims/reports/basinsandwaterbodies/hydroCapeFear.pdf

North Carolina Department of Transportation. 1997 . Best Management Practices for Protection of Surface Waters.

North Carolina Department of Transportation. 2008. Invasive Exotic Plant List for North Carolina.

North Carolina Natural Heritage Program. 2001. Guide to Federally Listed Endangered and Threatened Species of North Carolina. Raleigh, NC. 134 pp.

North Carolina Natural Heritage Program. 2014. Biotics Database. Department of Environmental and Natural Resources, Raleigh, North Carolina. (Accessed: June 23, 2014).

N.C. Natural Heritage Program. 2012. Natural Heritage Program List of the Rare Animal Species of North Carolina: Revised March 25, 2013. Office of Conservation and Community Affairs. Raleigh.

N.C. Natural Heritage Program. 2012. List of Rare Plant Species of North Carolina, Natural Heritage Program, Office of Natural Resource Planning and Conservation. Edited by Laura E. Gadd. Revised February 27, 2013

North Carolina Natural Heritage Program. Tar Spinymussel: http://www.ncnhp.org/Images/65.pdf. (Accessed: October 20, 2010).

North Carolina Wildlife Resources Commission. North Carolina Mussel Atlas: http://www.ncwildlife.org/wildlife_species_con/WSC_Mussel_1.htm. (Accessed: October 20, 2010).

North Carolina Wildlife Resources Commission. North Carolina Mussel Atlas: http://www.ncwildlife.org/wildlife_species_con/WSC_Mussel_3.htm. (Accessed: February 14, 2008).

Newcomb, L. 1977. Newcomb's Wildflower Guide. Boston: Little, Brown and Company. 490 pp.

Radford, A.E., H.E. Ahles, and C.R. Bell. 1968. Manual of the Vascular Flora of the Carolinas. Chapel Hill: University of North Carolina Press. 1183 pp.

Rohde, F.C., R.G. Arndt, D.G. Lindquist, and J.F. Parnell. 1994. Freshwater Fishes of the Carolinas, Virginia, Maryland, and Delaware. Chapel Hill: The University of North Carolina Press. 222 pp.

Schafale, M.P. and A.S. Weakley. 1990. Classification of the Natural Communities of North Carolina: Third Approximation. North Carolina Natural Heritage Program, Division of Parks and Recreation, NCDEHNR. Raleigh, North Carolina. 325 pp.

United States Department of Agriculture, Soil Conservation Service. 1970. Soil Survey of Wake County, North Carolina.

United States Department of Agriculture, Soil Conservation Service. 1994. Soil Survey of Johnston County, North Carolina.

United States Department of Agriculture, Natural Resources Conservation Service. 1998. Hydrologic Units-North Carolina (metadata). Raleigh, North Carolina.

United States Fish and Wildlife Service. 1993. Michaux's Sumac Recovery Plan. Atlanta, Georgia. 30 pp.

United States Fish and Wildlife Service. 1999. National Wetlands Inventory GIS Data Layer. Statewide, North Carolina. Updated 18 May 1999.

United States Fish and Wildlife Service. 2006. Optimal Survey Windows for North Carolina's Federally Threatened and Endangered Plant Species. http://www.fws.gov/nc-es/es/plant_survey.html. (Accessed: February 10, 2010).

United States Fish and Wildlife Service. Region 4: Southeast Region, North Carolina Ecological Services. 2014a. Endangered Species, Threatened Species, Federal Species of Concern, and Candidate Species: Johnston County, North Carolina. Updated 27 December 2012. http://www.fws.gov/raleigh/species/cntylist/johnston.html

United States Fish and Wildlife Service. Region 4: Southeast Region, North Carolina Ecological Services. 2014 b. Endangered Species, Threatened Species, Federal Species of Concern, and Candidate Species: Wake County, North Carolina. Updated 22 January 2014. http://www.fws.gov/raleigh/species/cntylist/wake.html

United States Fish and Wildlife Service. Dwarf wedgemussel fact sheet. http://www.fws.gov/asheville/htmls/listedspecies/dwarf_wedgemussel.html. (Accessed: October 20, 2010).

United States Fish and Wildlife Service. Michaux's Sumac in North Carolina. http://www.fws.gov/nc-es/plant/michsumac.html. (Accessed: December 14, 2010).

United States Fish and Wildlife Service. Red-cockaded Woodpecker (Picoides borealis). http://www.fws.gov/rcwrecovery/rcw.html. (Accessed: October 18, 2010).

United States Fish and Wildlife Service. Tar spinymussel fact sheet. http://www.fws.gov/asheville/htmls/listedspecies/Tar_spinymussel.html. (Accessed: October 20, 2010).

United States Geological Survey. 1981. Angier, North Carolina, Topographic Quadrangle (7.5-minute series). Reston: 1 sheet.

United States Geological Survey. 1987a. Garner, North Carolina, Topographic Quadrangle (7.5-minute series). Reston: 1 sheet.

United States Geological Survey. 1987b. Lake Wheeler, North Carolina, Topographic Quadrangle (7.5-minute series). Reston: 1 sheet.

United States Geological Survey. 1987c. Raleigh East, North Carolina, Topographic Quadrangle (7.5-minute series). Reston: 1 sheet.

United States Geological Survey. 1988a. Apex, North Carolina, Topographic Quadrangle (7.5-minute series). Reston: 1 sheet.

United States Geological Survey. 1988b. Edmondson, North, North Carolina, Topographic Quadrangle (7.5-minute series). Reston: 1 sheet.

United States Geological Survey. 1988c. Knightdale, North Carolina, Topographic Quadrangle (7.5-minute series). Reston: 1 sheet.

Weakley, Alan S. 2011. Flora of the Southern and Mid-Atlantic States (May 2011 version). University of North Carolina Herbarium, North Carolina Botanical Garden, UNC Chapel Hill. http://herbarium.unc.edu/FloraArchives/WeakleyFlora_2011-May-nav.pdf

Webster, W.D., J.F. Parnell, and W.C. Biggs. 1985. Mammals of the Carolinas, Virginia, and Maryland. Chapel Hill, The University of North Carolina Press. 255 pp.

Appendix A

Figures

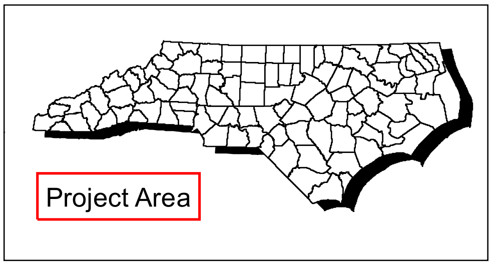
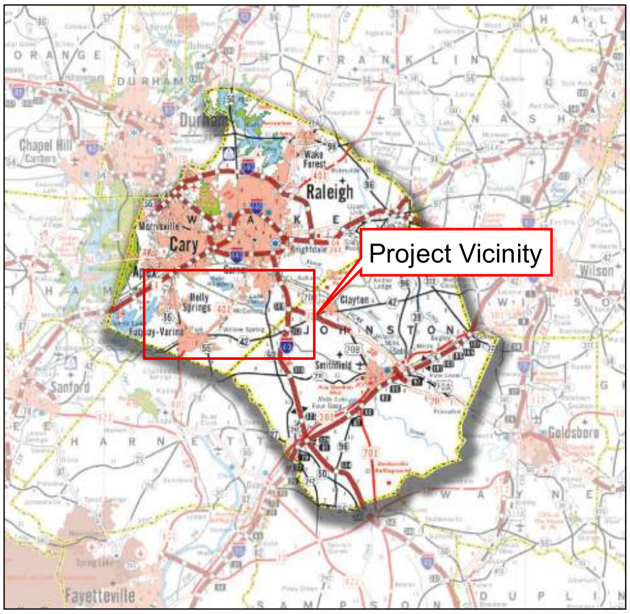


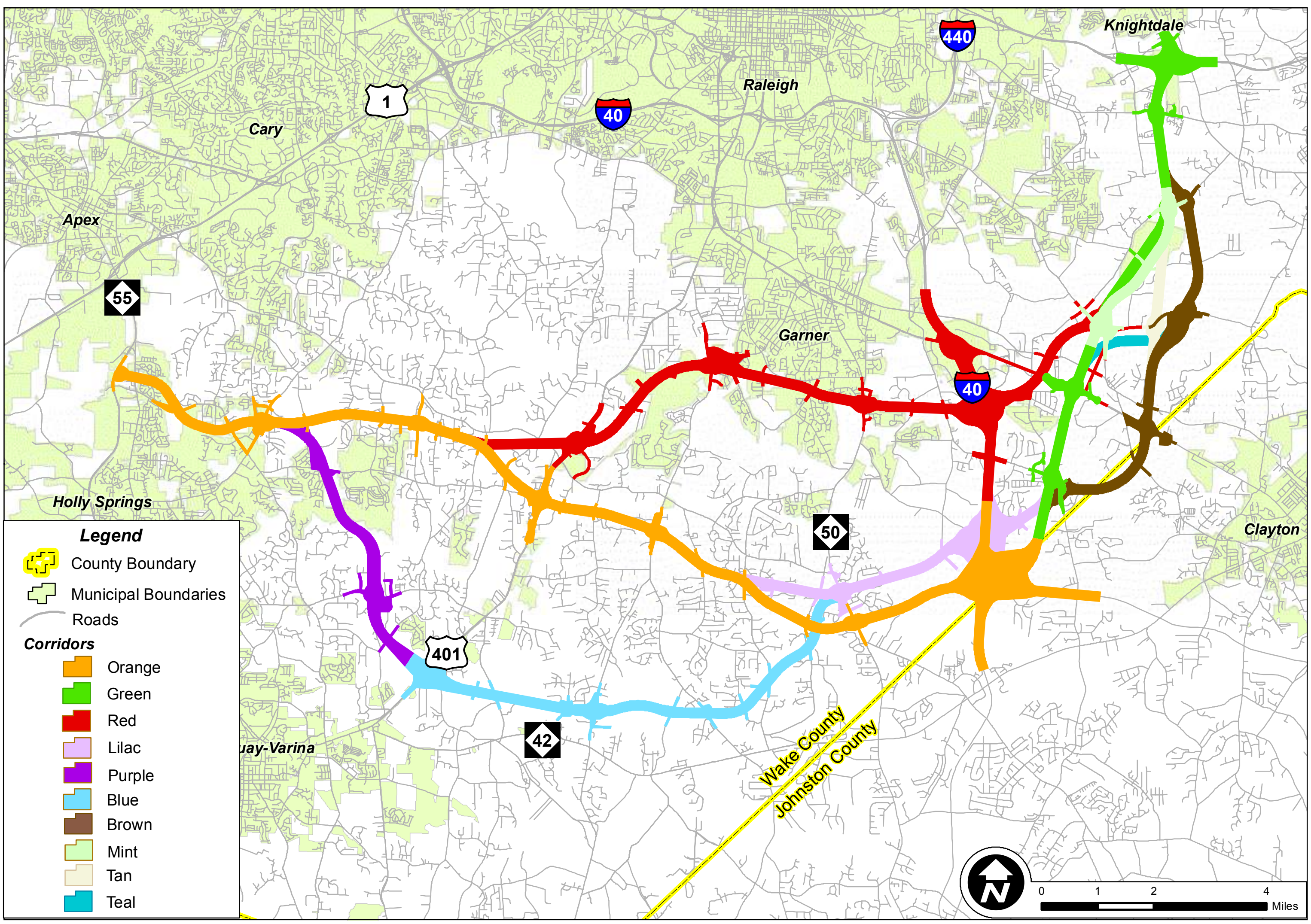
Figure 1

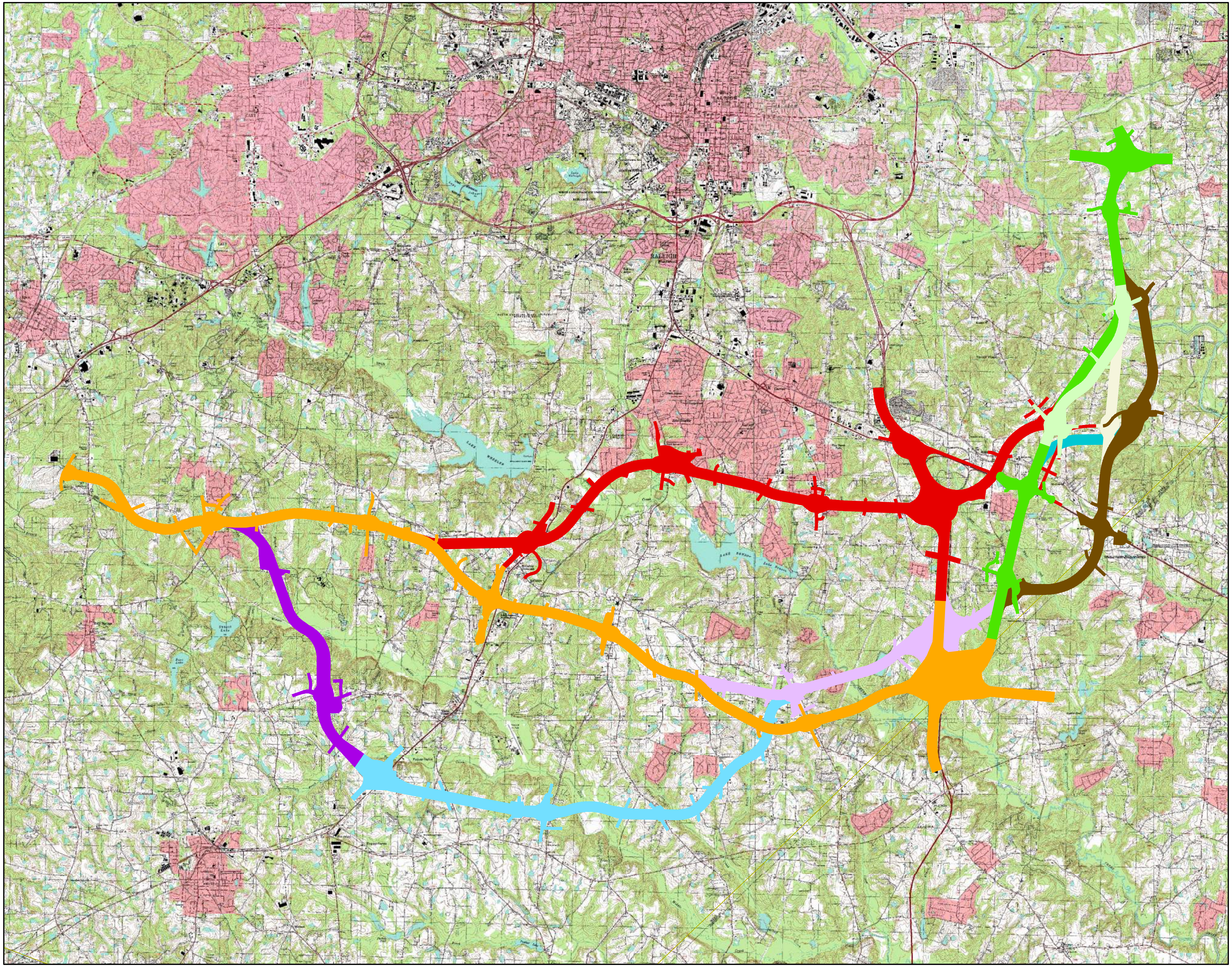
Project Vicinity

Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, North Carolina







Legend

County Boundary

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Project Study Area

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

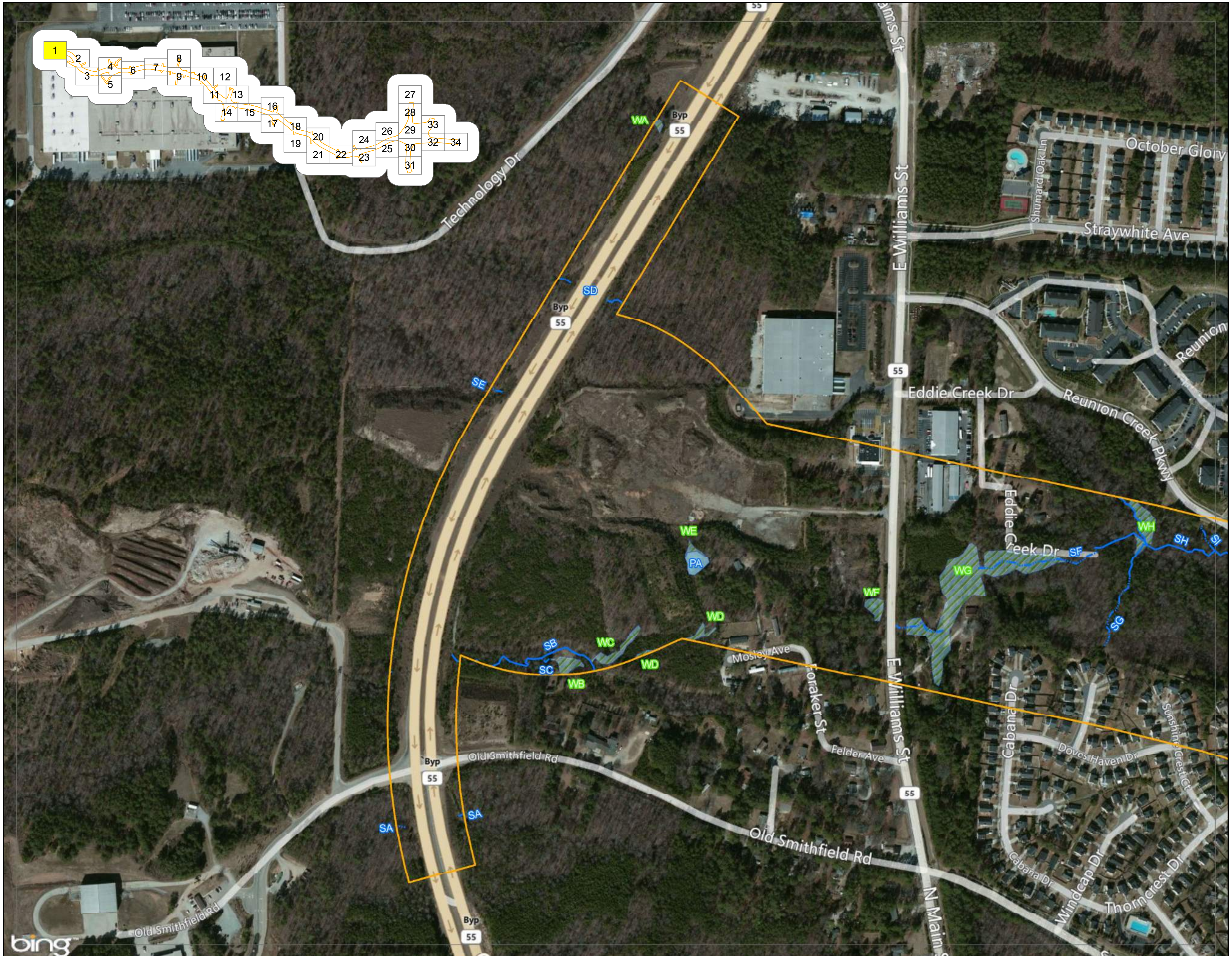
Wake and Johnston Counties, NC

0 4,200 8,400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 06/18/2014

N

Figure 2



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

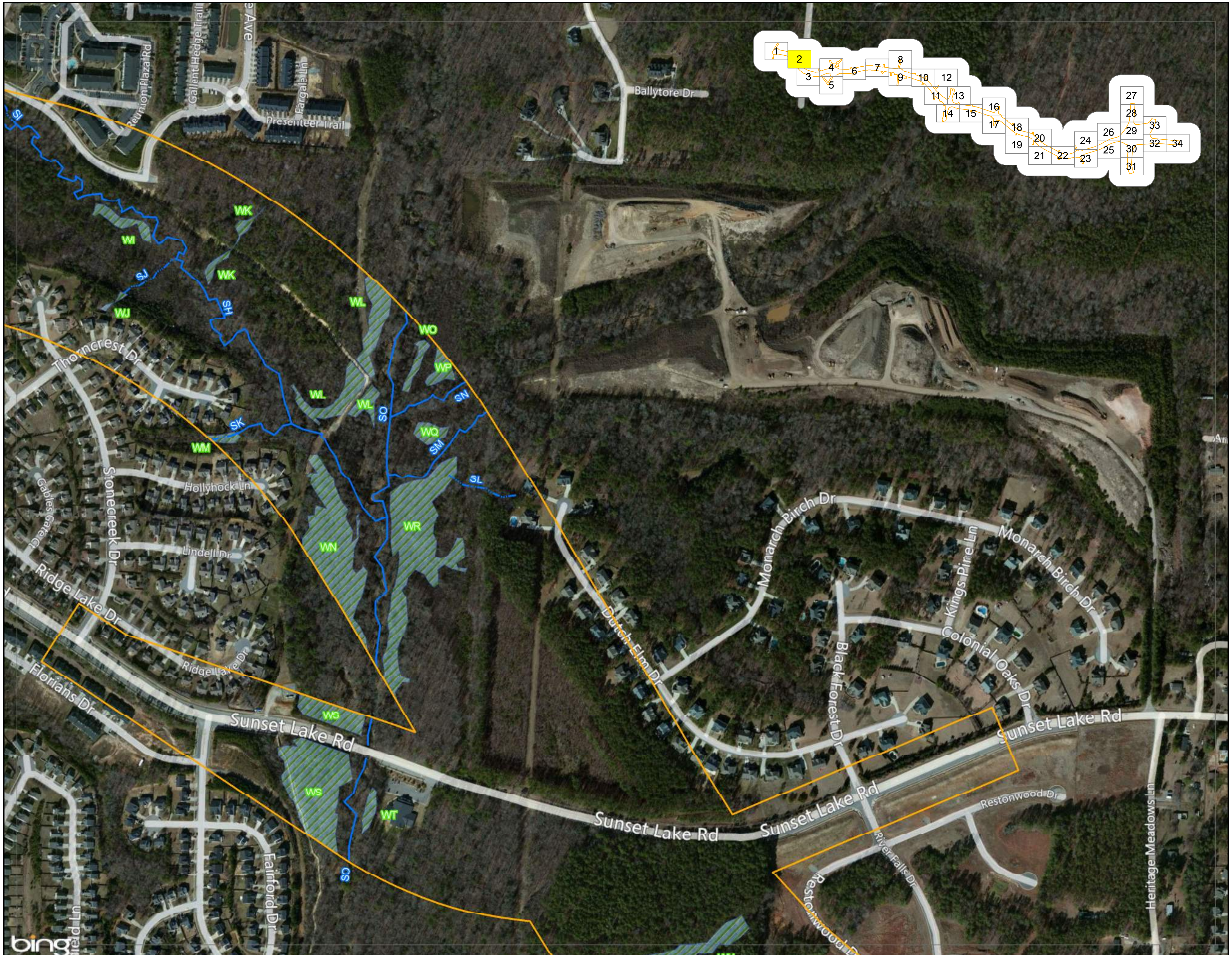
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-1



Legend

Map Grid

Roads

County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

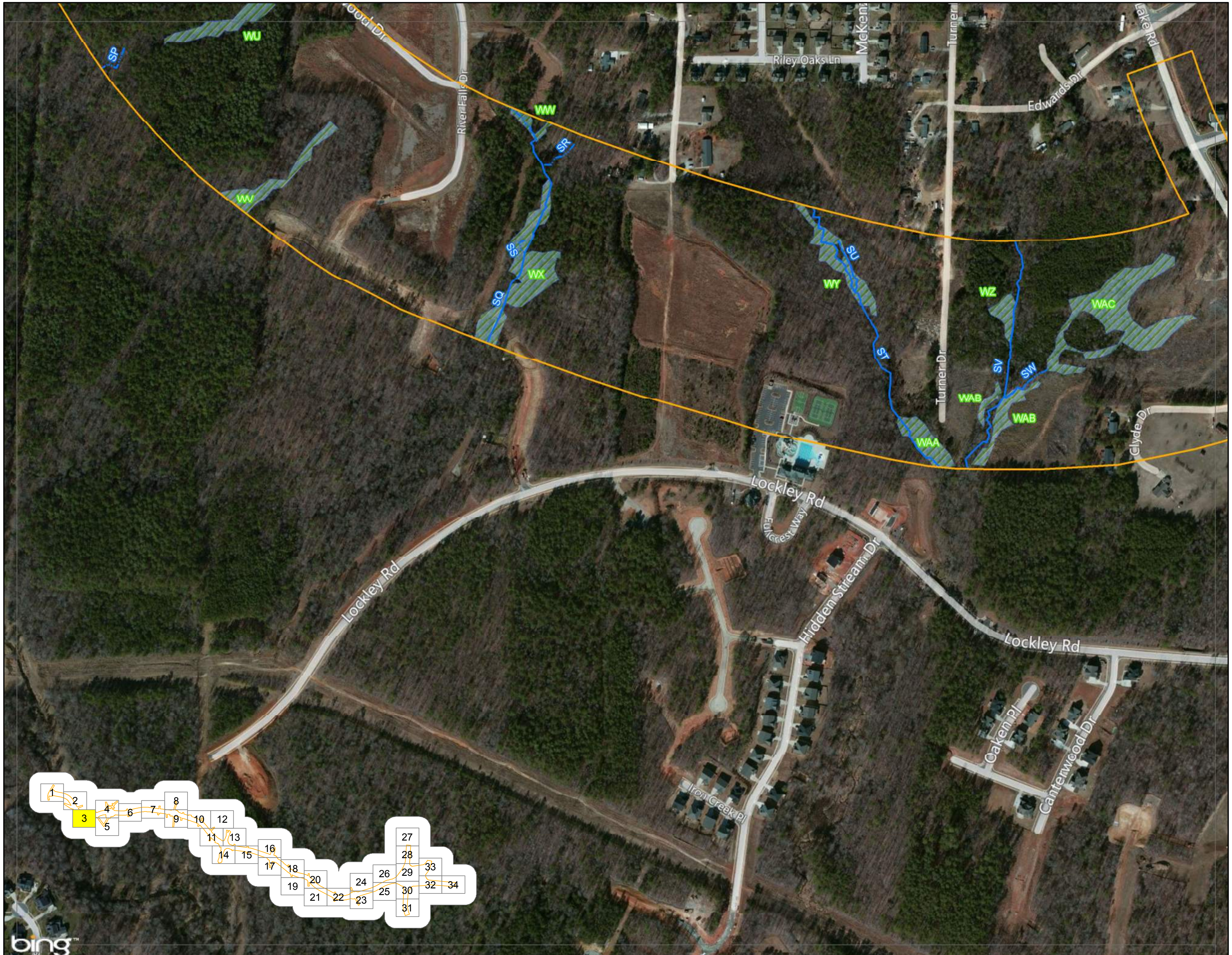
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-2



Legend

Map Grid

Roads

County Boundary

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

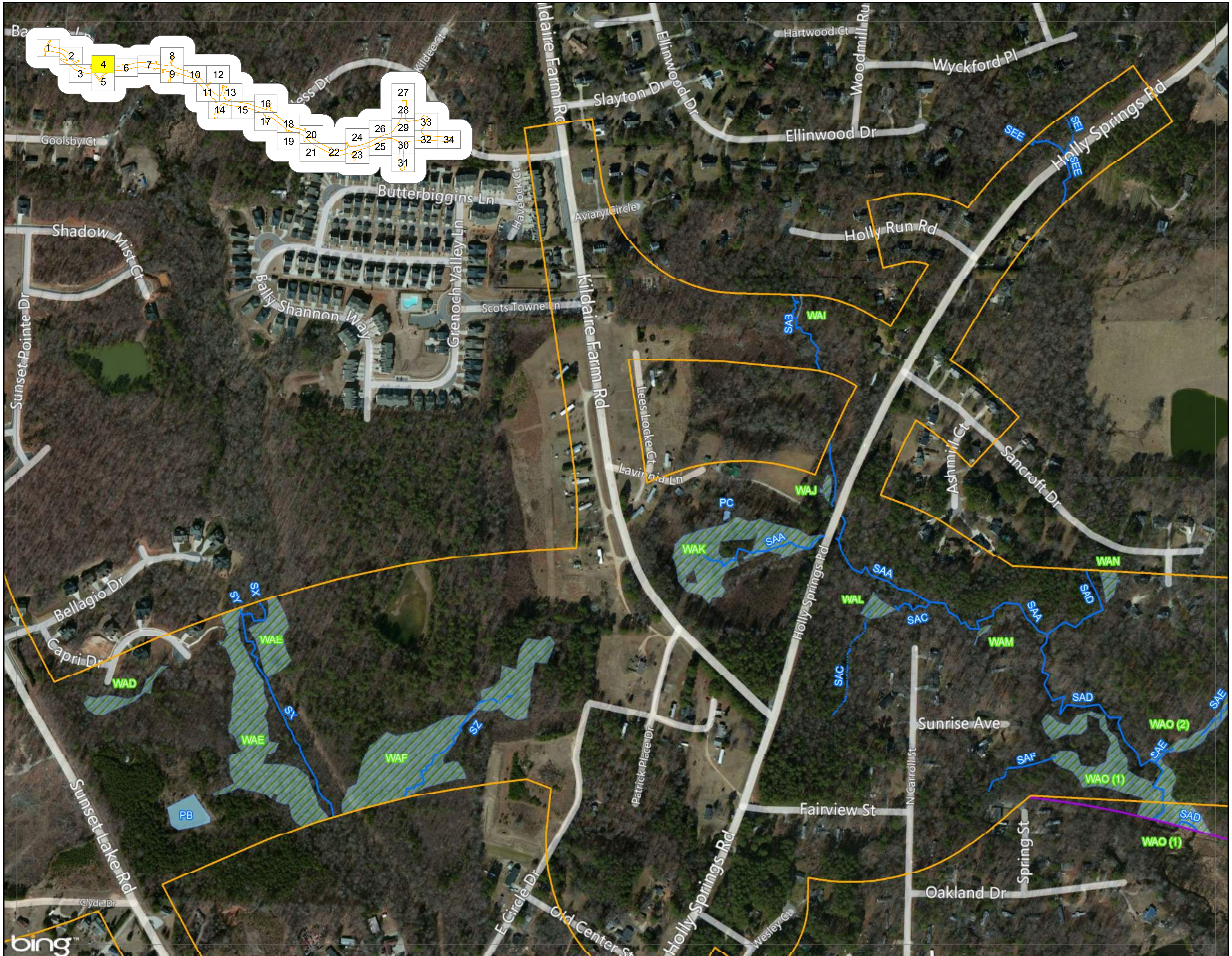
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-3



Legend

- Map Grid
- Roads
- County Boundary

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Jurisdictional Features

- Wetlands
- Beaver Impoundment
- Ponds
- Streams - Intermittent
- Streams - Perennial
- Streams - Ephemeral

Jurisdictional Features

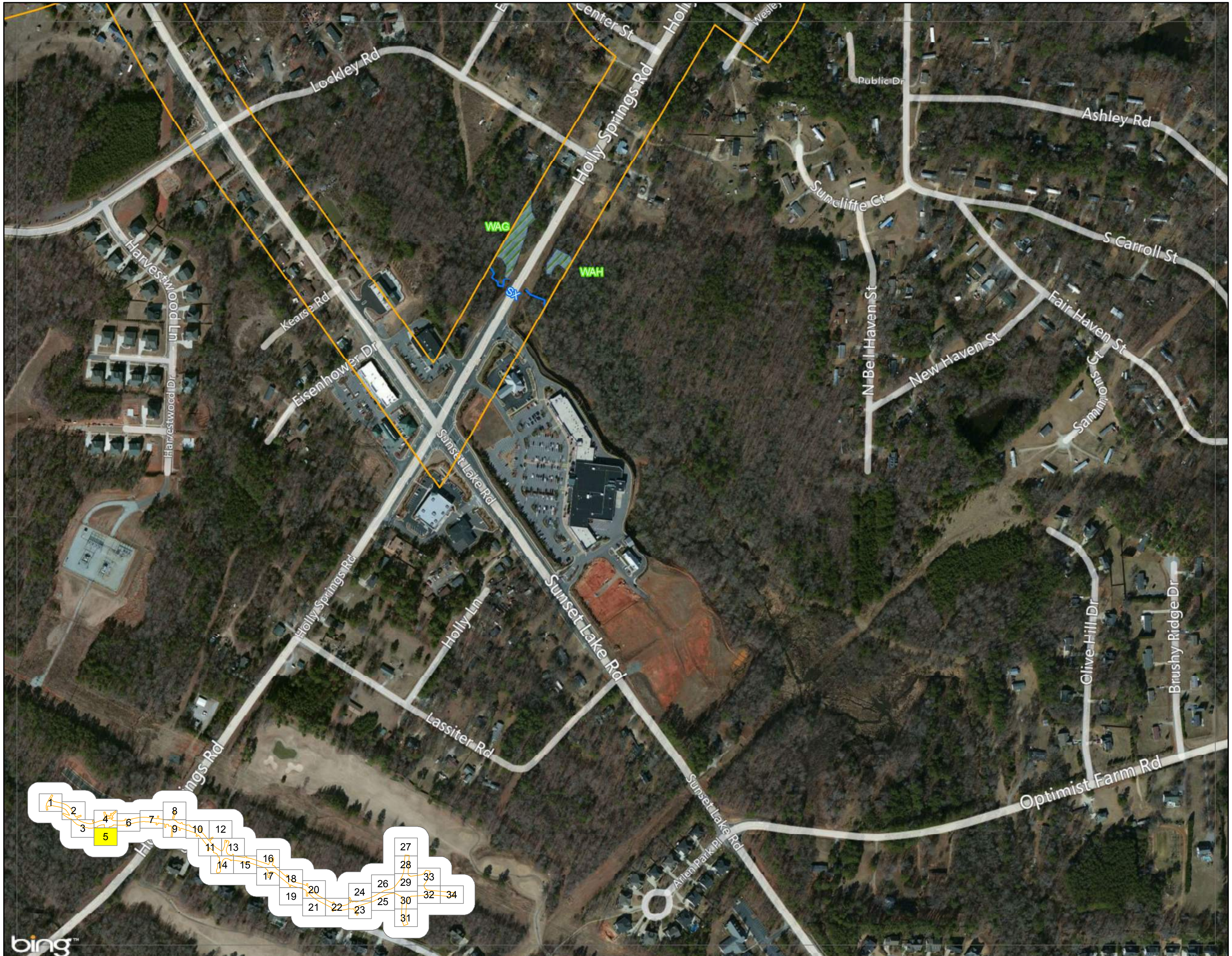
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-4



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

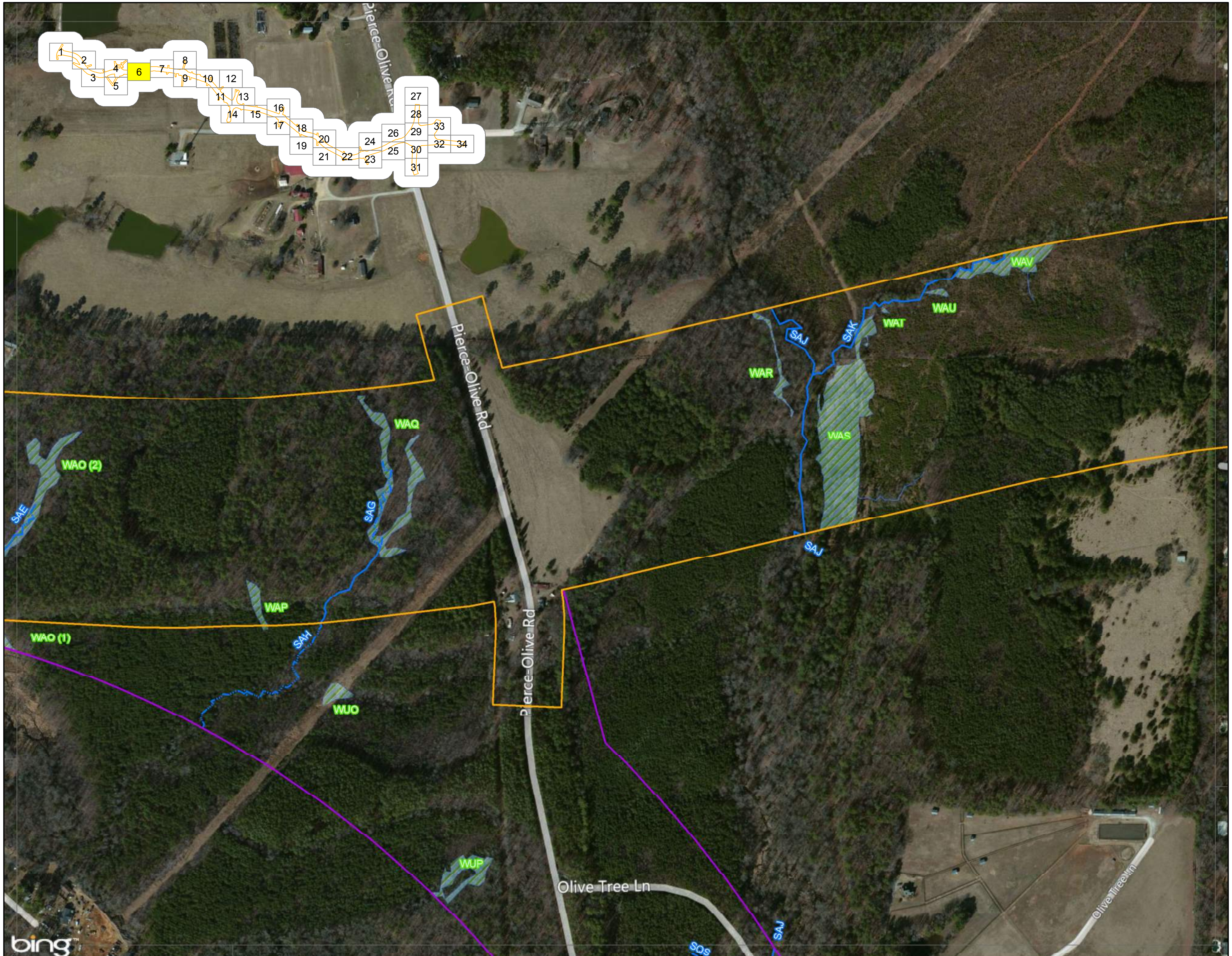
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-5



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

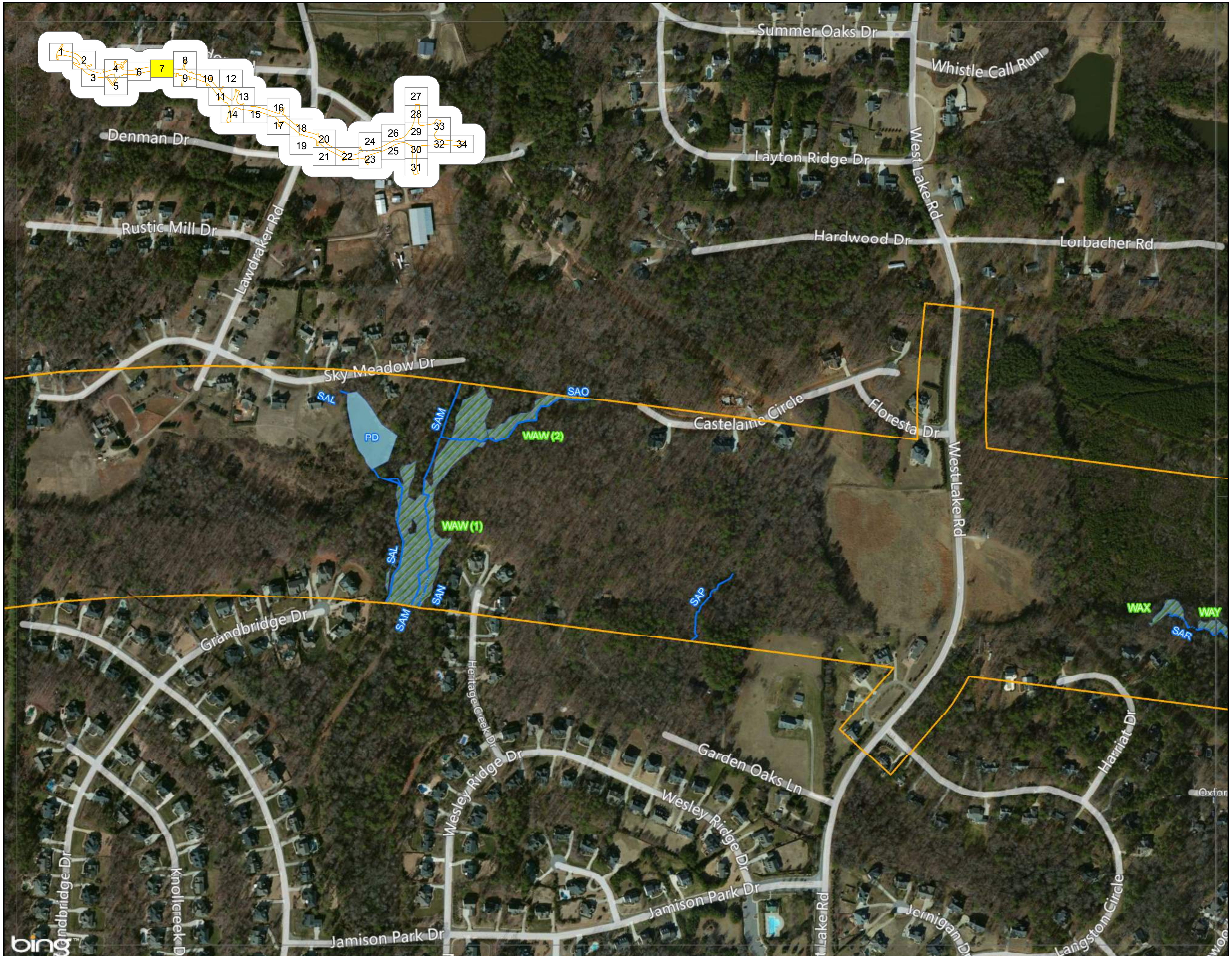
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-6



Legend

Map Grid
Roads
County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

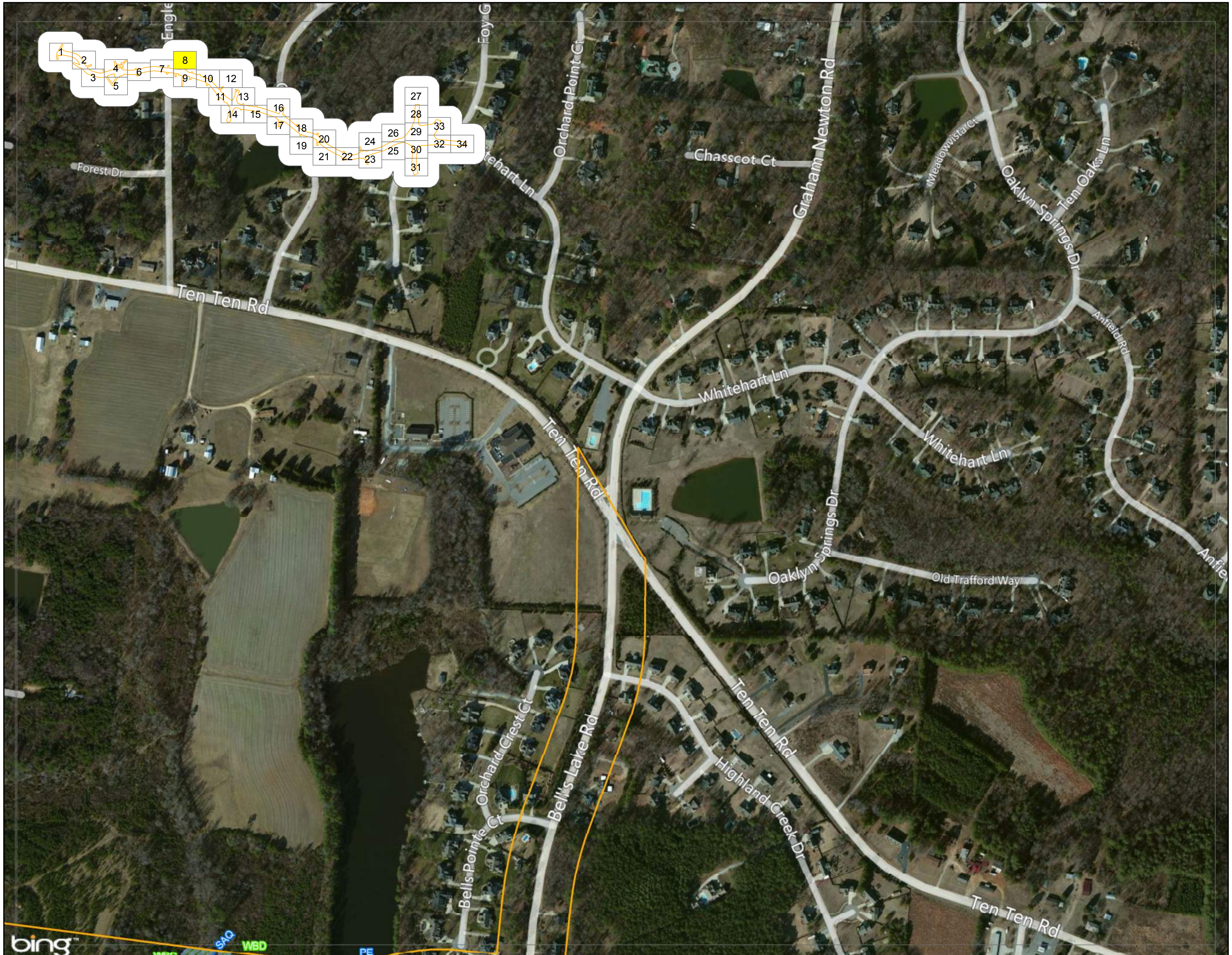
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-7



Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

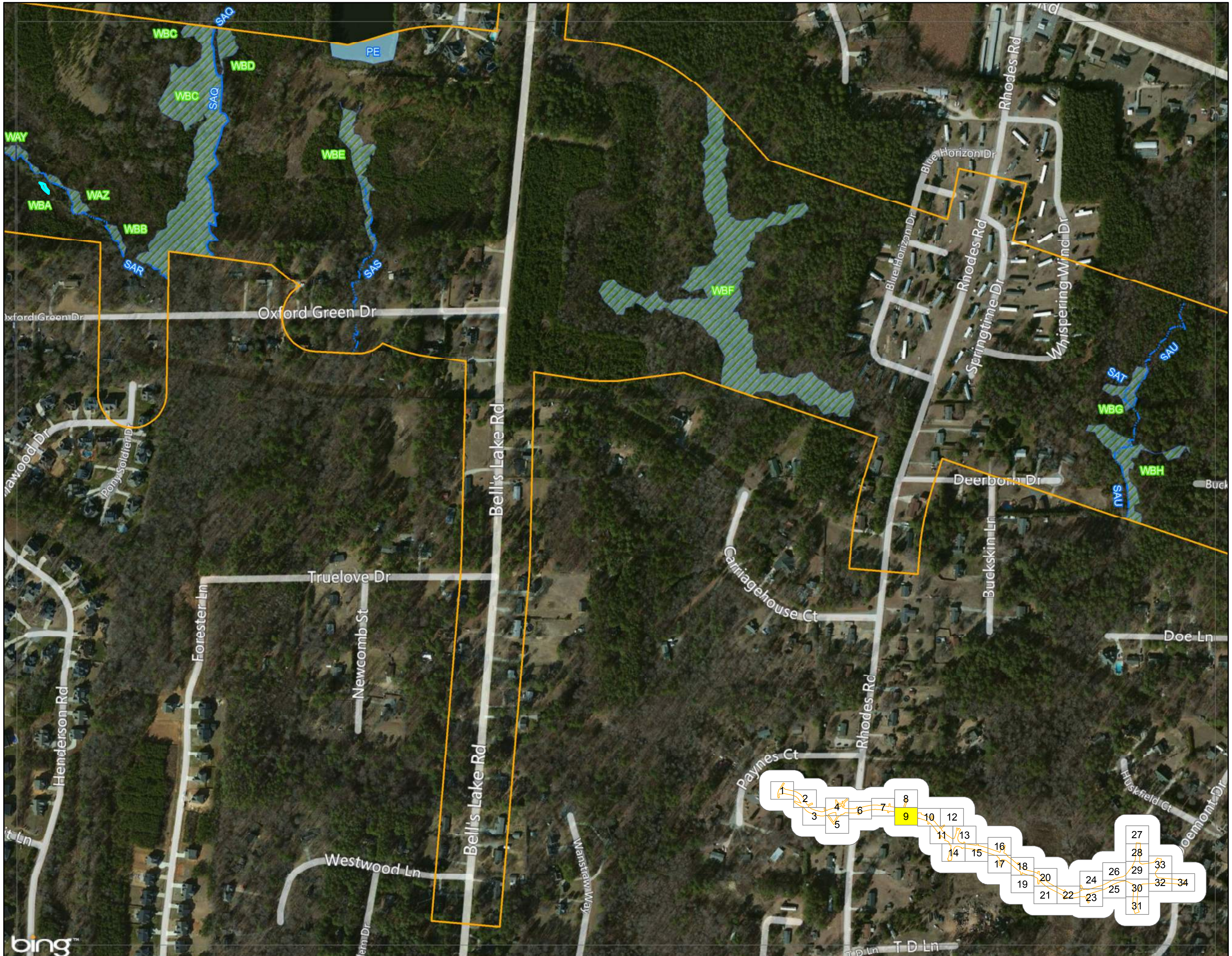
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-8



Legend

Map Grid
Roads
County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-9

Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

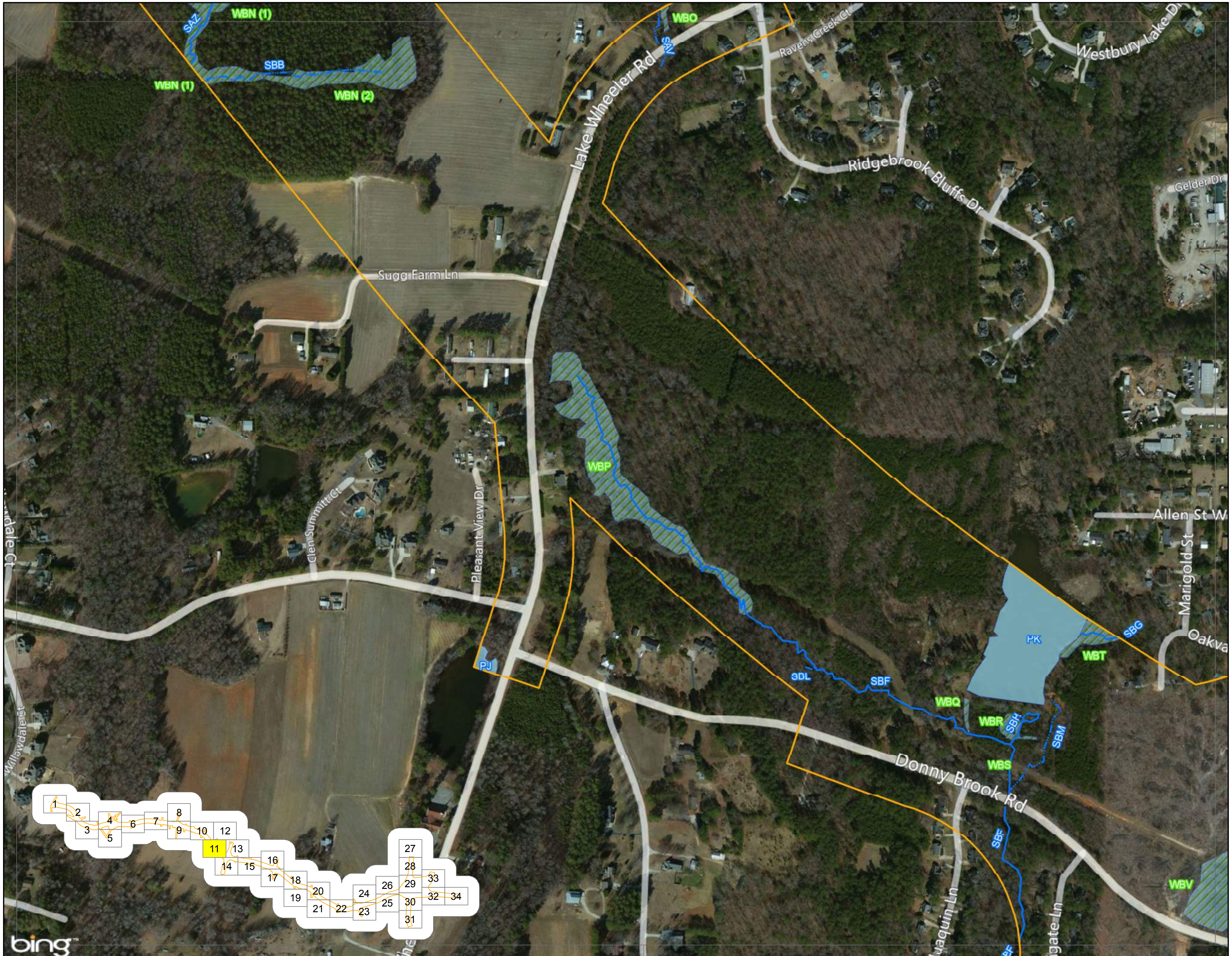
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-10



Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

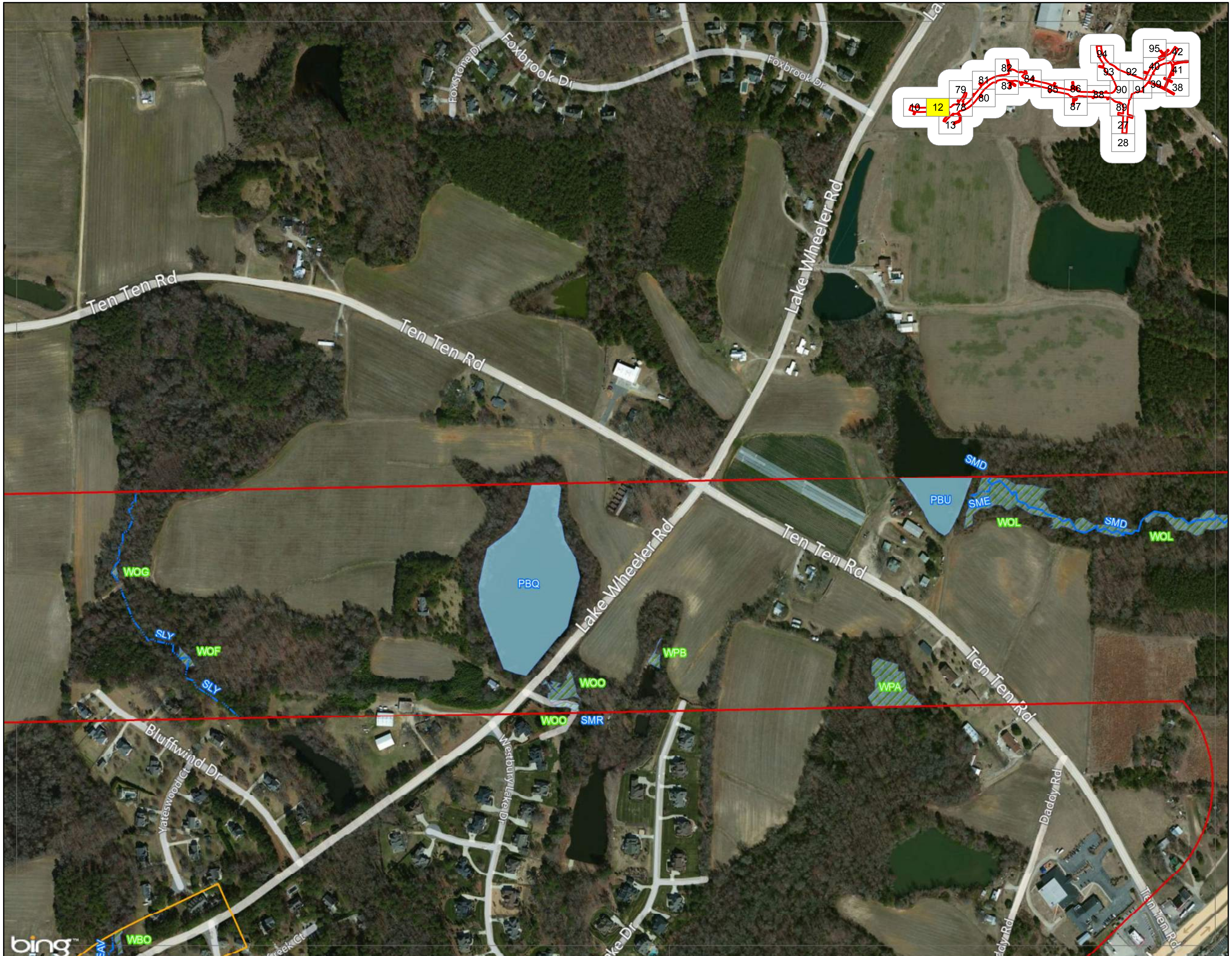
Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-11



Legend

Map Grid

Roads

County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

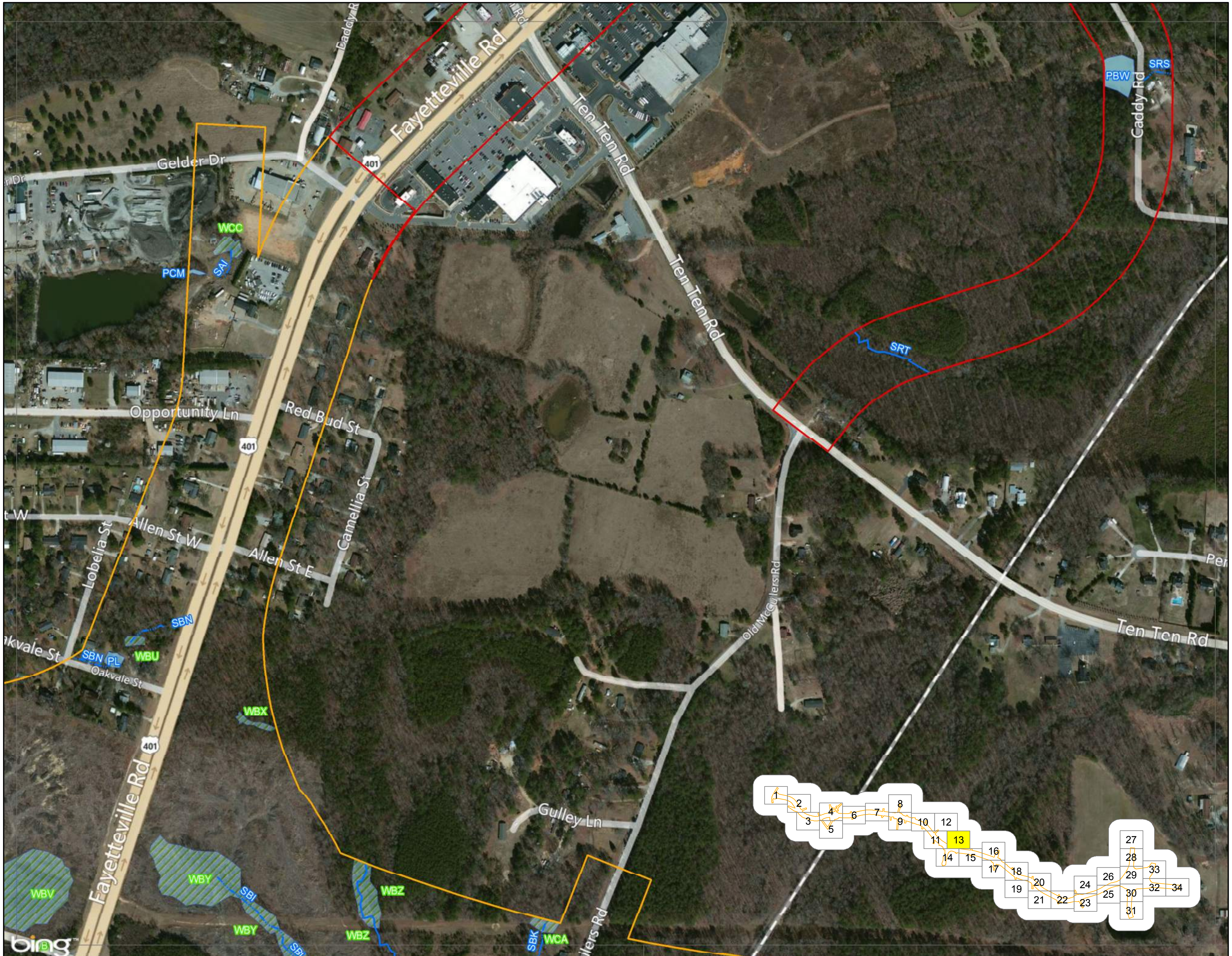
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-12



Legend

Map Grid

Roads

County Boundary

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-13

Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

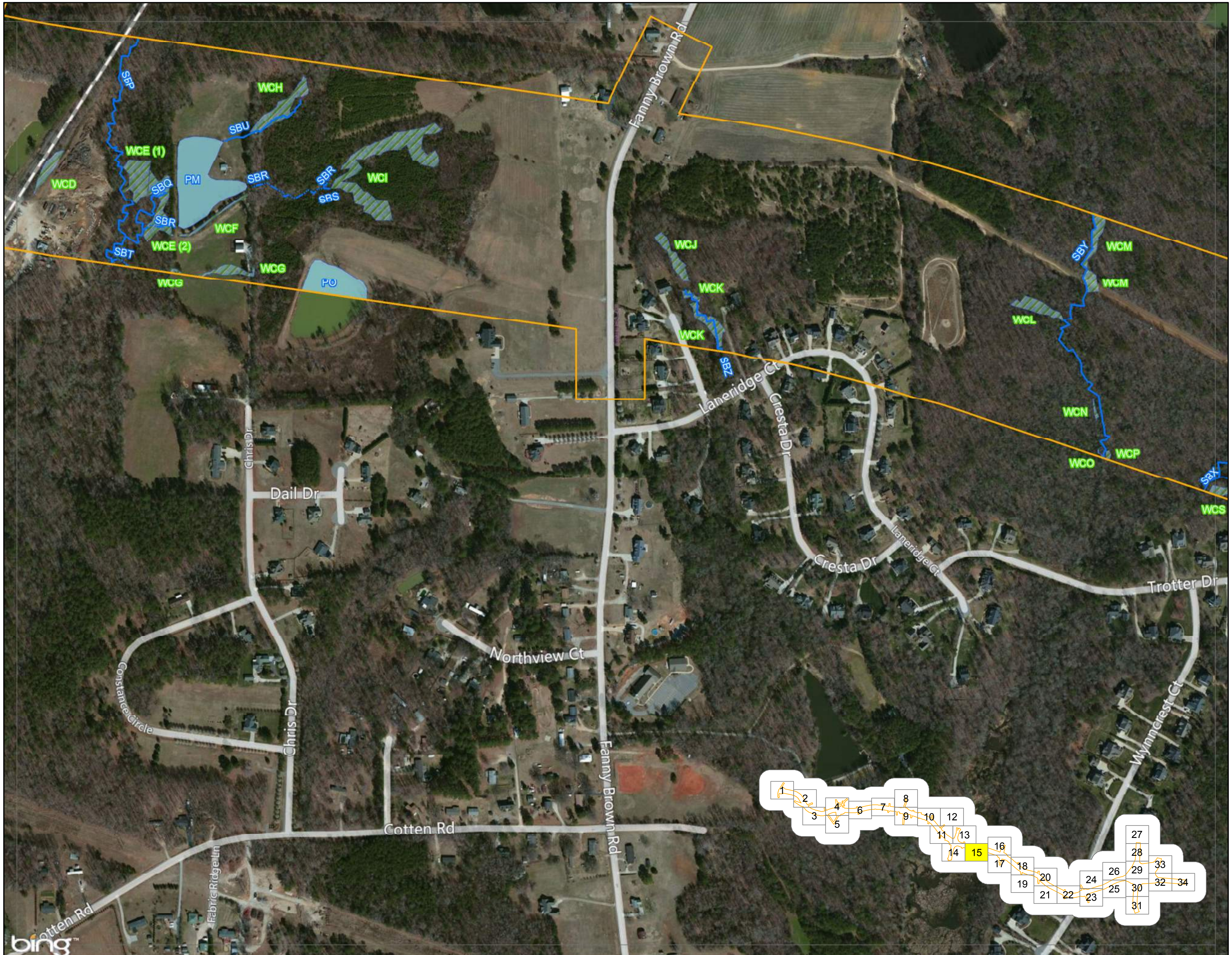
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-14



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

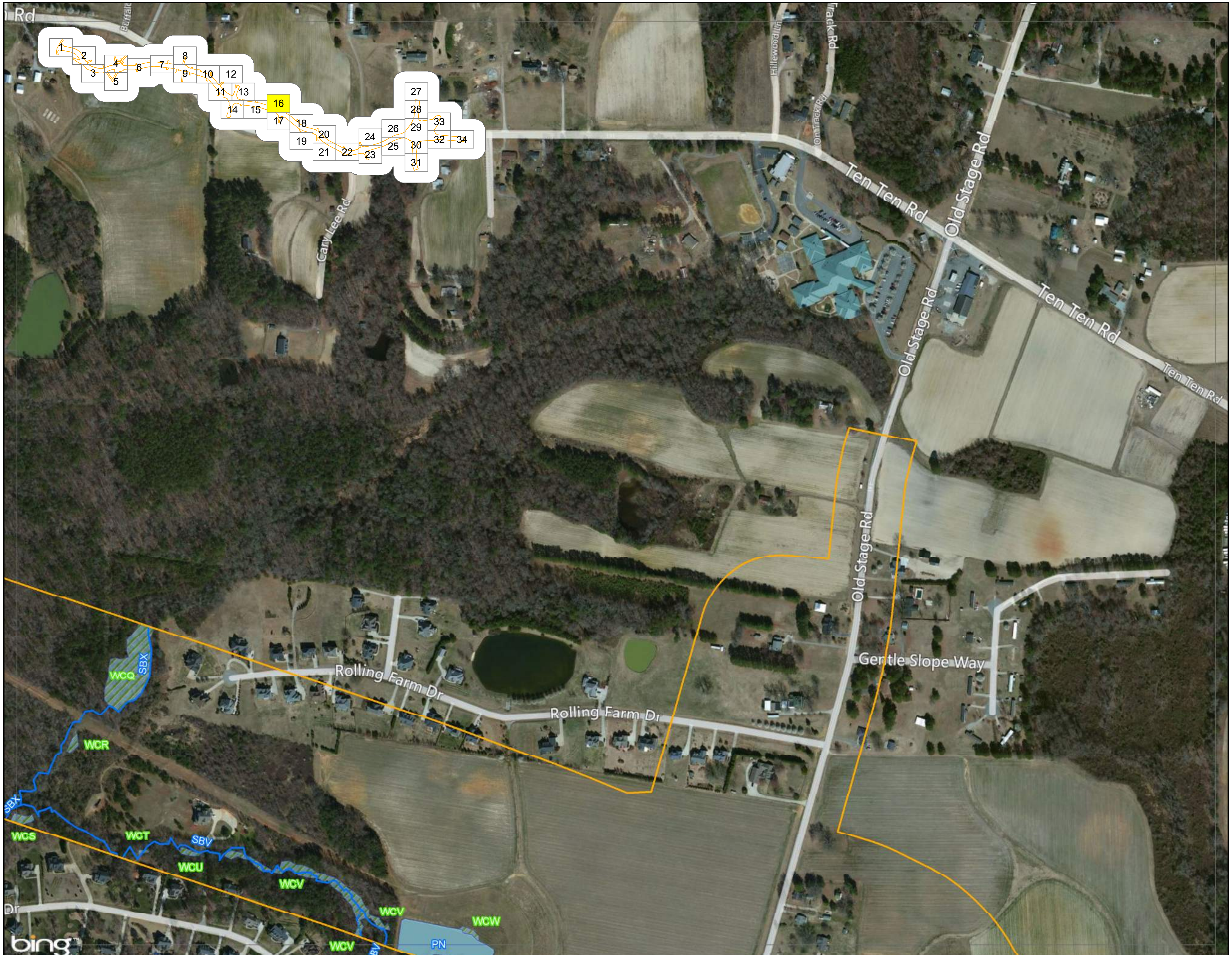
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-15



Legend

Map Grid
Roads
County Boundary

Corridors

Orange, Blue, Green, Brown, Red, Mint, Lilac, Tan, Purple, Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-16

Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

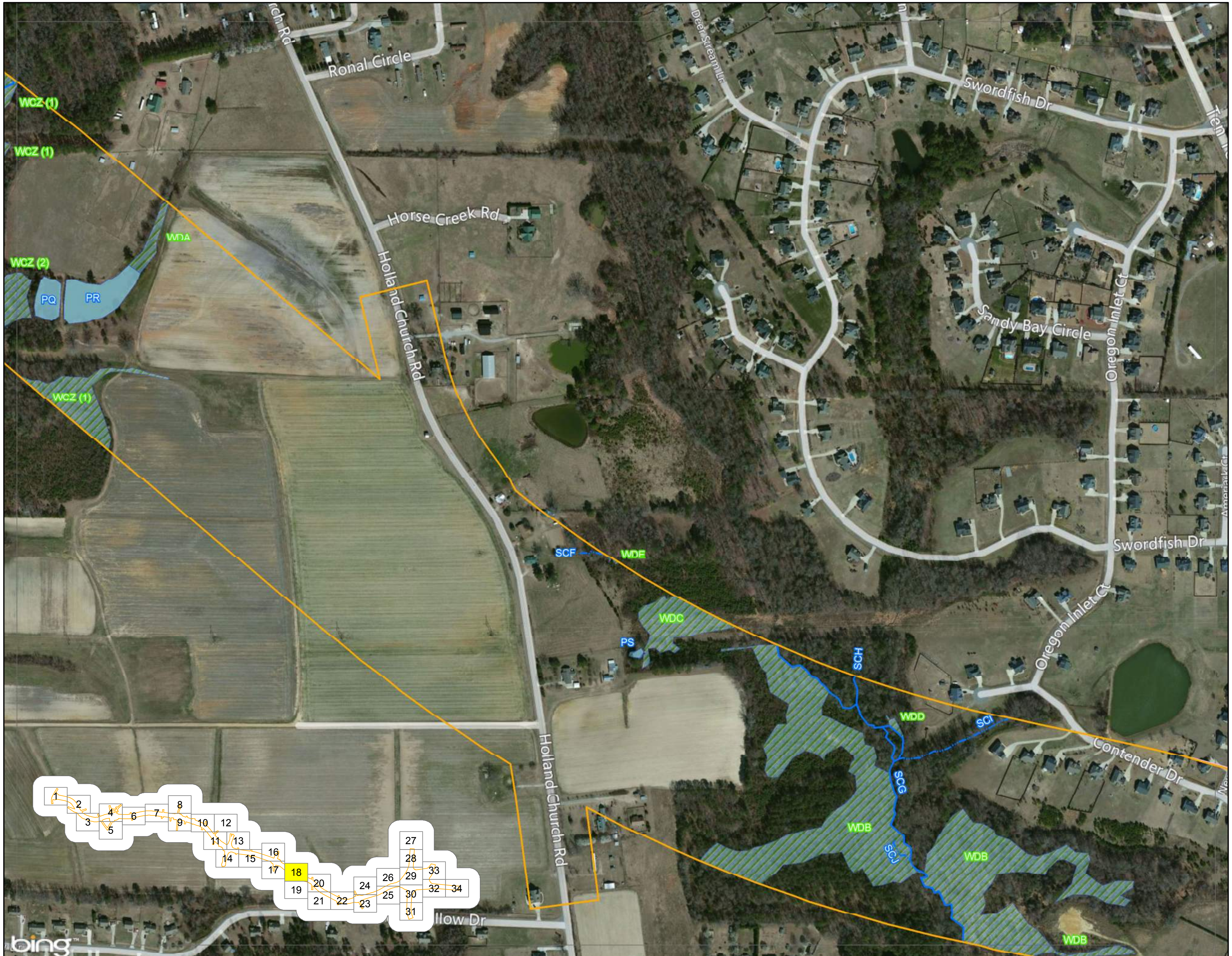
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-17



Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

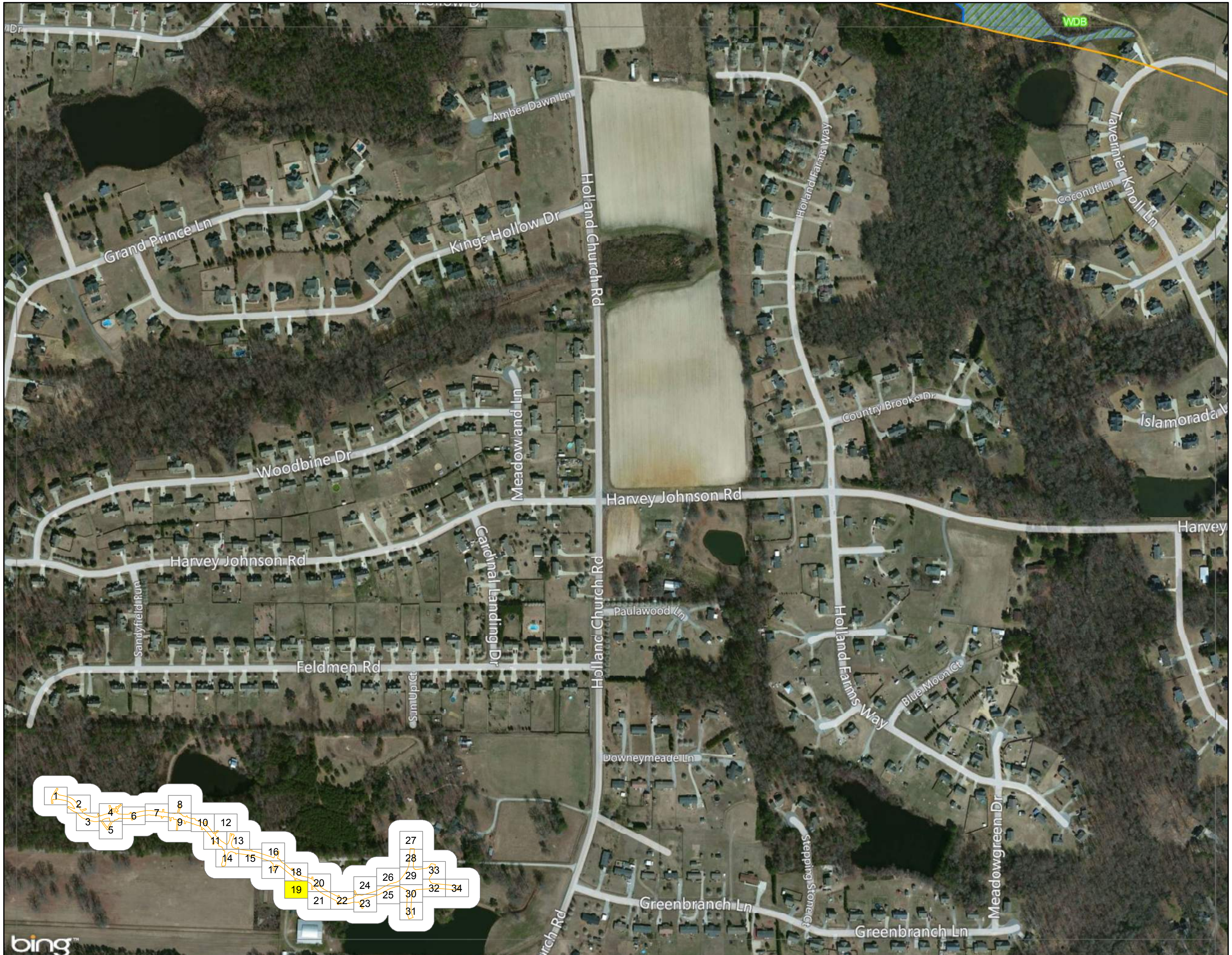
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-18



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

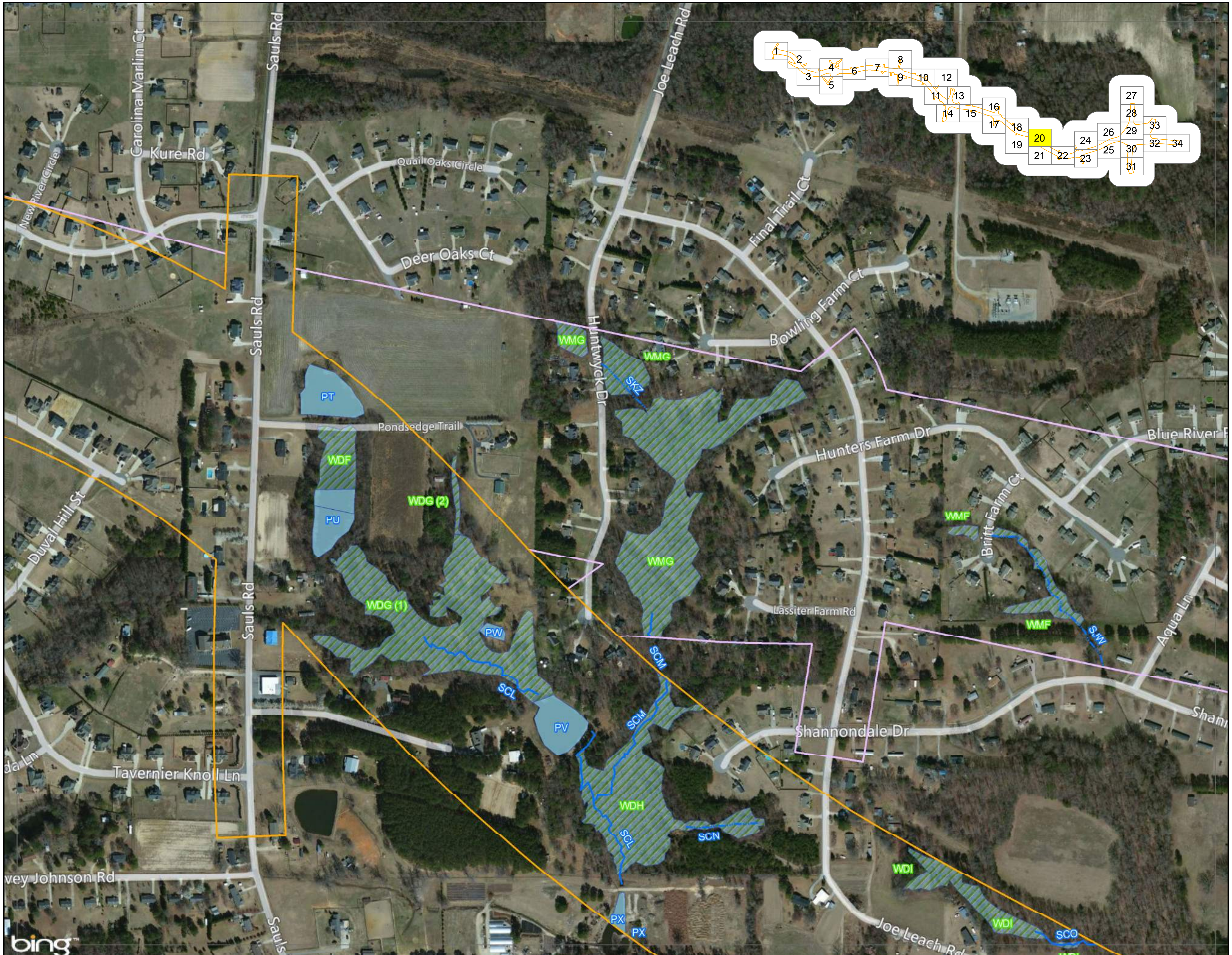
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-19



Legend

Map Grid

Roads

County Boundary

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

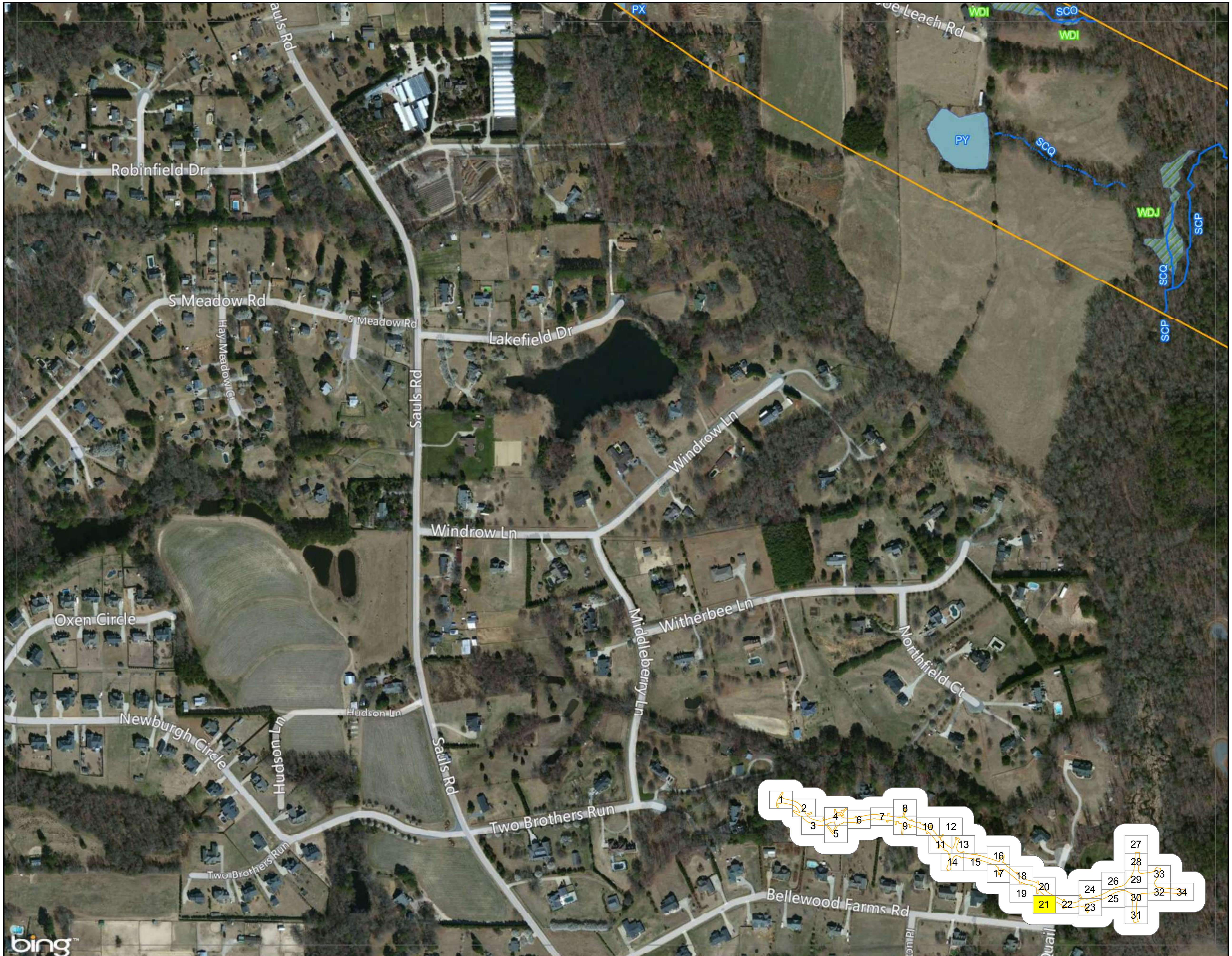
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-20



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

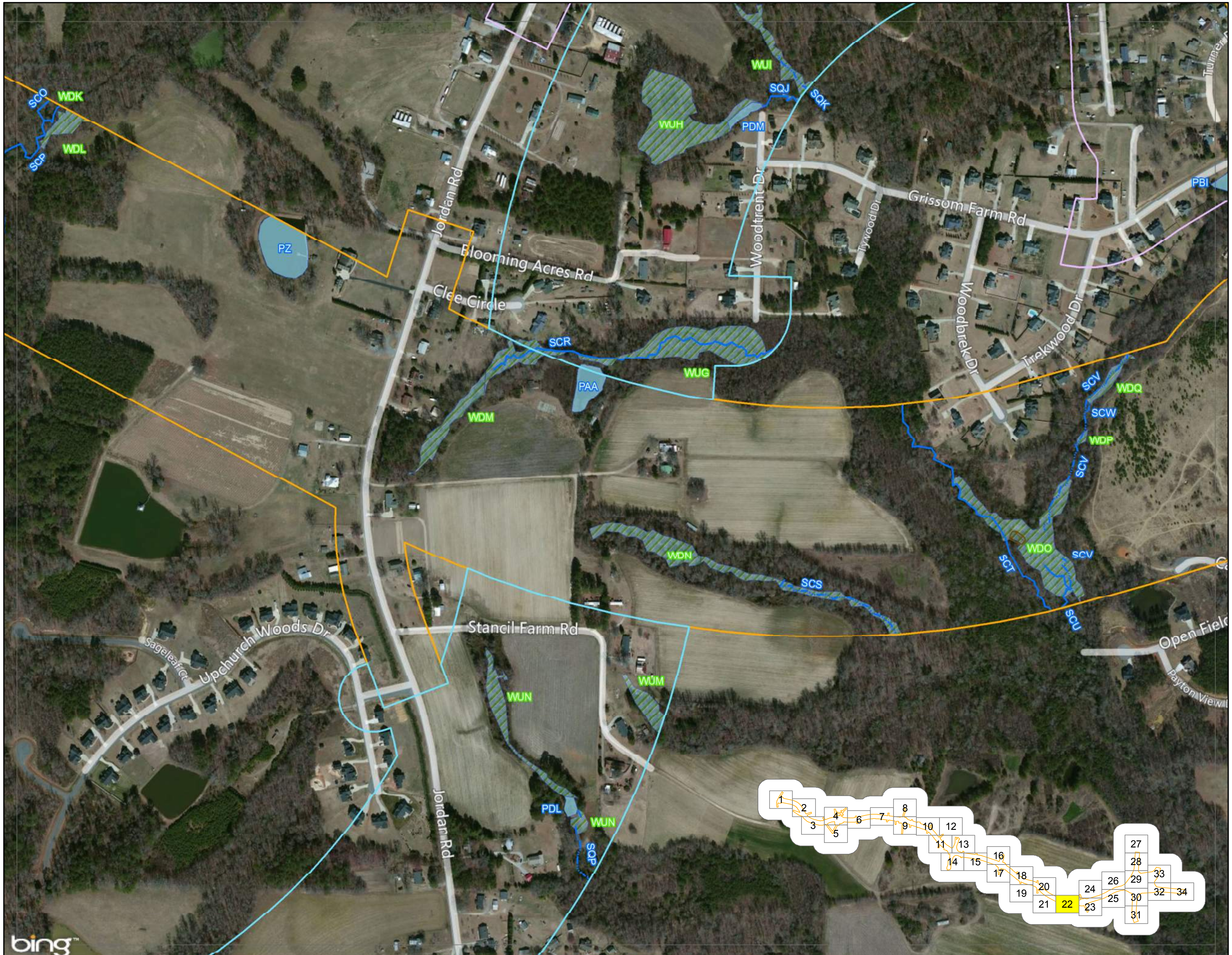
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-21



Legend

Map Grid

Roads

County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

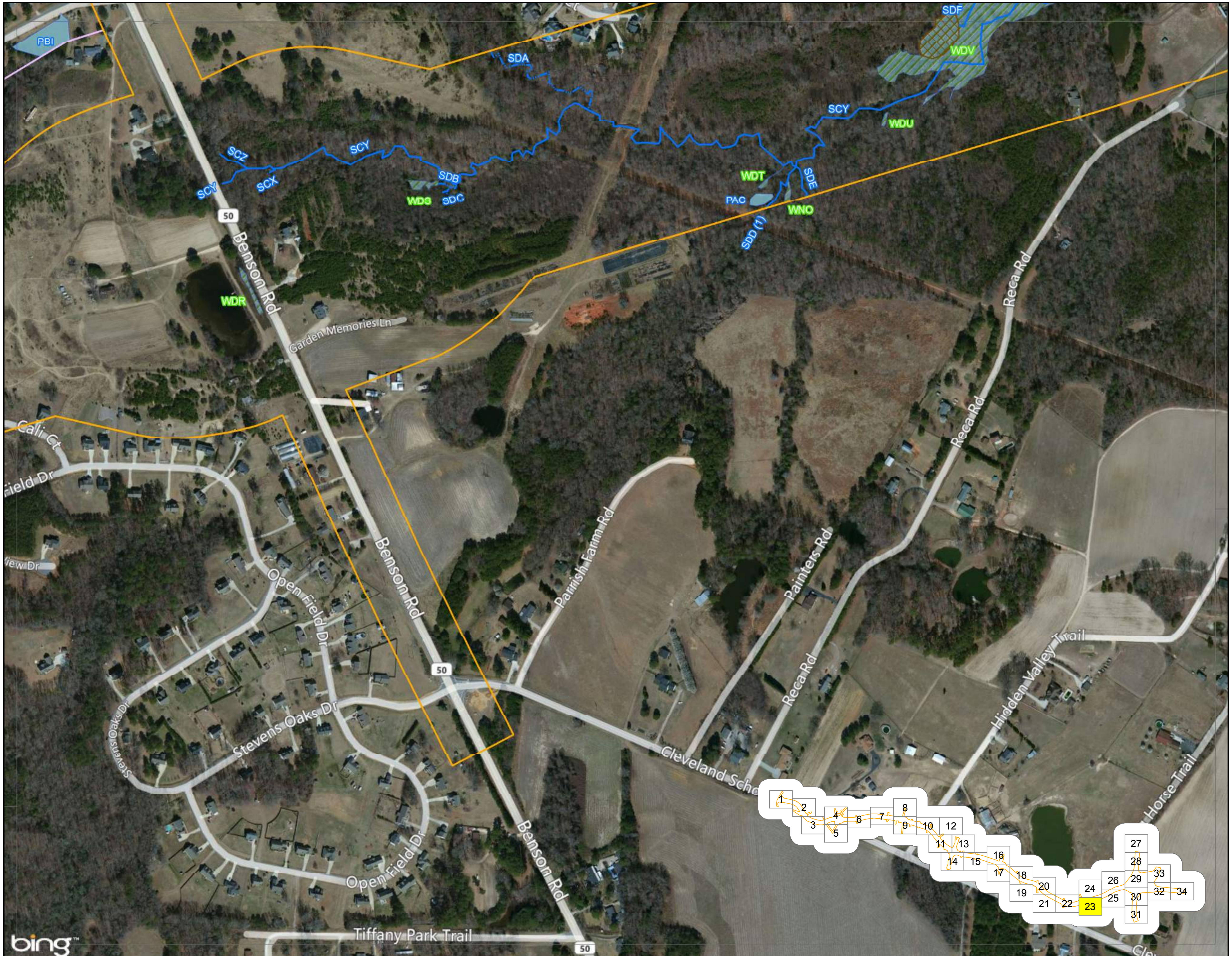
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-22



Legend

- Map Grid
- Roads
- County Boundary

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Jurisdictional Features

- Wetlands
- Beaver Impoundment
- Ponds
- Streams - Intermittent
- Streams - Perennial
- Streams - Ephemeral

Jurisdictional Features

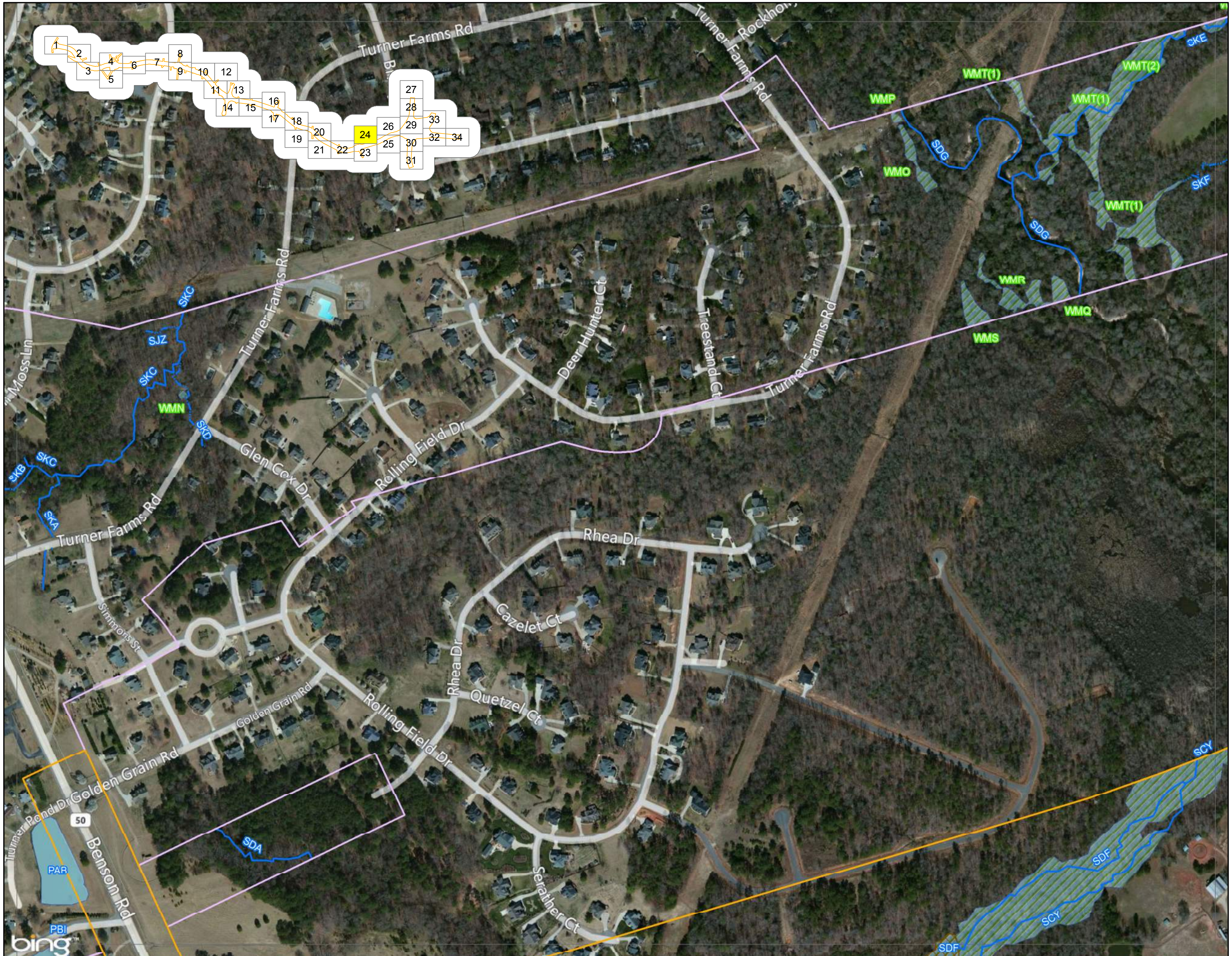
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-23



Legend

- Map Grid
- Roads
- County Boundary

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Jurisdictional Features

- Wetlands
- Beaver Impoundment
- Ponds
- Streams - Intermittent
- Streams - Perennial
- Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-24

Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

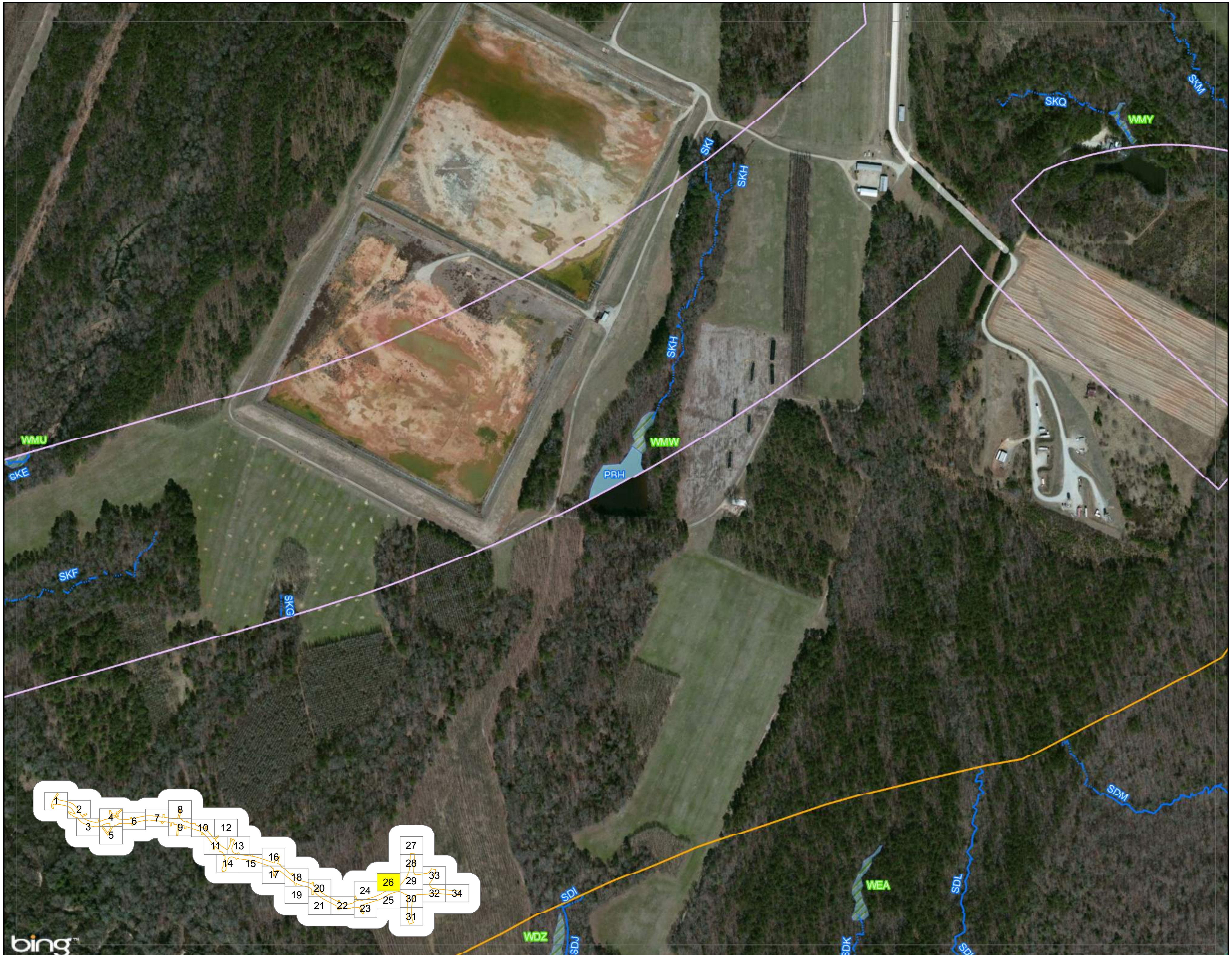
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-25



Legend

Map Grid

Roads

County Boundary

Corridors

Orange

Green

Red

Lilac

Purple

Blue

Brown

Mint

Tan

Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

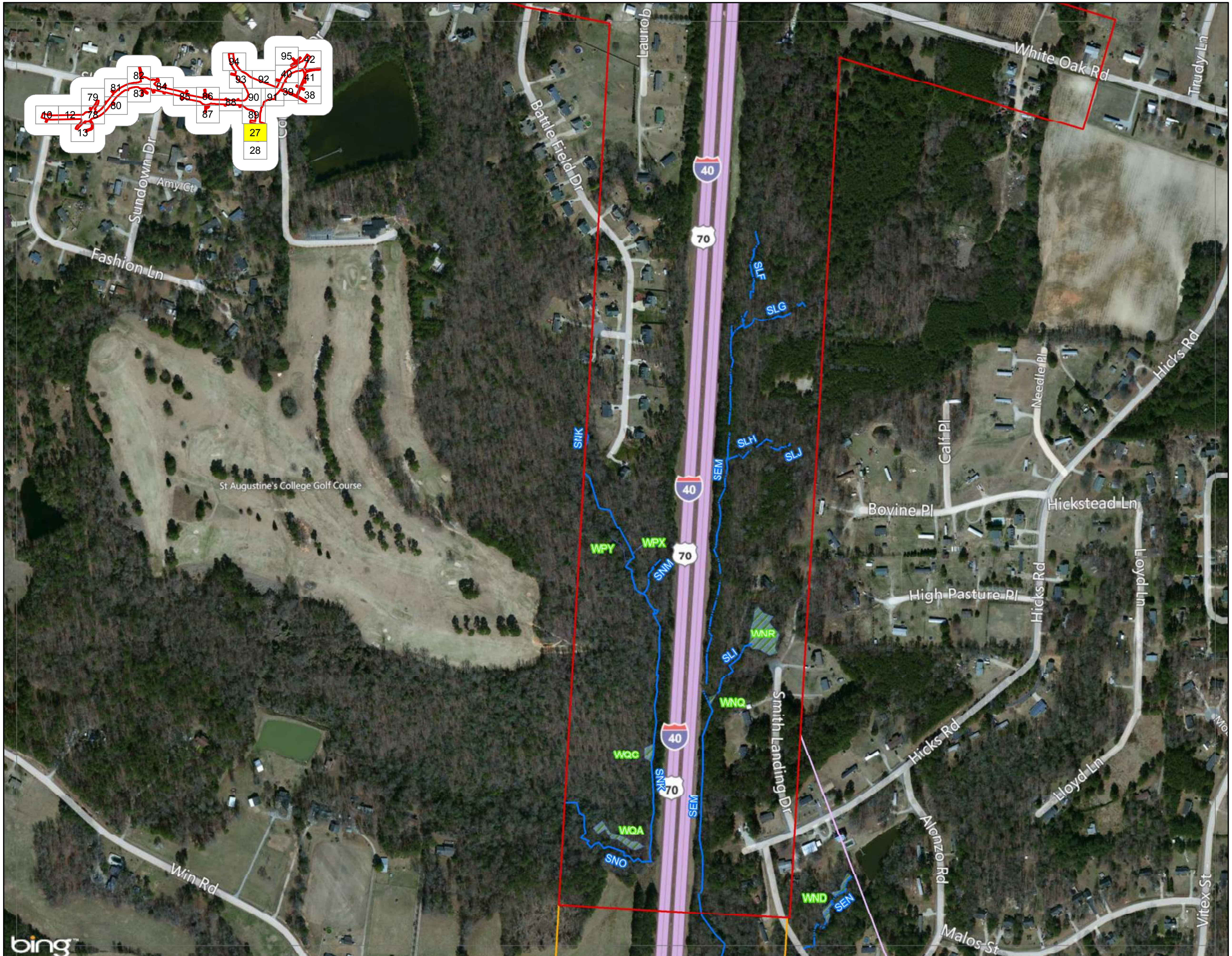
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-26



Legend

Map Grid

Roads

County Boundary

Corridors

Orange | Blue
Green | Brown
Red | Mint
Lilac | Tan
Purple | Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

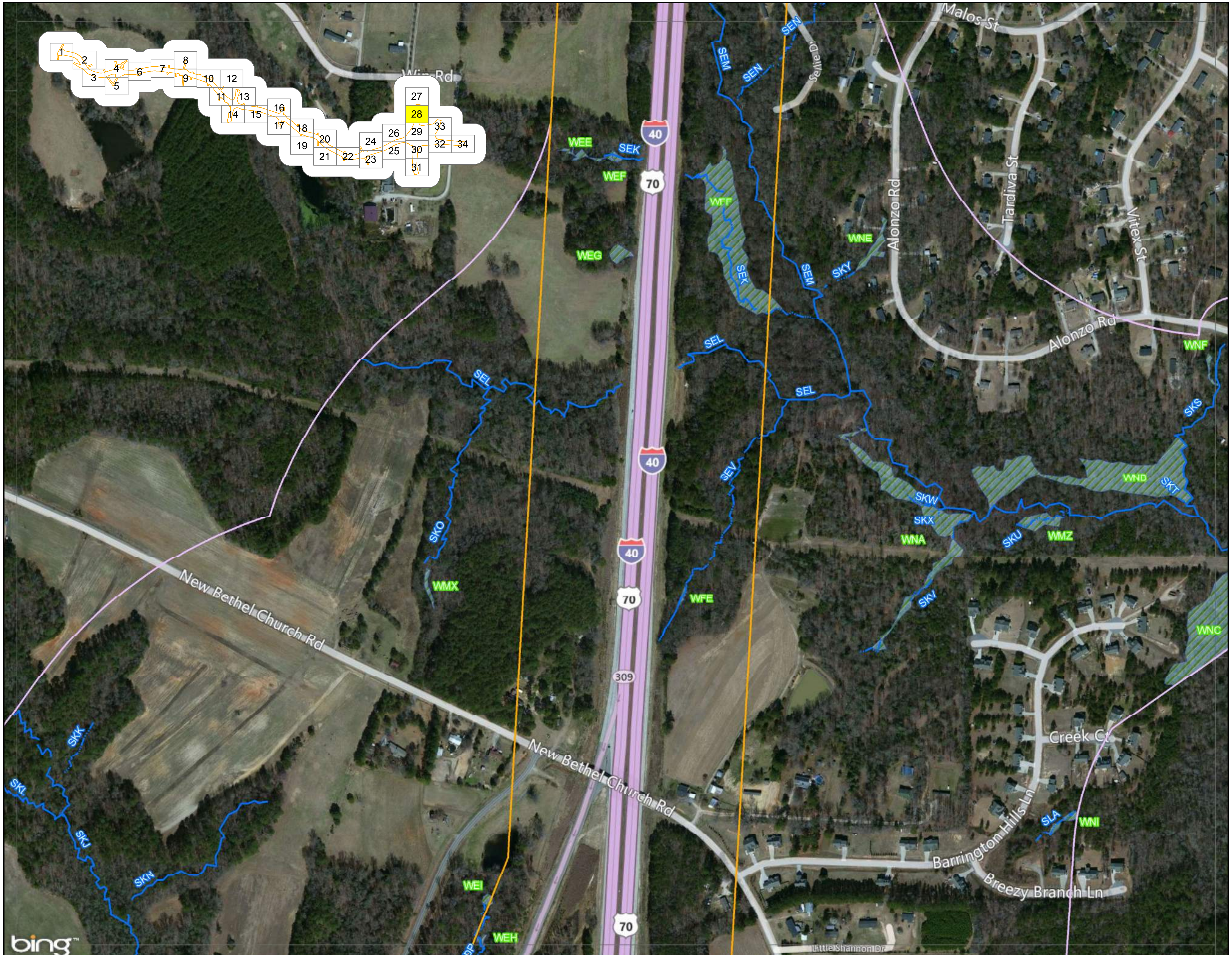
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-27



Legend

- Map Grid
- Roads
- County Boundary

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Jurisdictional Features

- Wetlands
- Beaver Impoundment
- Ponds
- Streams - Intermittent
- Streams - Perennial
- Streams - Ephemeral

Jurisdictional Features

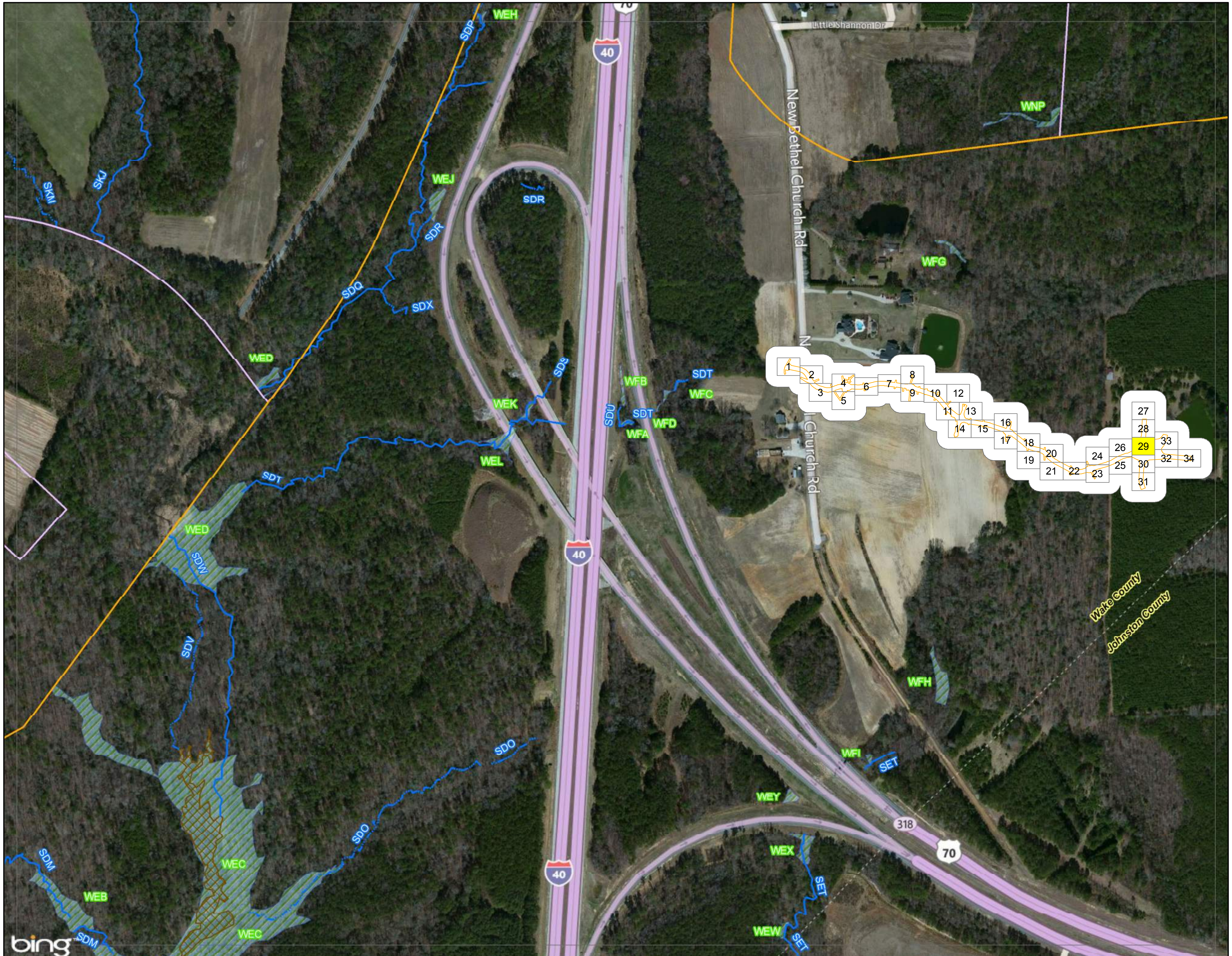
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-28



Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

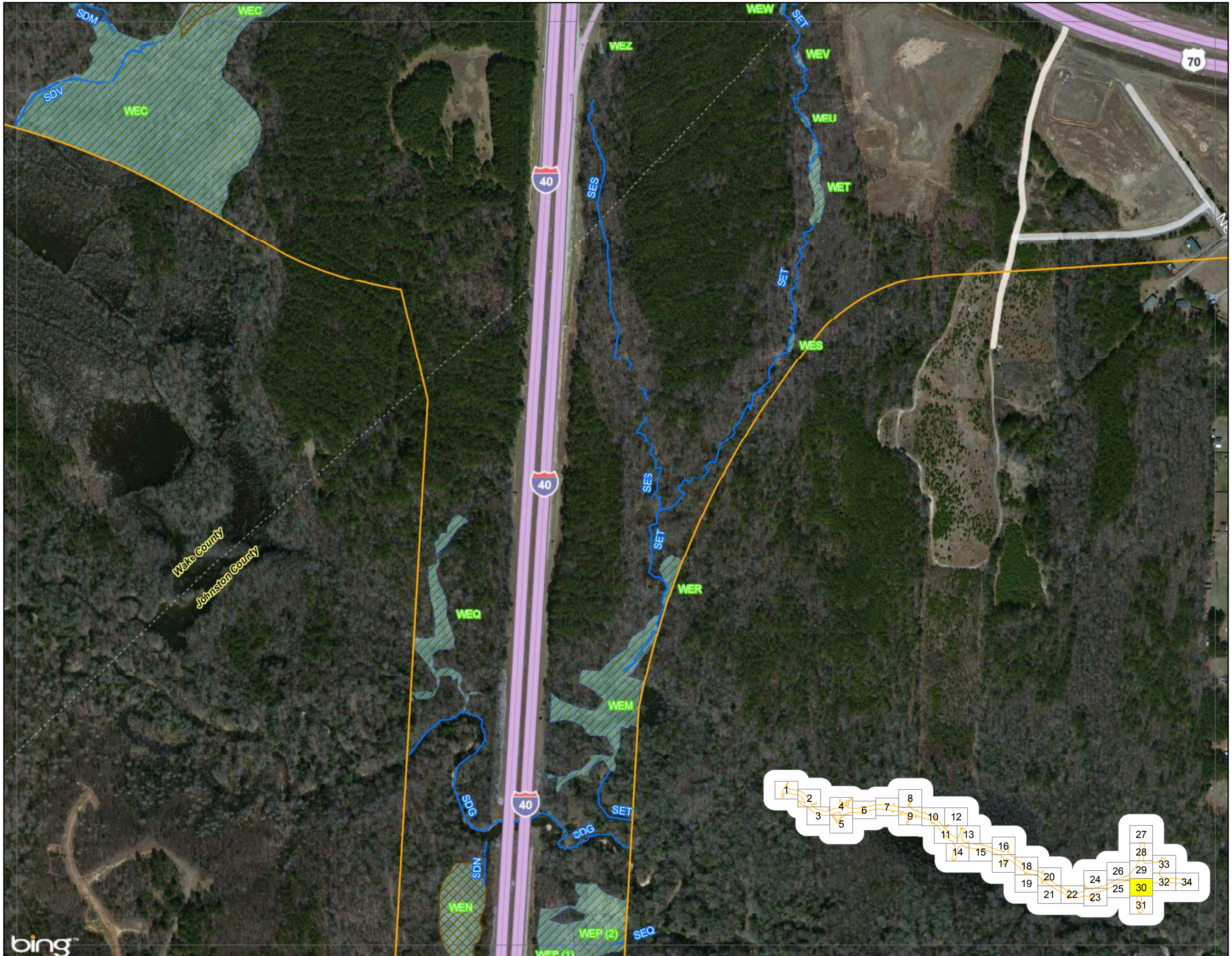
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-29



Legend

Map Grid

Roads

County Boundary

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

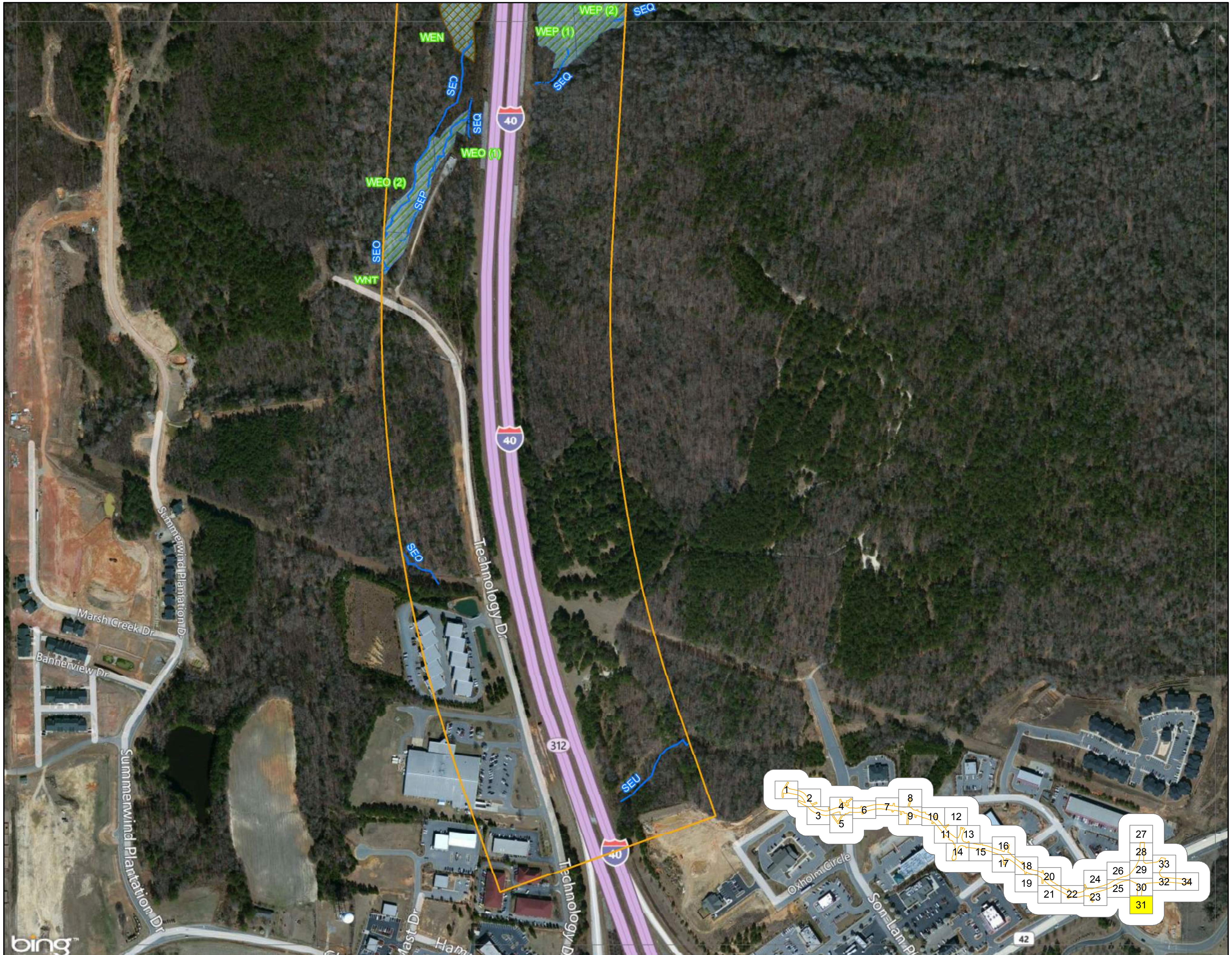
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-30



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

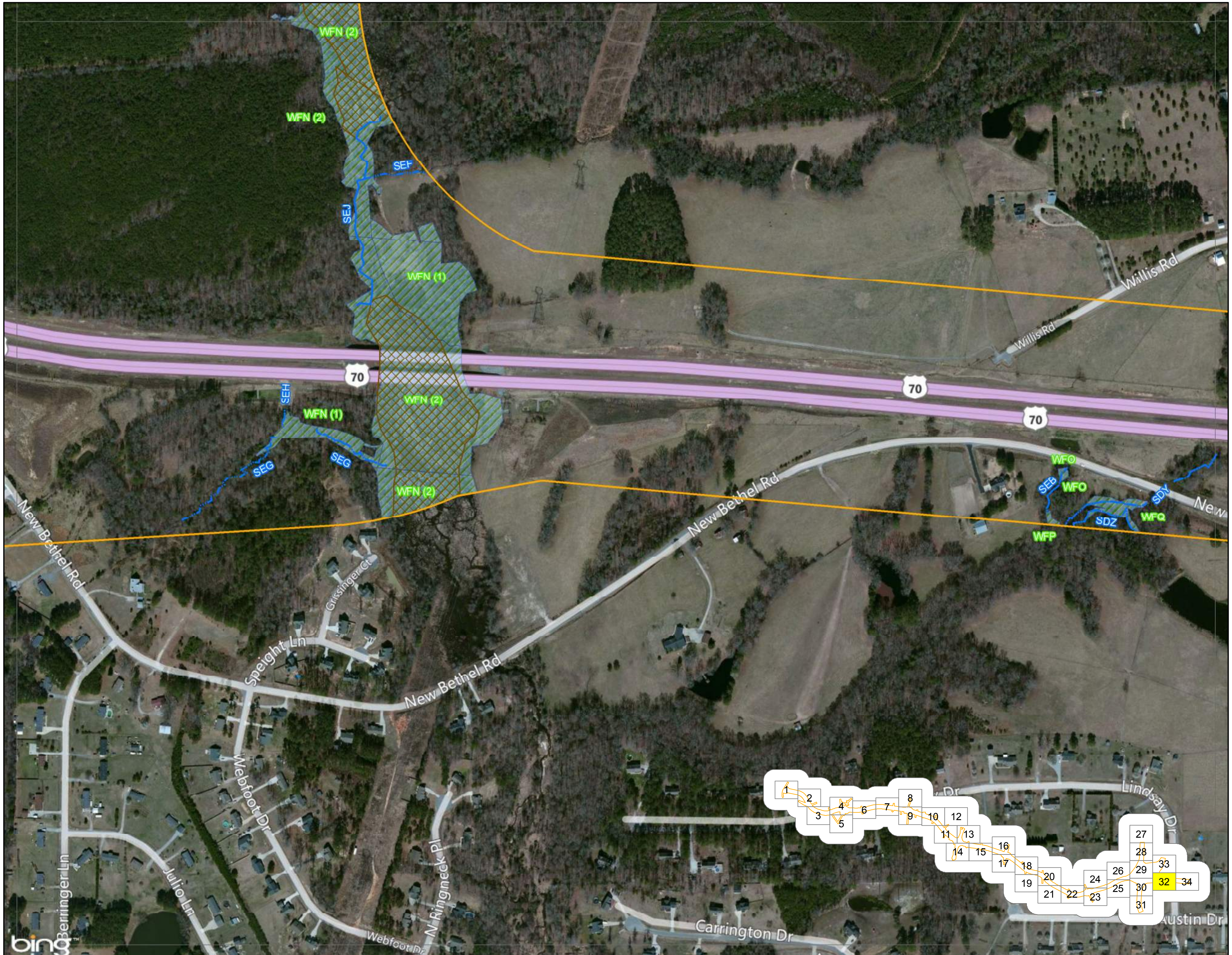
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-31



Legend

Map Grid
Roads
County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

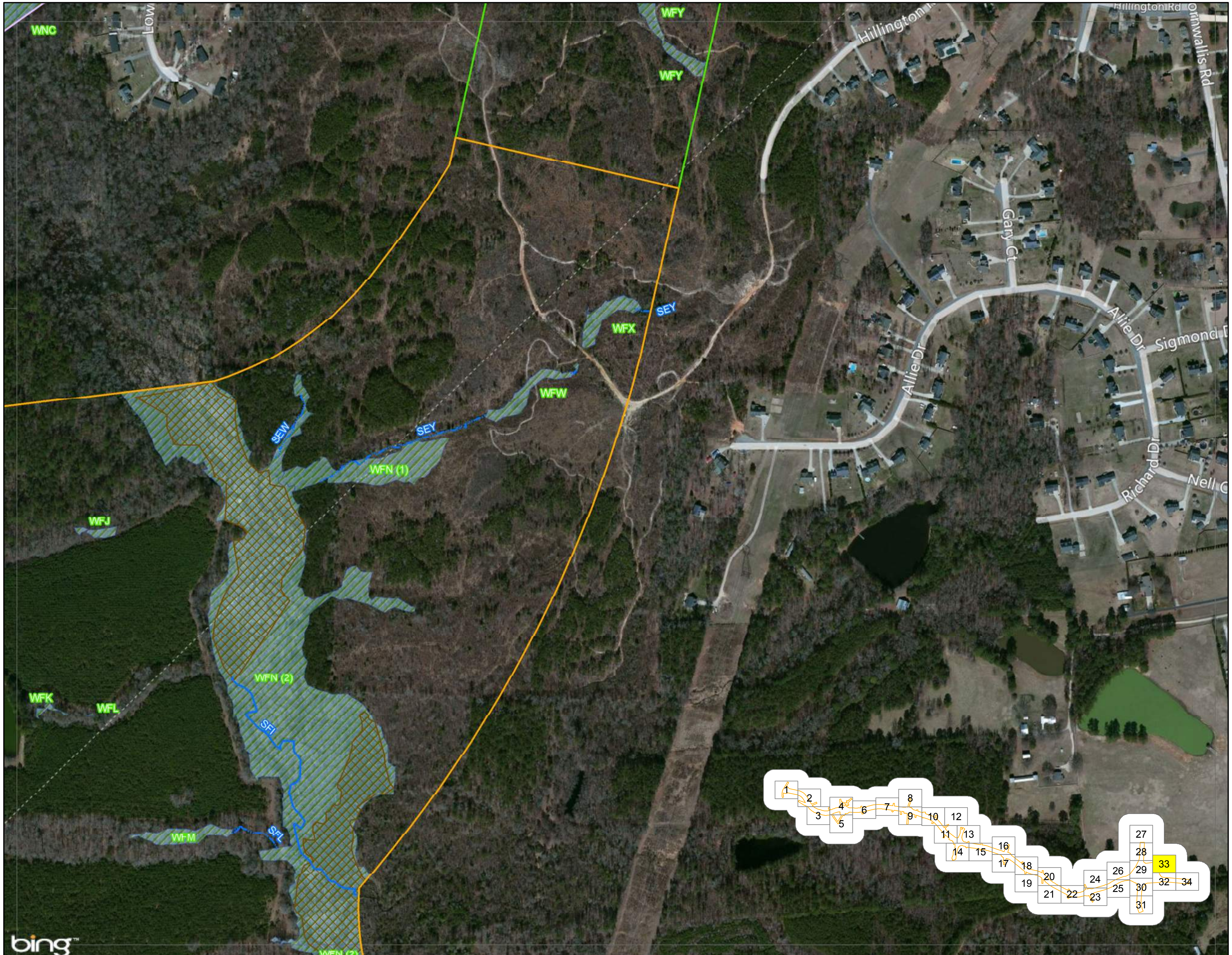
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-32



Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Blue
Green
Brown
Red
Mint
Lilac
Tan
Purple
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-33

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-34

Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

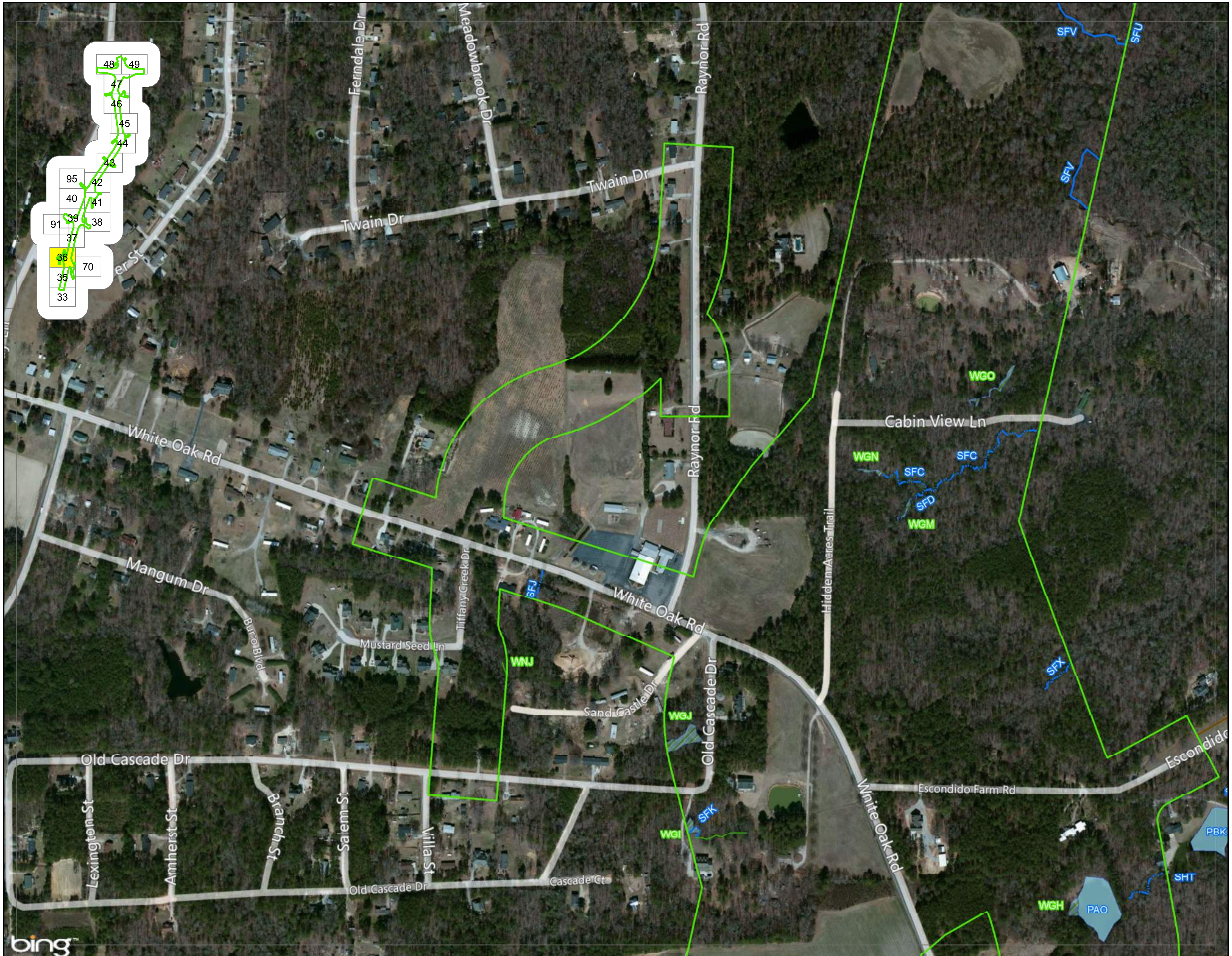
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-35



Legend

Map Grid

Roads

County Boundary

Corridors

Orange

Green

Red

Lilac

Purple

Blue

Brown

Mint

Tan

Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

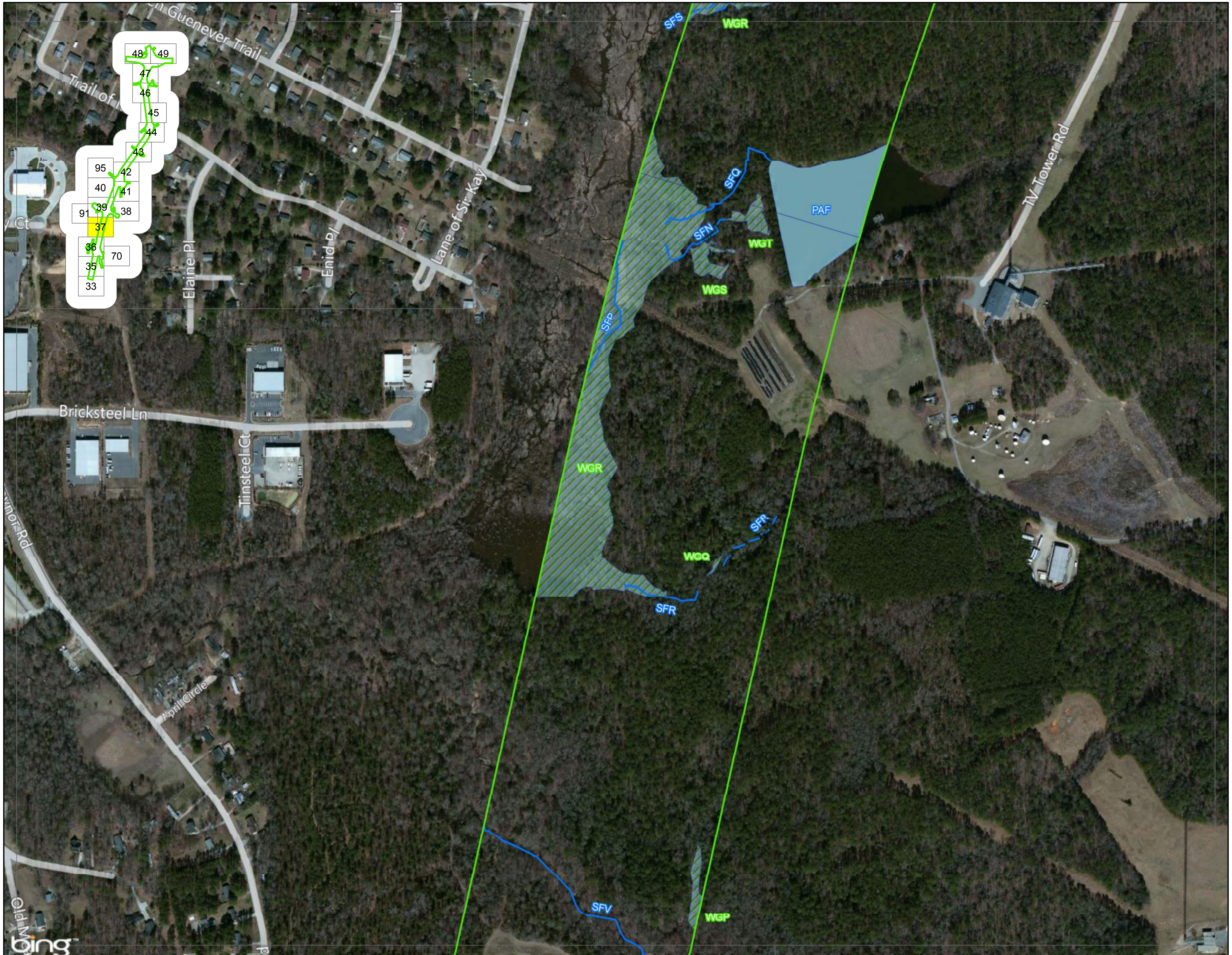
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-36



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Blue
Green
Brown
Red
Mint
Lilac
Tan
Purple
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

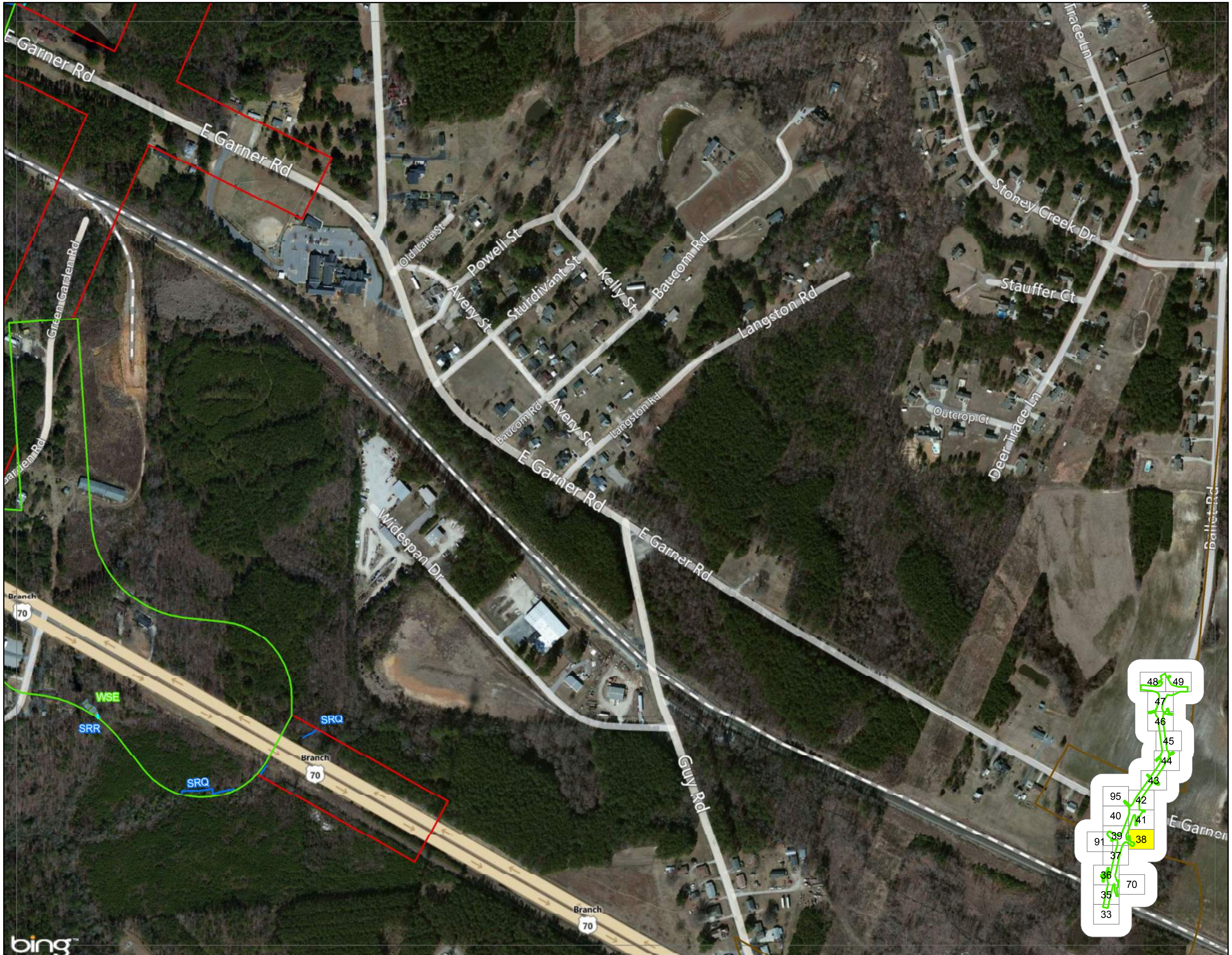
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-37



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

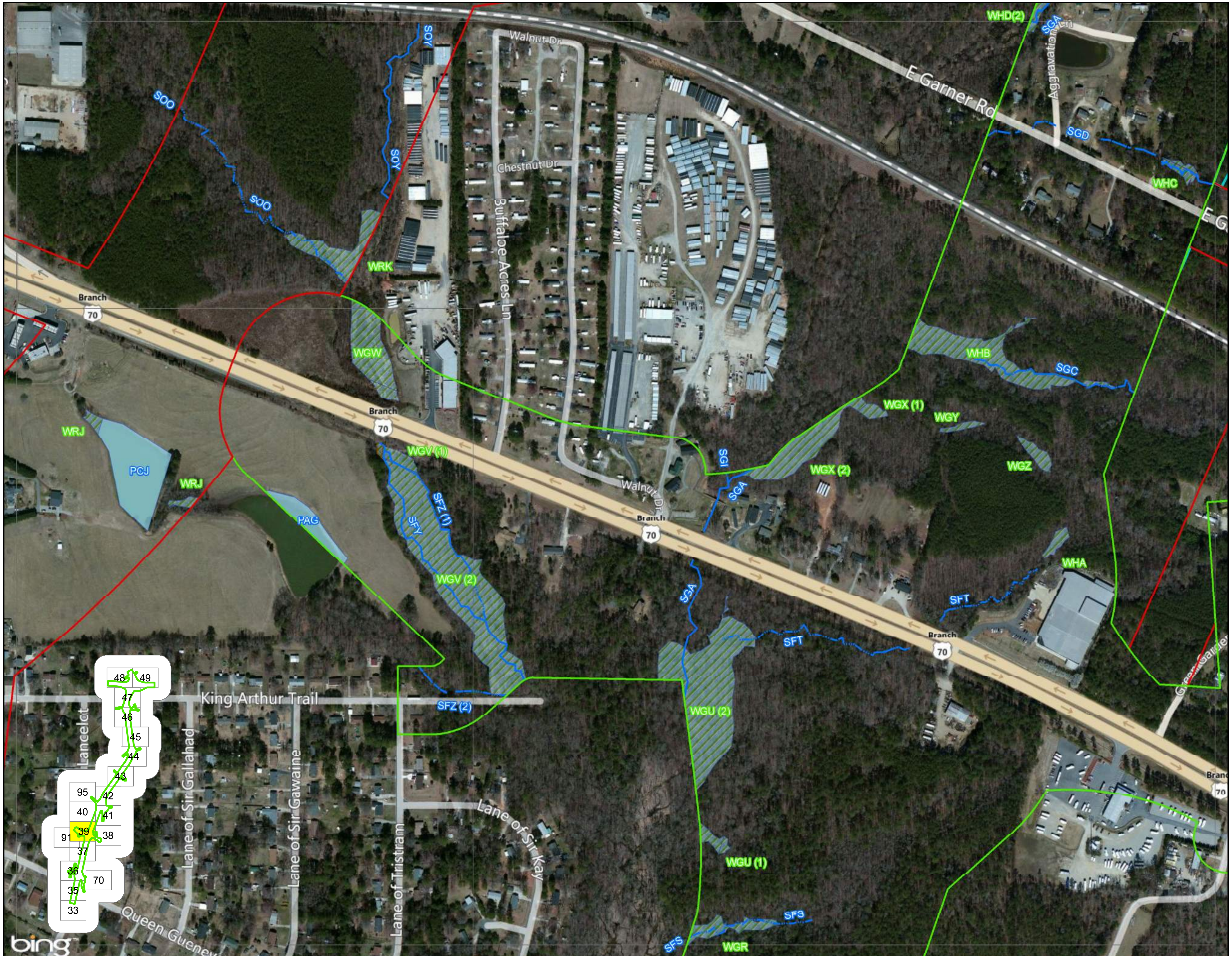
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-38



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-39

Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

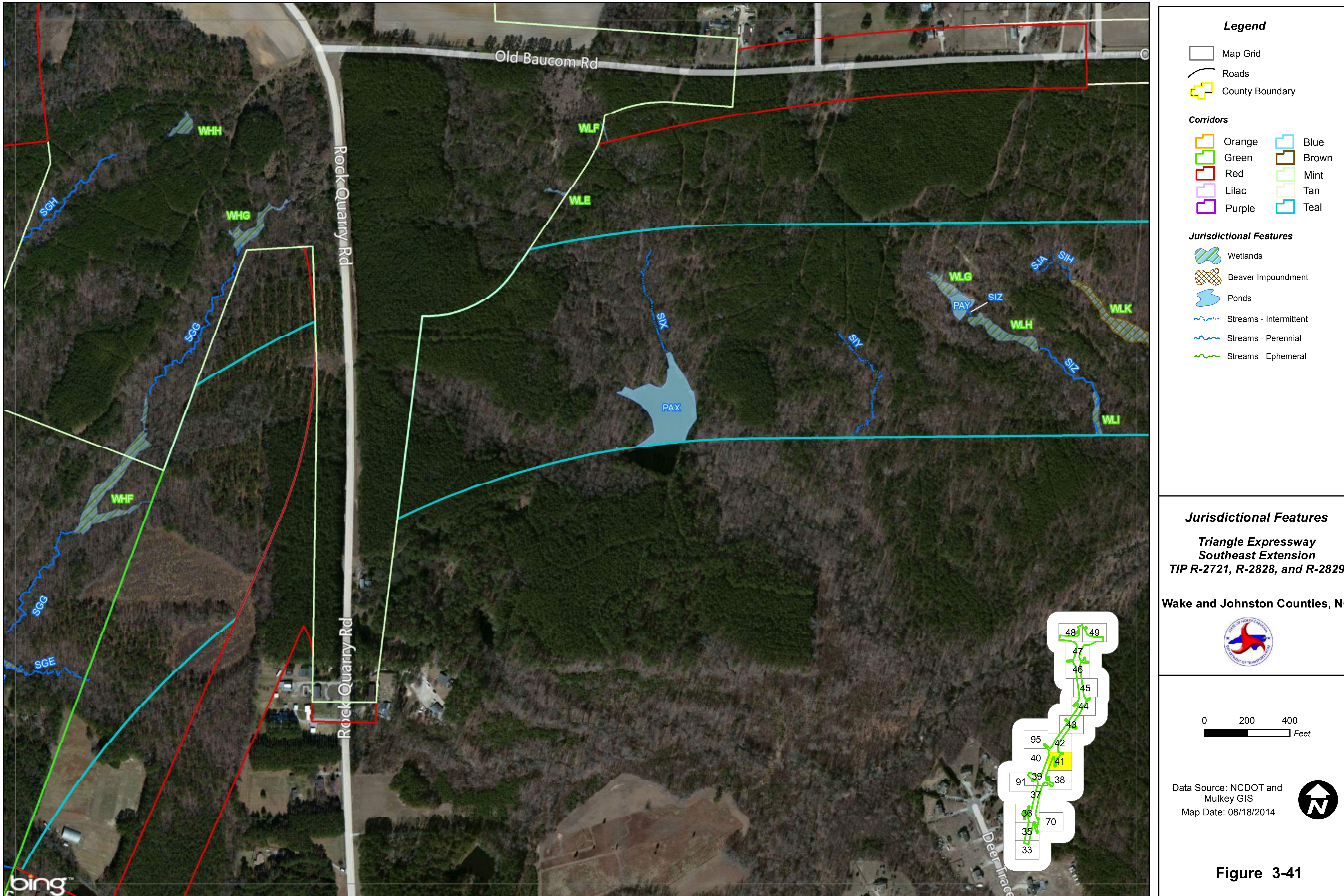
0 200 400

Feet

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-40



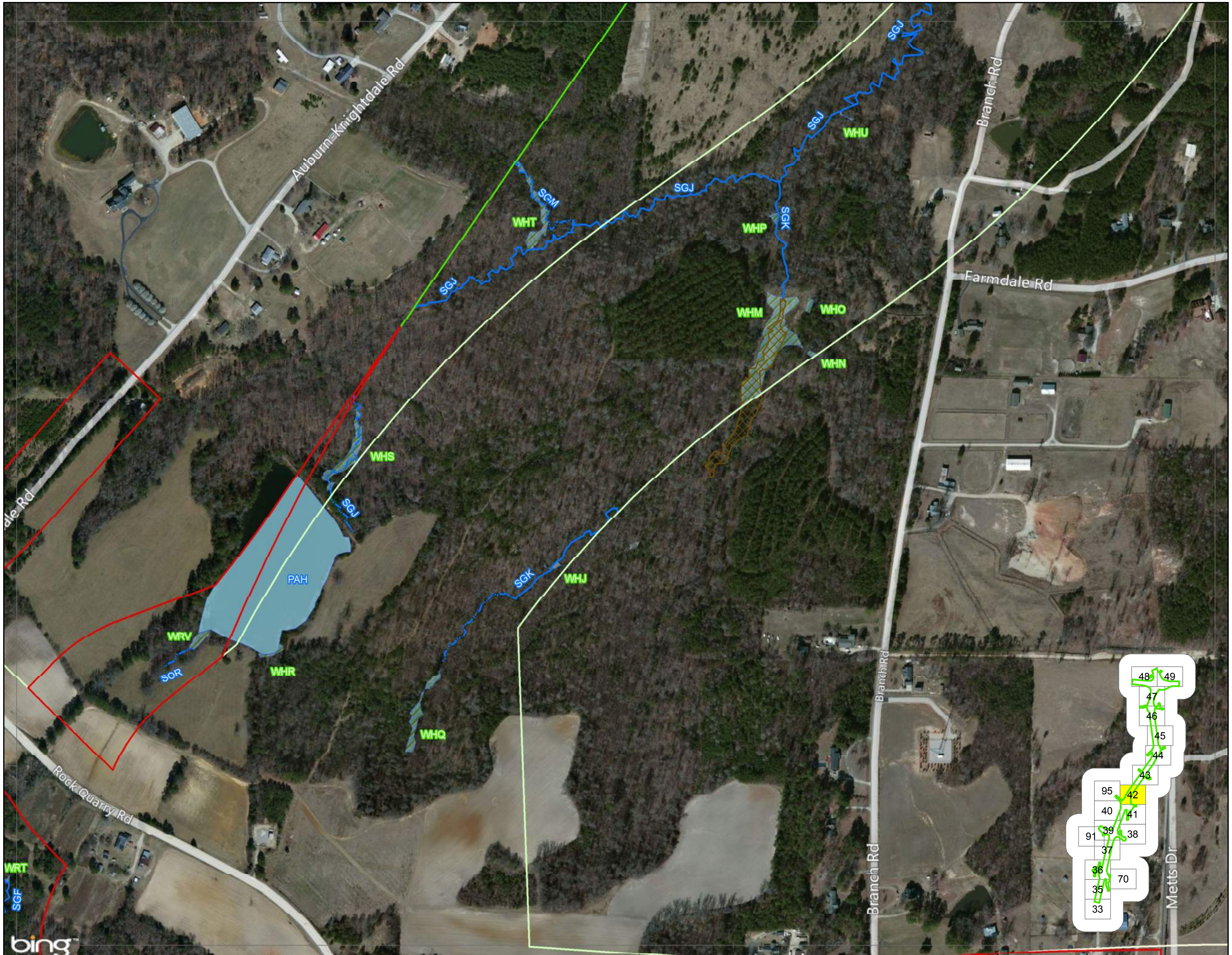
Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-41



Legend

- Map Grid
- Roads
- County Boundary

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Jurisdictional Features

- Wetlands
- Beaver Impoundment
- Ponds
- Streams - Intermittent
- Streams - Perennial
- Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-42

Legend

- Map Grid
- Roads
- County Boundary

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Jurisdictional Features

- Wetlands
- Beaver Impoundment
- Ponds
- Streams - Intermittent
- Streams - Perennial
- Streams - Ephemeral

Jurisdictional Features

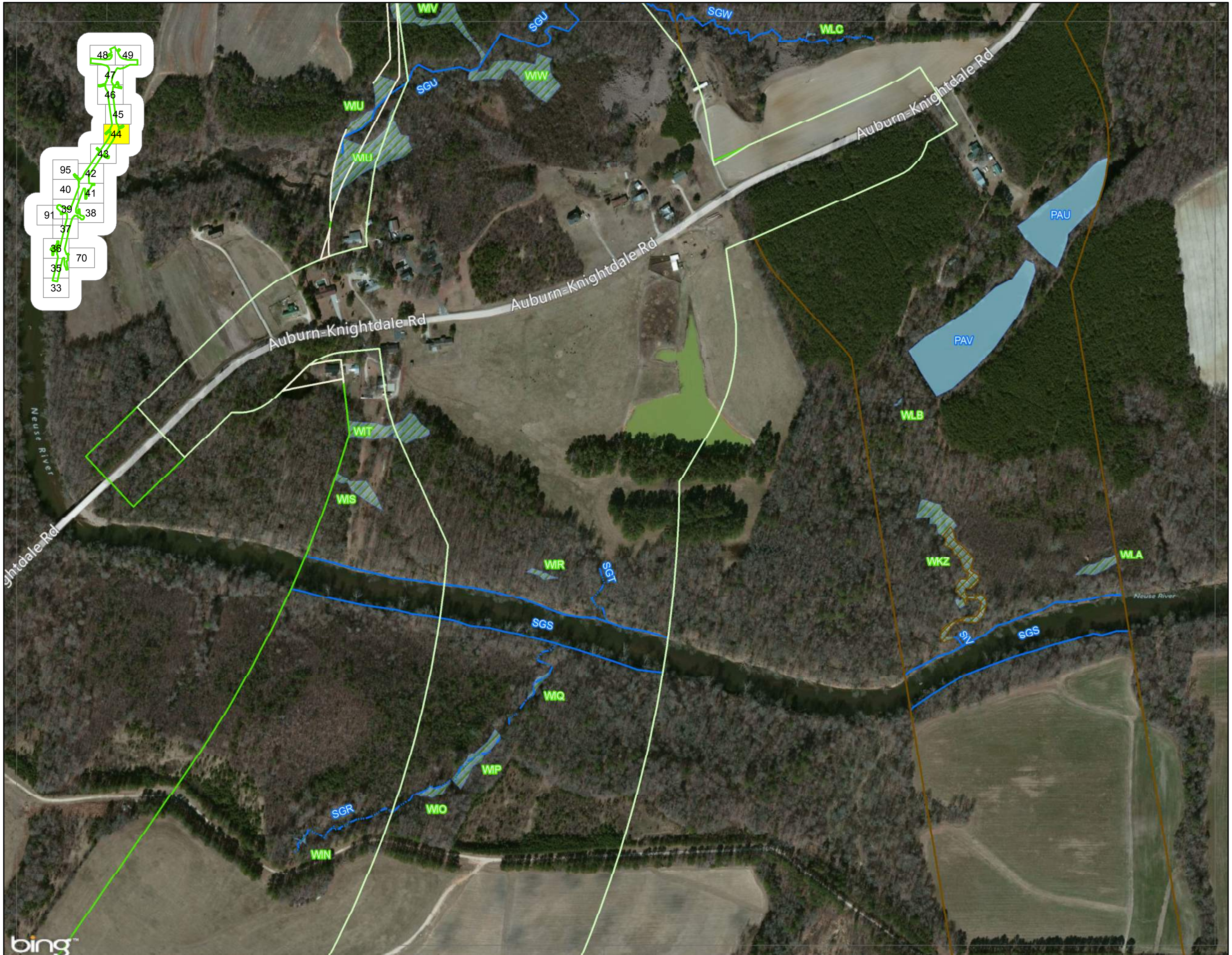
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-43



Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Blue
Green
Brown
Red
Mint
Lilac
Tan
Purple
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

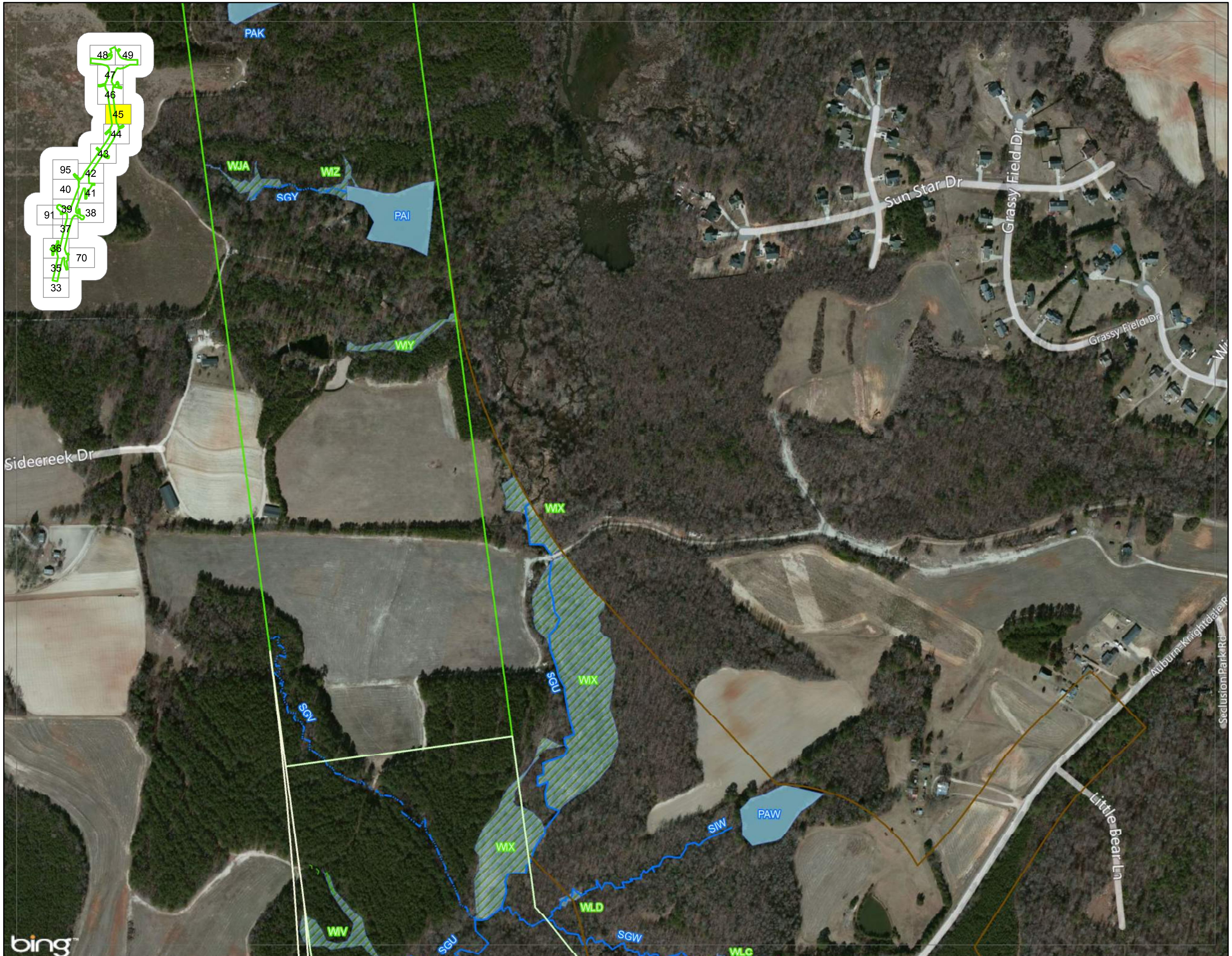
0 200 400

Feet

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-44



Legend

Map Grid

Roads

County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

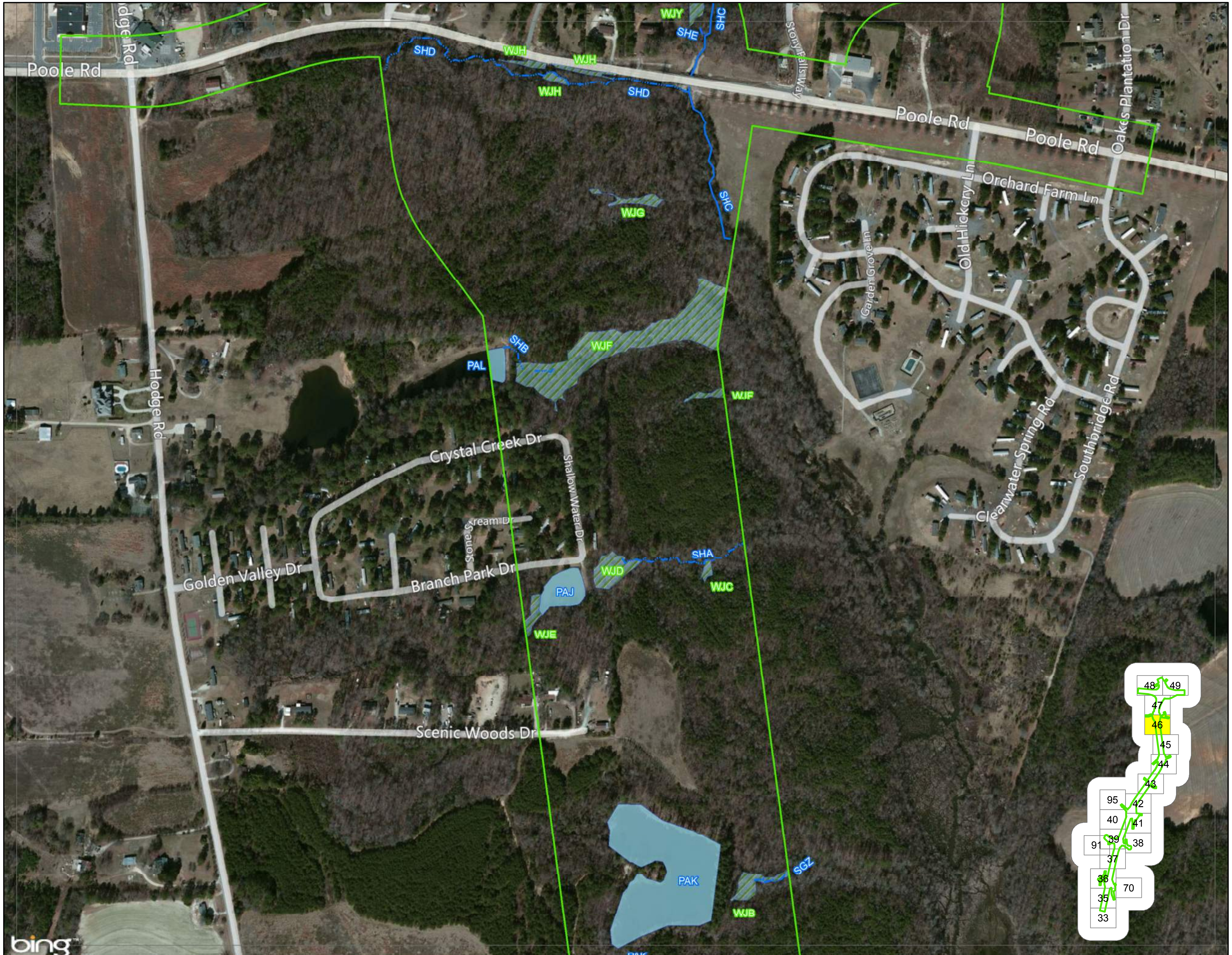
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-45



Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Blue
Green
Brown
Red
Mint
Lilac
Tan
Purple
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

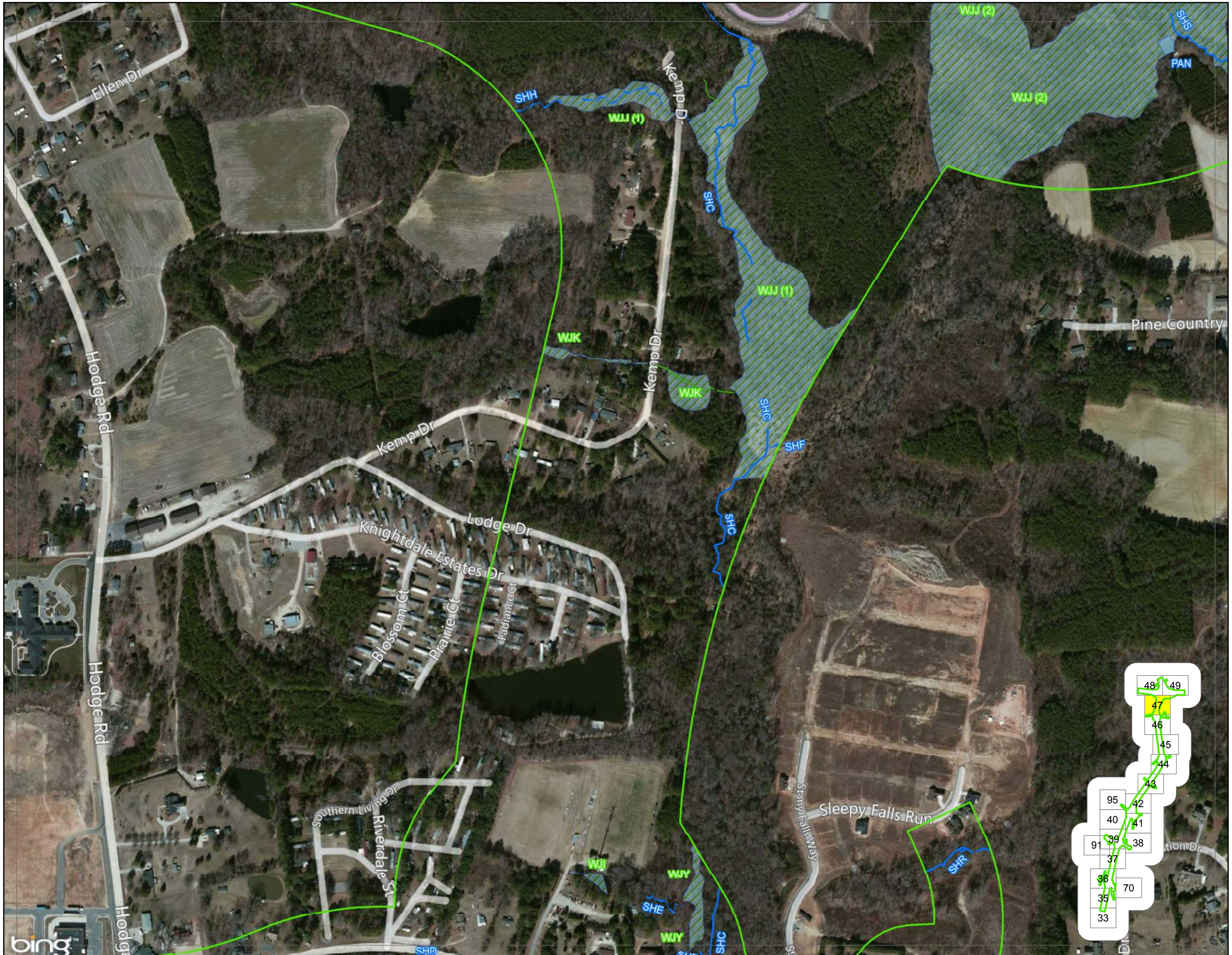
Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-46



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

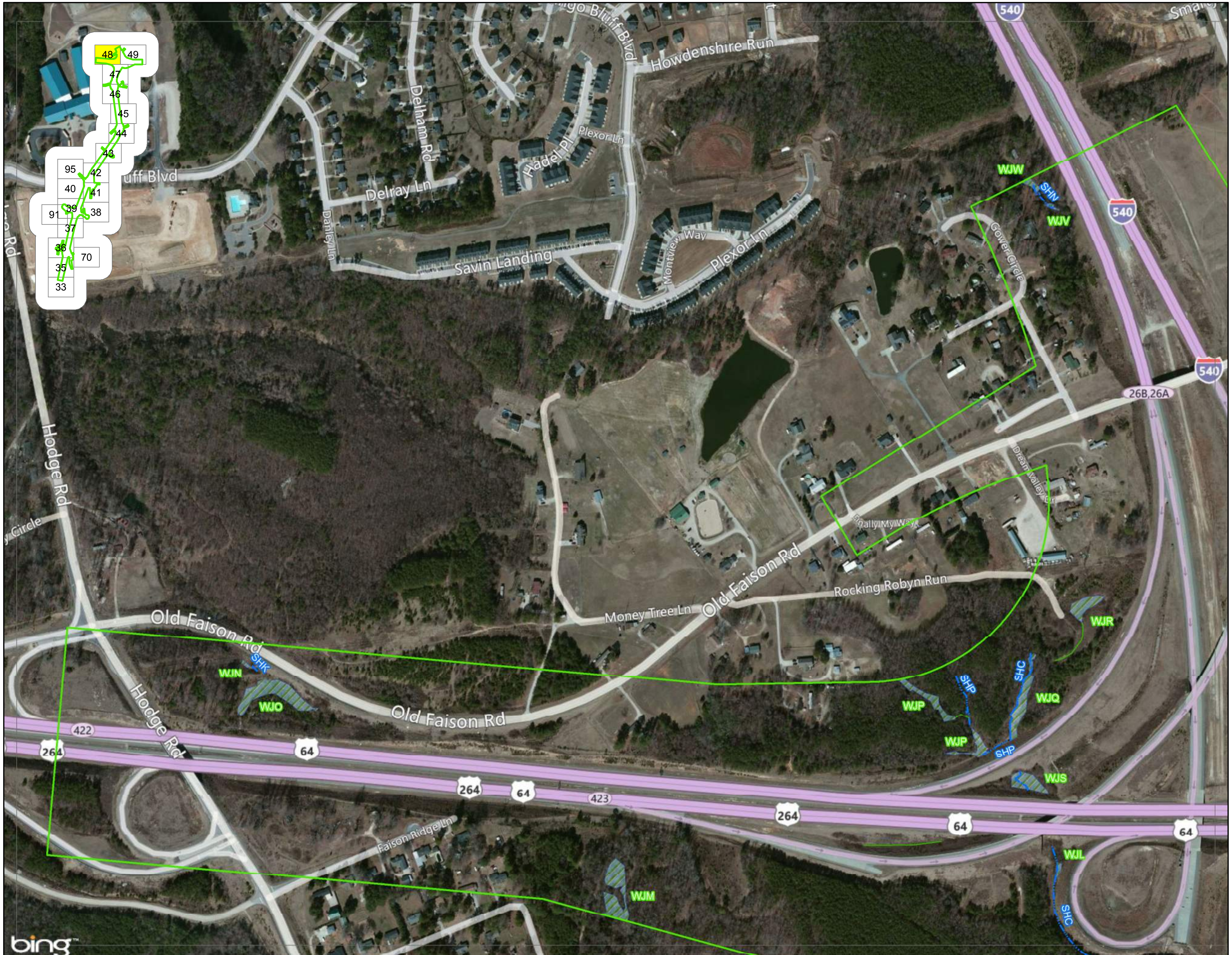
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-47



Legend

Map Grid

Roads

County Boundary

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

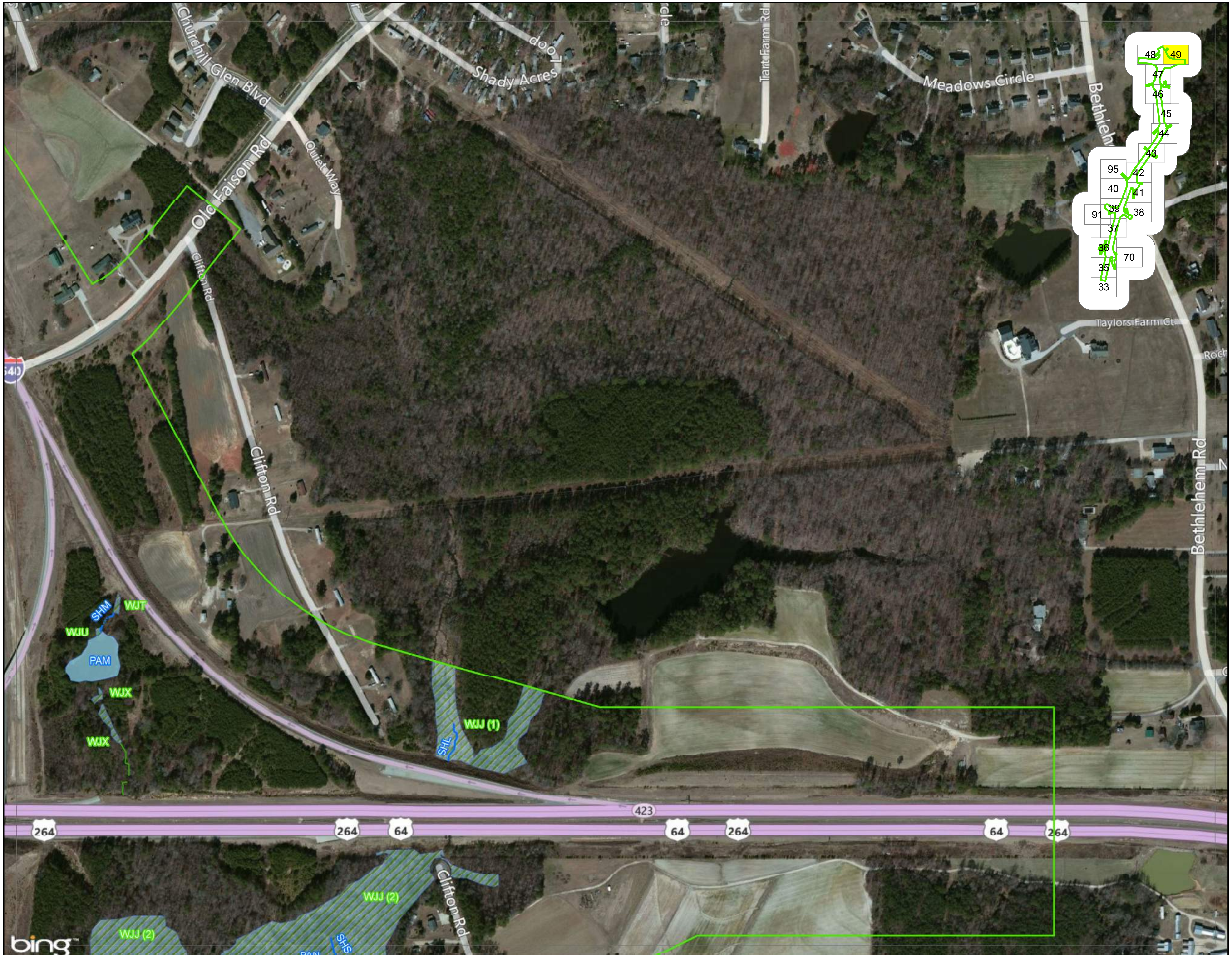
Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-48



Legend

Map Grid

Roads

County Boundary

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

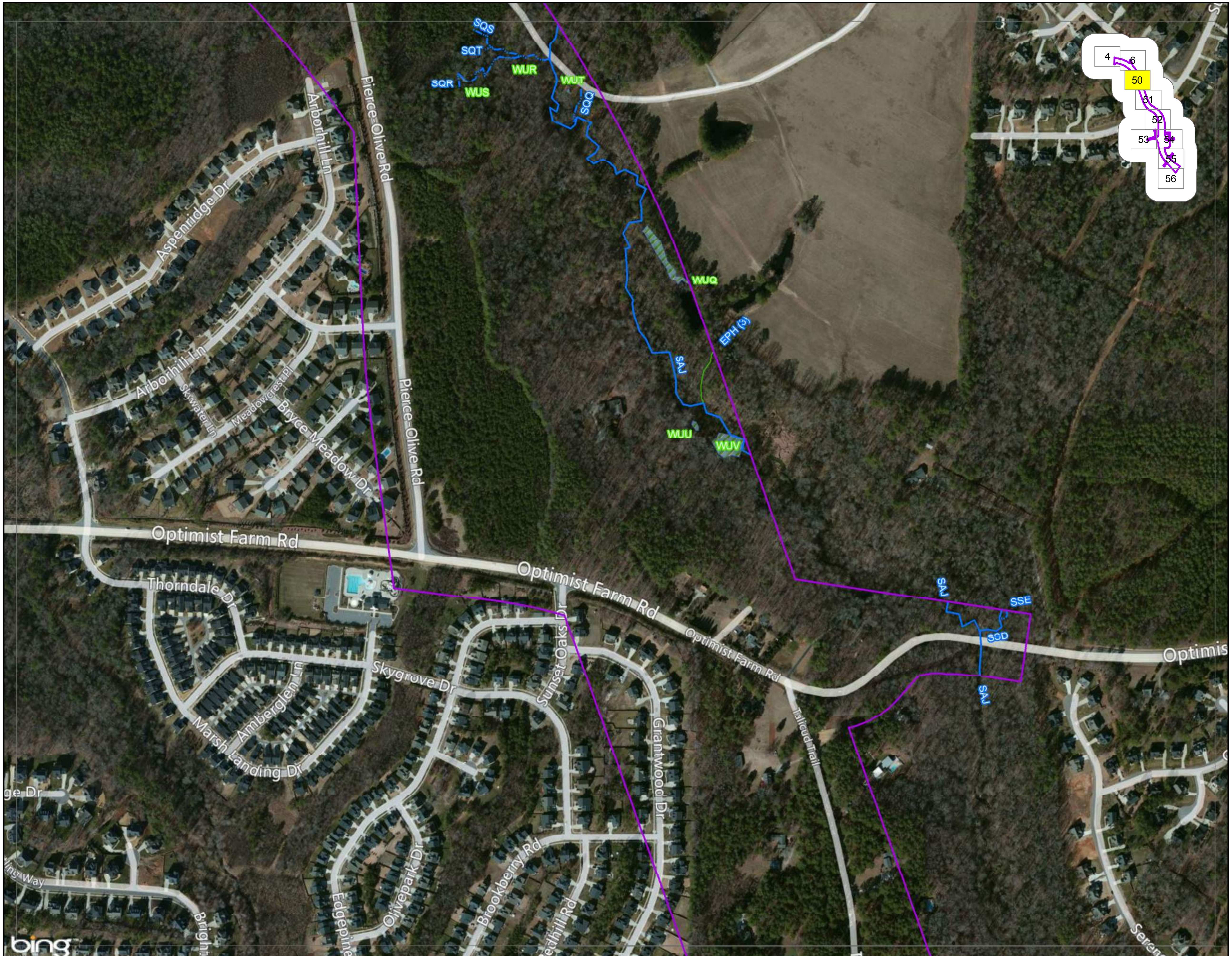
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-49



Legend

- Map Grid
- Roads
- County Boundary

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Jurisdictional Features

- Wetlands
- Beaver Impoundment
- Ponds
- Streams - Intermittent
- Streams - Perennial
- Streams - Ephemeral

Jurisdictional Features

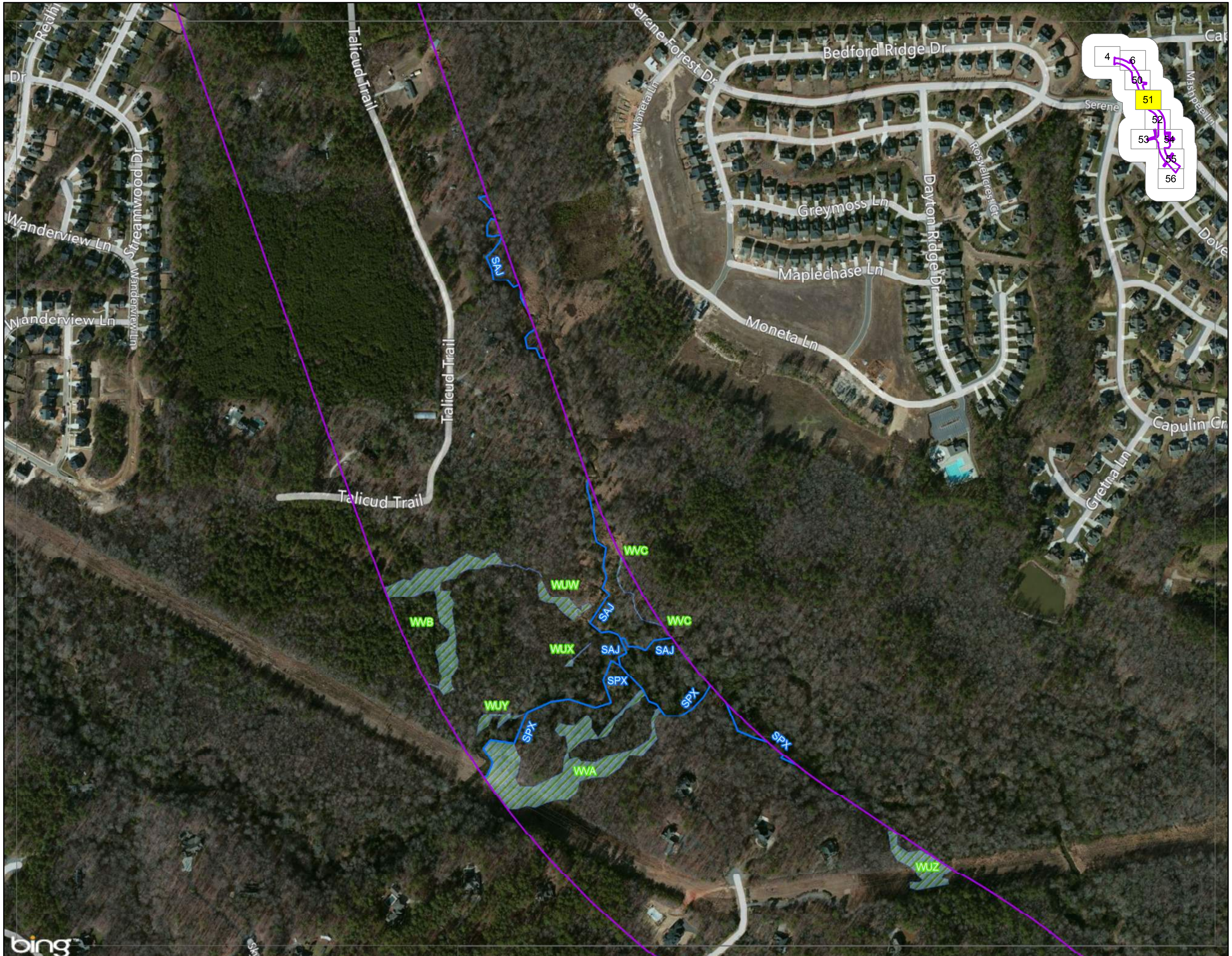
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-50



Legend

Map Grid

Roads

County Boundary

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

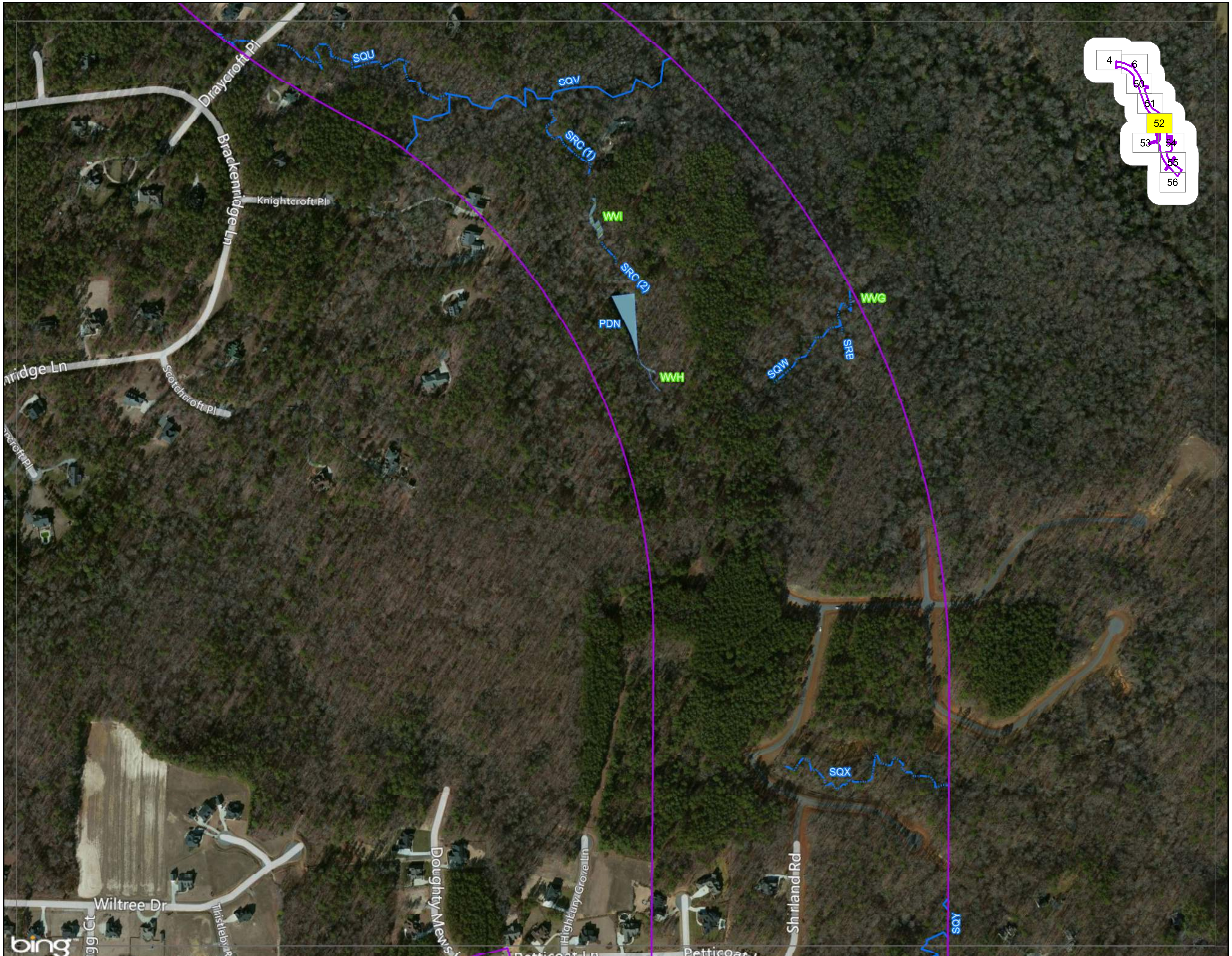
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-51



Legend

Map Grid

Roads

County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

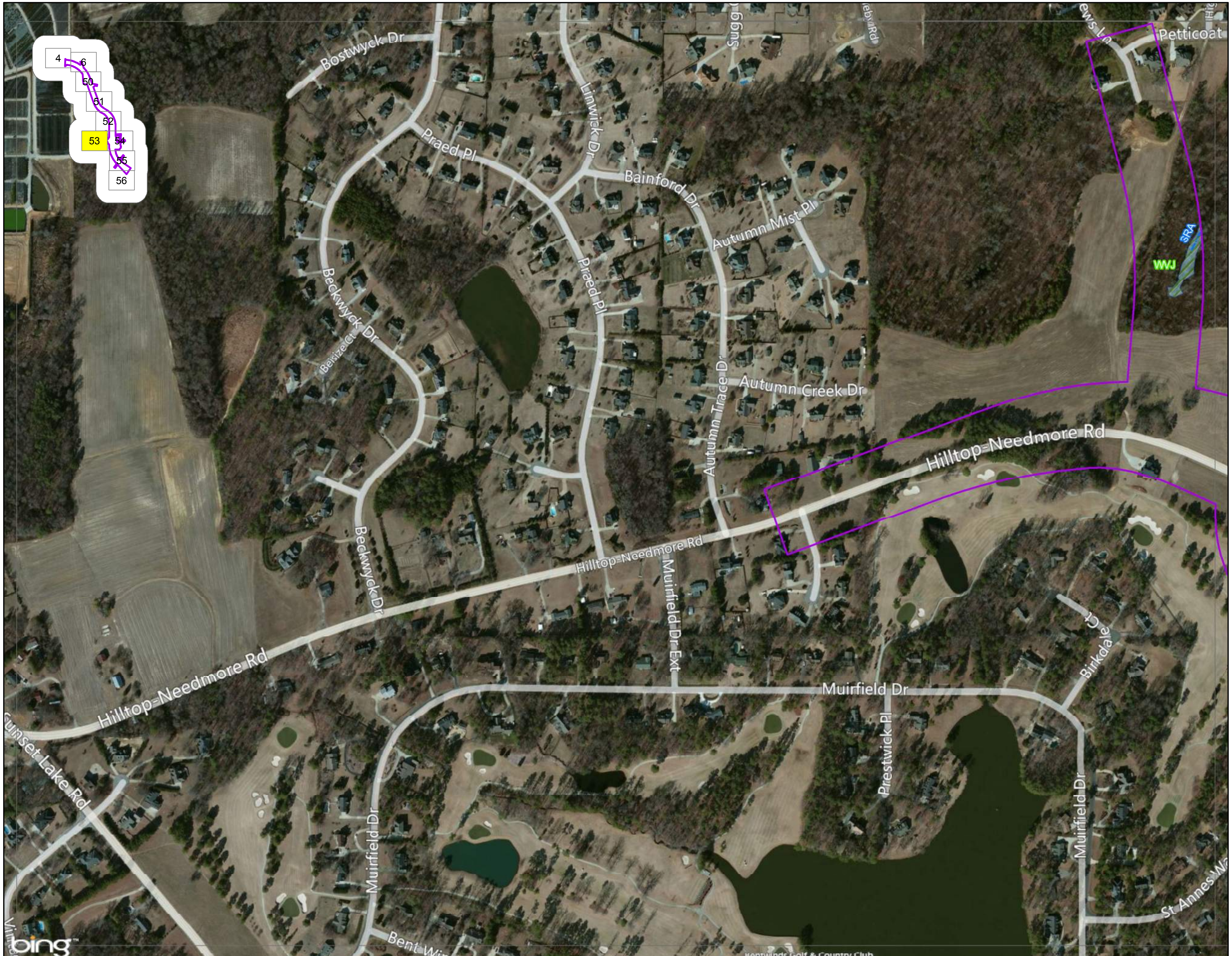
Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-52



Legend

Map Grid

Roads

County Boundary

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

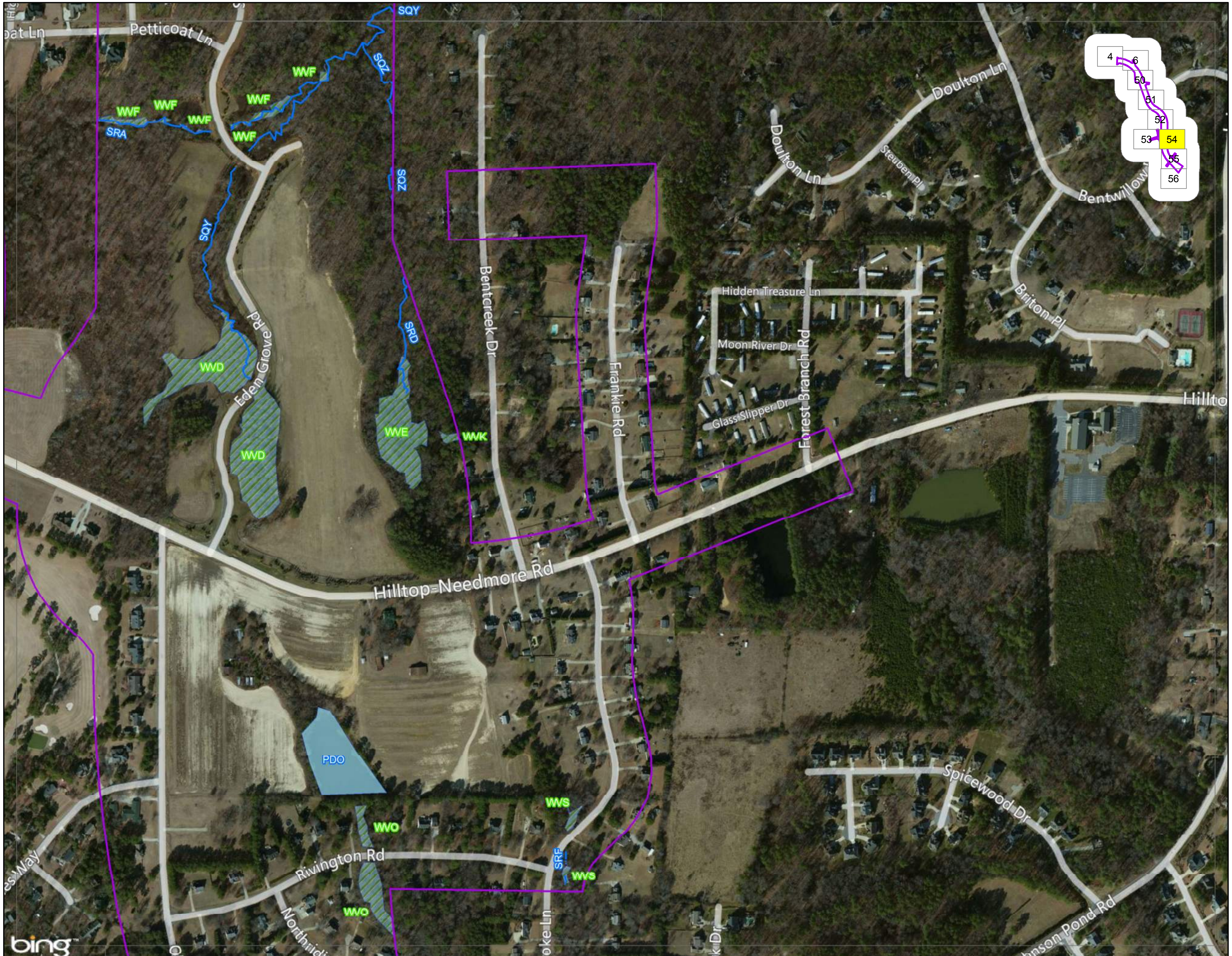
Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-53



Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

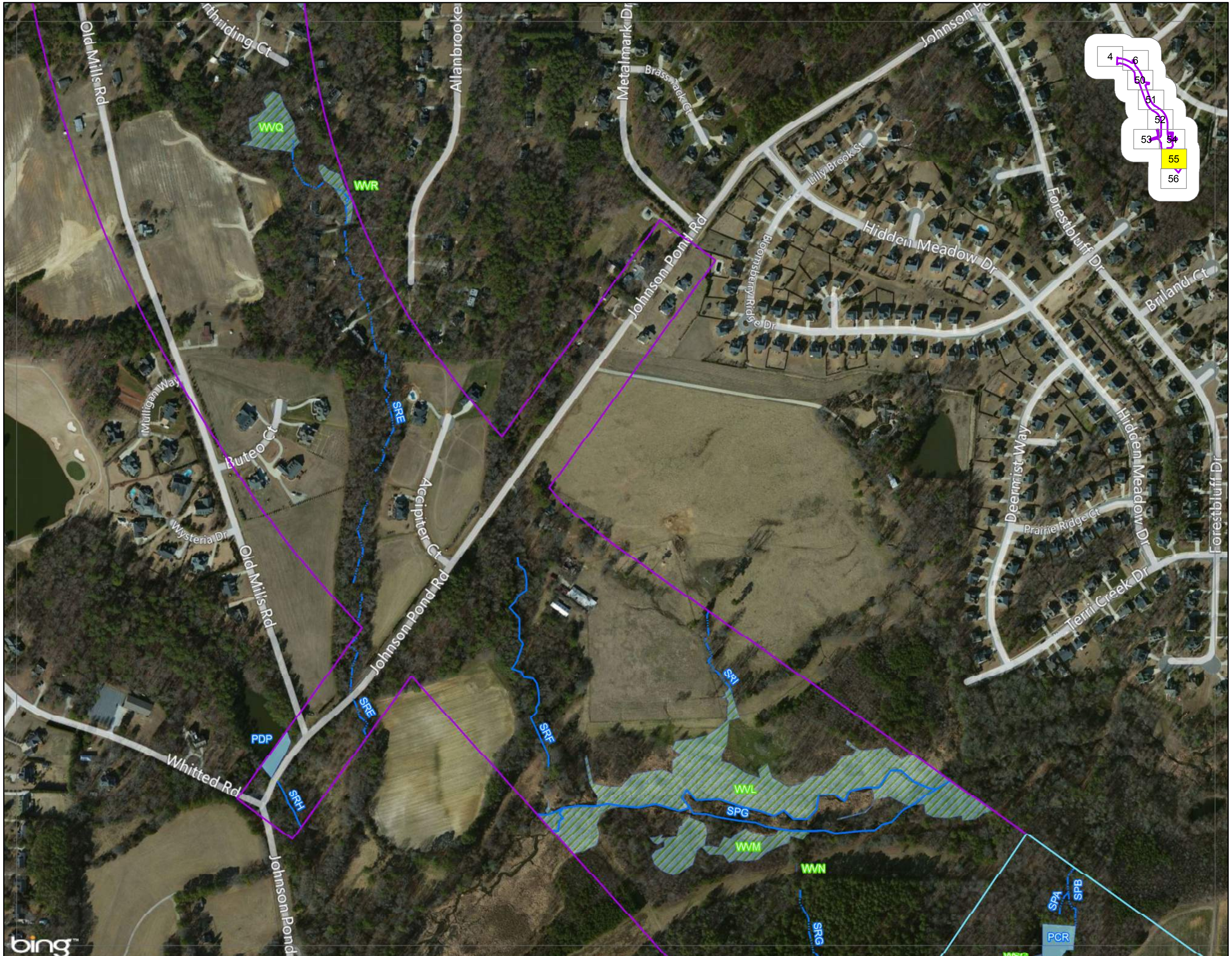
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-54



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-55

Legend

Map Grid

Roads

County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

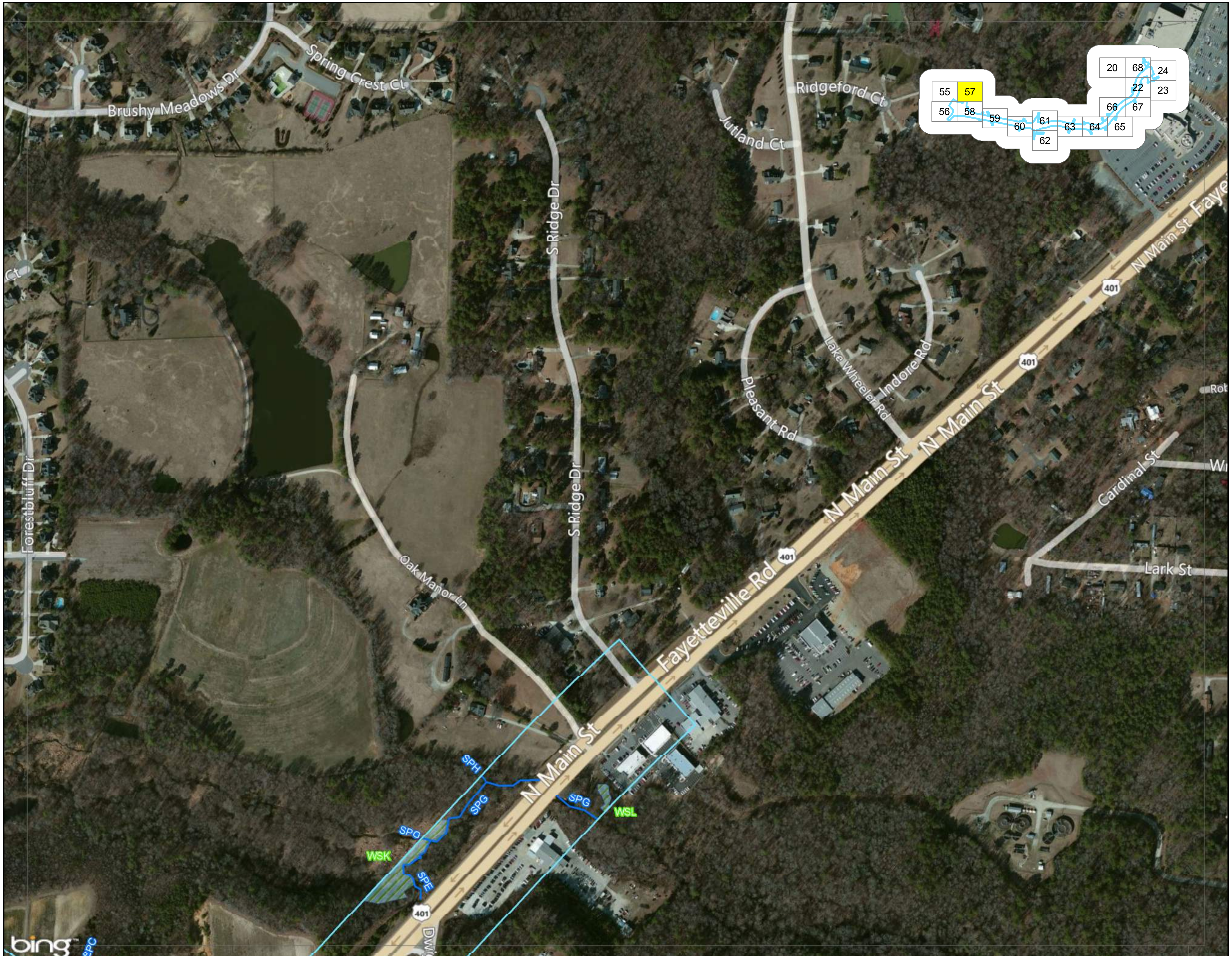
Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-56



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-57

Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-58

Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

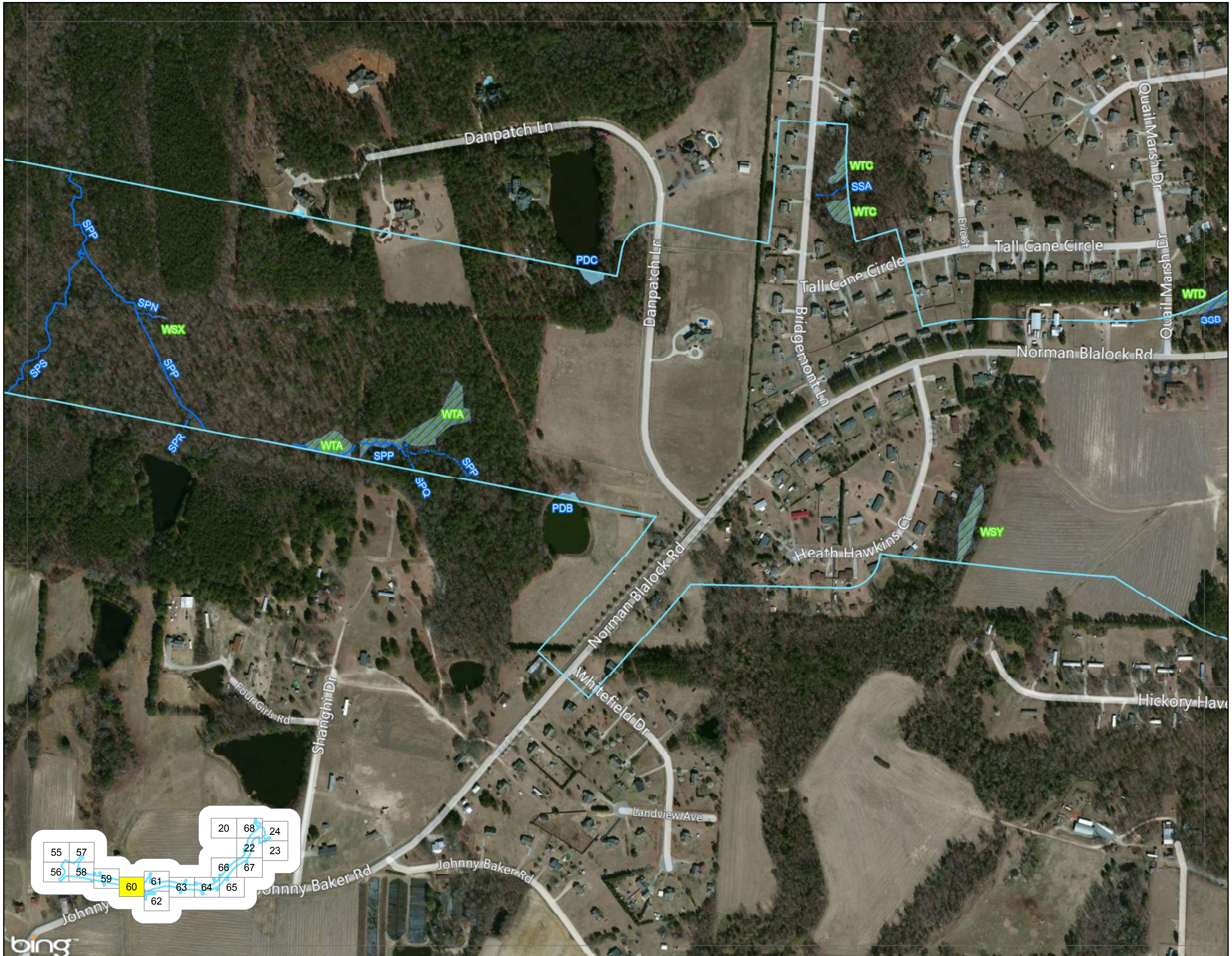
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-59



Legend

Map Grid

Roads

County Boundary

Corridors

Orange

Green

Red

Lilac

Purple

Blue

Brown

Mint

Tan

Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

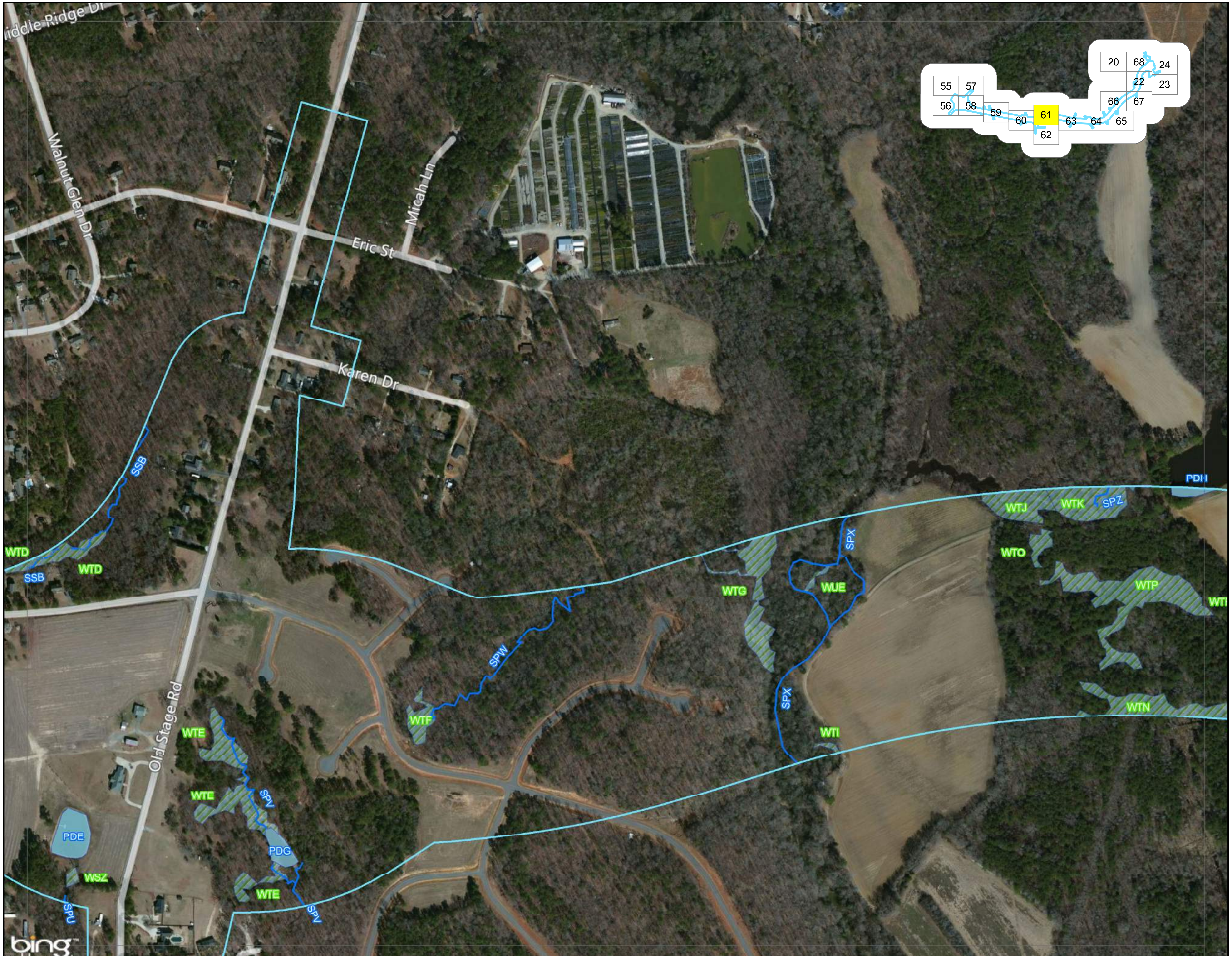
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-60



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

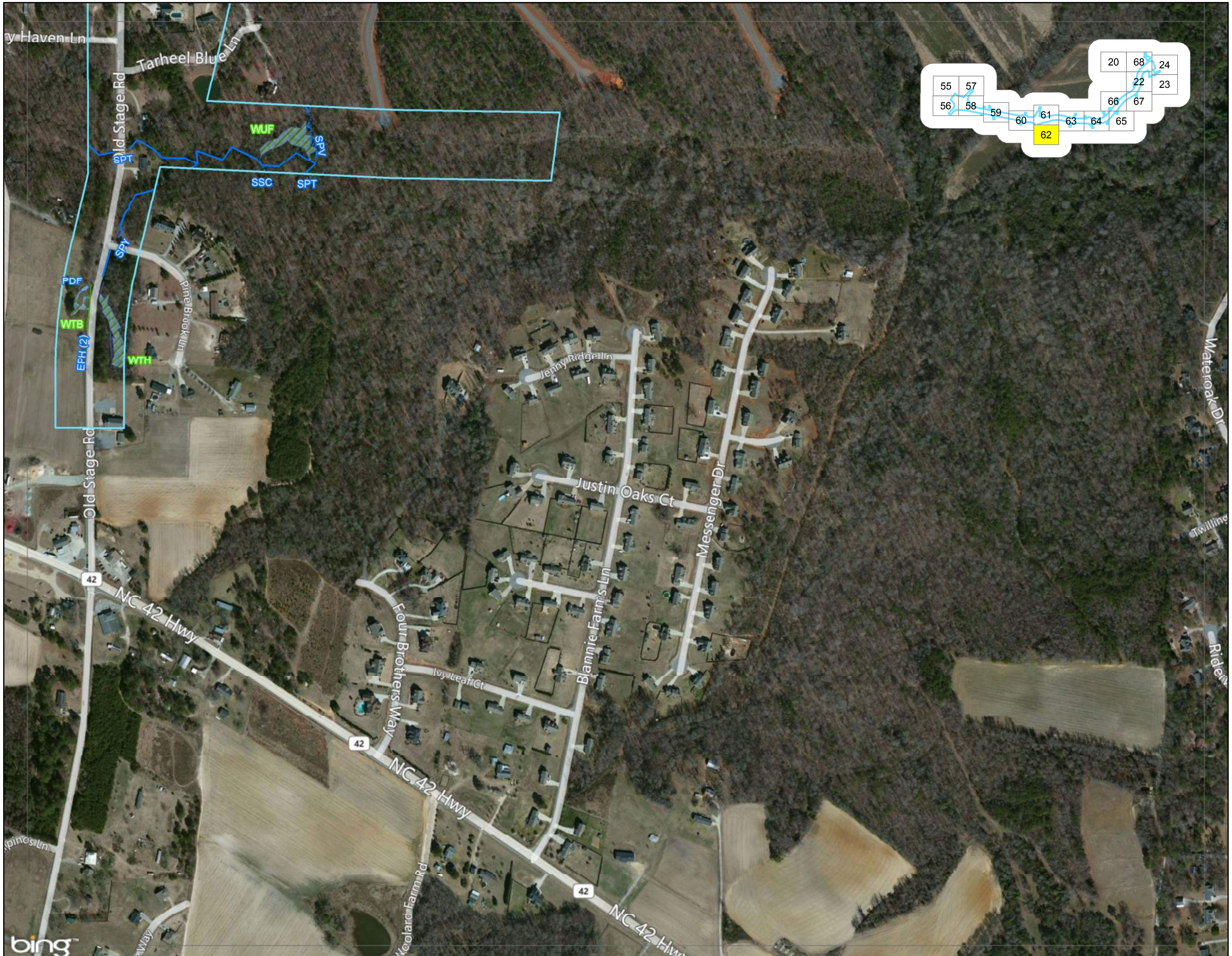
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-61



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-62

Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

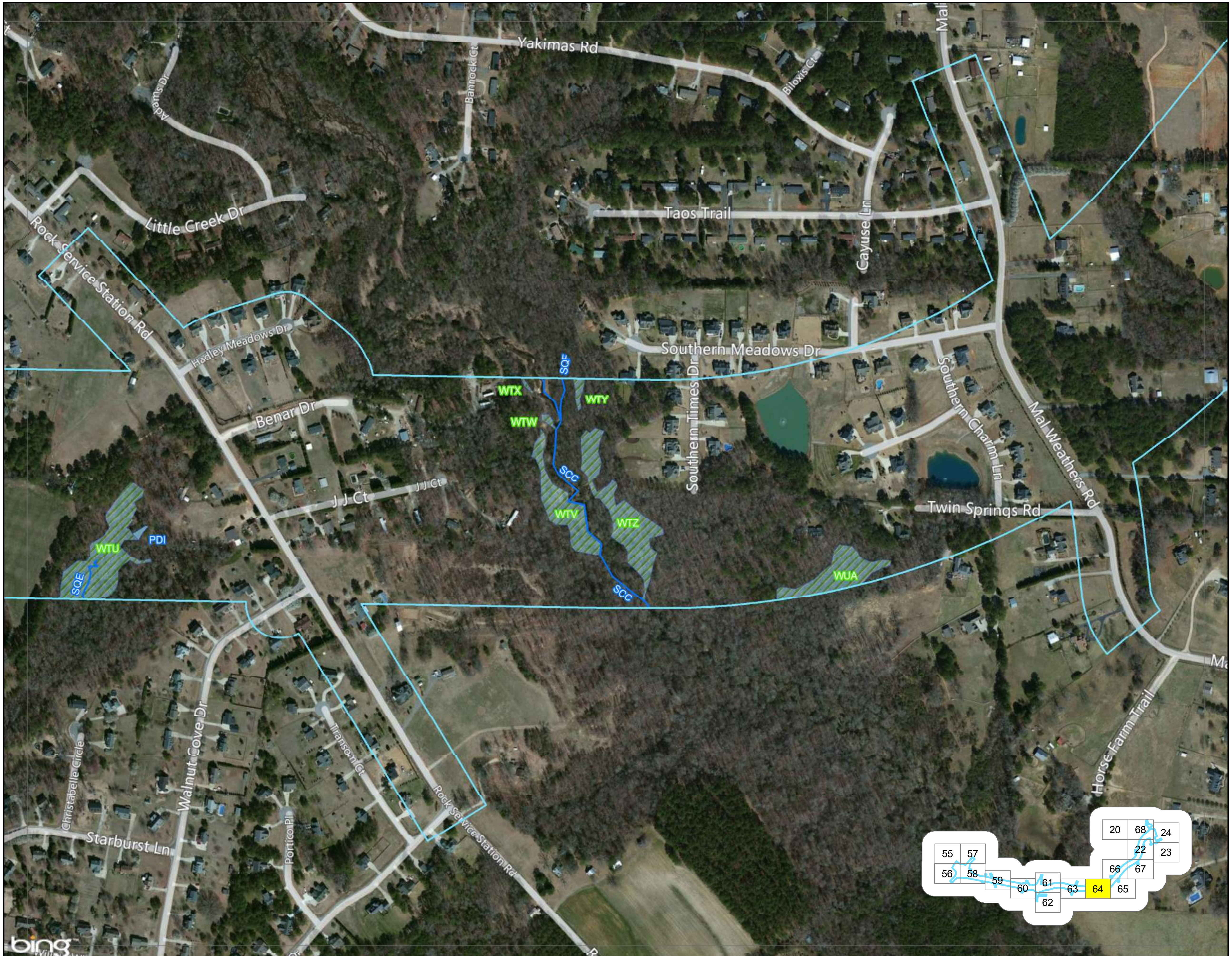
Triangle Expressway
Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-63



Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

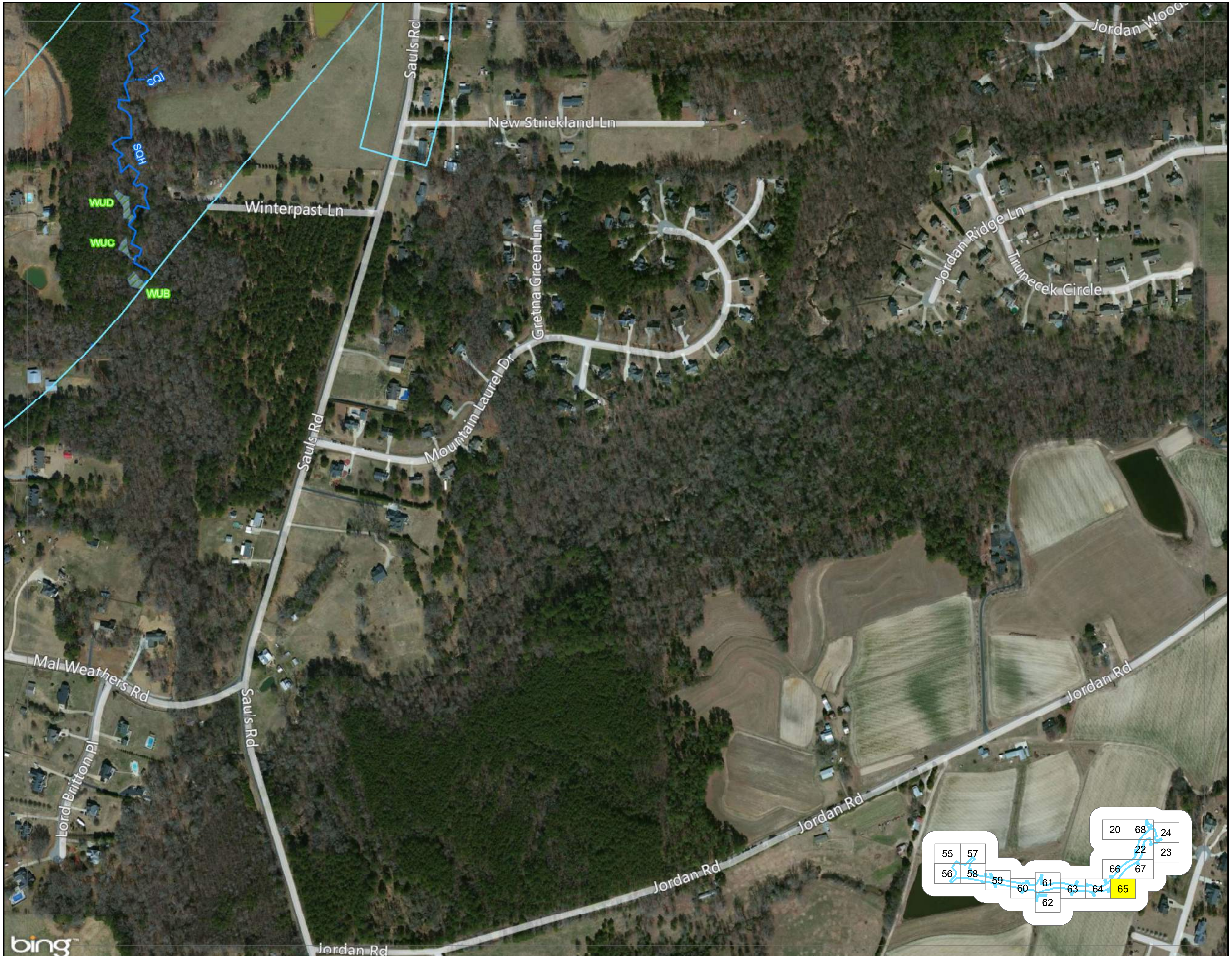
Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-64



Legend

Map Grid

Roads

County Boundary

Corridors

Orange

Green

Red

Lilac

Purple

Blue

Brown

Mint

Tan

Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

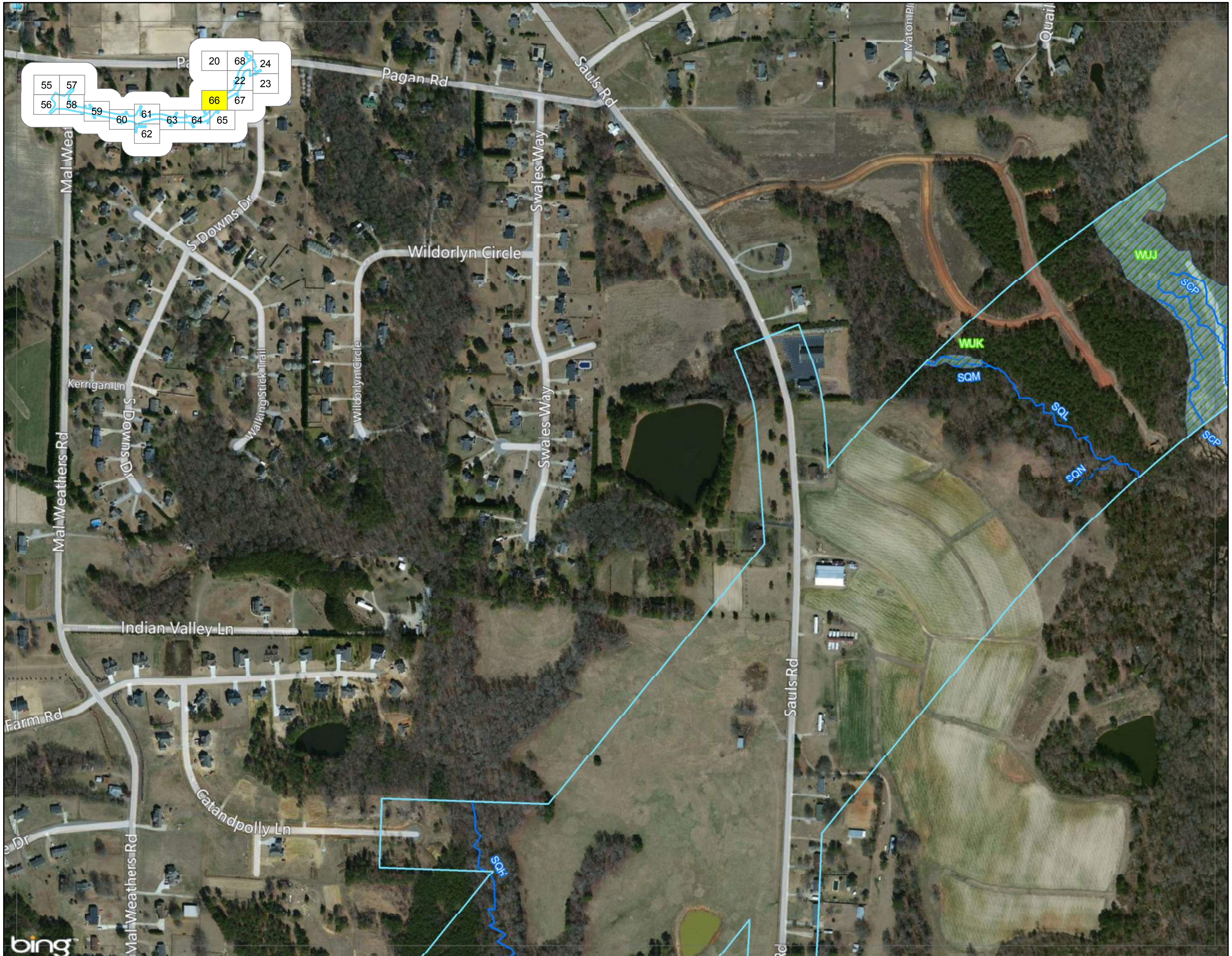
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-65



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

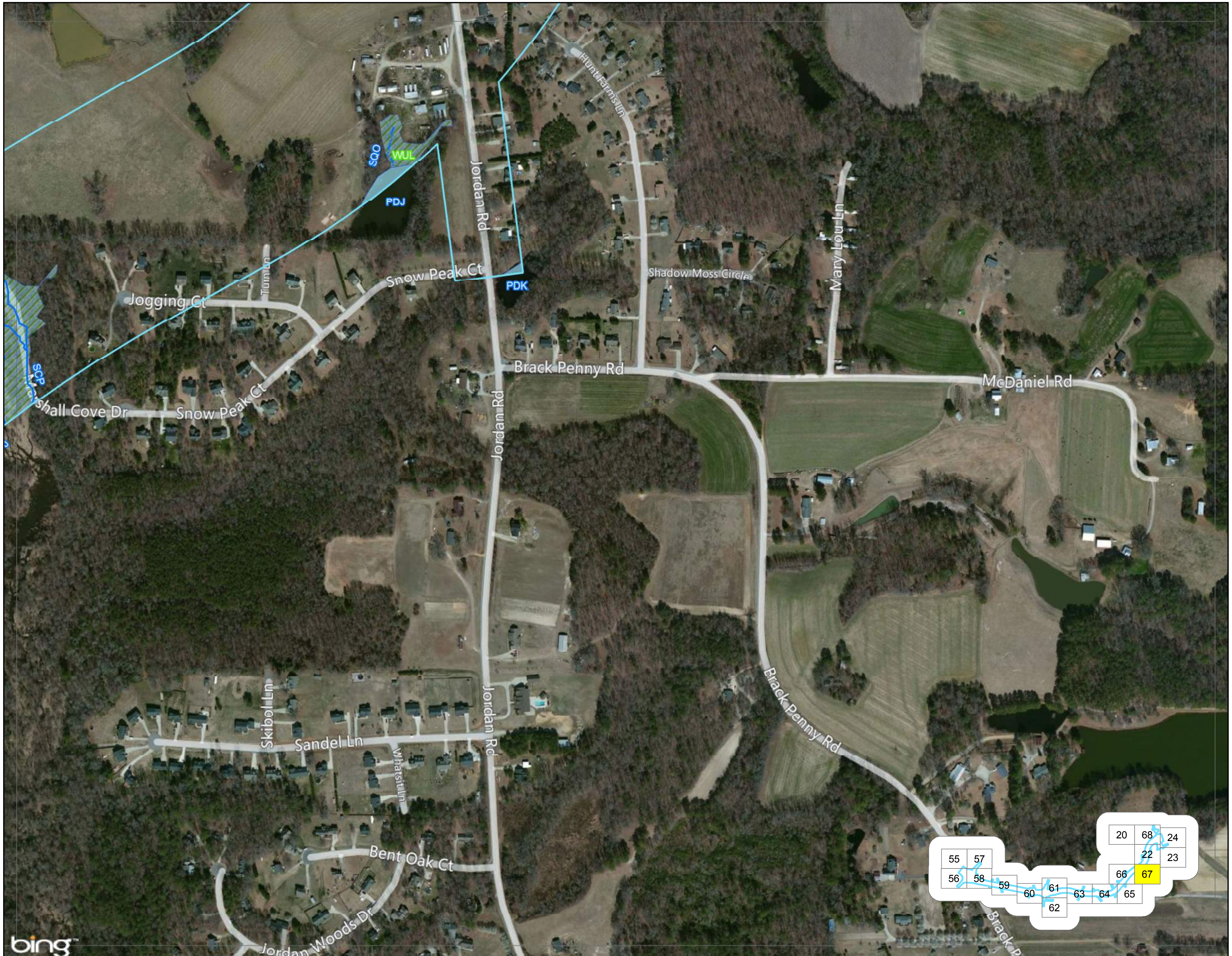
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-66



Legend

Map Grid
Roads
County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

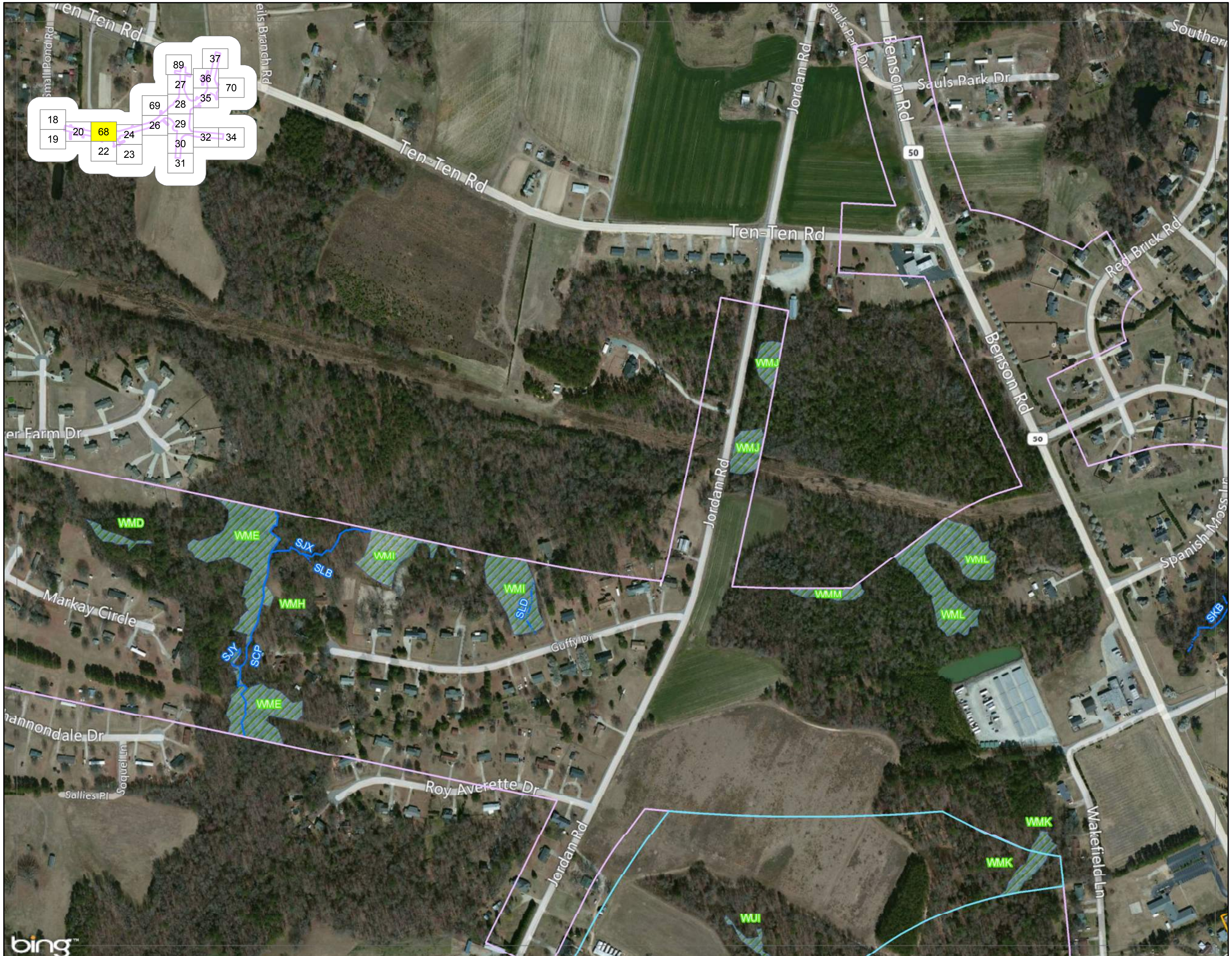
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-67



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

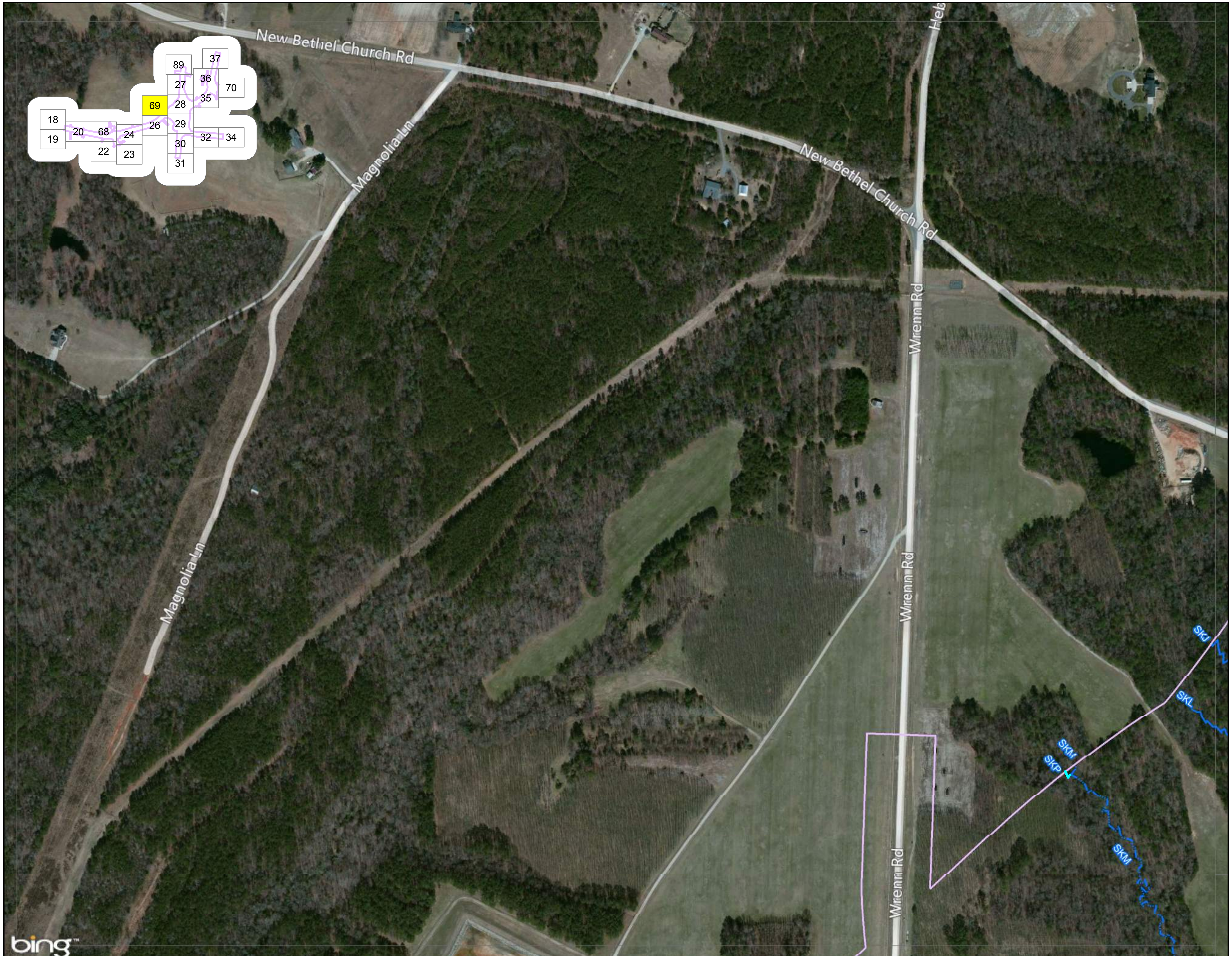
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-68



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

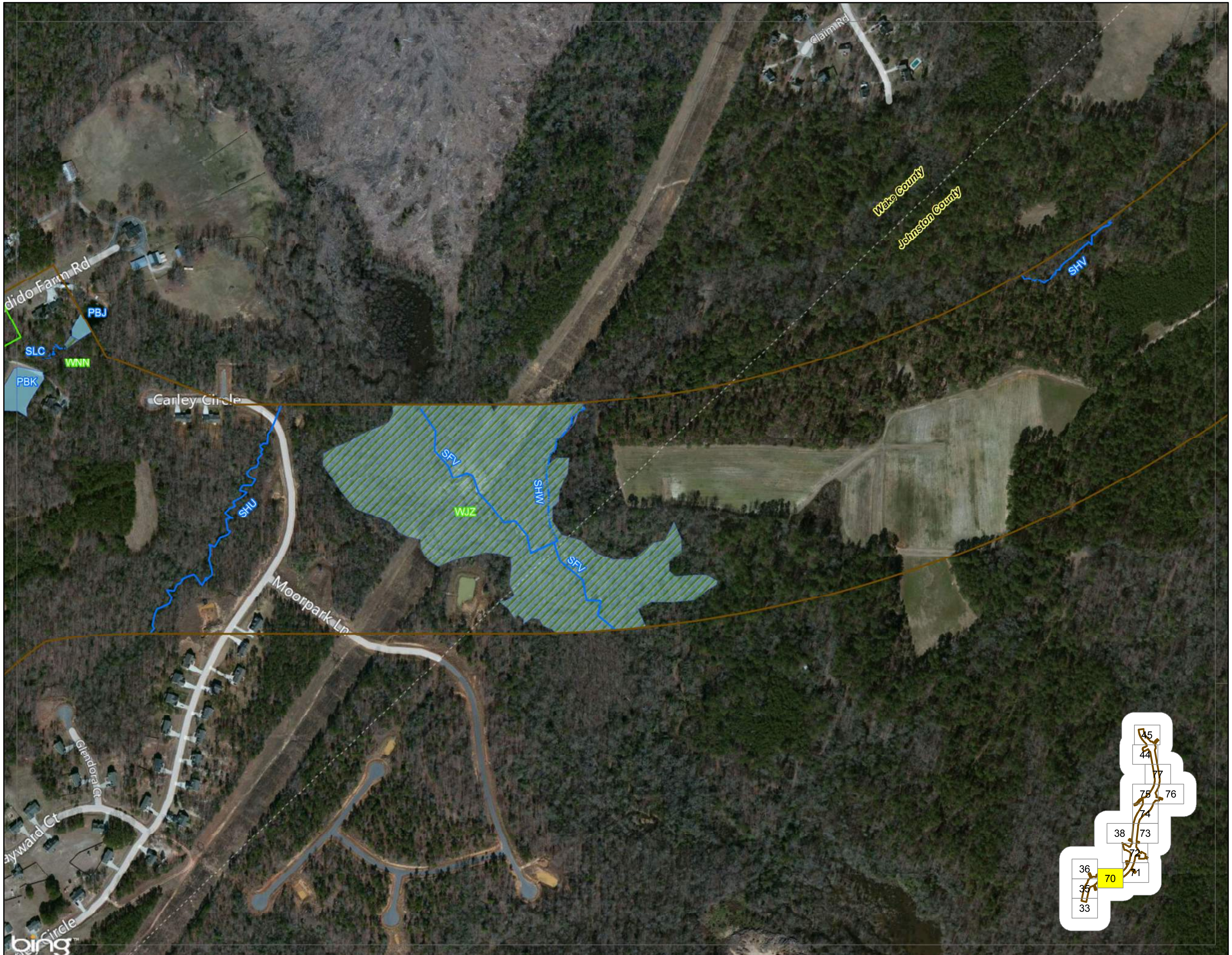
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-69



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 07/21/2014

Figure 3-70

Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

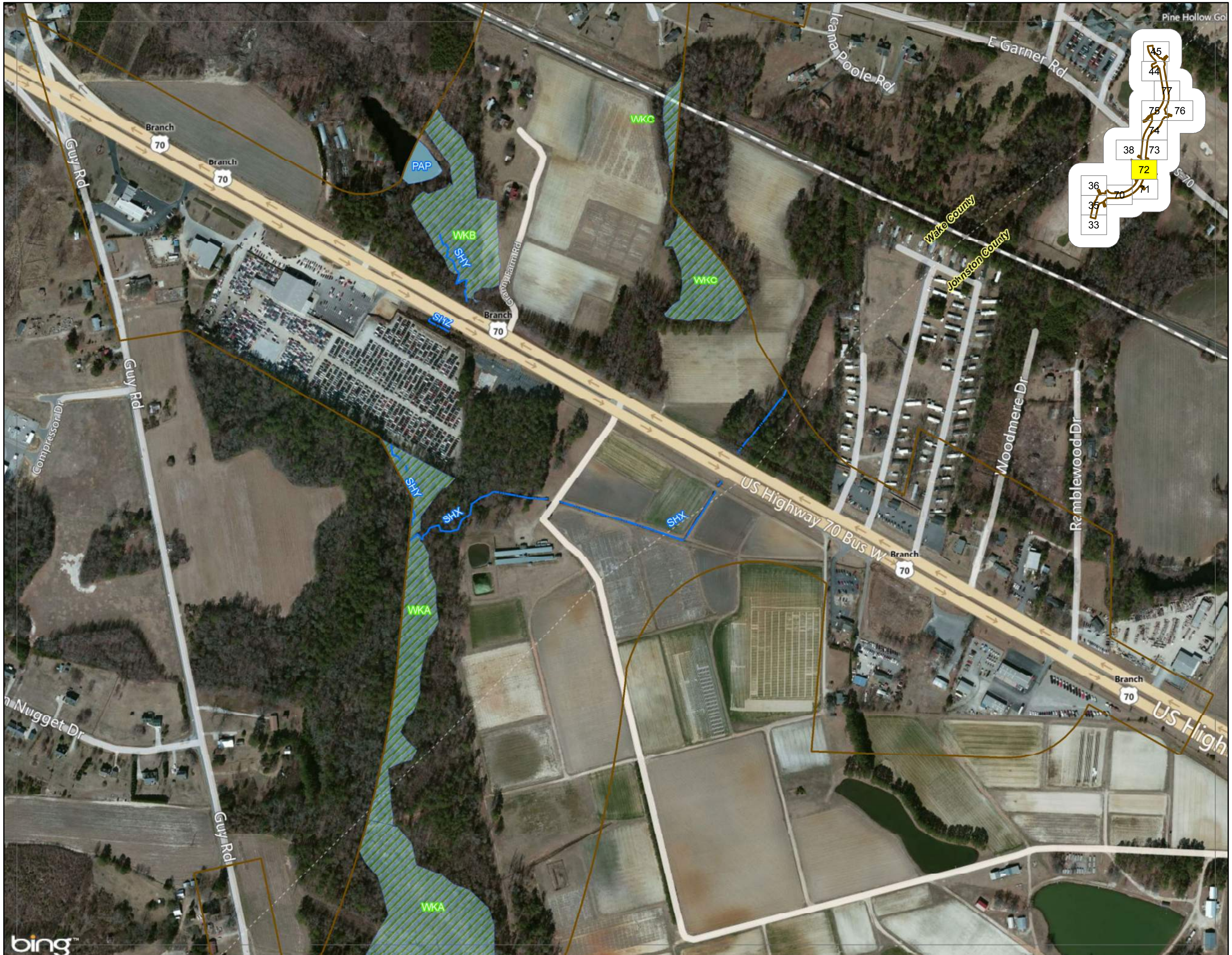
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 07/21/2014

Figure 3-71



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

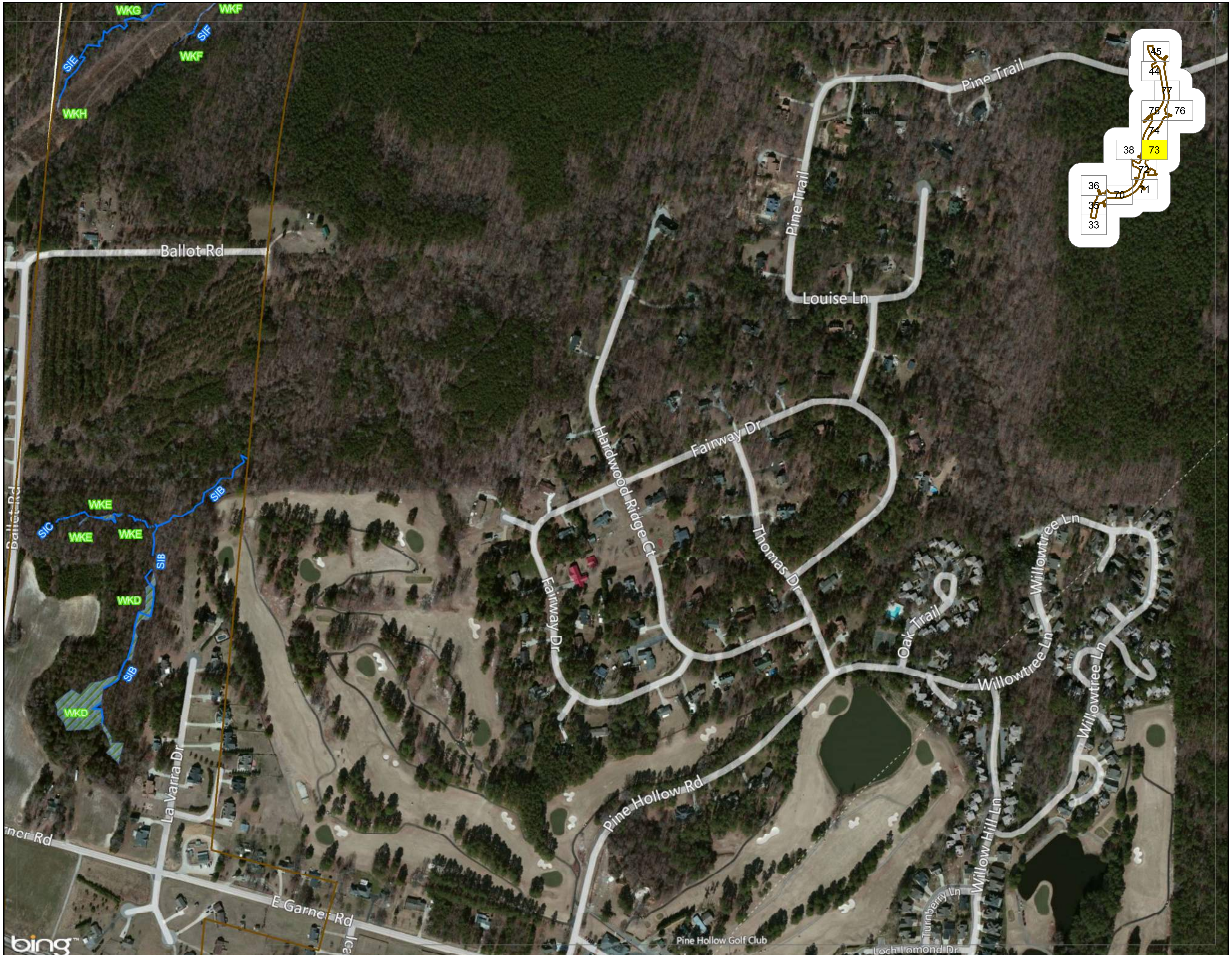
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 07/21/2014

Figure 3-72



Legend

Map Grid

Roads

County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

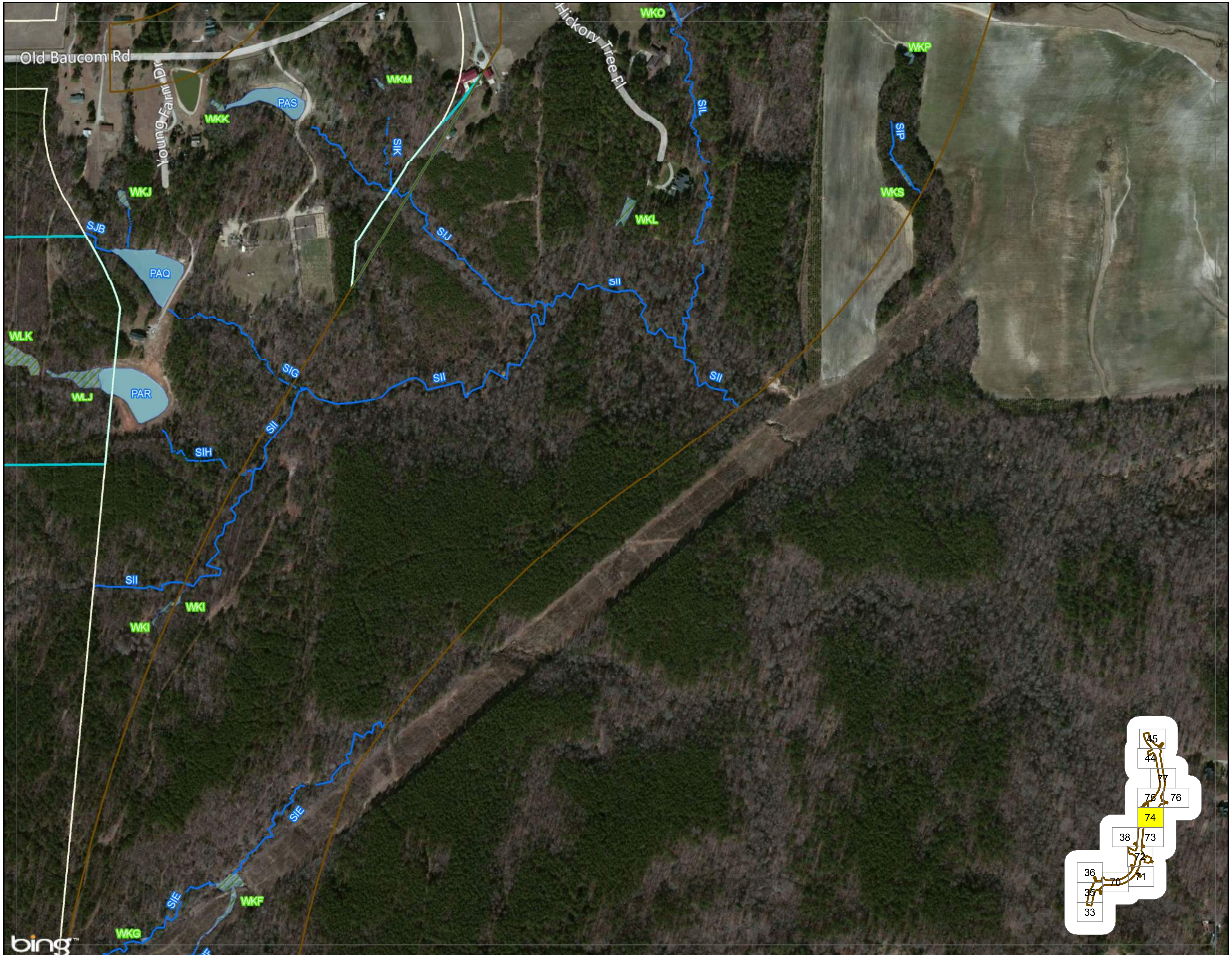
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-73



Legend

Map Grid

Roads

County Boundary

Corridors

Orange

Green

Red

Lilac

Purple

Blue

Brown

Mint

Tan

Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

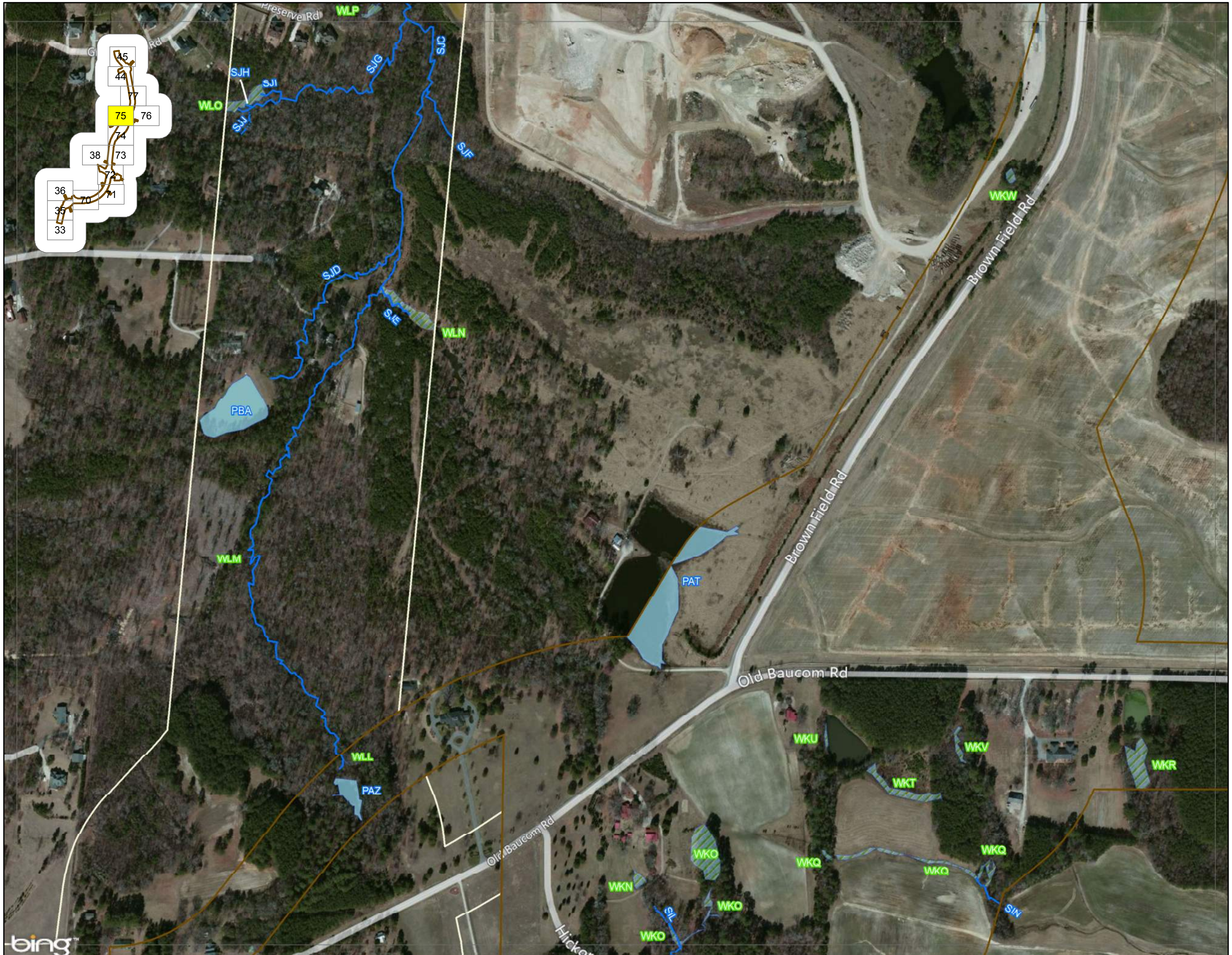
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-74



Legend

- Map Grid
- Roads
- County Boundary

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Jurisdictional Features

- Wetlands
- Beaver Impoundment
- Ponds
- Streams - Intermittent
- Streams - Perennial
- Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-75

Legend

Map Grid

Roads

County Boundary

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-76

Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-77

Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Blue
Green
Brown
Red
Mint
Lilac
Tan
Purple
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-78

Legend

Map Grid

Roads

County Boundary

Corridors

Orange, Blue, Green, Brown, Red, Mint, Lilac, Tan, Purple, Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

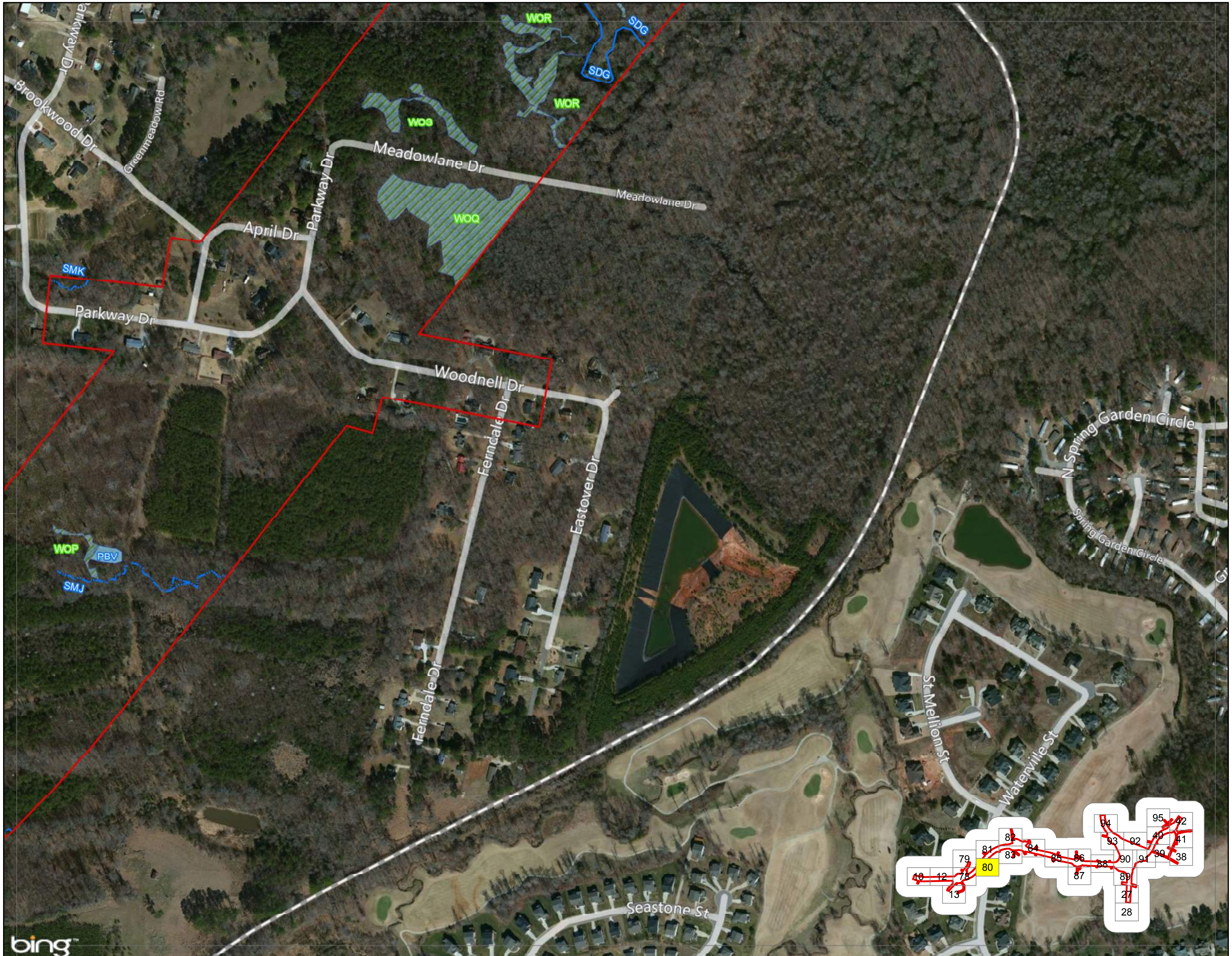
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-79



Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-80

Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Blue
Green
Brown
Red
Mint
Lilac
Tan
Purple
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

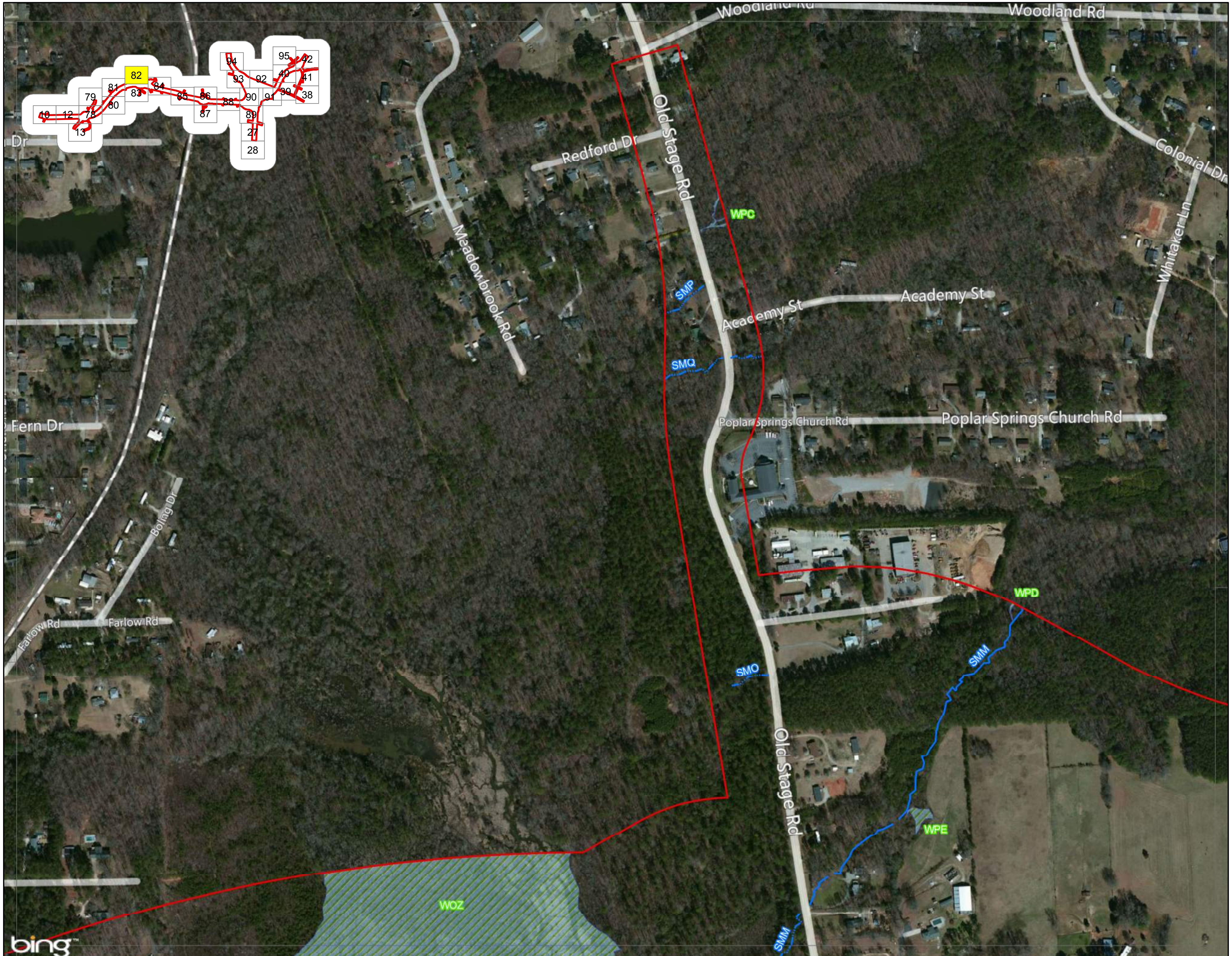
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-81



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

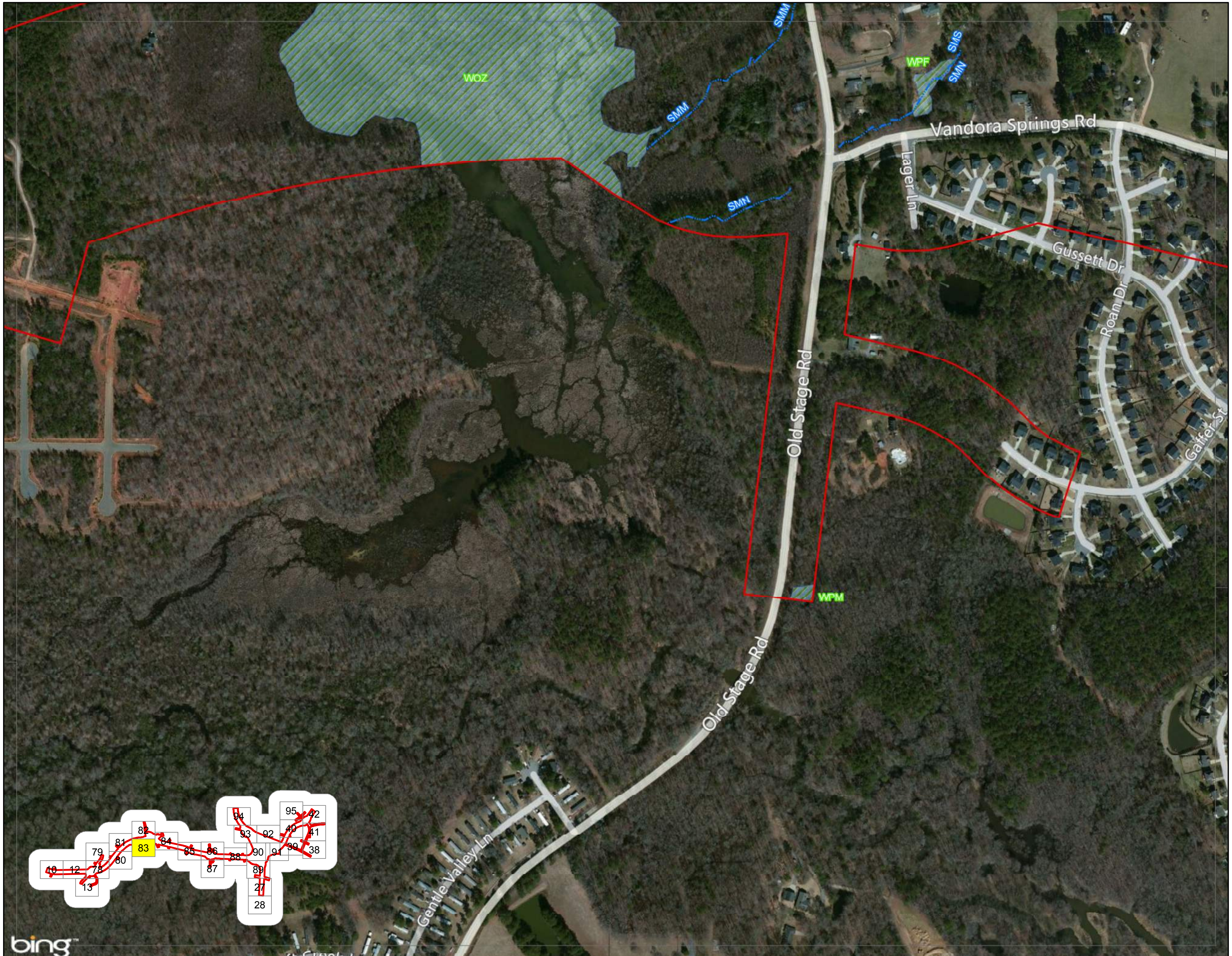
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-82



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Blue
Green
Brown
Red
Mint
Lilac
Tan
Purple
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

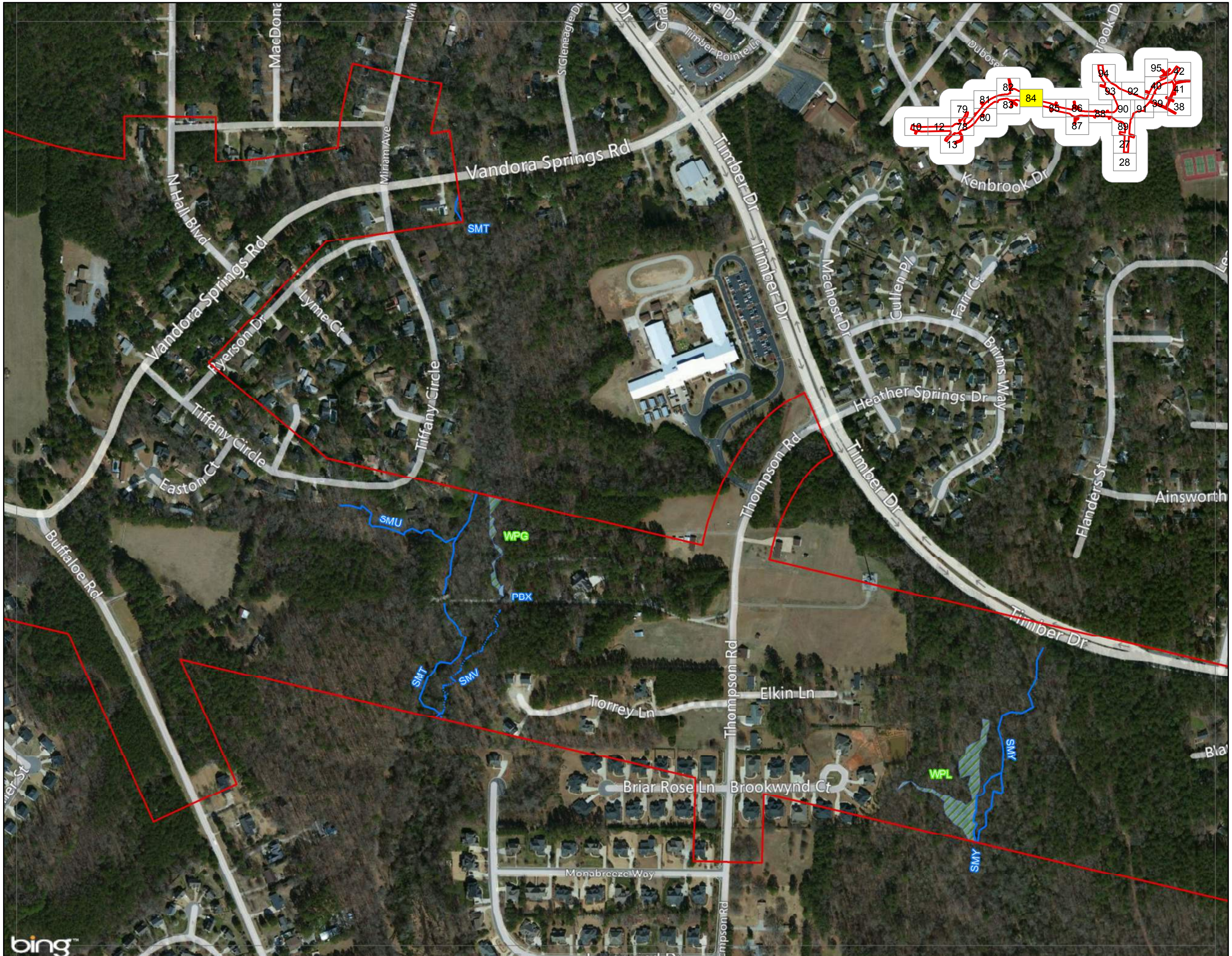
Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-83



Legend

Map Grid

Roads

County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

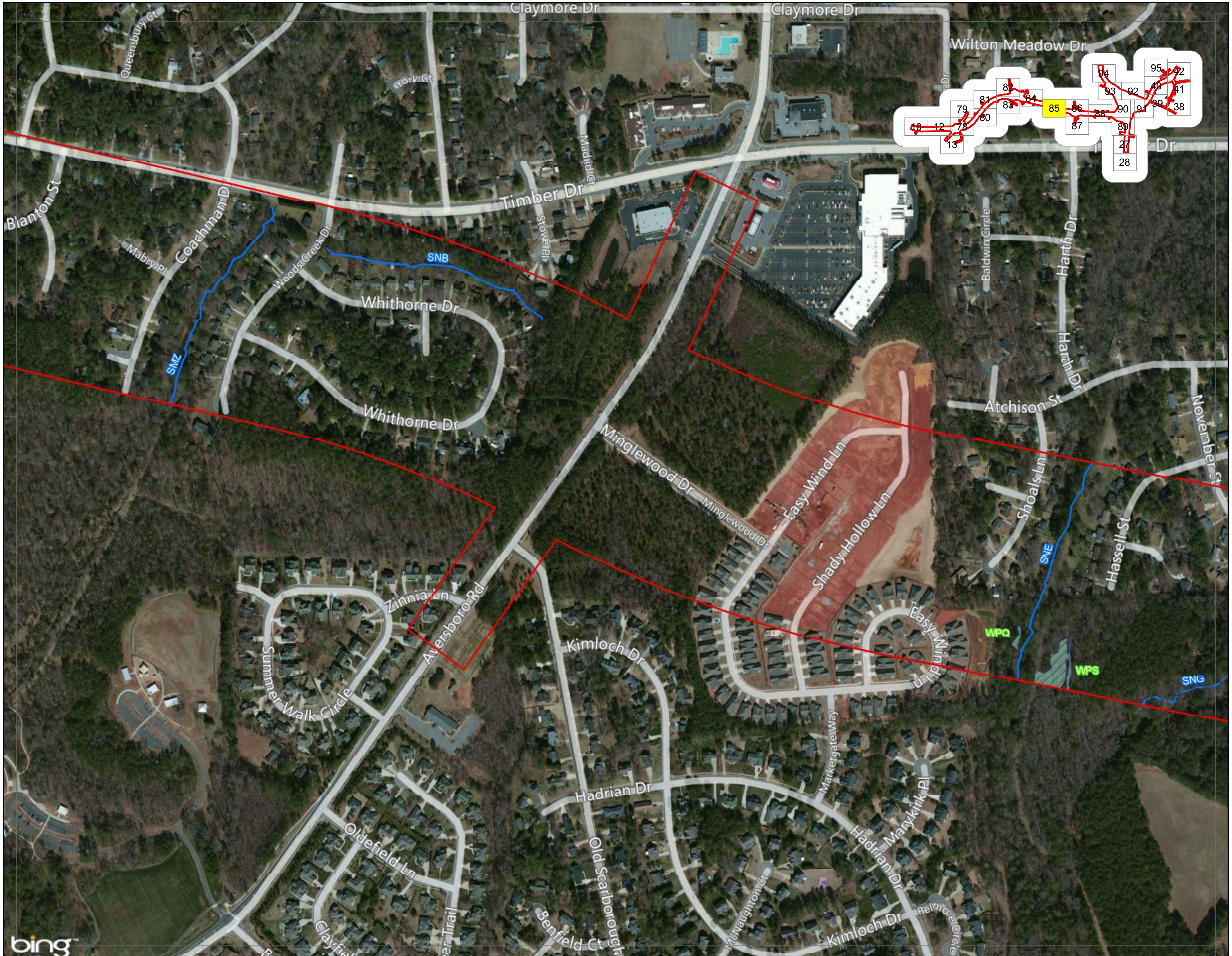
Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-84



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

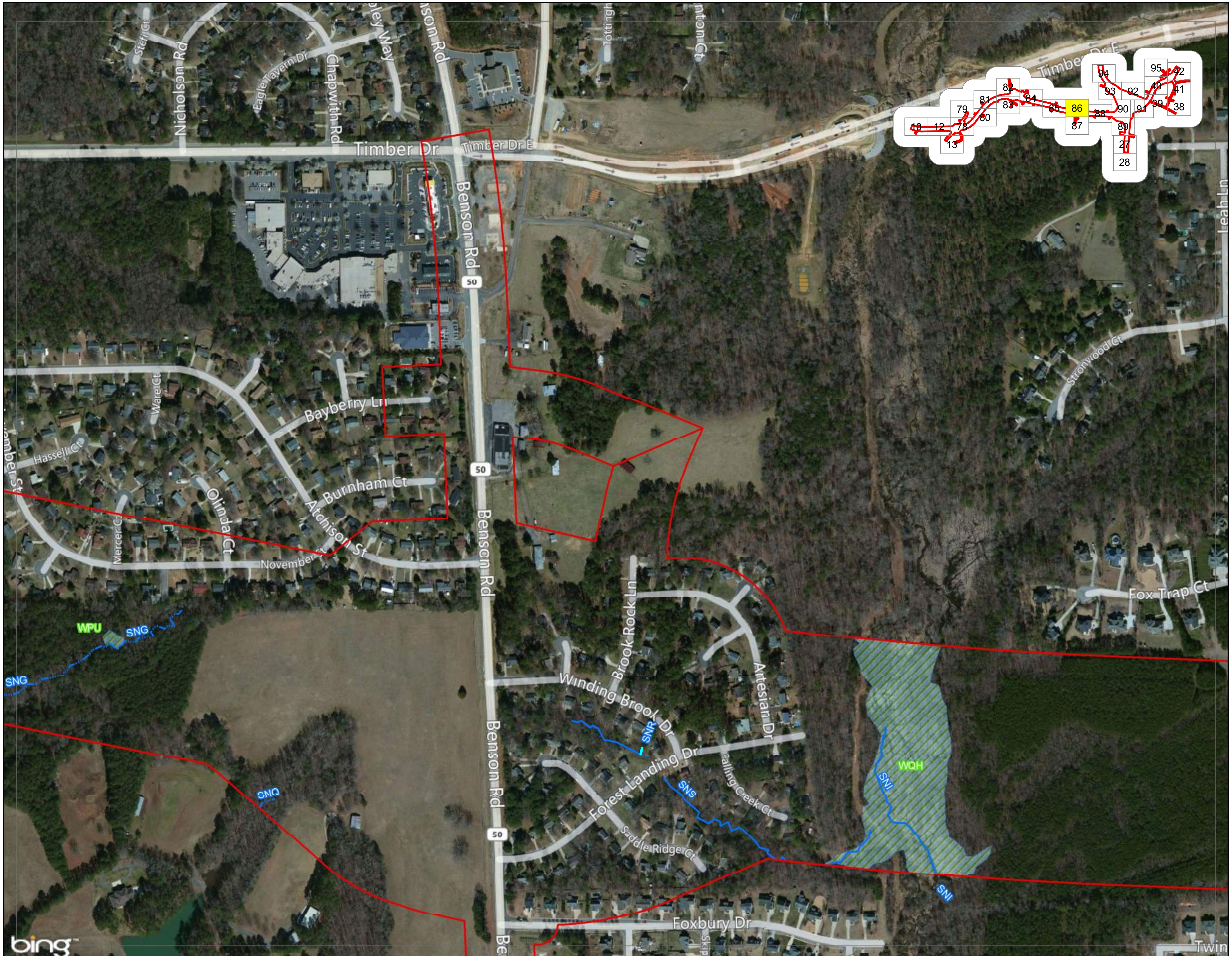
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-85



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

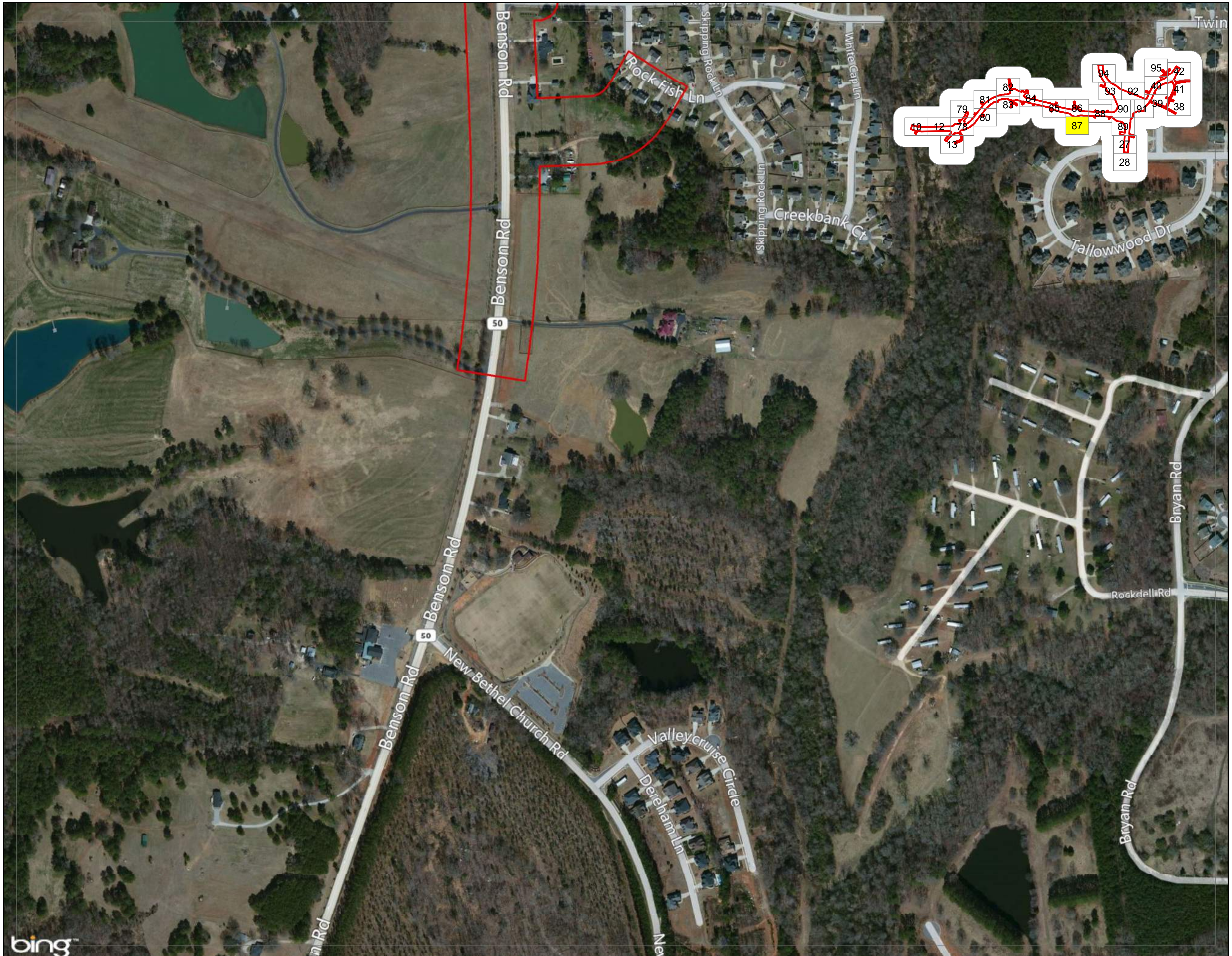
Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-86



Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-87

Legend

Map Grid
Roads
County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

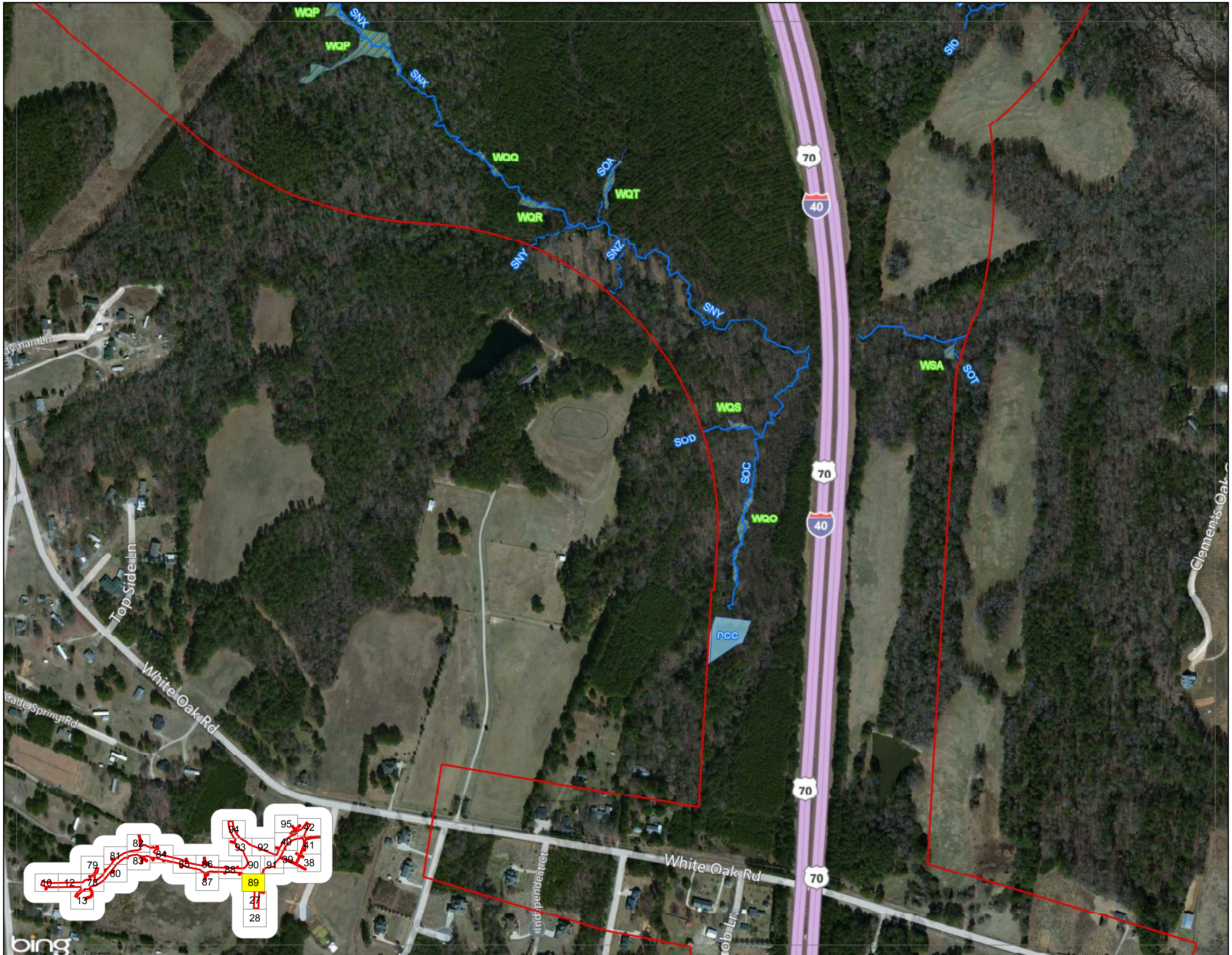
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-88



Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

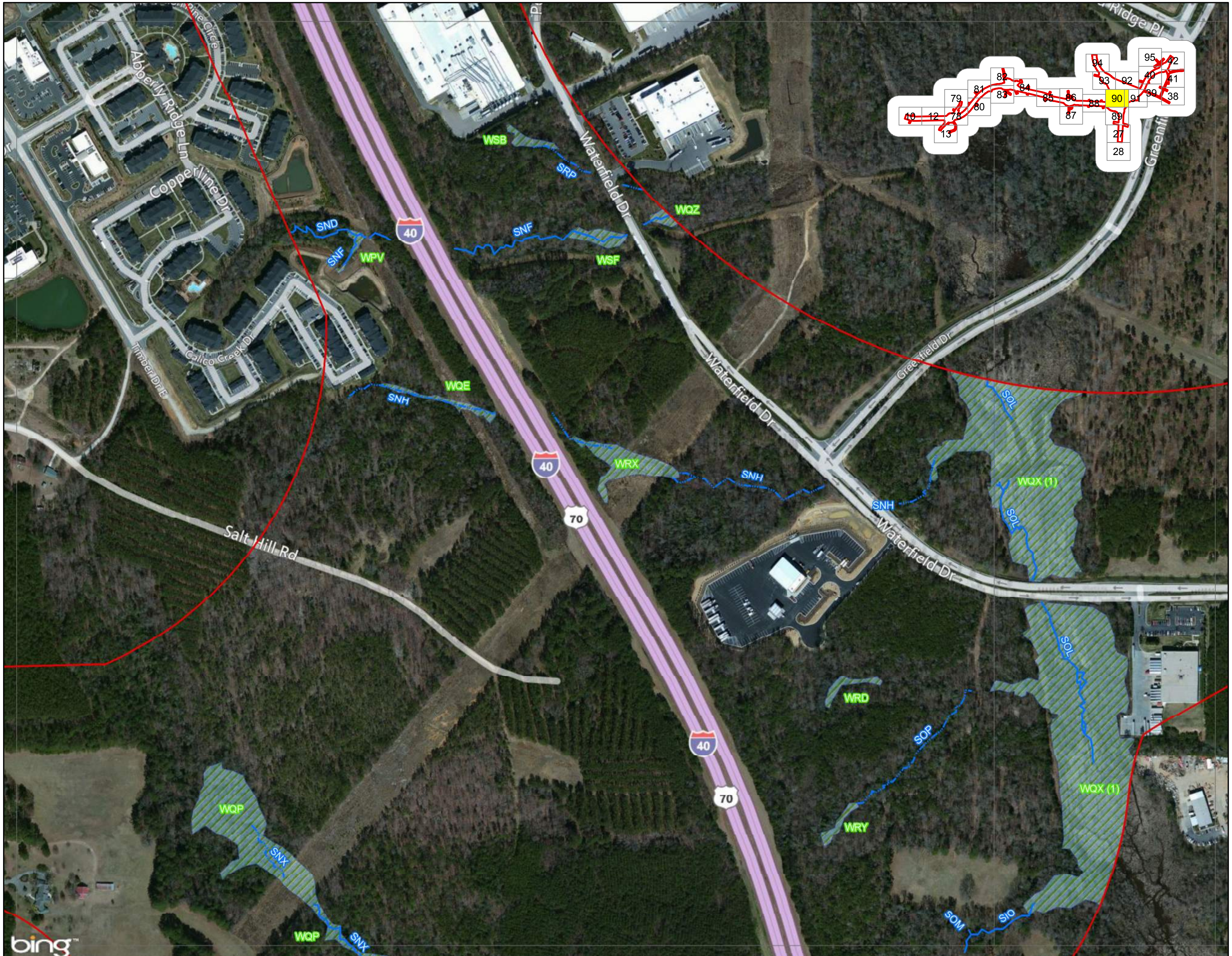
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-89



Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-90

Legend

Map Grid

Roads

County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-91

Legend

Map Grid

Roads

County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-92

Legend

- Map Grid
- Roads
- County Boundary

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Jurisdictional Features

- Wetlands
- Beaver Impoundment
- Ponds
- Streams - Intermittent
- Streams - Perennial
- Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-93

Legend

Map Grid

Roads

County Boundary

Corridors

Orange, Green, Red, Lilac, Purple, Blue, Brown, Mint, Tan, Teal

Jurisdictional Features

Wetlands

Beaver Impoundment

Ponds

Streams - Intermittent

Streams - Perennial

Streams - Ephemeral

Jurisdictional Features

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/18/2014

Figure 3-94

Legend

Map Grid
Roads
County Boundary

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Jurisdictional Features

Wetlands
Beaver Impoundment
Ponds
Streams - Intermittent
Streams - Perennial
Streams - Ephemeral

Jurisdictional Features

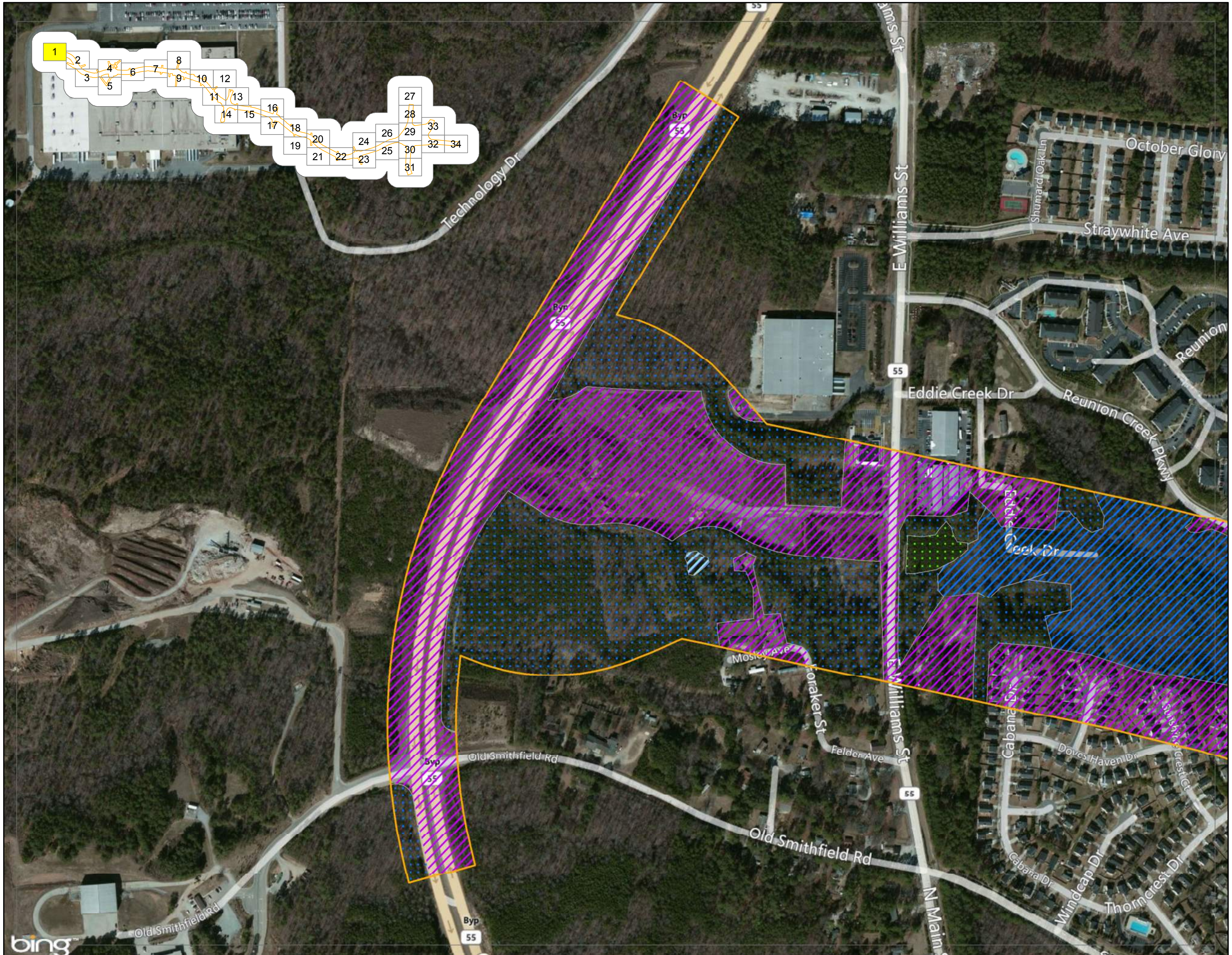
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/18/2014

Figure 3-95



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

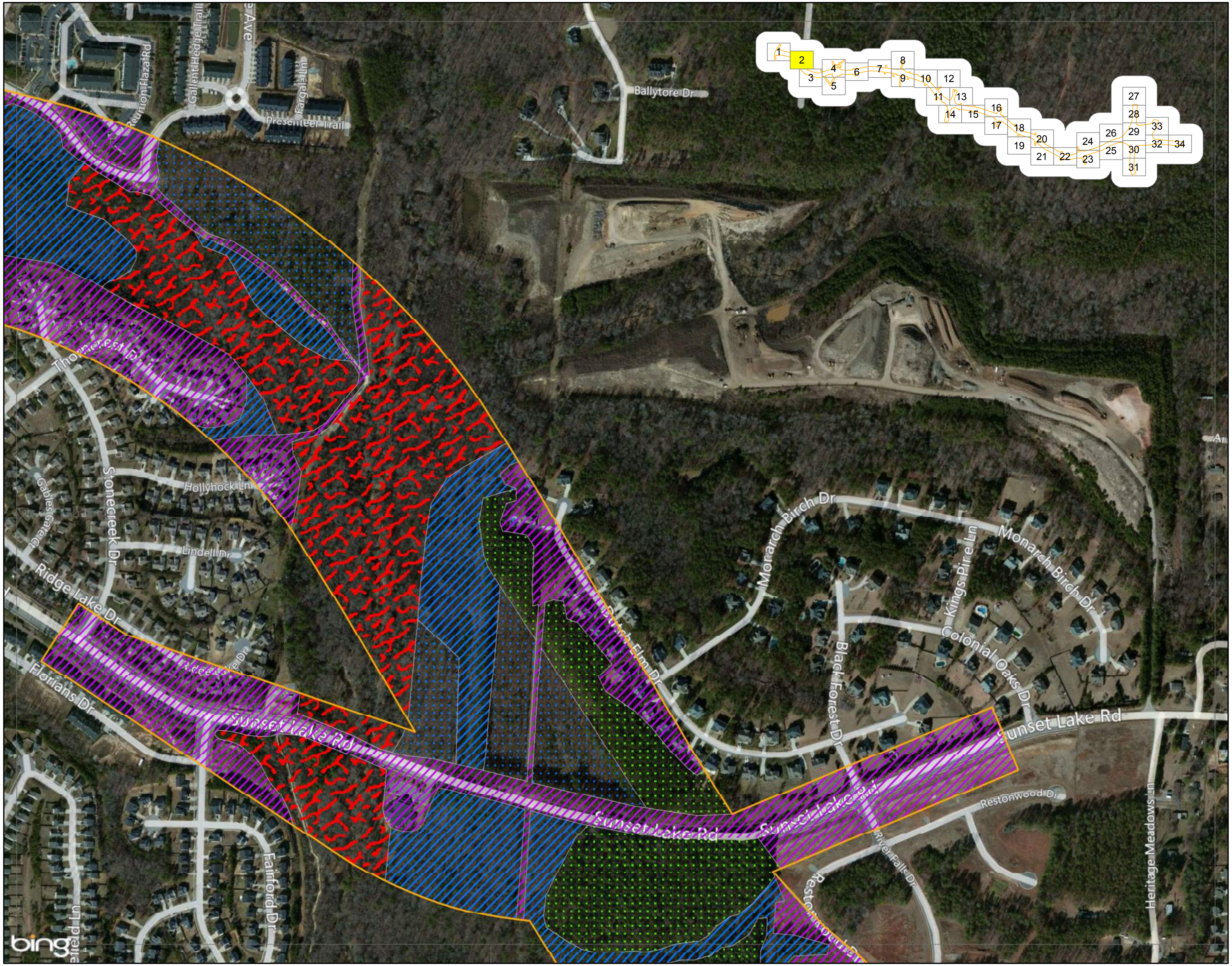
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-1



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

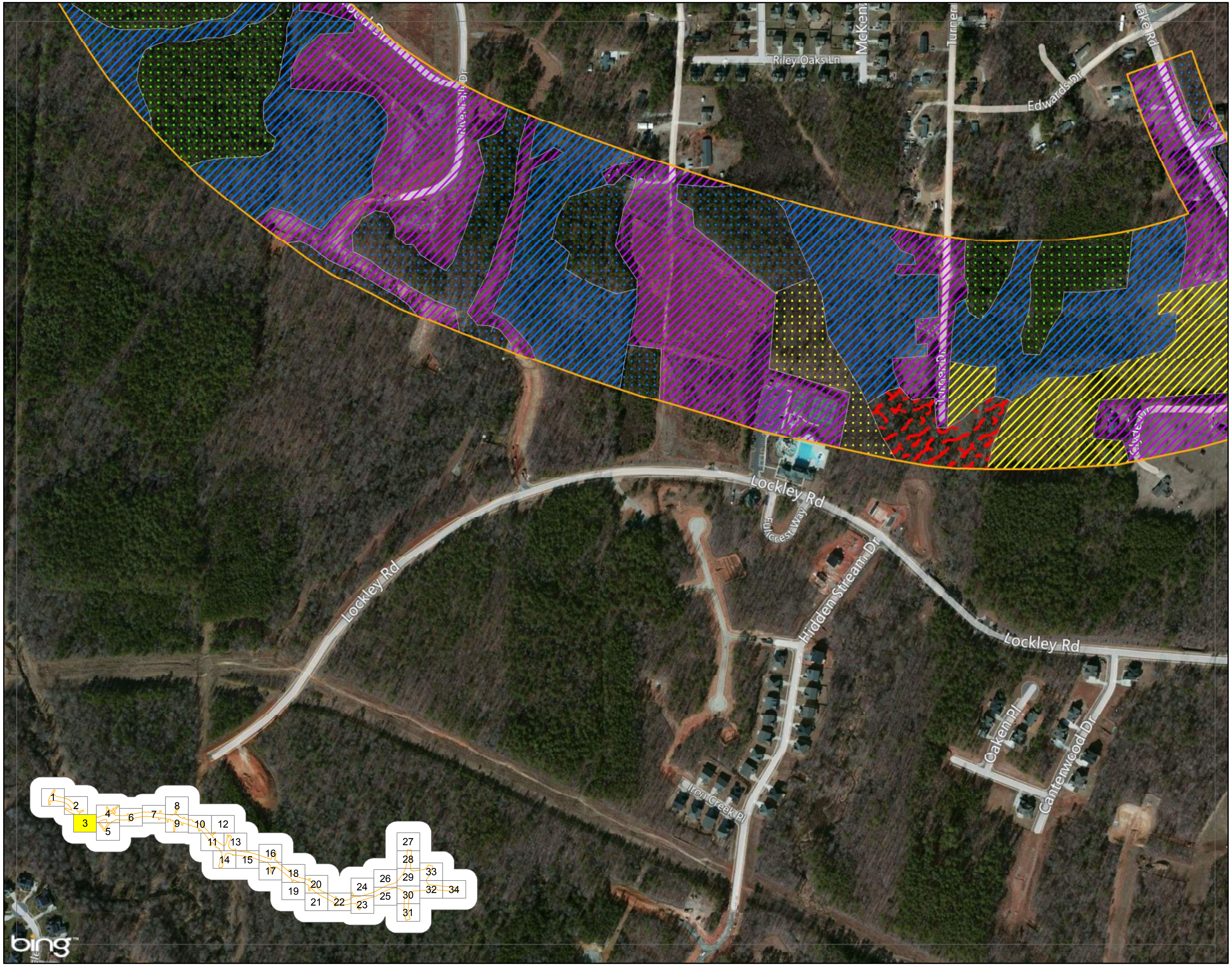
Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS

Map Date: 08/28/2014

Figure 4-2



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

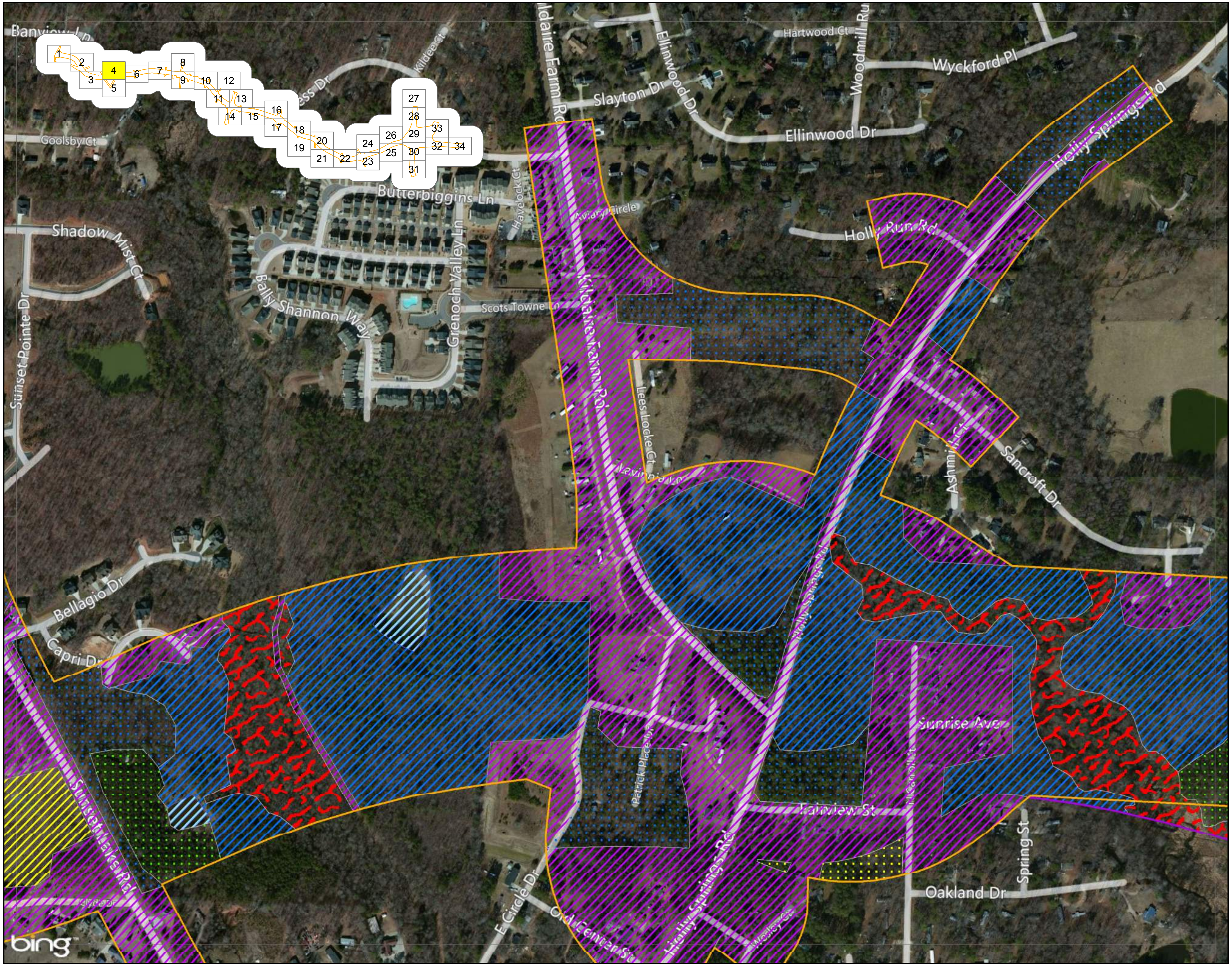
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-3



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

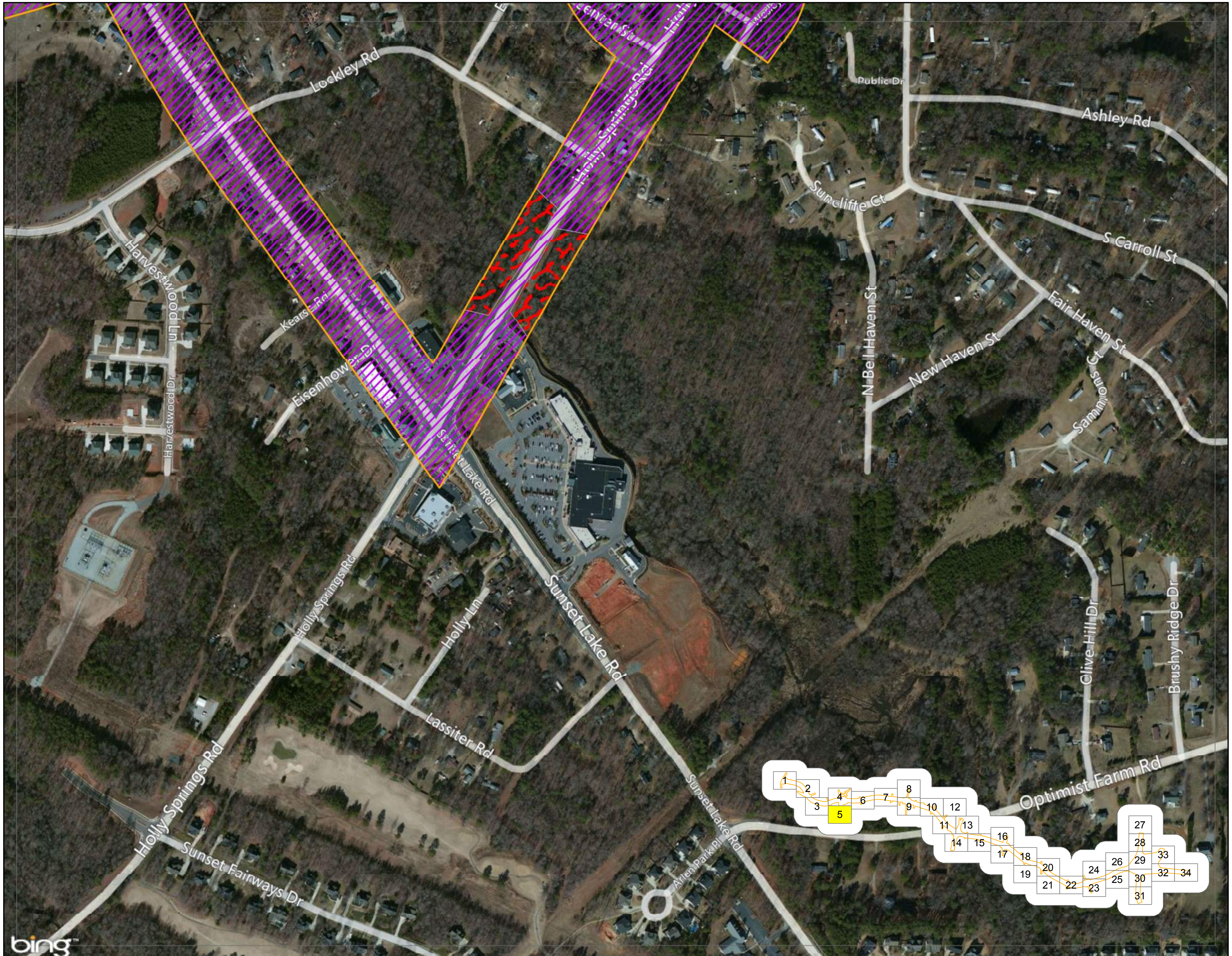
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-4



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

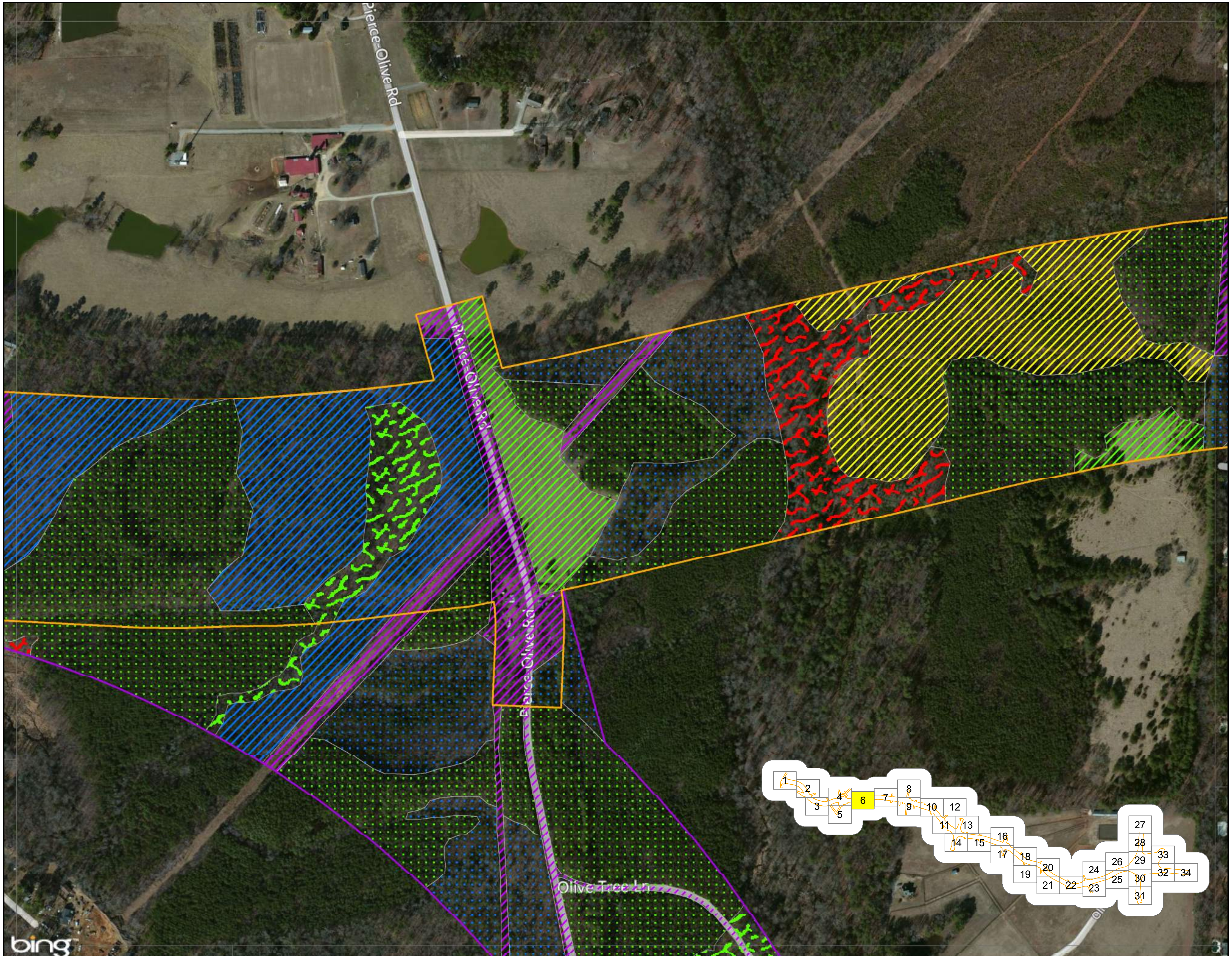
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-5



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

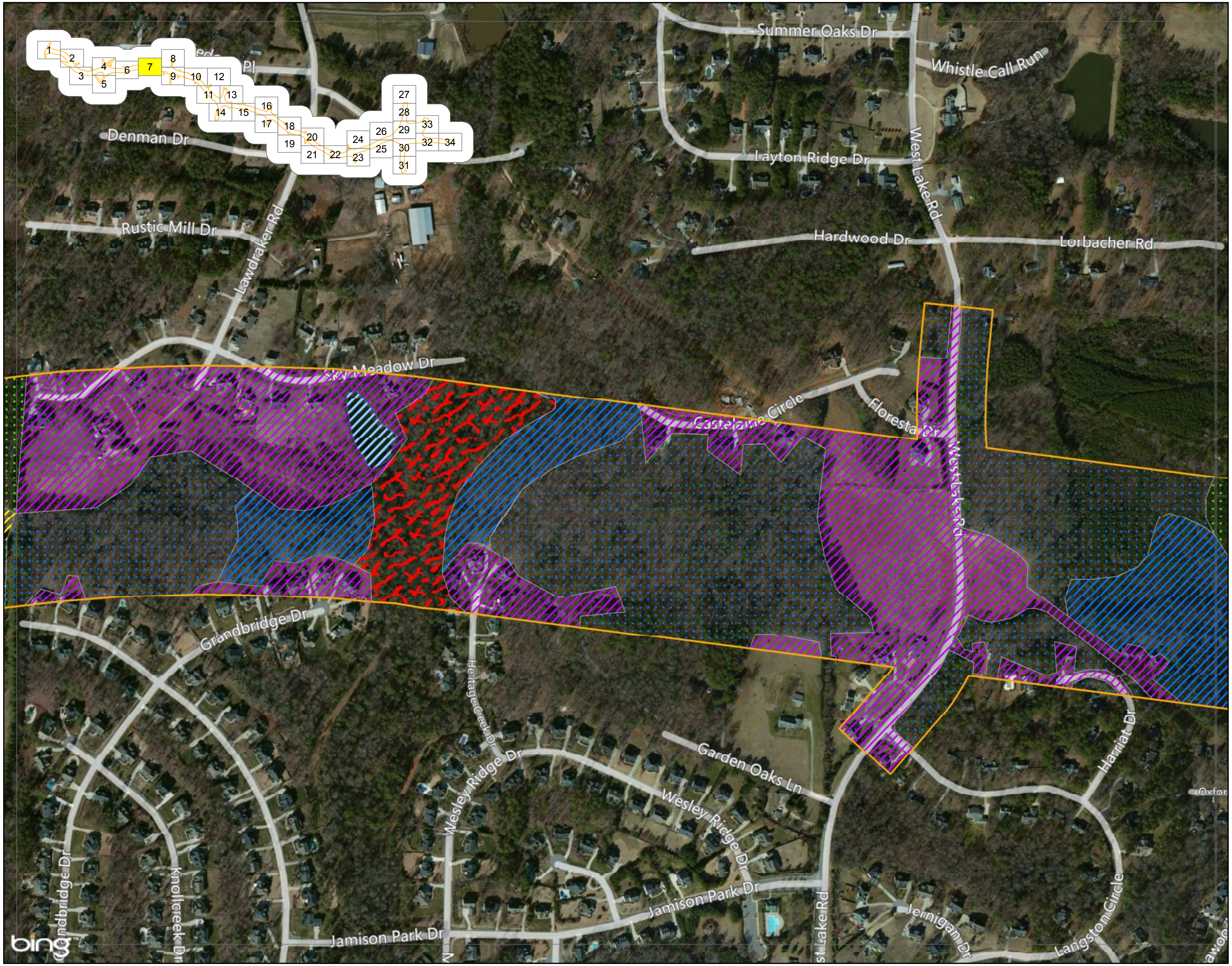
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-6



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

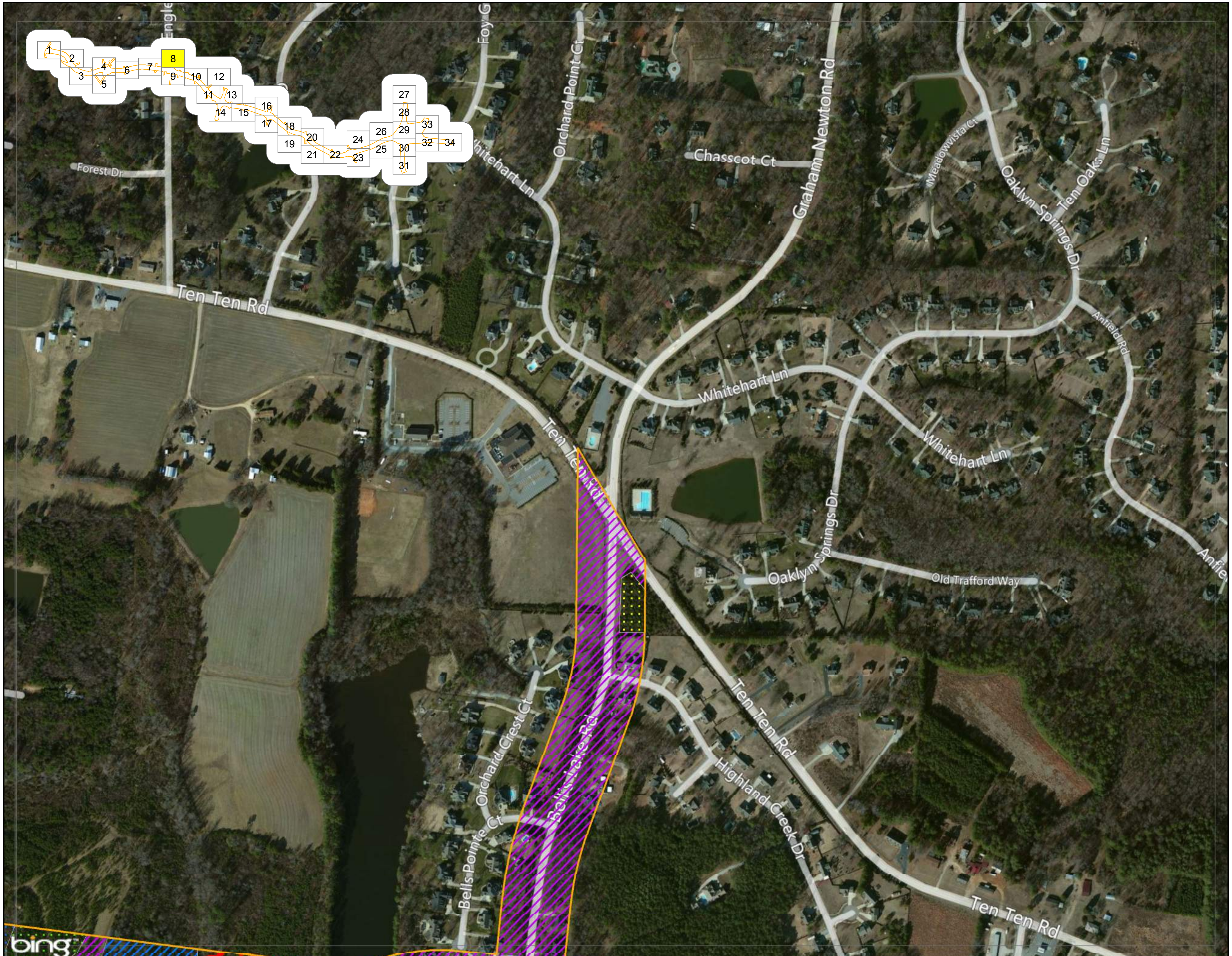
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-7



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

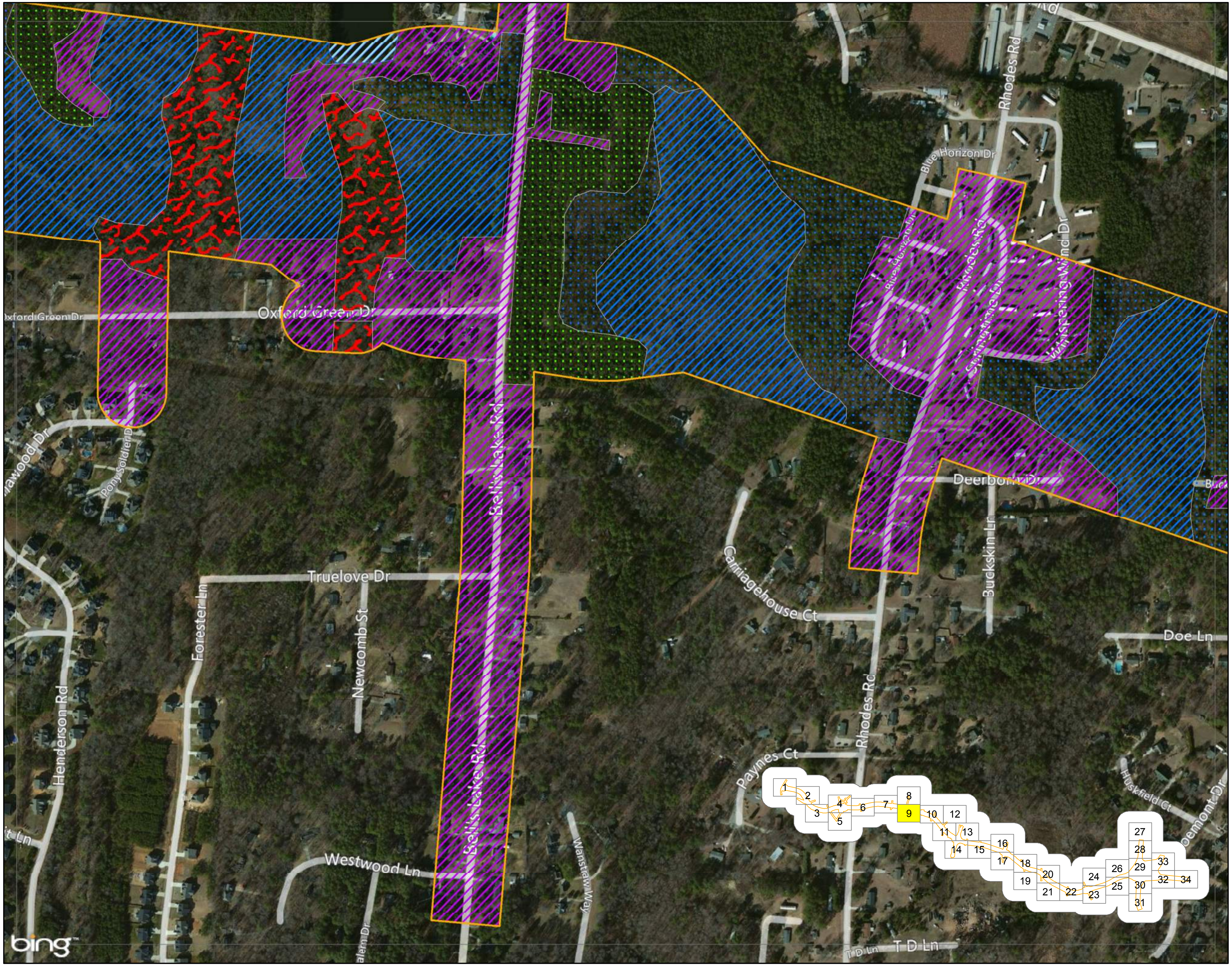
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-8



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

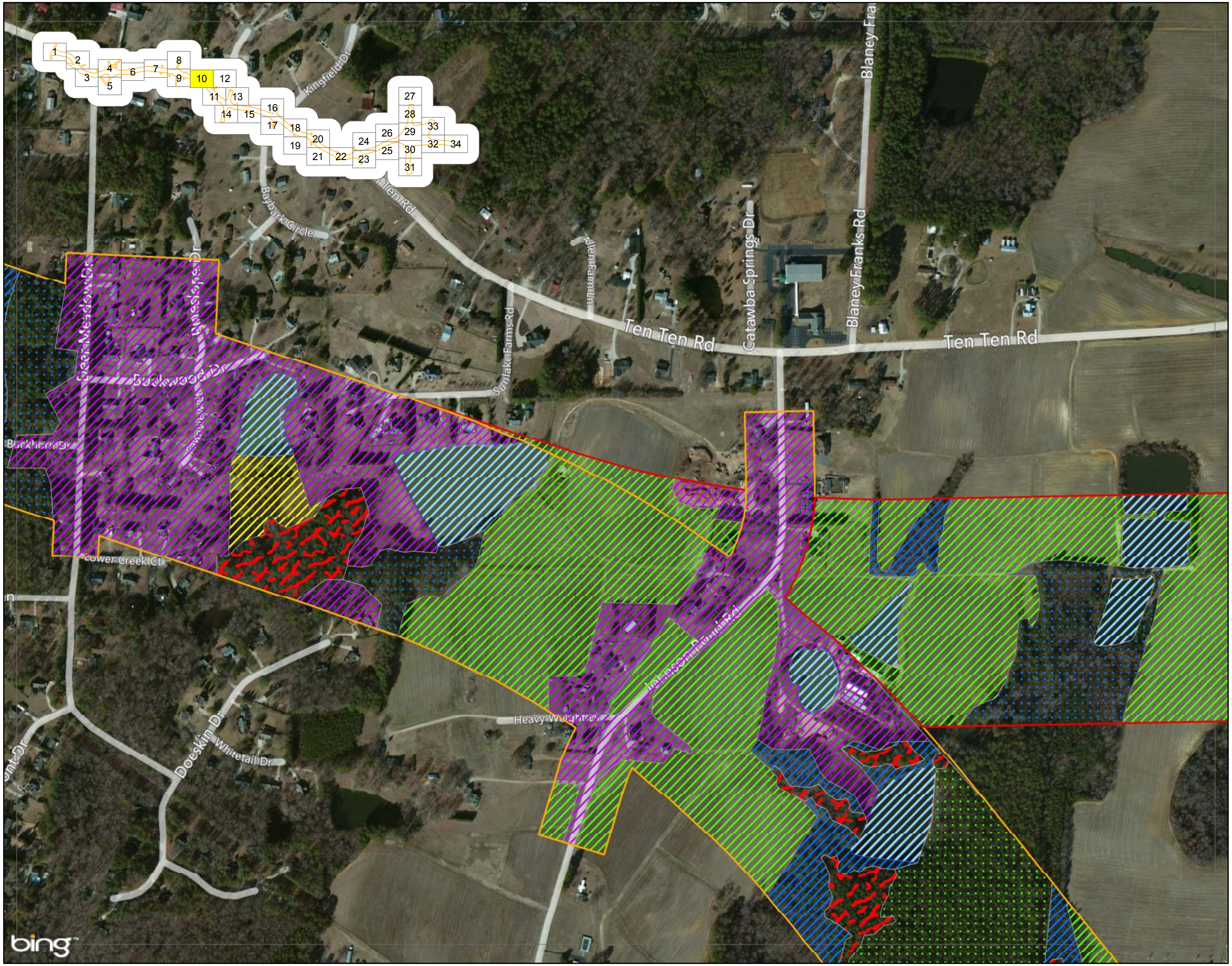
Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS

Map Date: 08/28/2014

Figure 4-9



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Blue
- Green
- Brown
- Red
- Mint
- Lilac
- Tan
- Purple
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

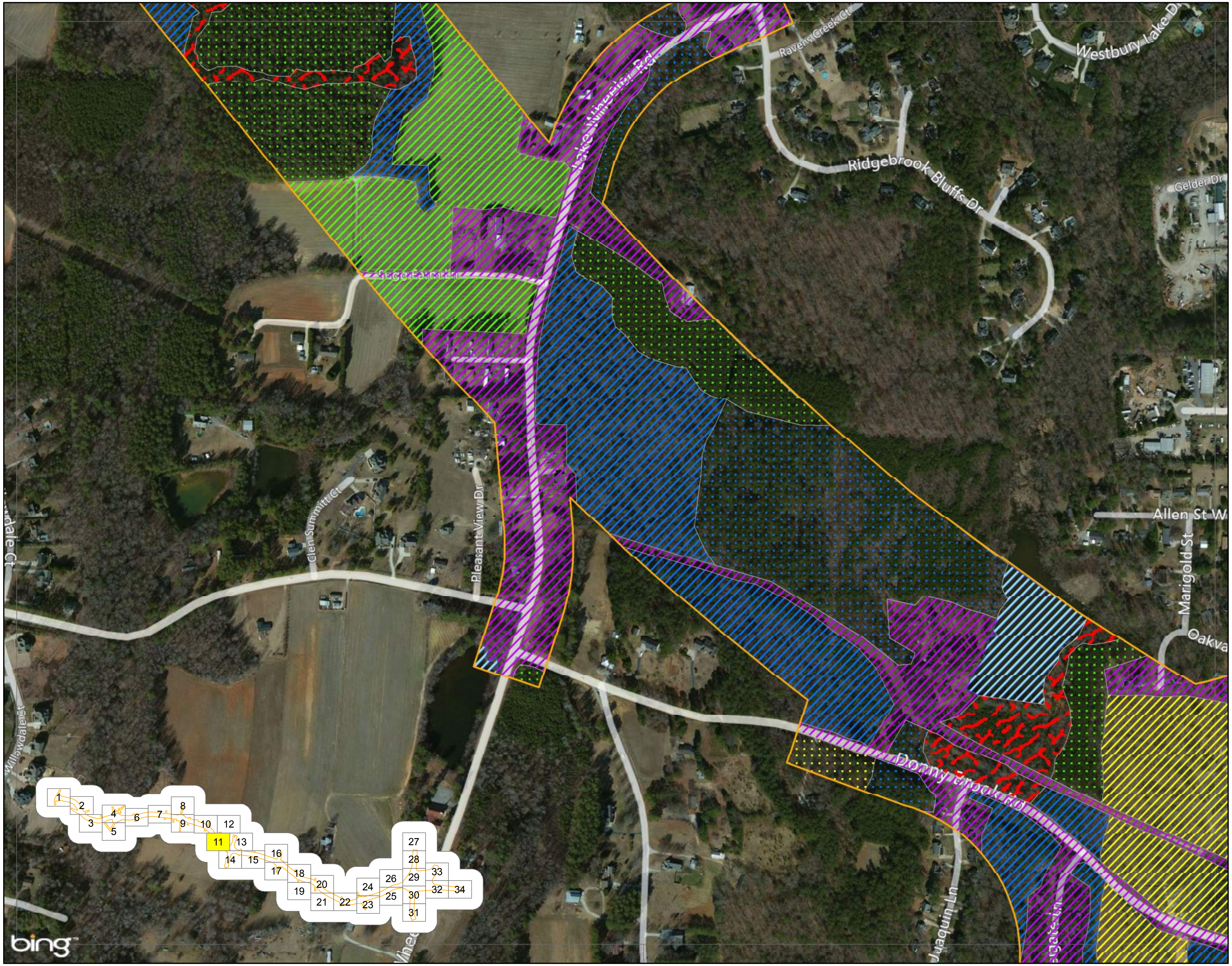
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-10



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

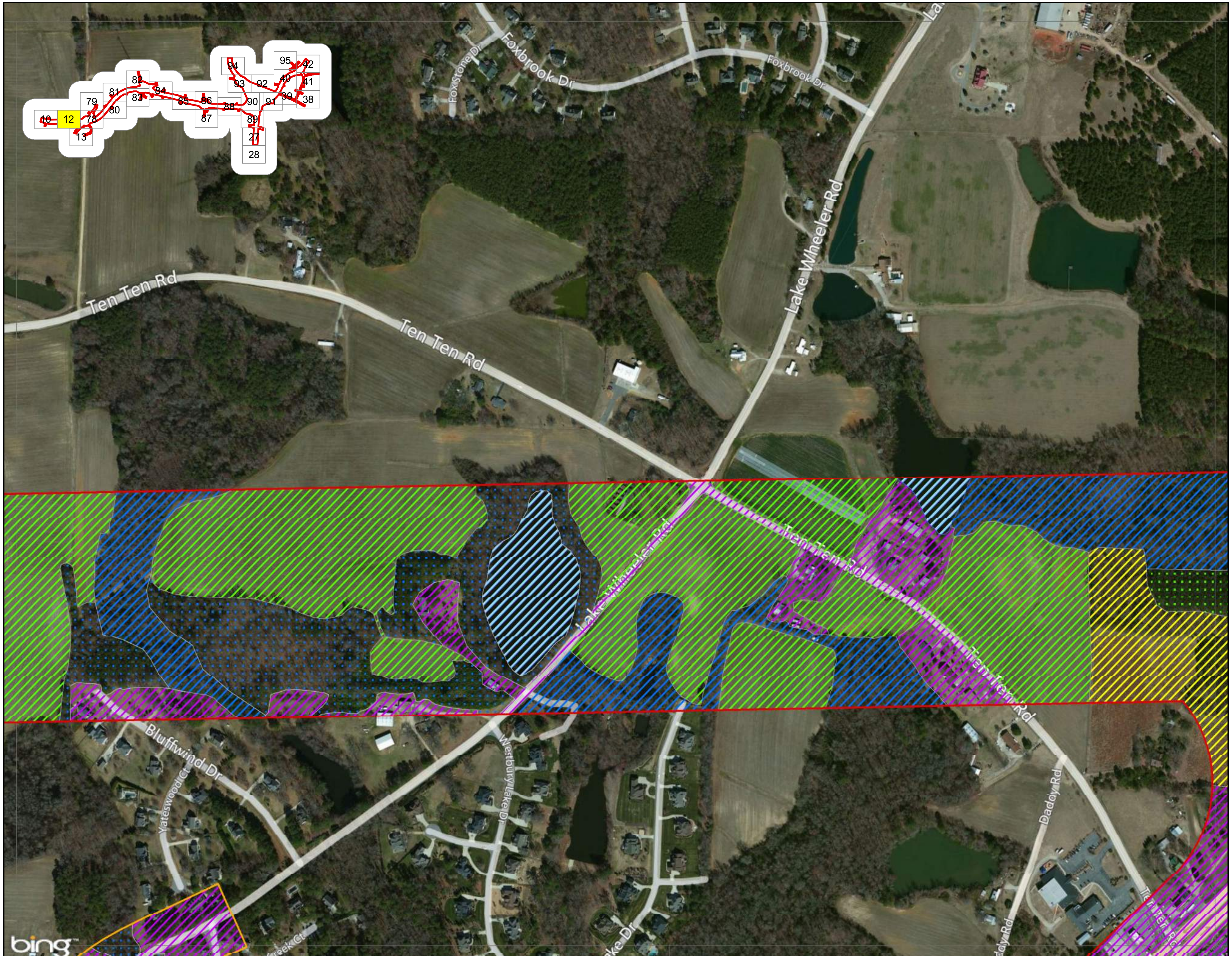
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-11



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

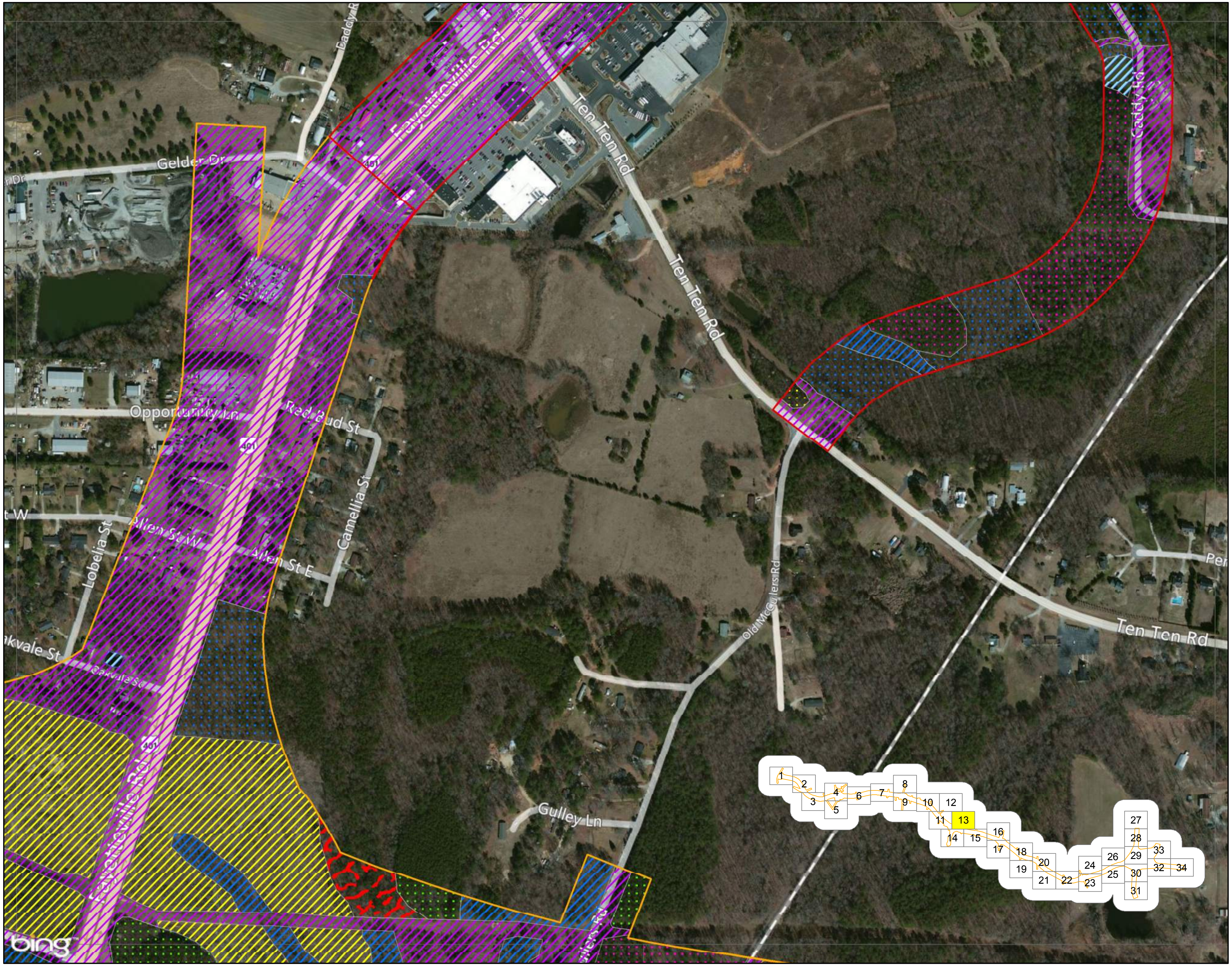
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-12



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

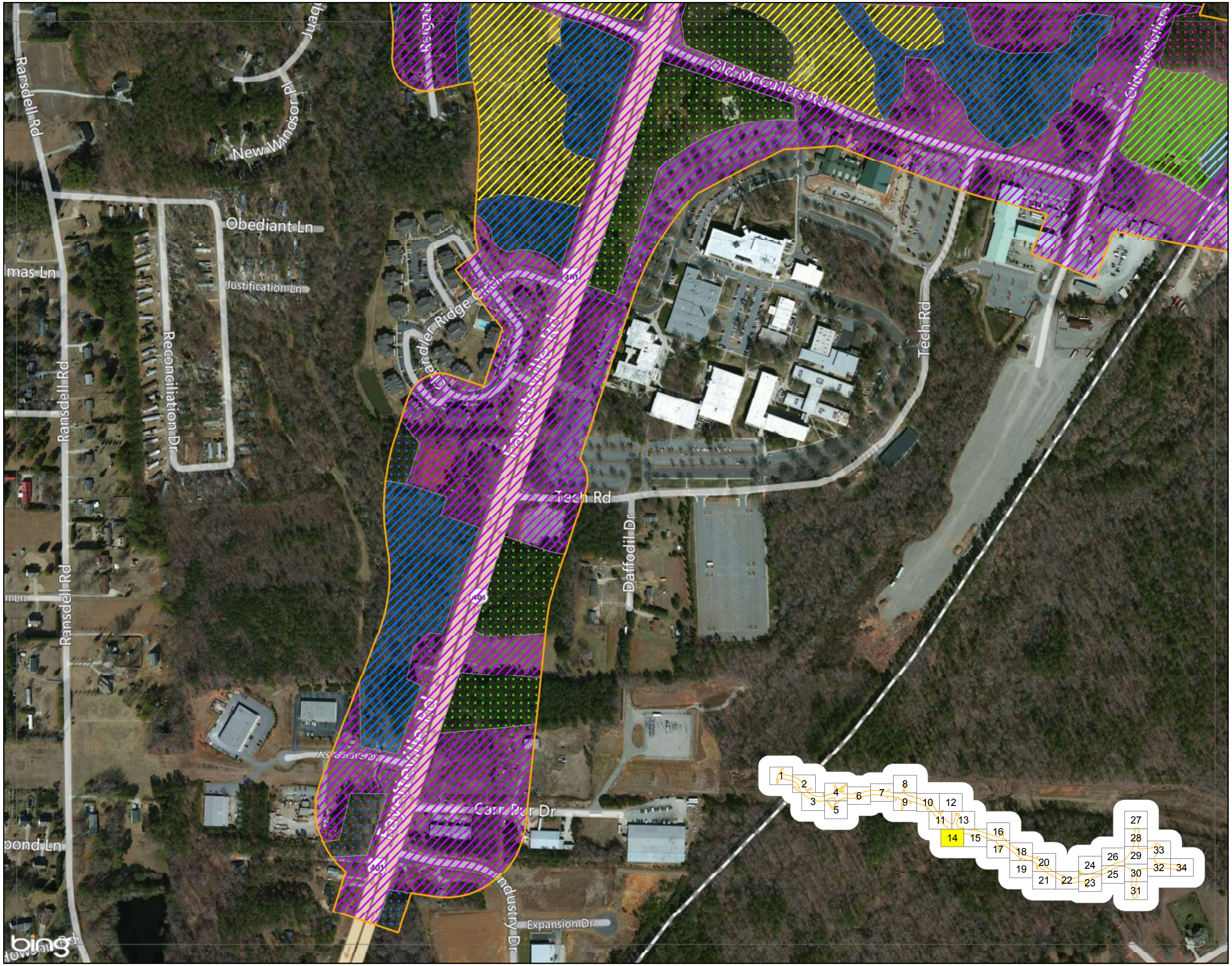
Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS

Map Date: 08/28/2014

Figure 4-13



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Blue
Green
Brown
Red
Mint
Lilac
Tan
Purple
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

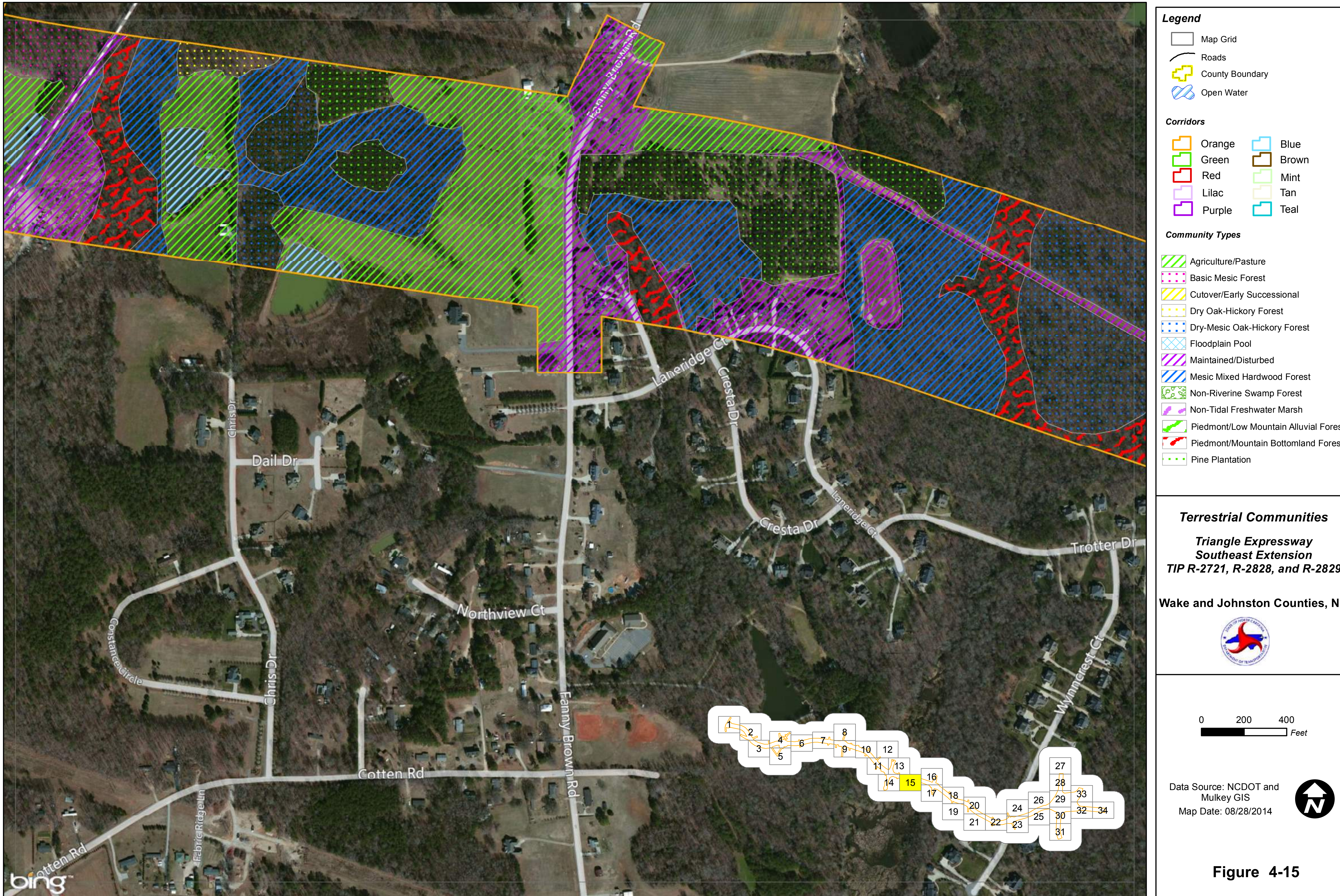
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-14



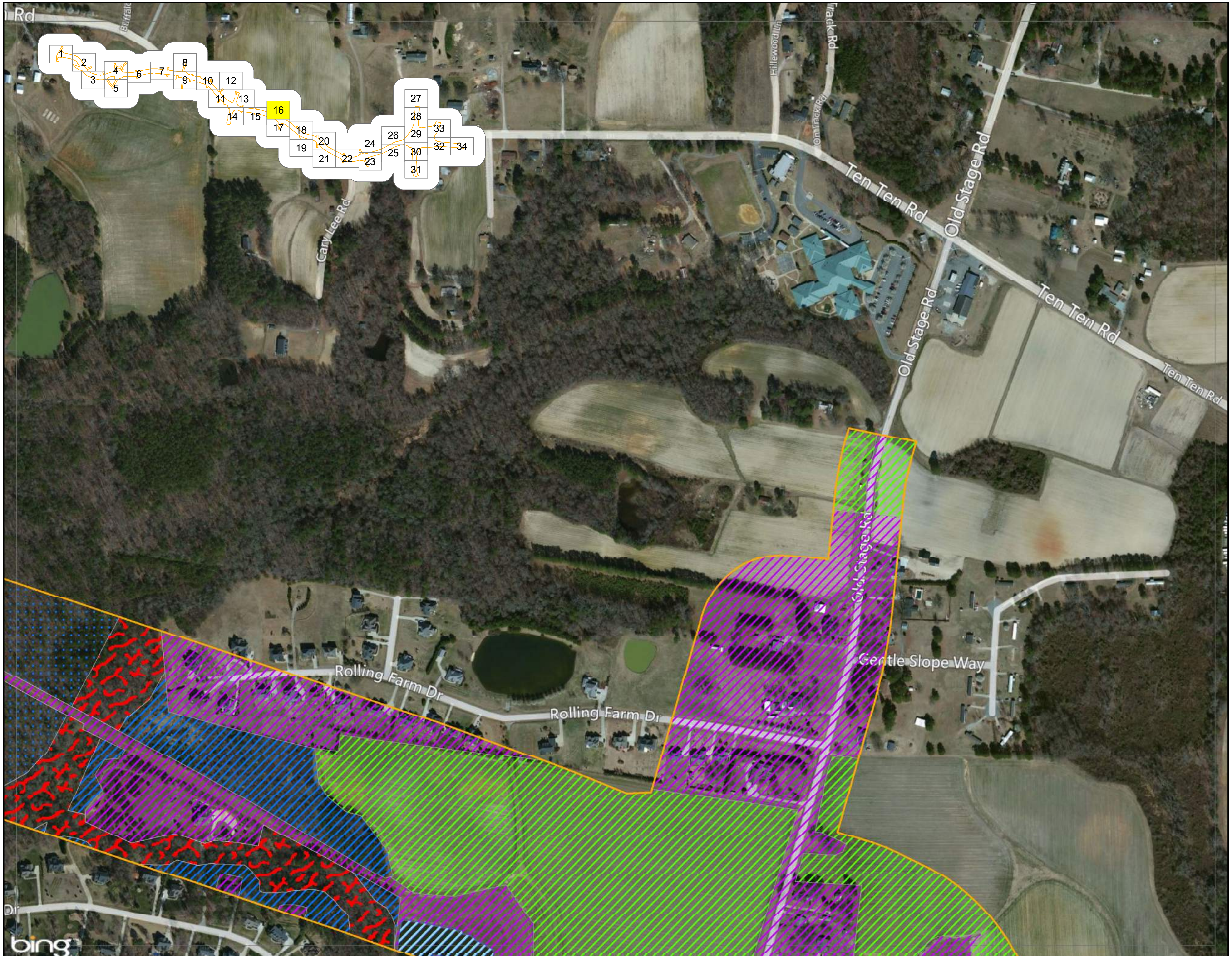
Terrestrial Communities

Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-15



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

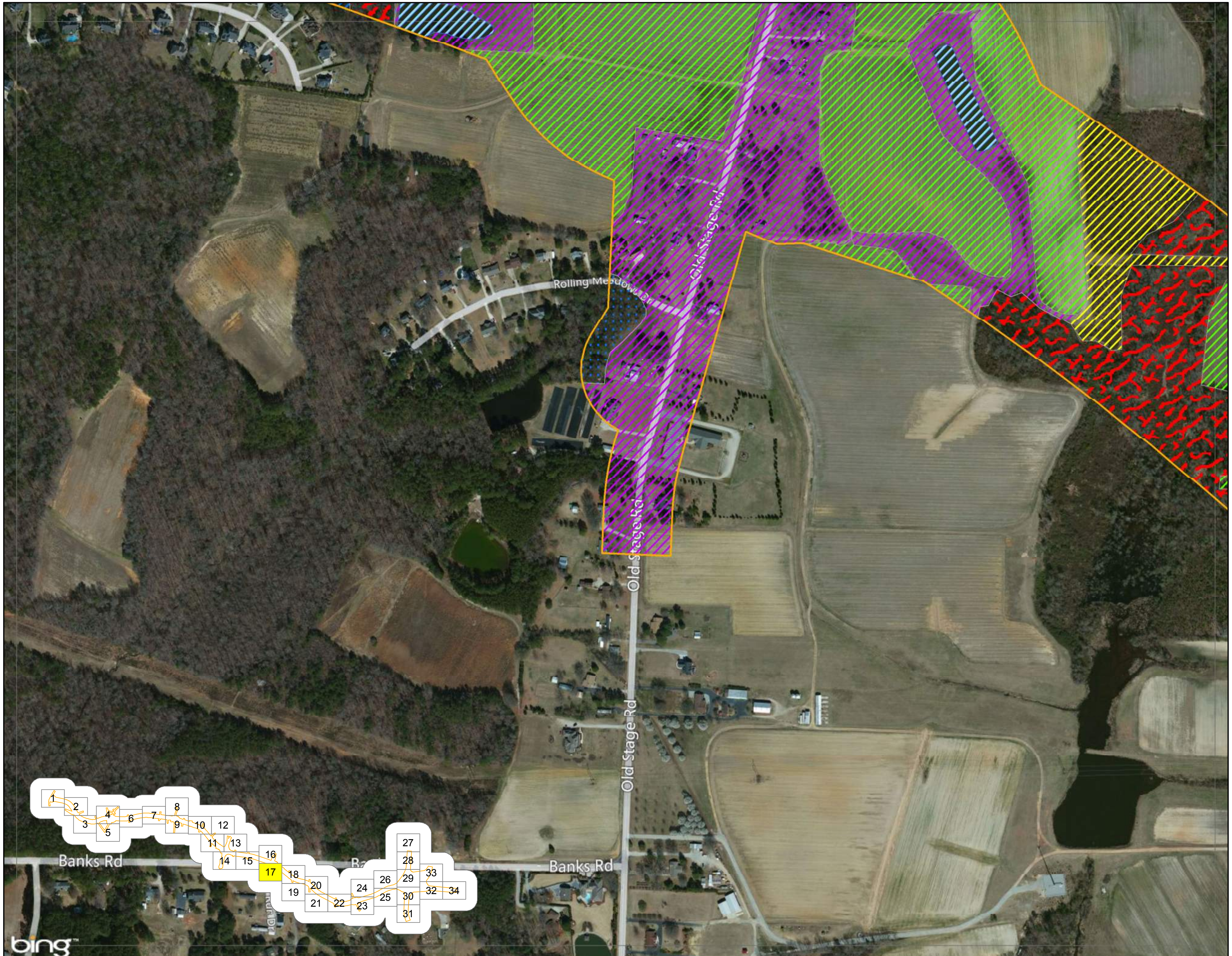
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-16



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

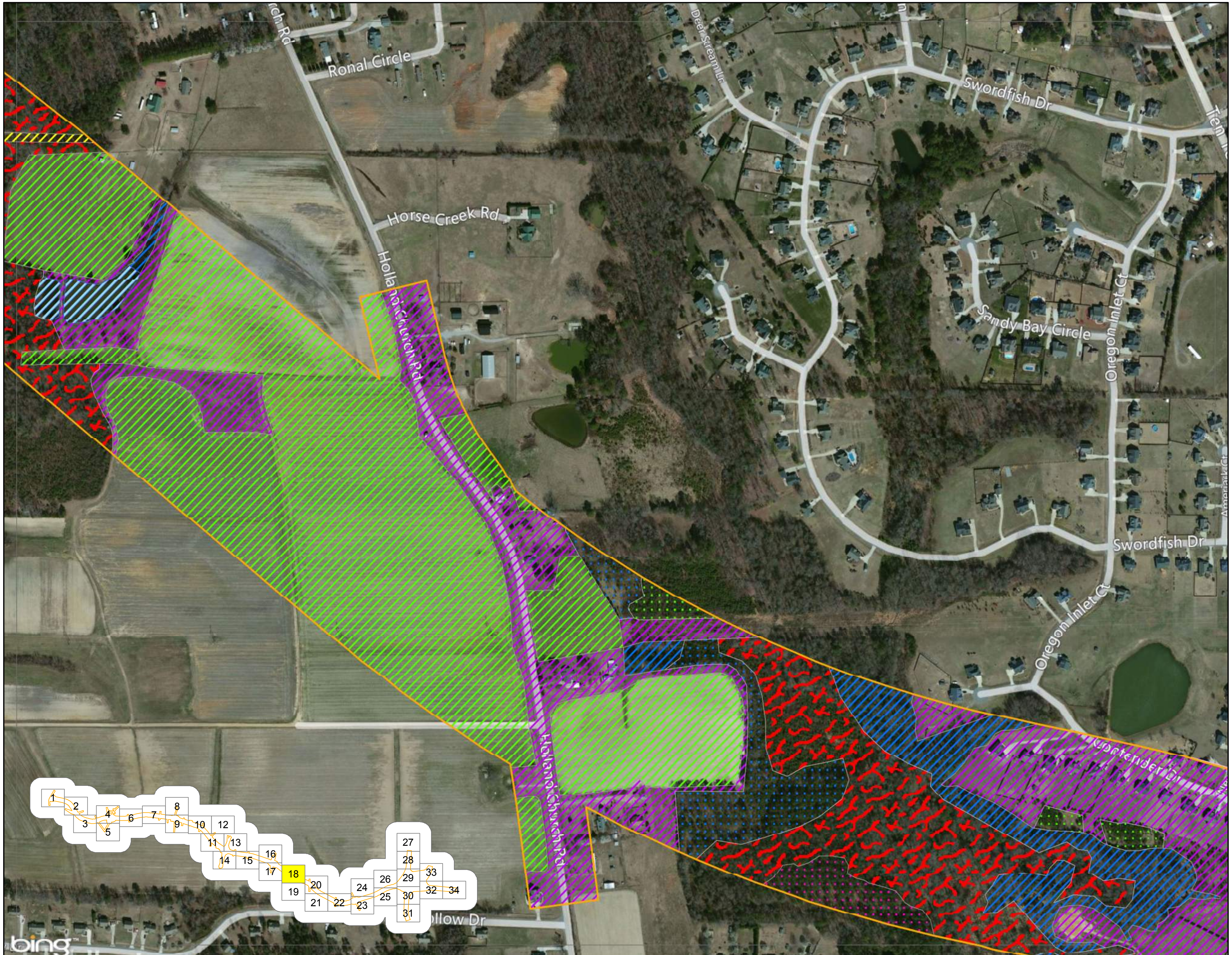
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-17



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

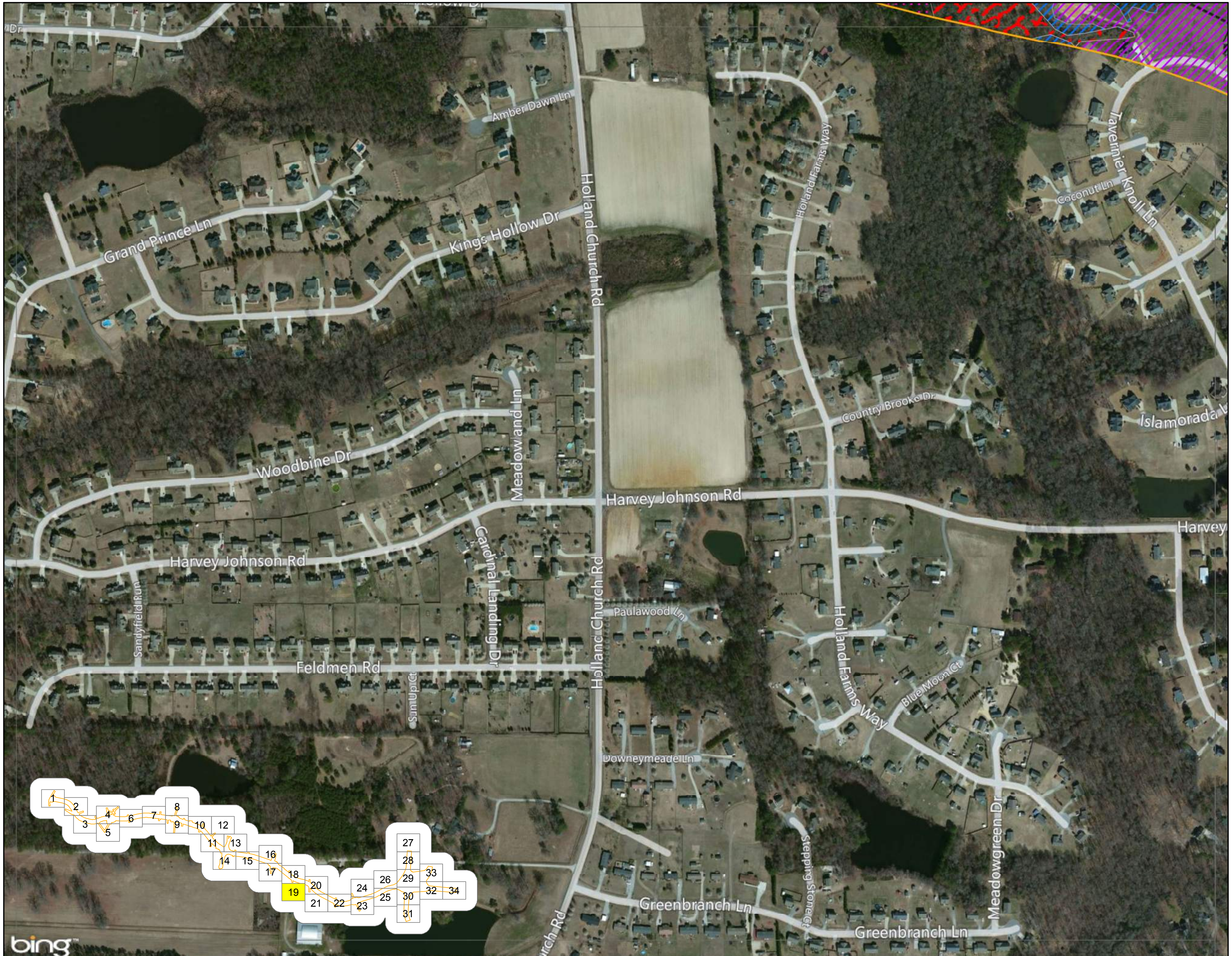
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-18



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

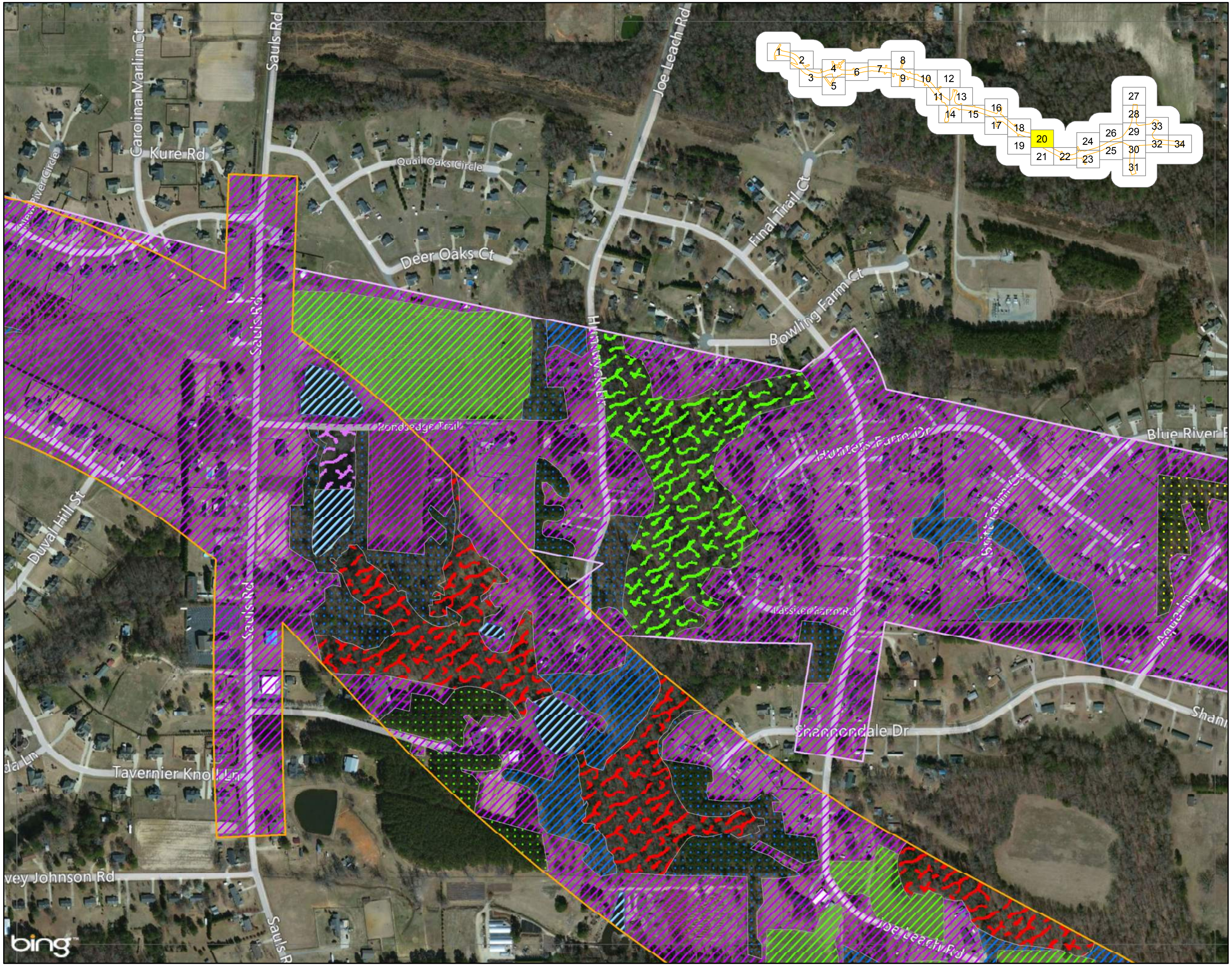
Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-19



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

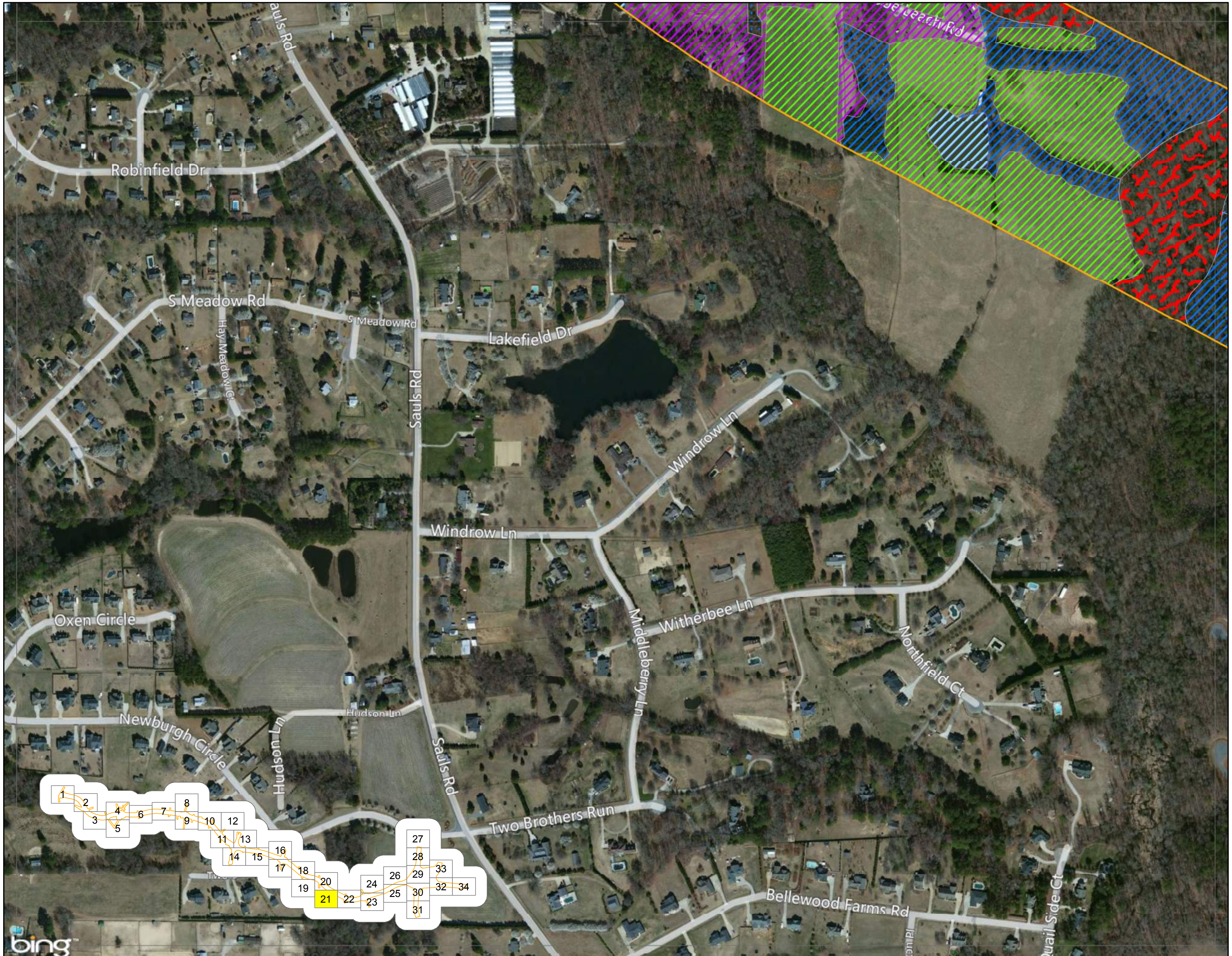
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-20



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange, Blue, Green, Brown, Red, Mint, Lilac, Tan, Purple, Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

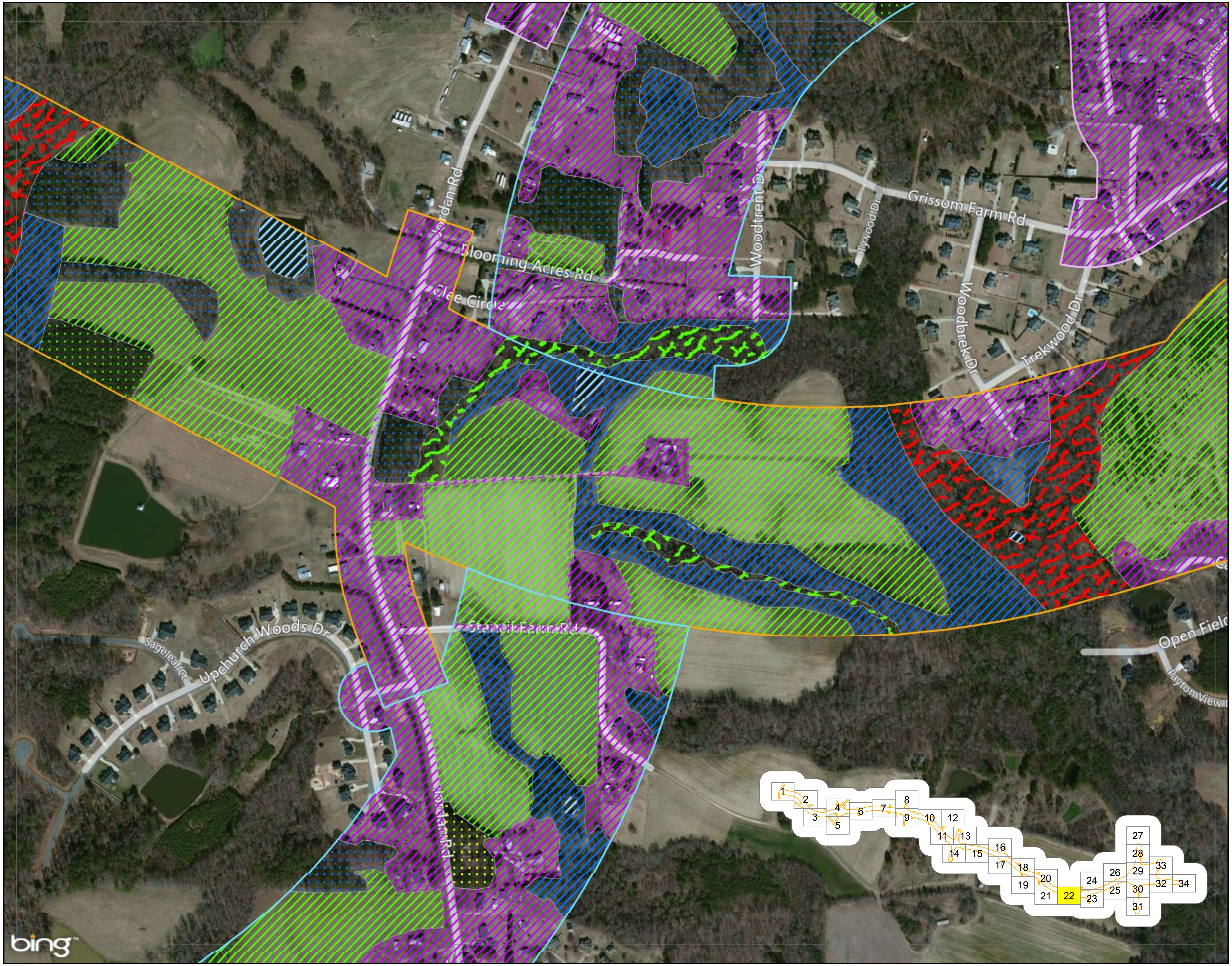
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-21



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

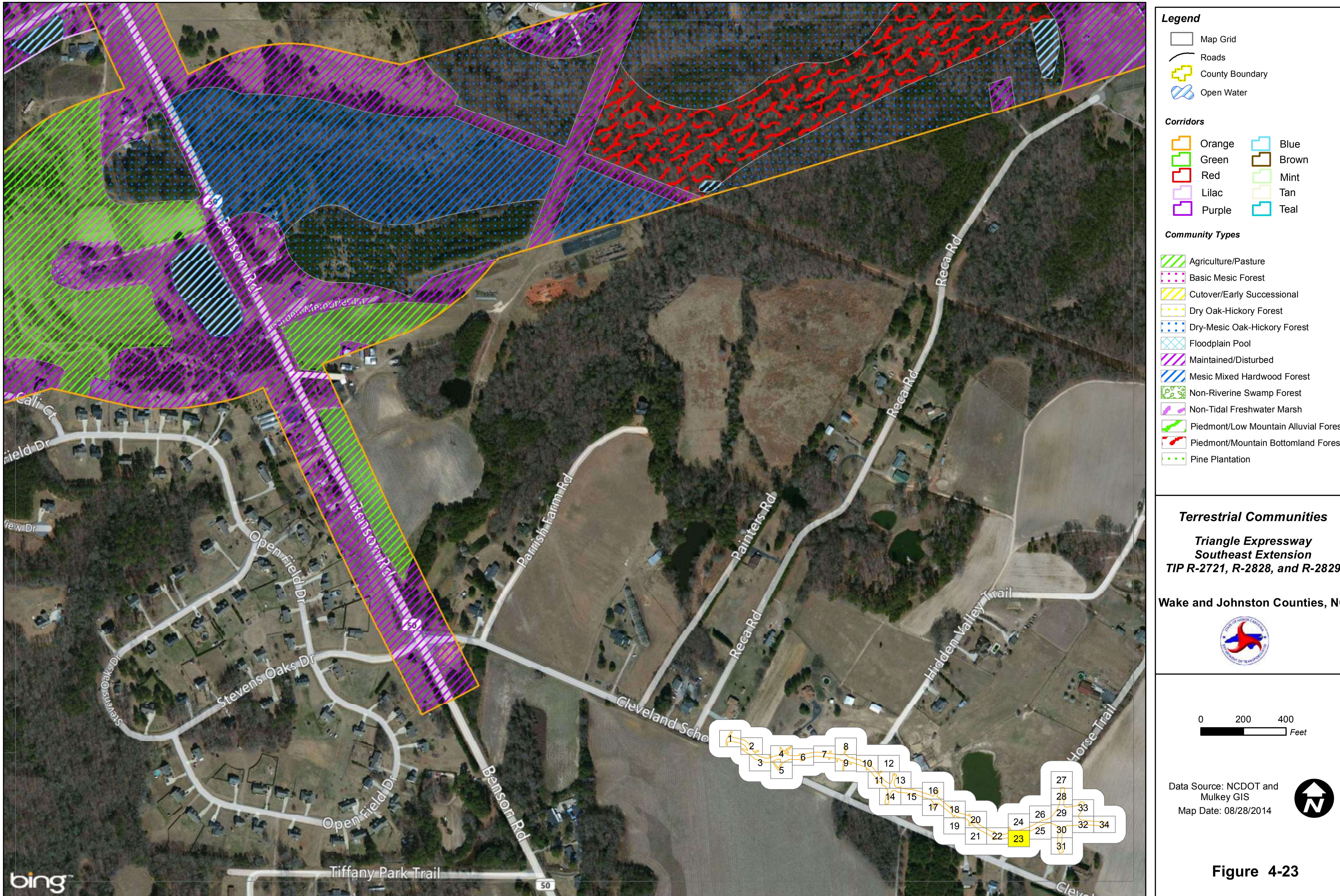
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

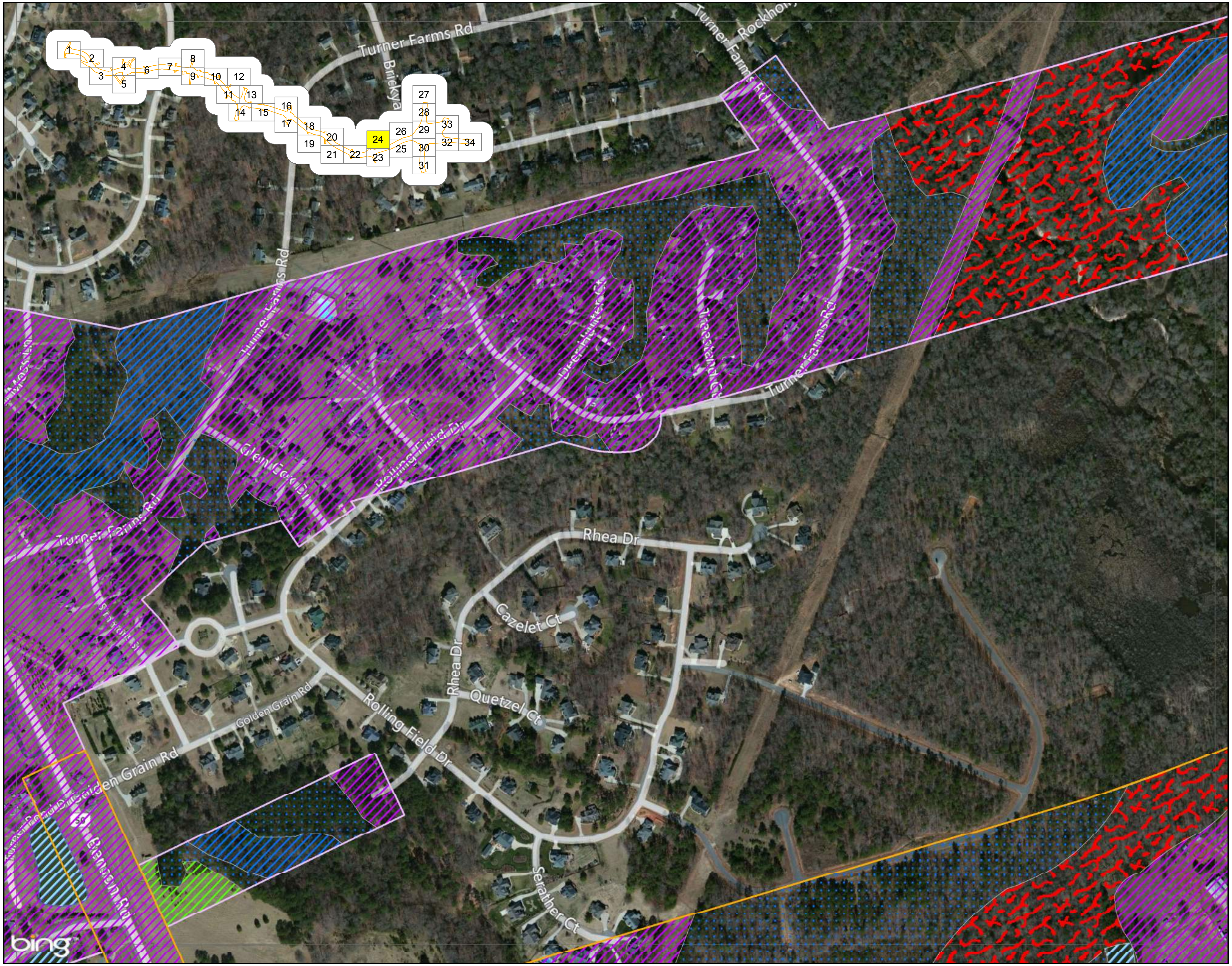
Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-22



Legend
Map Grid
Roads
County Boundary
Open Water
Corridors
Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal
Community Types
Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation
Terrestrial Communities
Triangle Expressway
Southeast Extension
TIP R-2721, R-2828, and R-2829
Wake and Johnston Counties, NC
0 200 400
Feet
Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014
Benson Rd
Reca Rd
Parrish Farm Rd
Painters Rd
Hidden Valley Trail
Cleveland School
Open Field Dr
Stevens Oaks Dr
Tiffany Park Trail
Cali Ct
Horse Trail

Figure 4-23



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

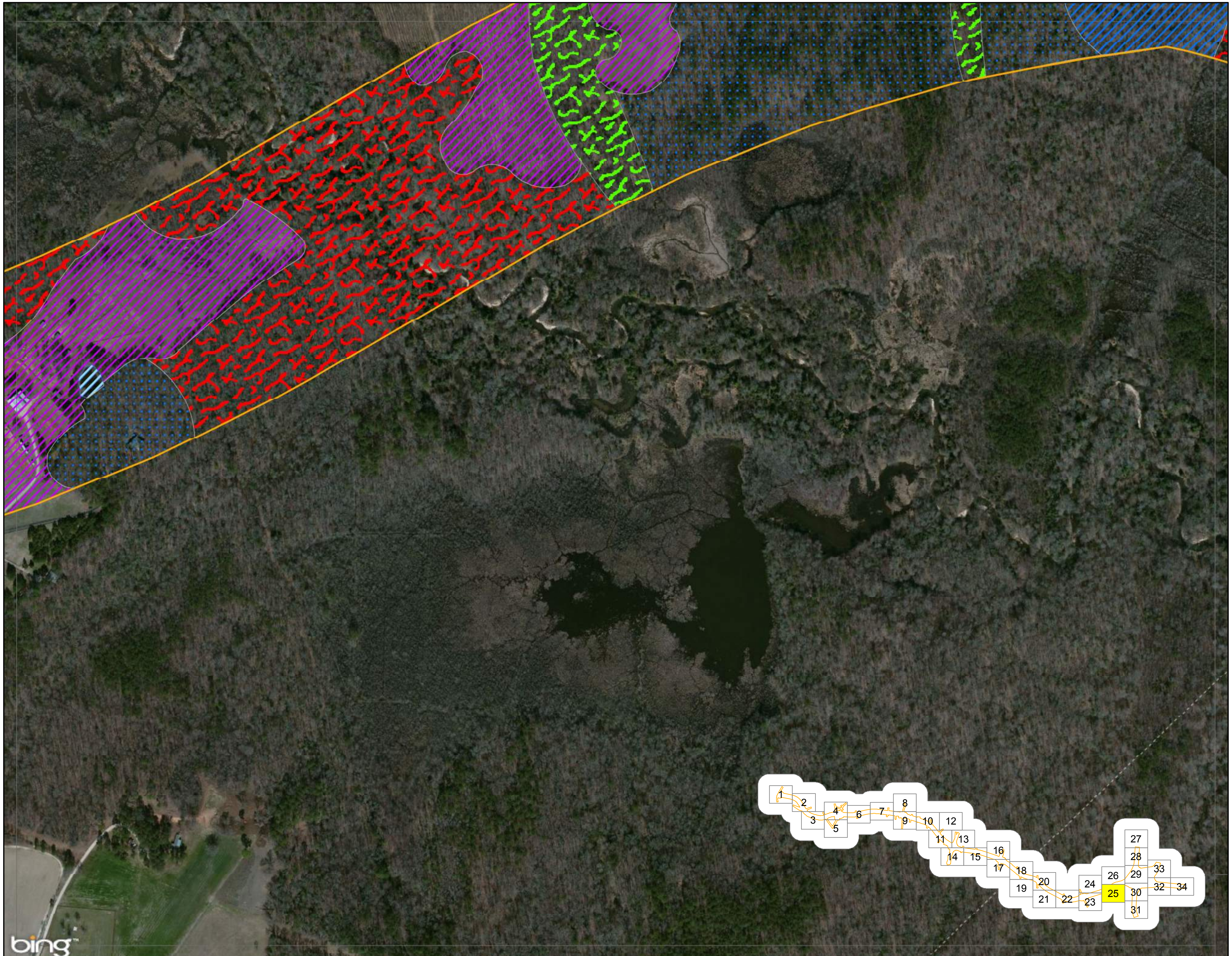
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-24



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

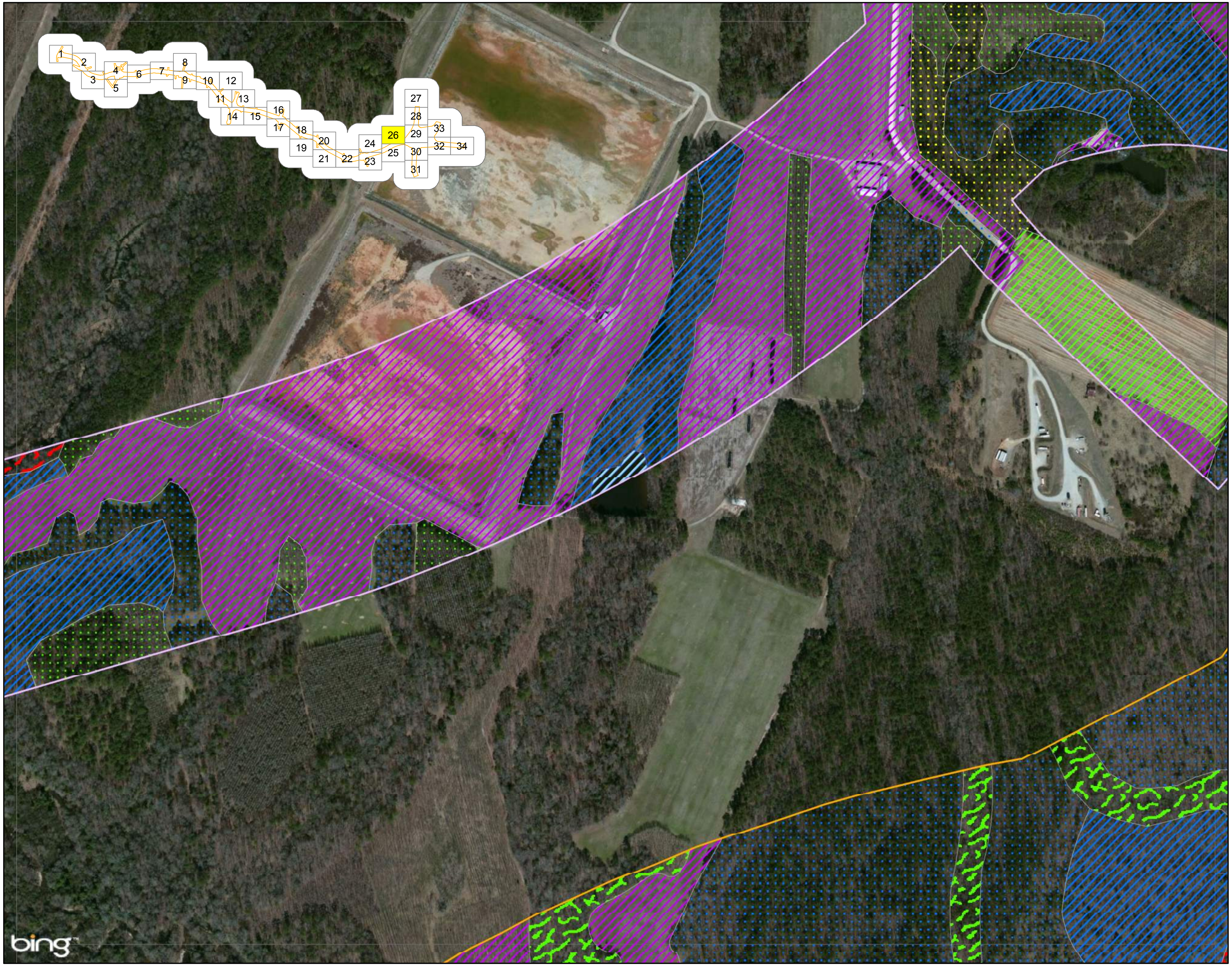
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-25



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

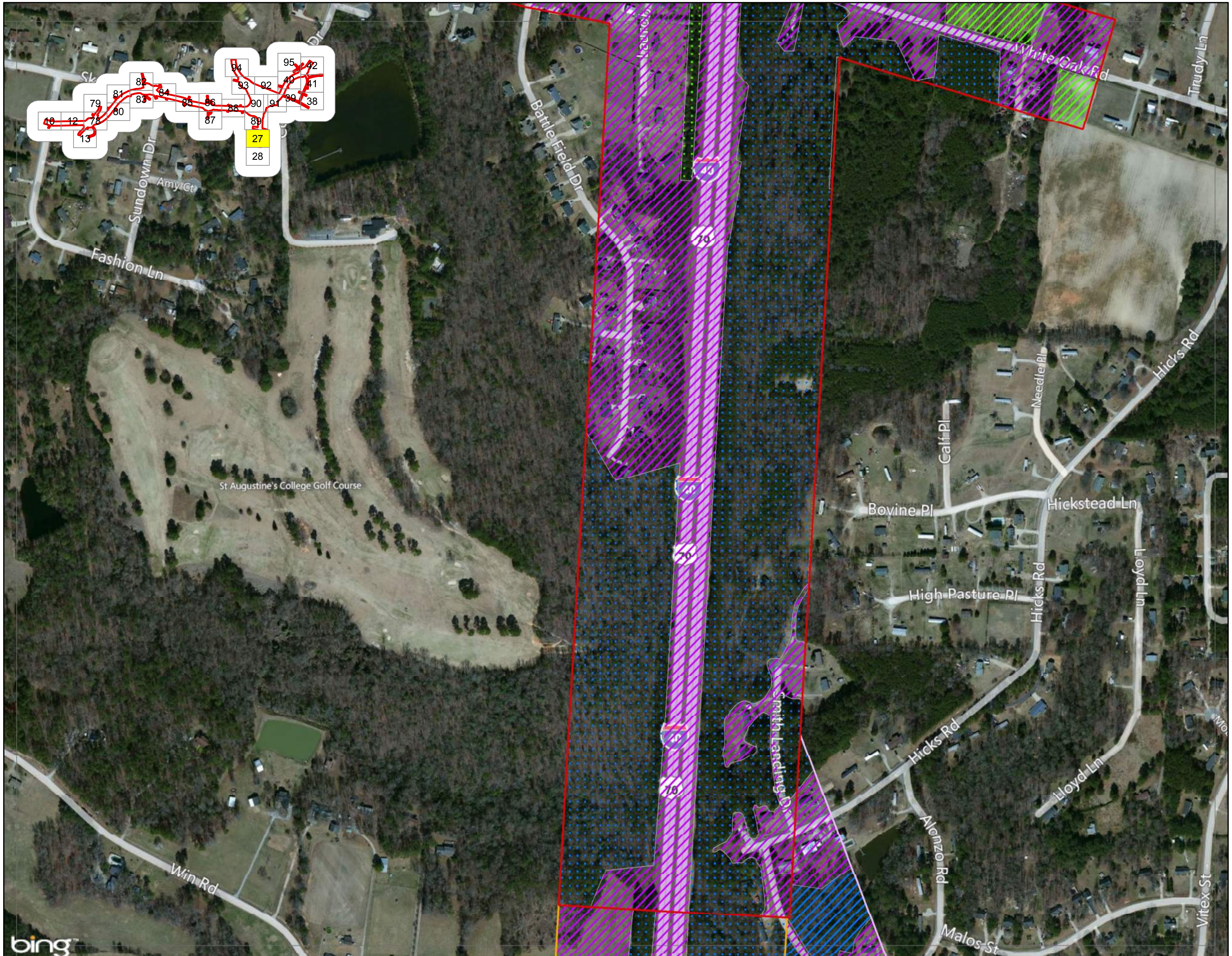
Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

N

Figure 4-26



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

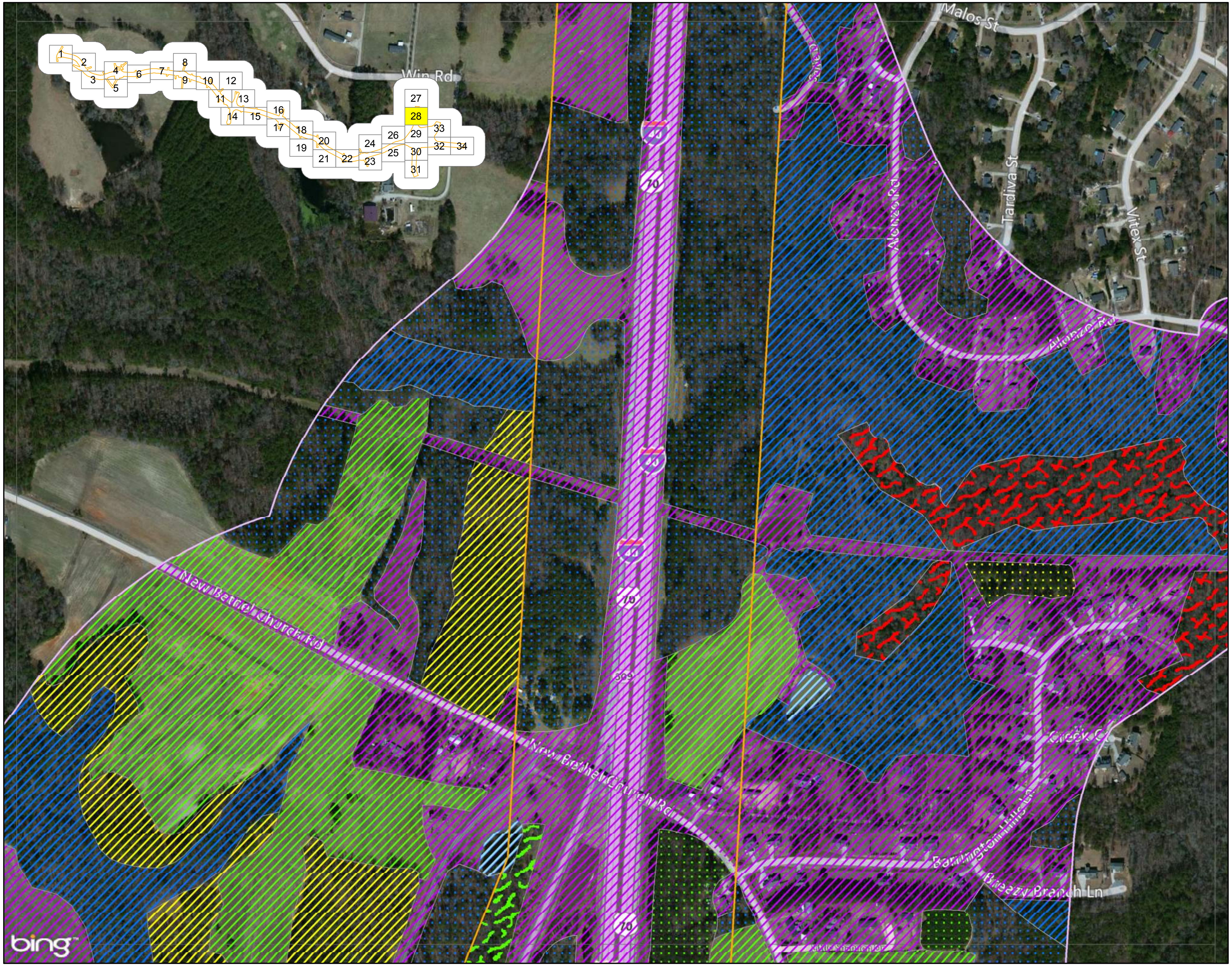
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-27



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

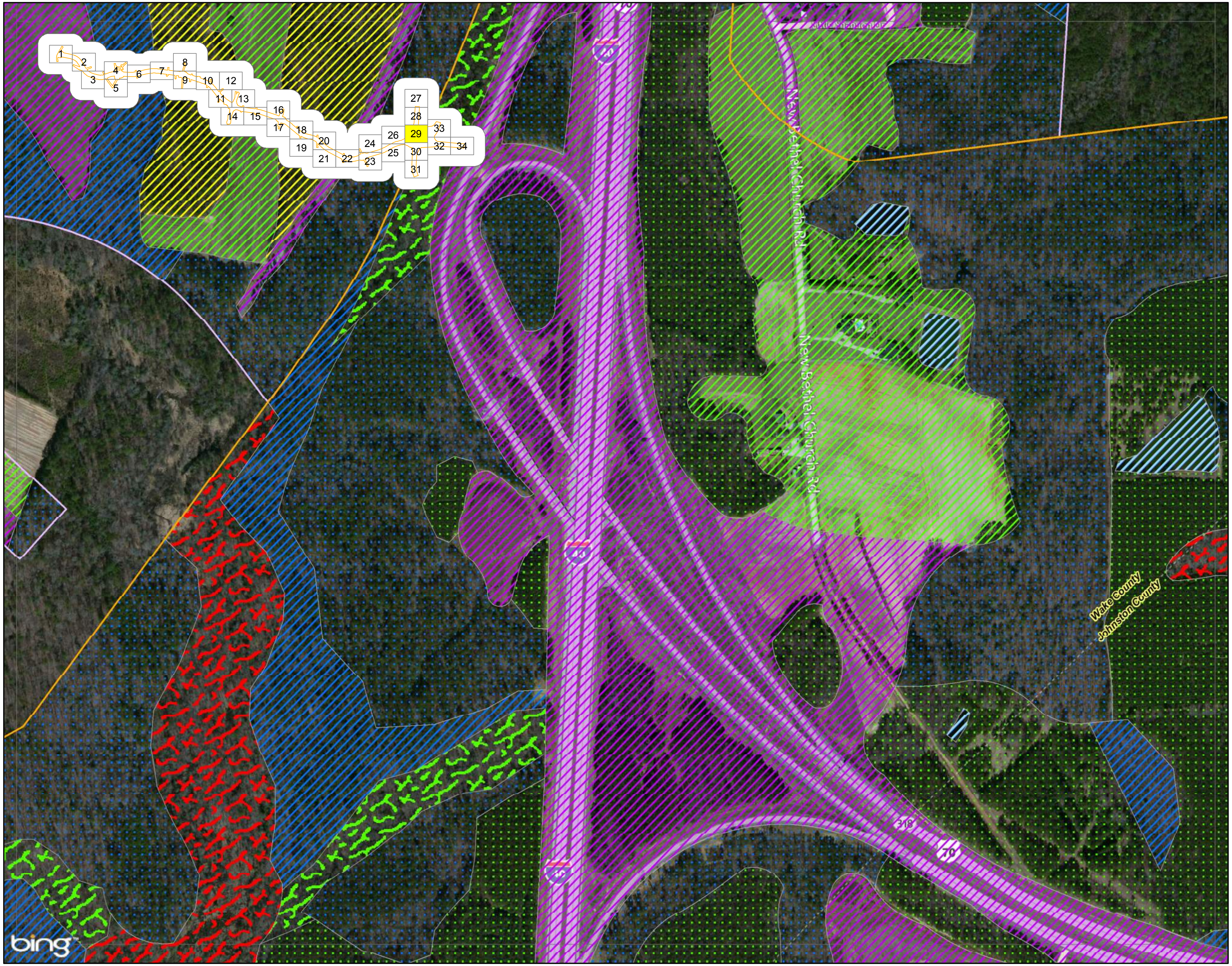
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-28



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

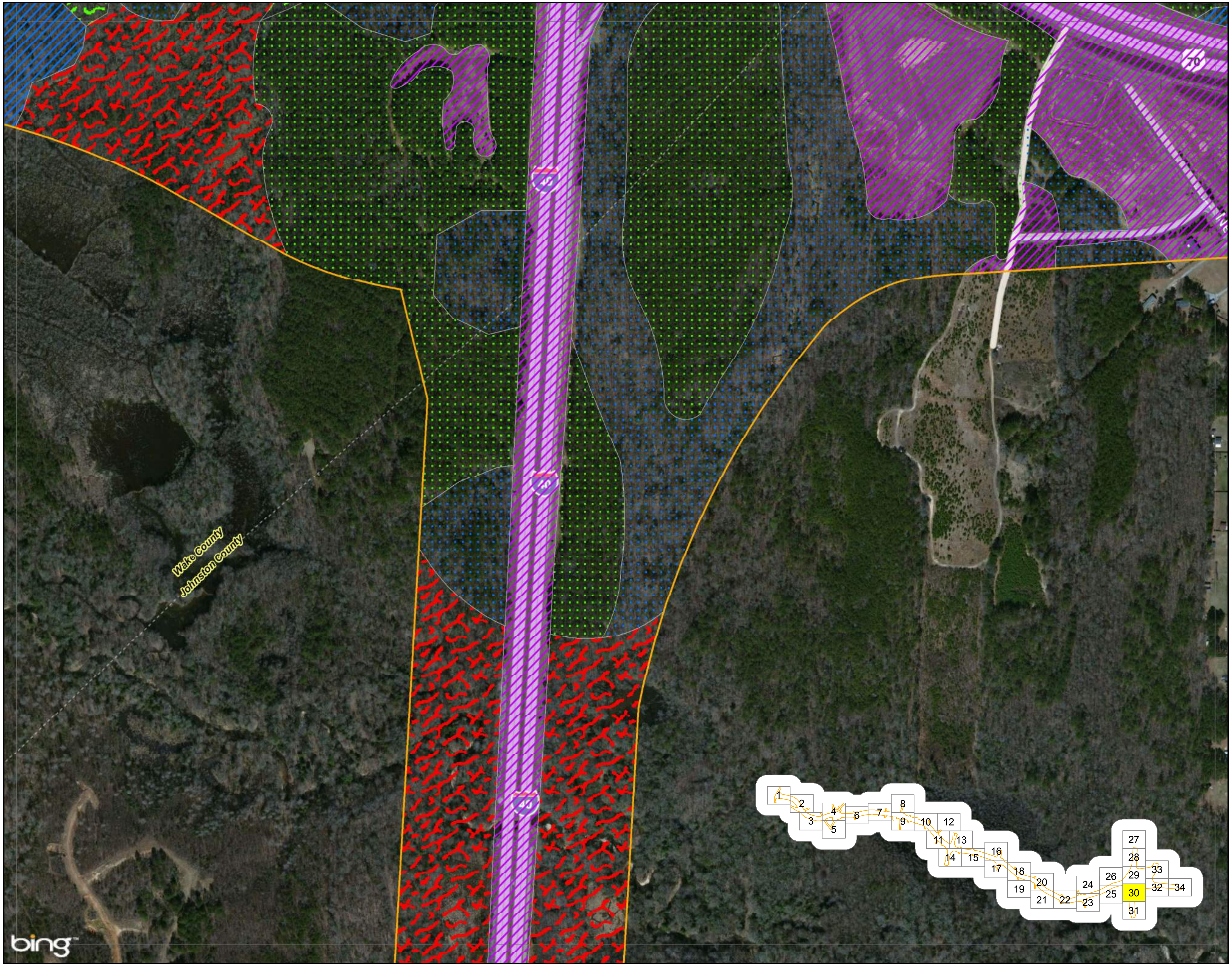
Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS

Map Date: 08/28/2014

Figure 4-29



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

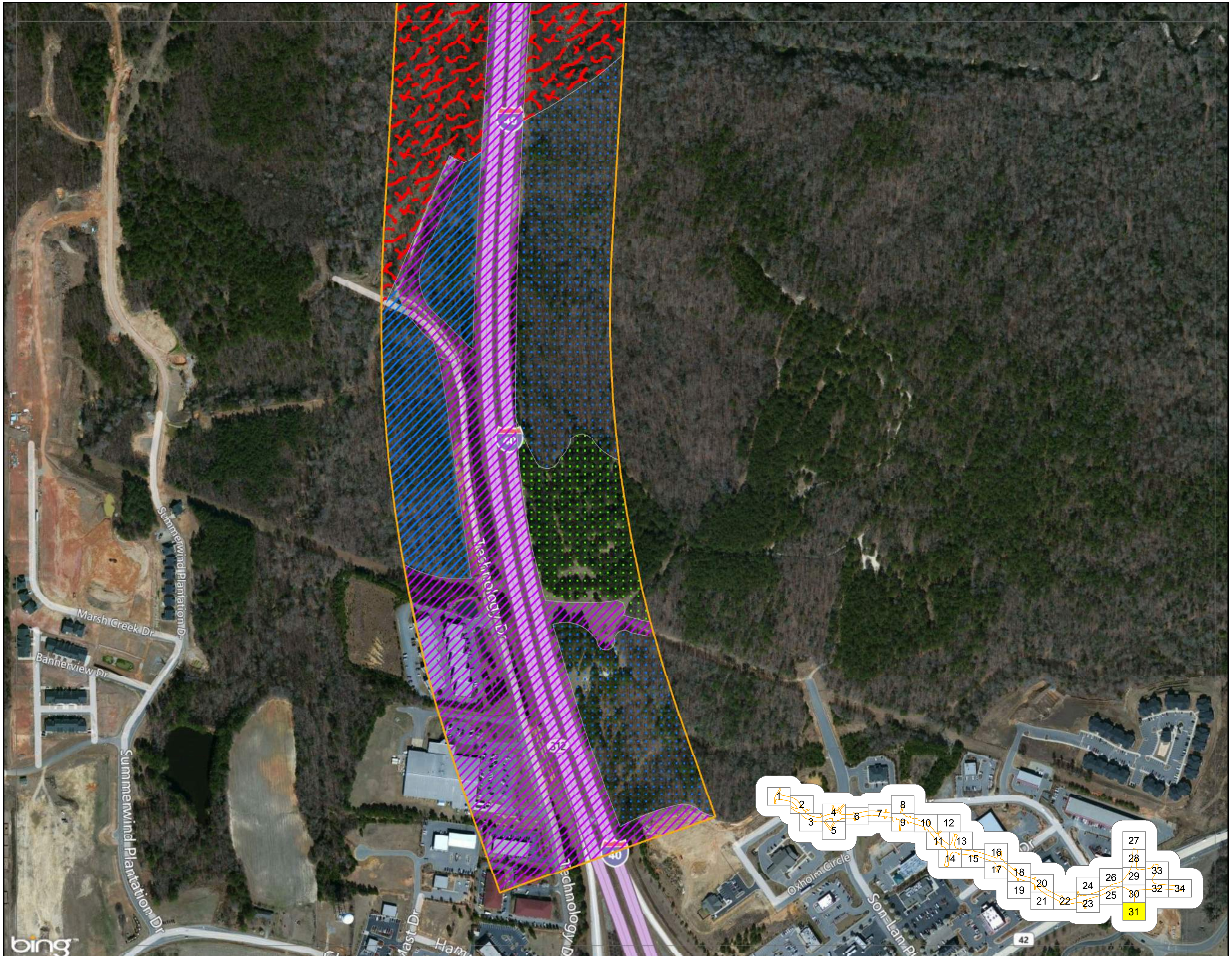
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-30



Legend

Map Grid

Roads

County Boundary

Open Water

Corridors

Orange
Blue
Green
Brown
Red
Mint
Lilac
Tan
Purple
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

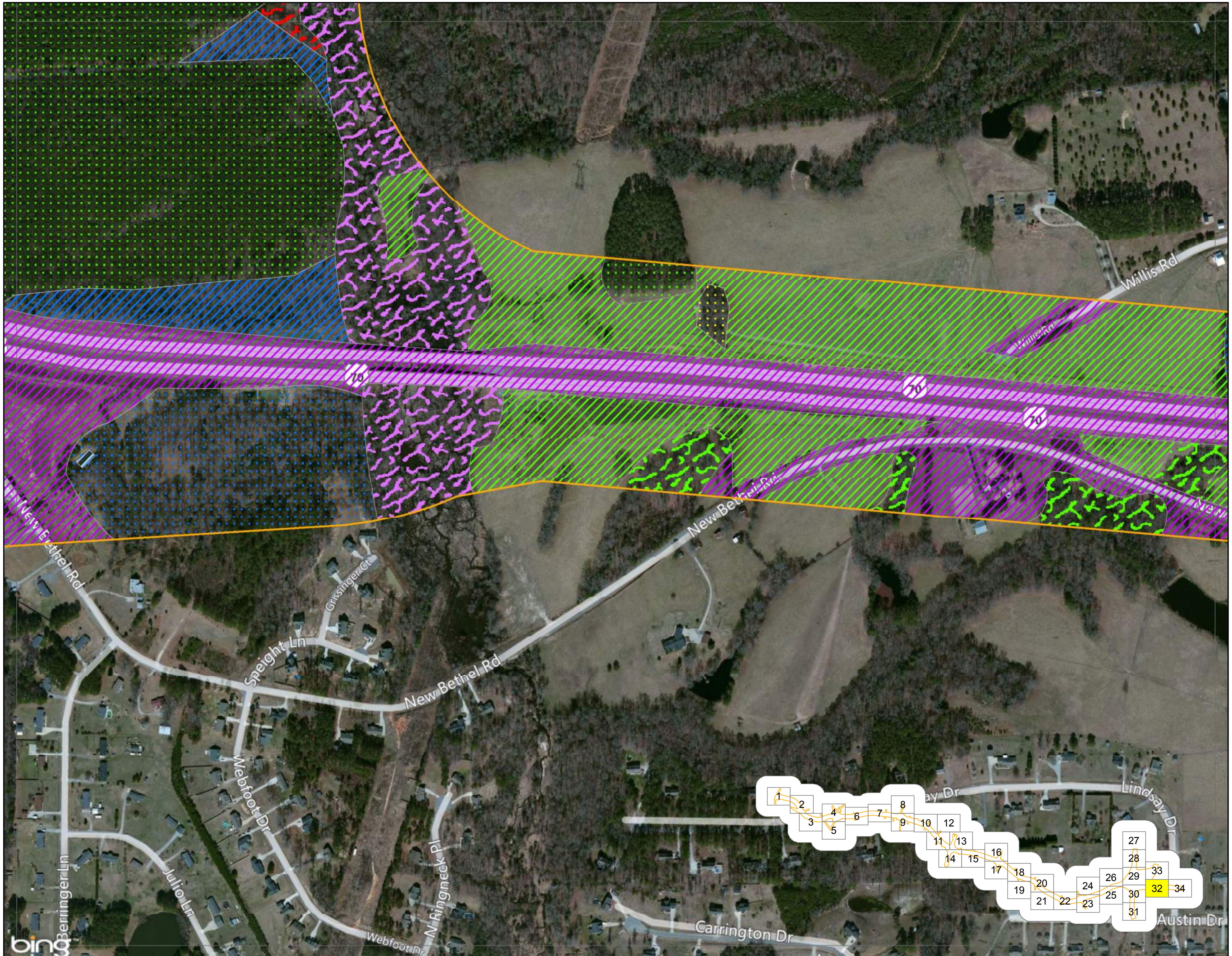
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-31



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange, Blue, Green, Brown, Red, Mint, Lilac, Tan, Purple, Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

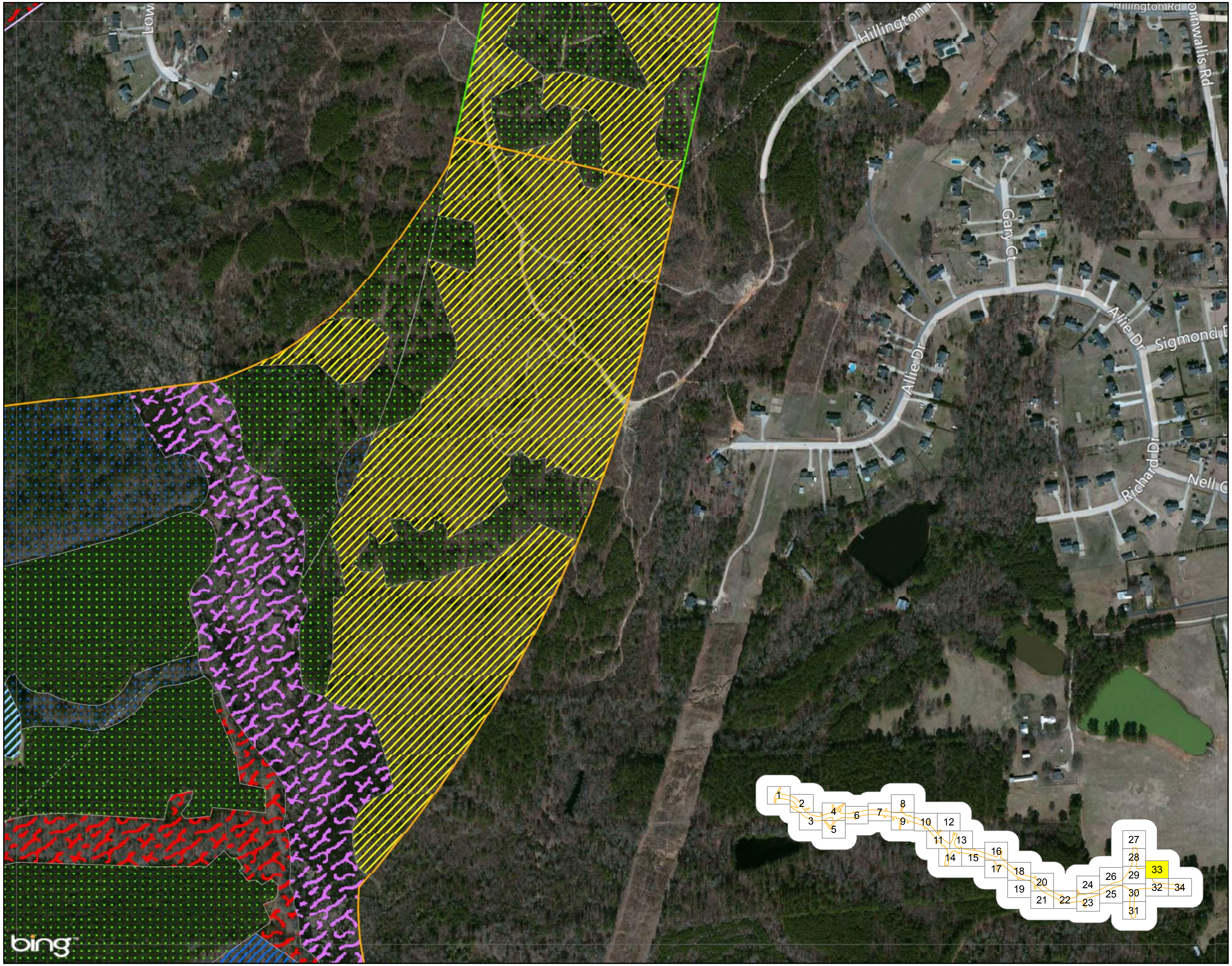
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-32



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

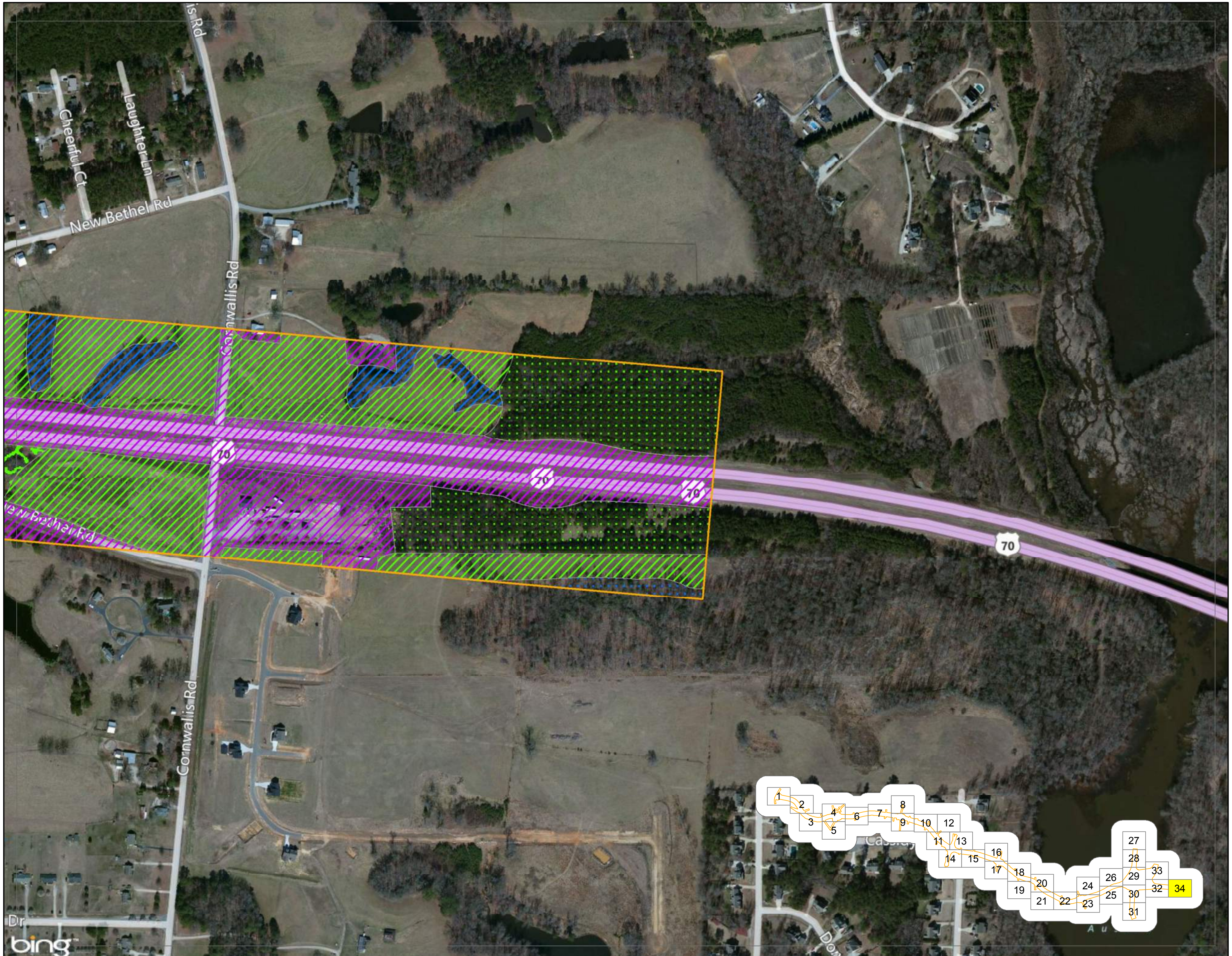
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-33



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

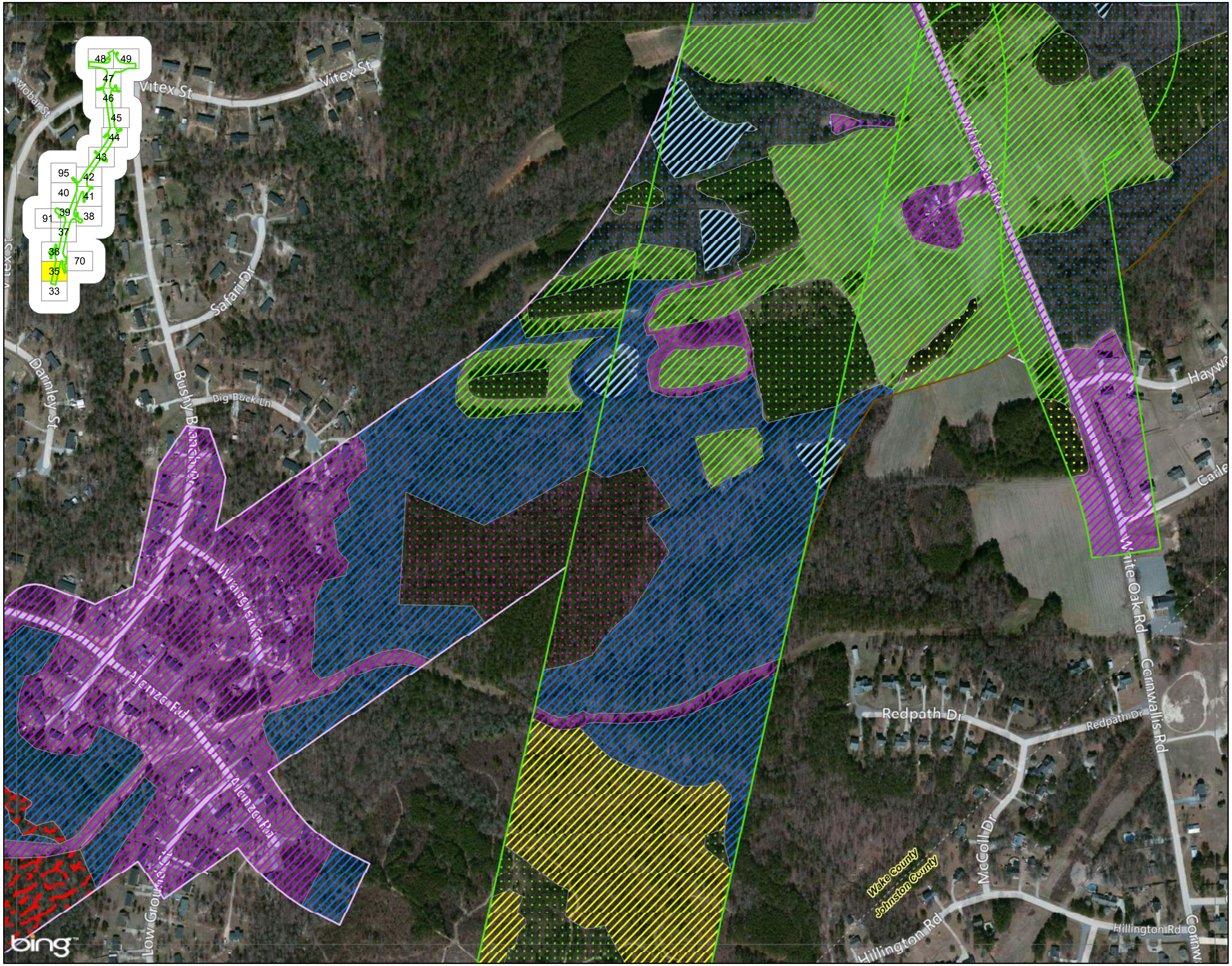
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-34



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

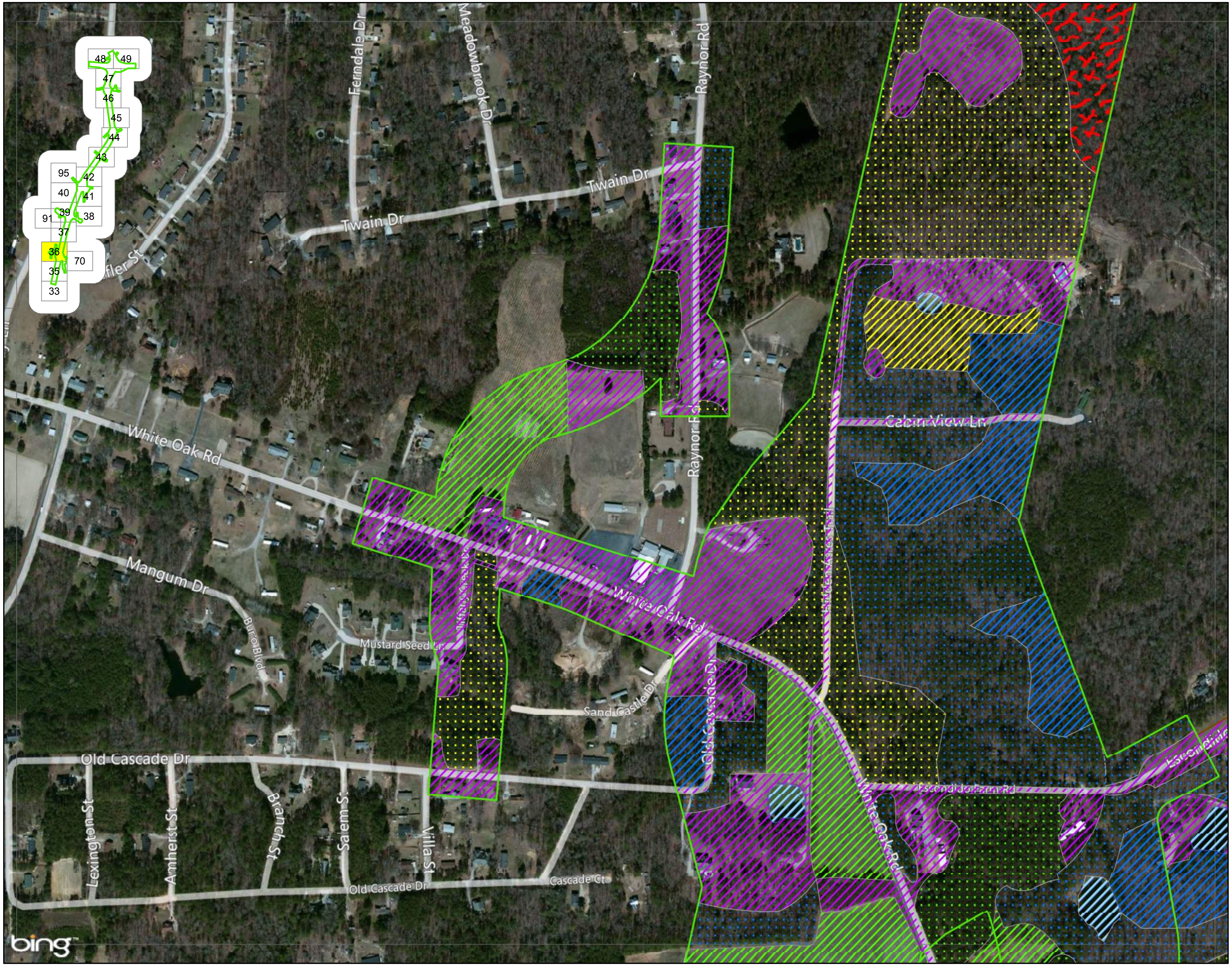
Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-35



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Blue
Green
Brown
Red
Mint
Lilac
Tan
Purple
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

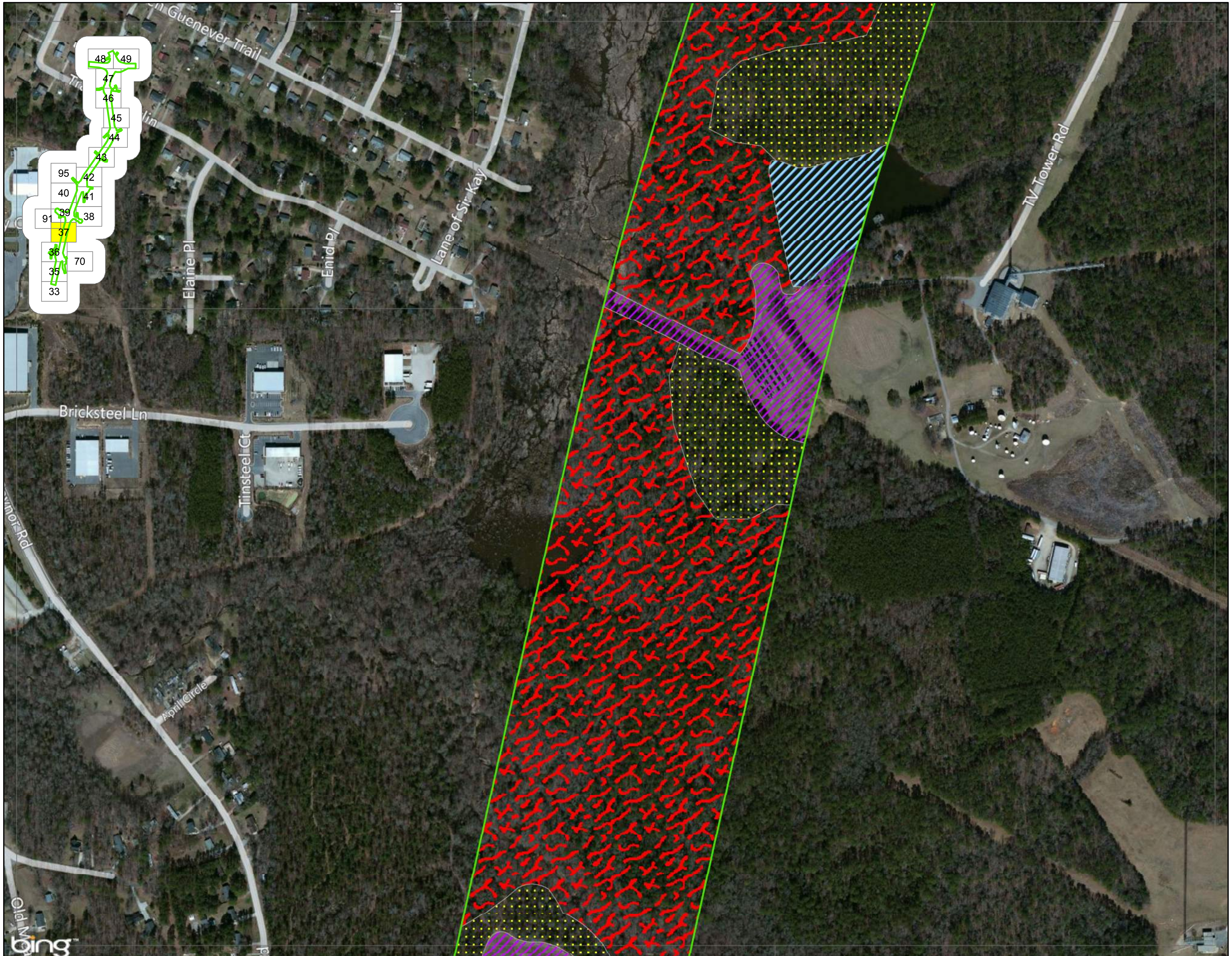
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-36



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

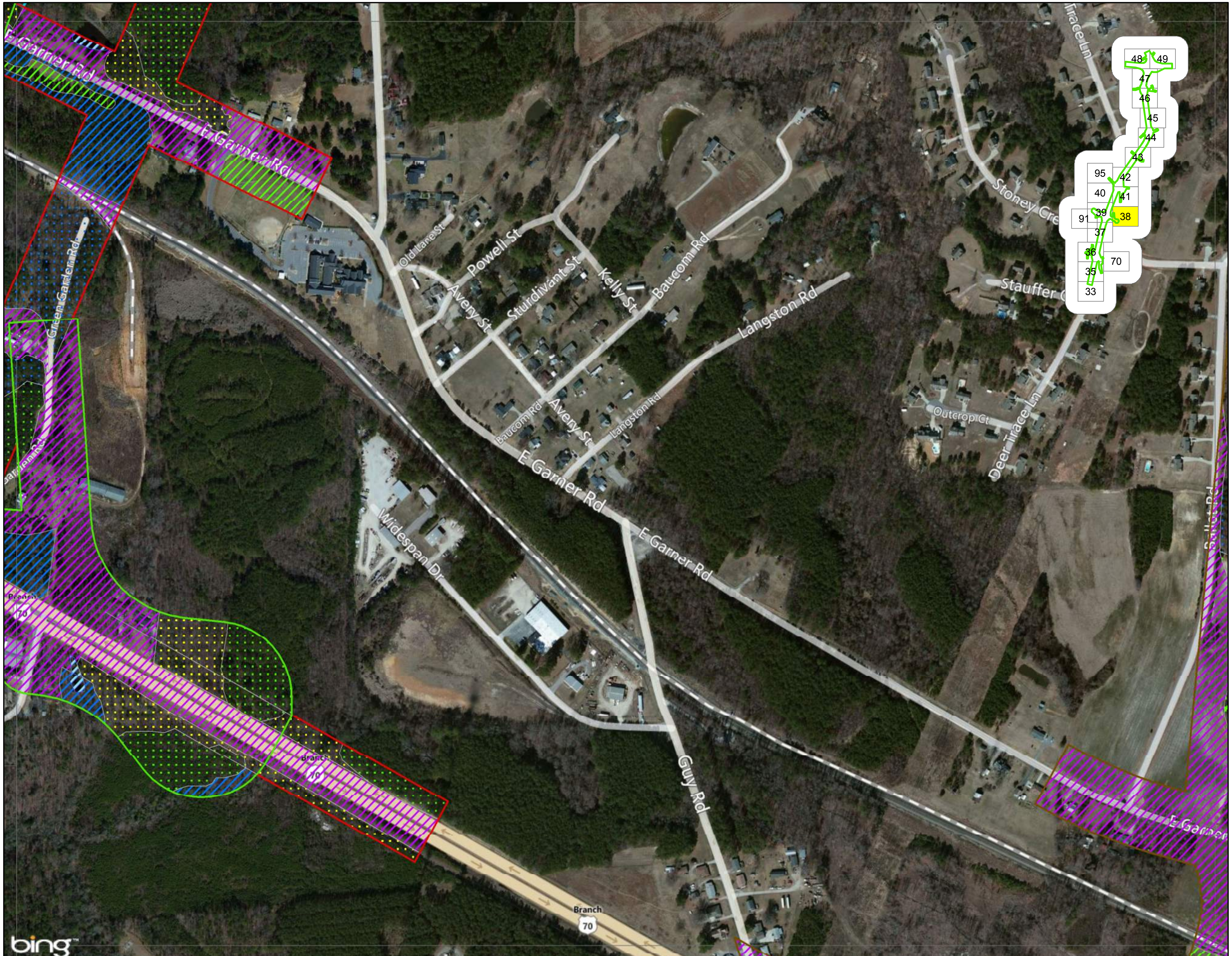
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-37



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

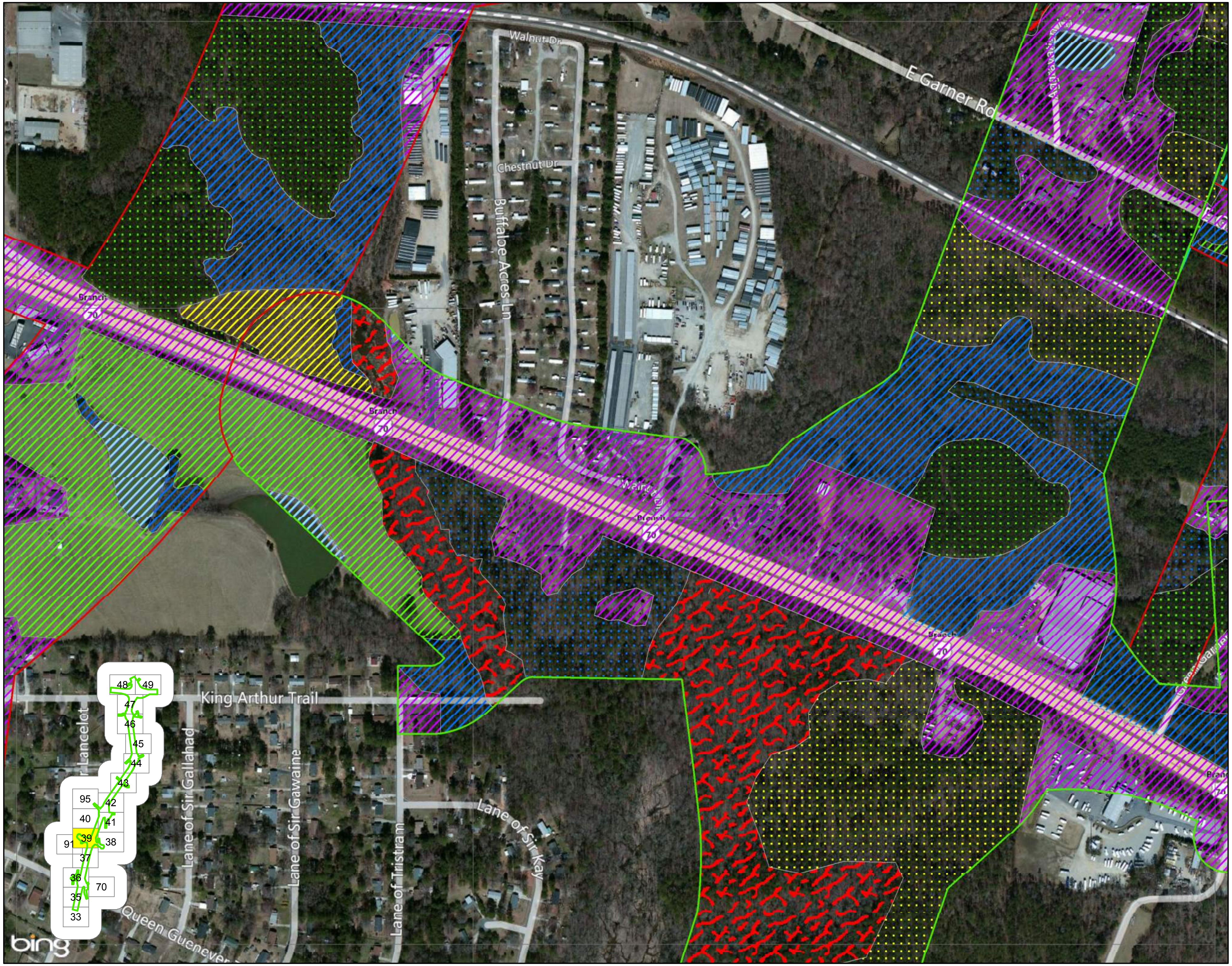
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-38



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

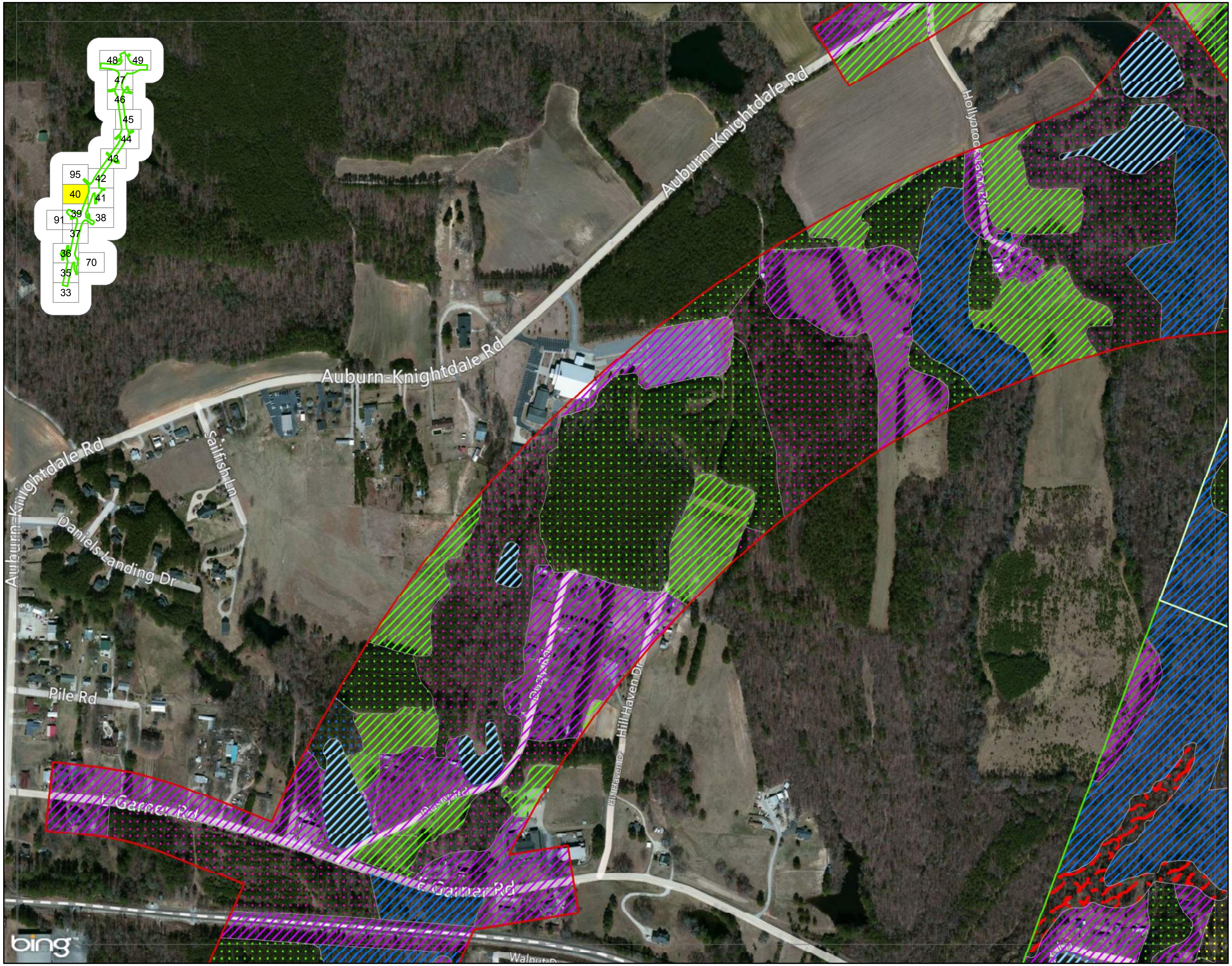
Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-39



Legend

Map Grid

Roads

County Boundary

Open Water

Corridors

Orange, Blue, Green, Brown, Red, Mint, Lilac, Tan, Purple, Teal

Community Types

Agriculture/Pasture

Basic Mesic Forest

Cutover/Early Successional

Dry Oak-Hickory Forest

Dry-Mesic Oak-Hickory Forest

Floodplain Pool

Maintained/Disturbed

Mesic Mixed Hardwood Forest

Non-Riverine Swamp Forest

Non-Tidal Freshwater Marsh

Piedmont/Low Mountain Alluvial Forest

Piedmont/Mountain Bottomland Forest

Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

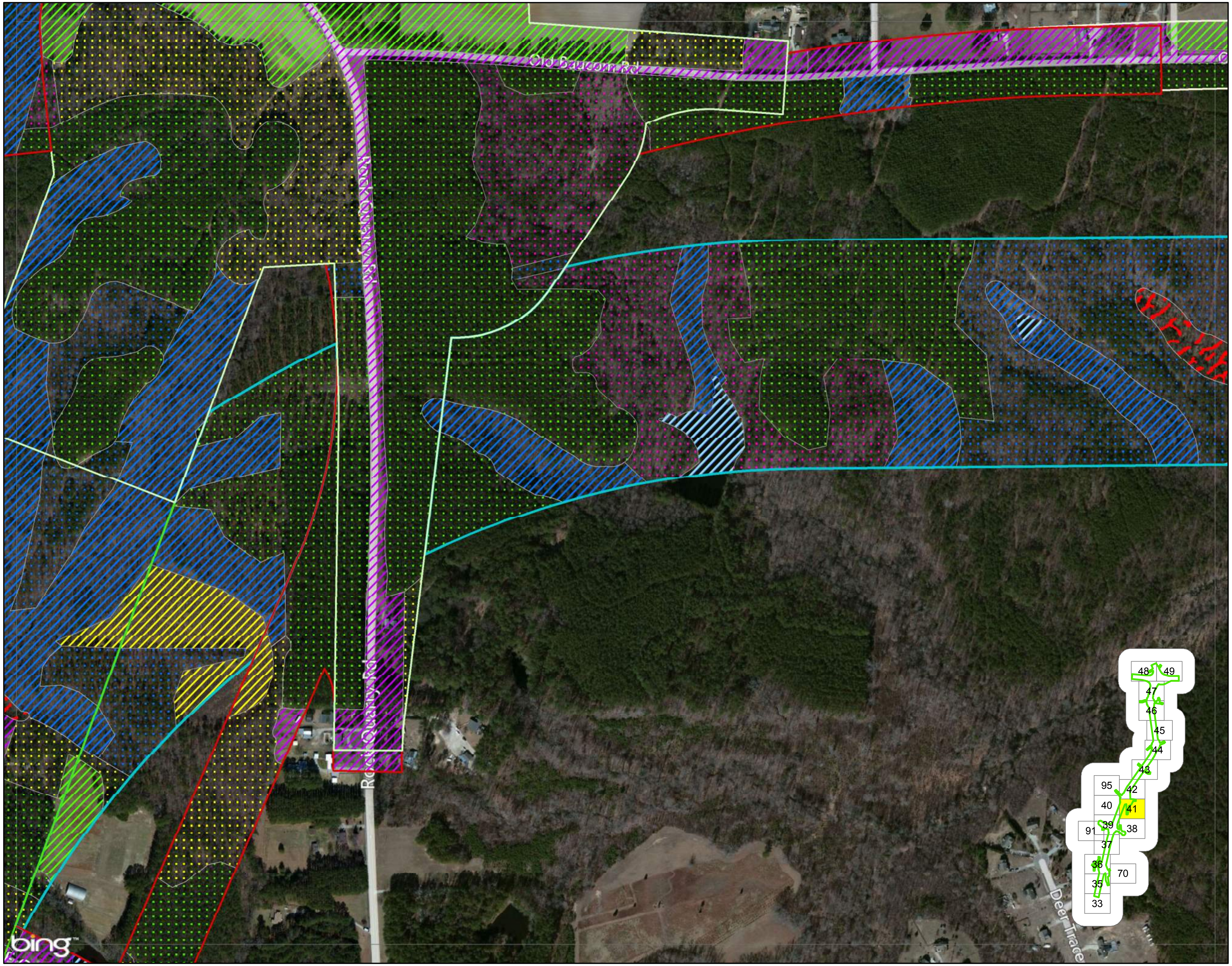
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/28/2014

Figure 4-40



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

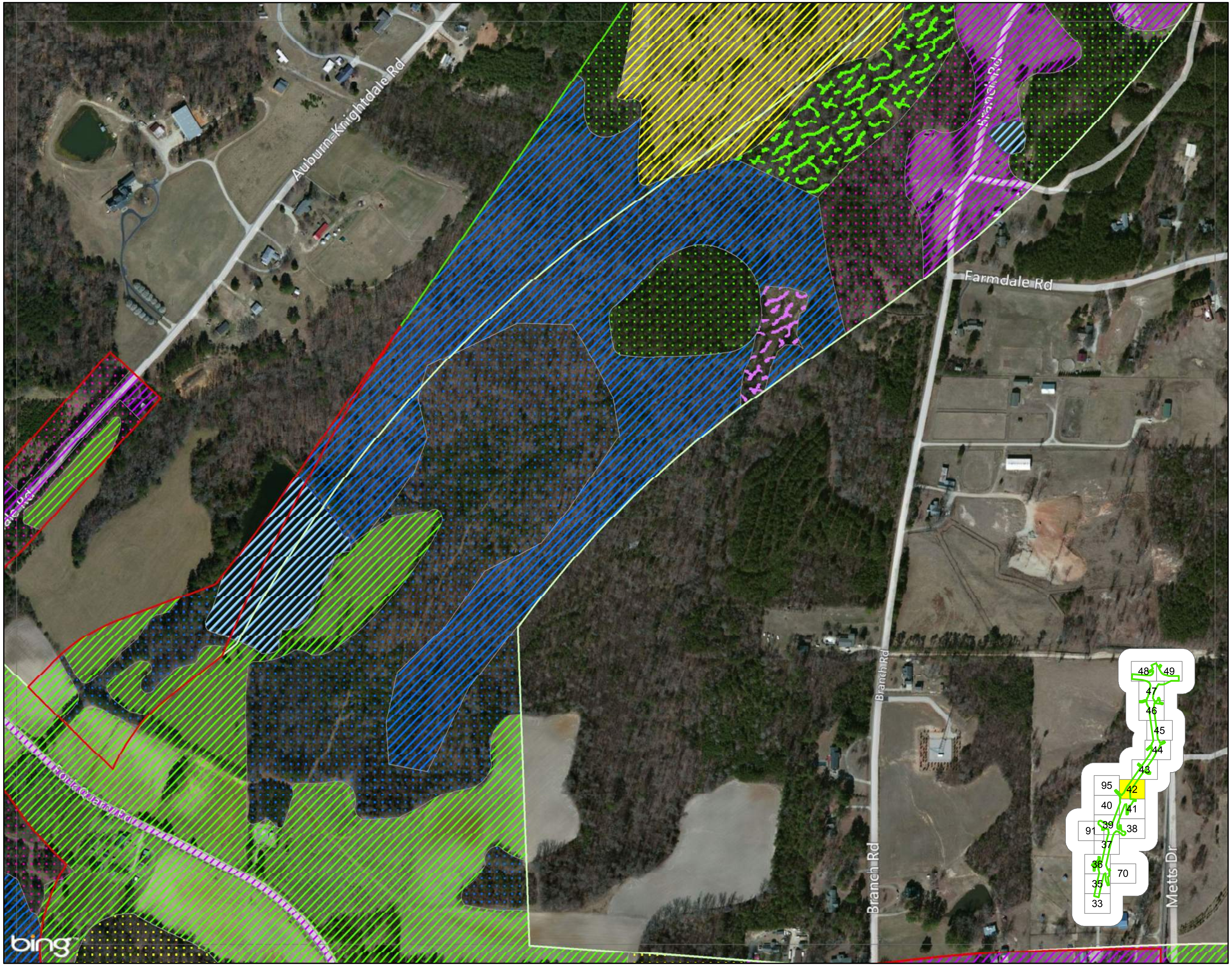
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-41



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-42

Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

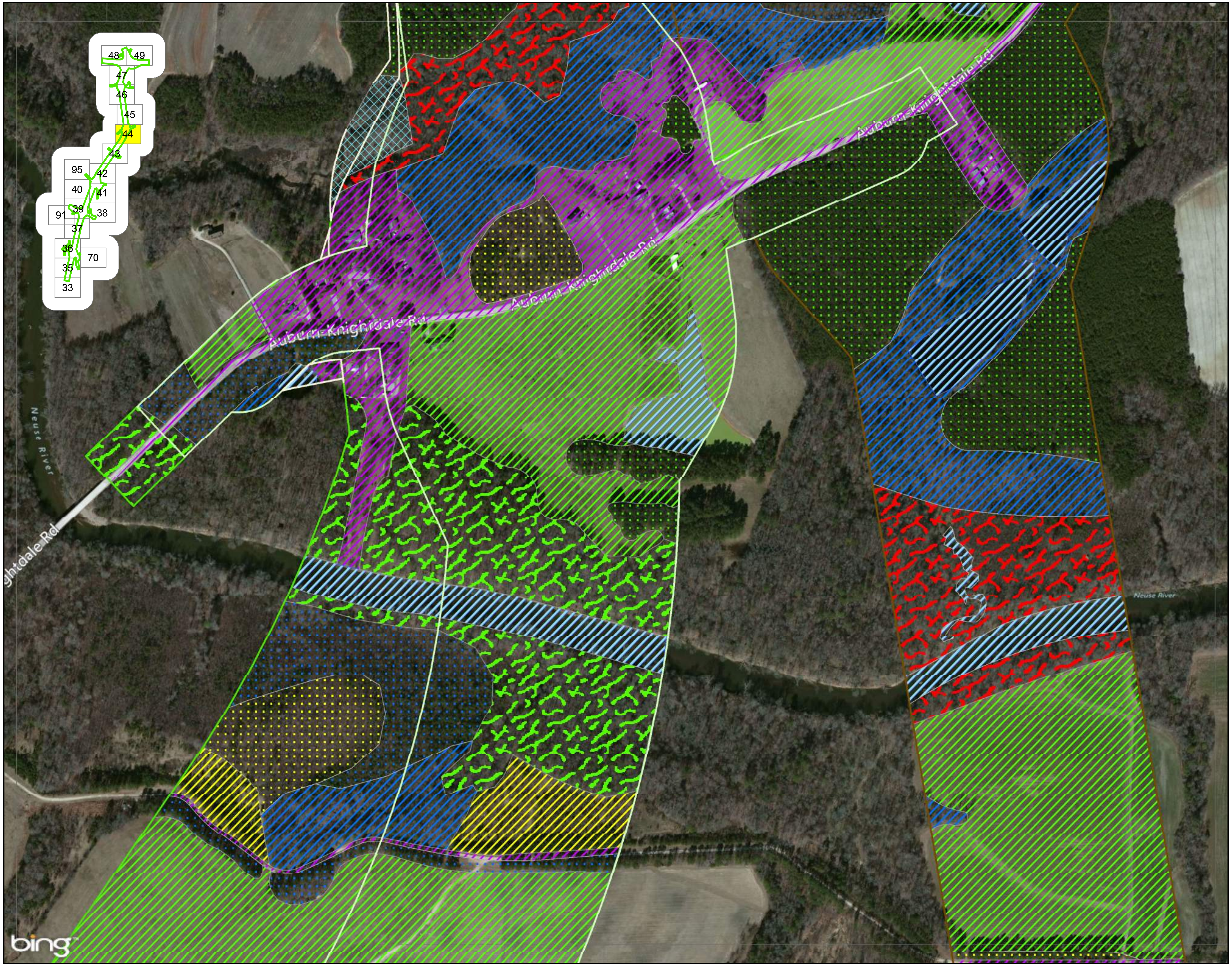
Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-43



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

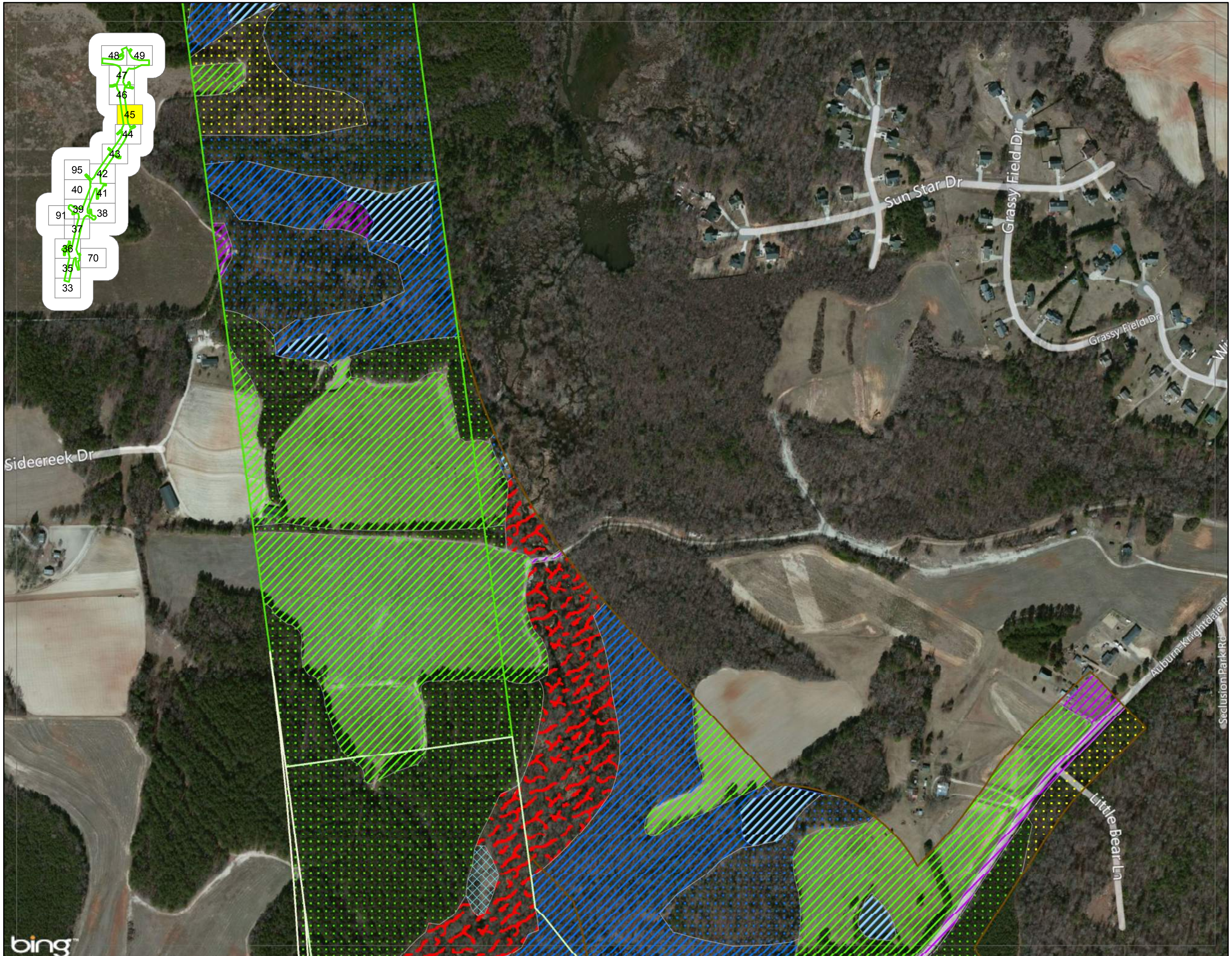
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-44



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

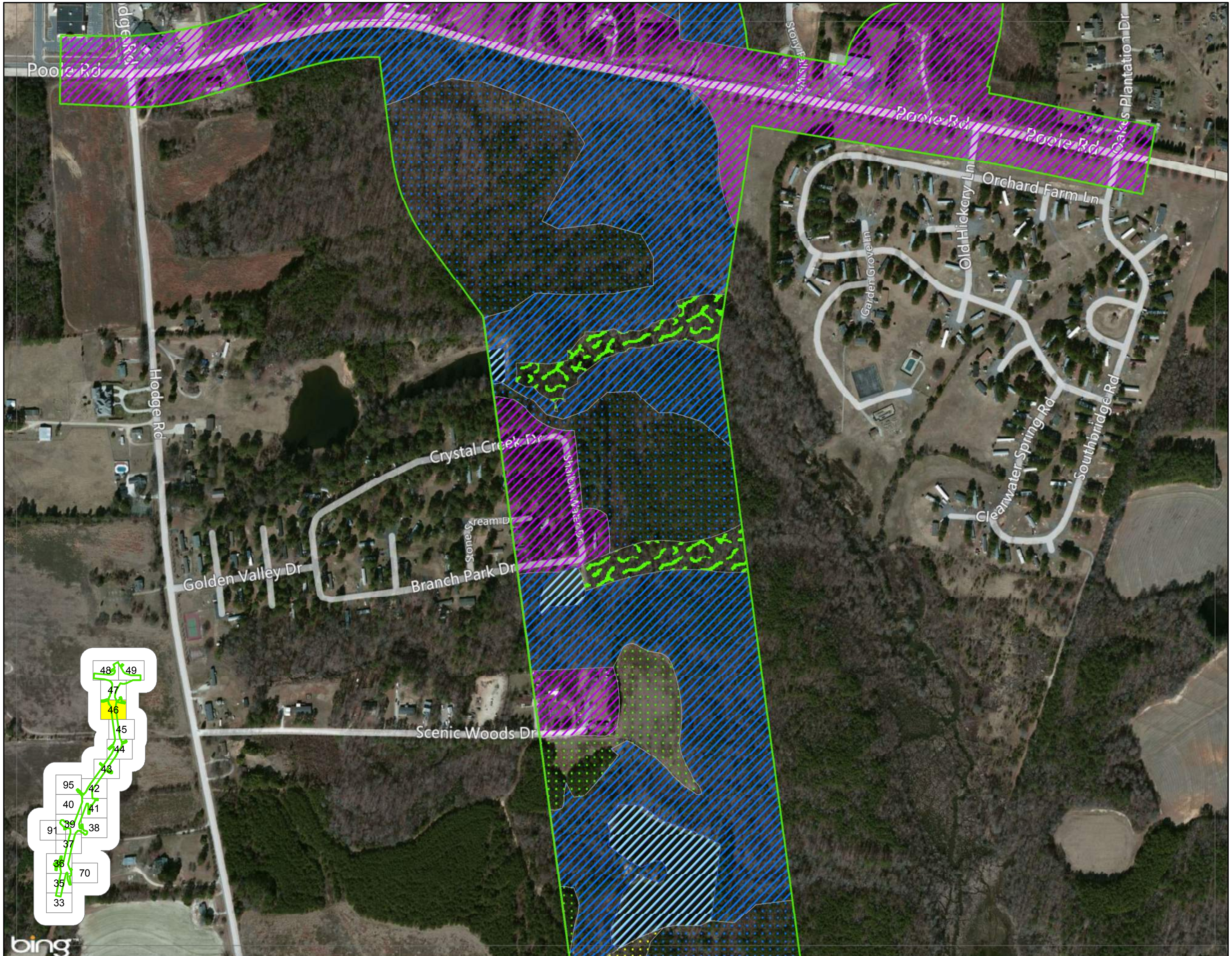
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-45



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Blue
- Green
- Brown
- Red
- Mint
- Lilac
- Tan
- Purple
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

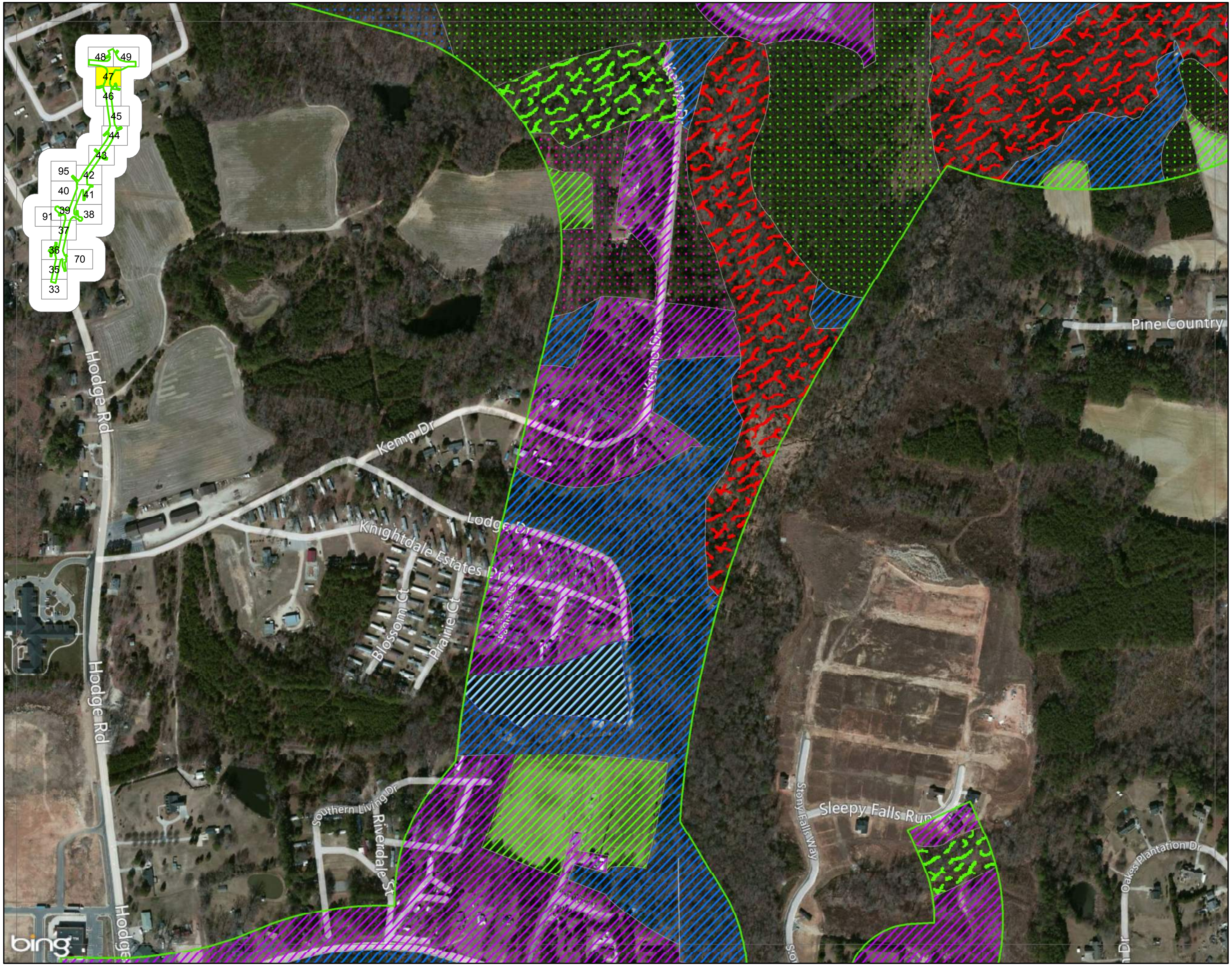
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-46



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

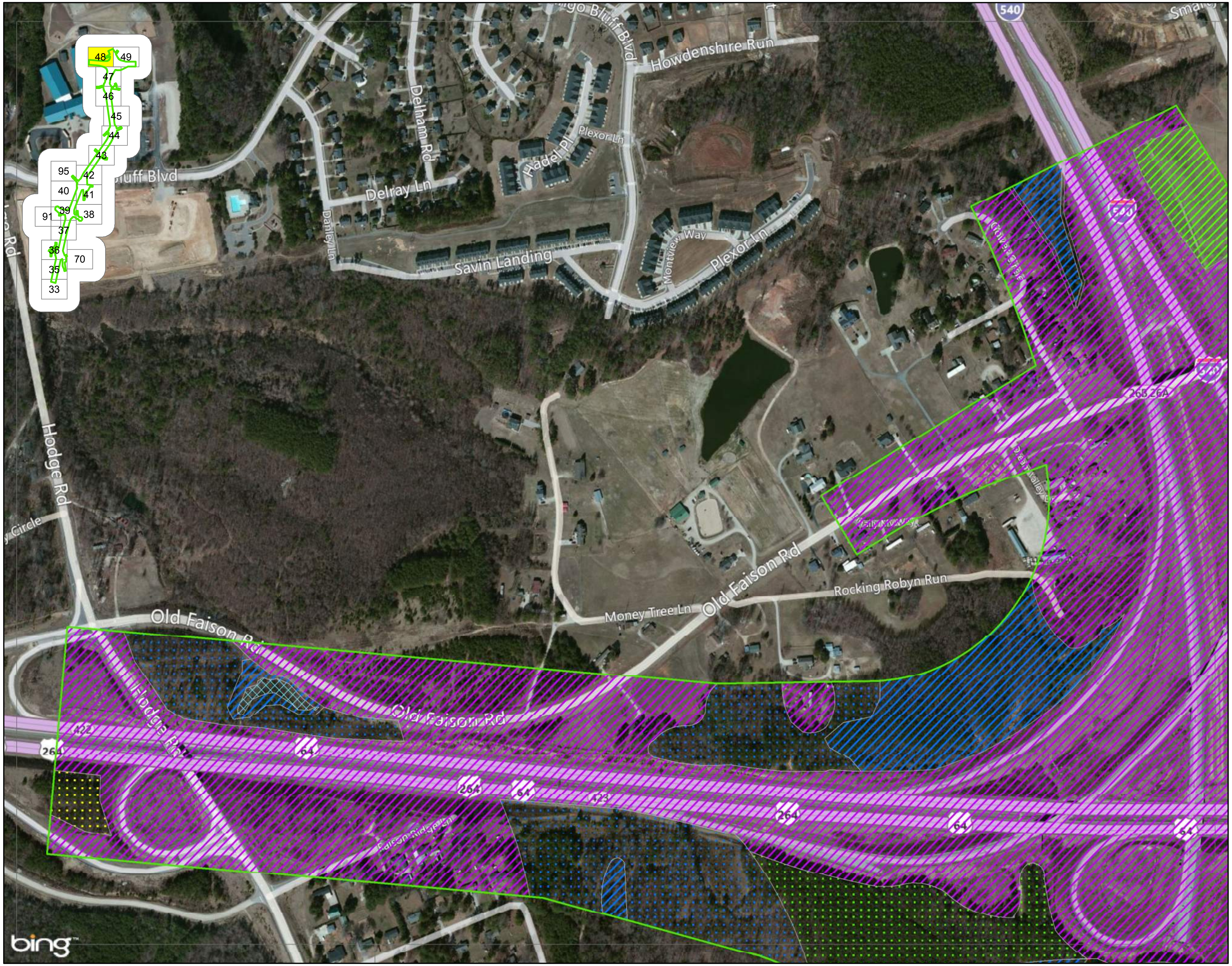
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-47



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

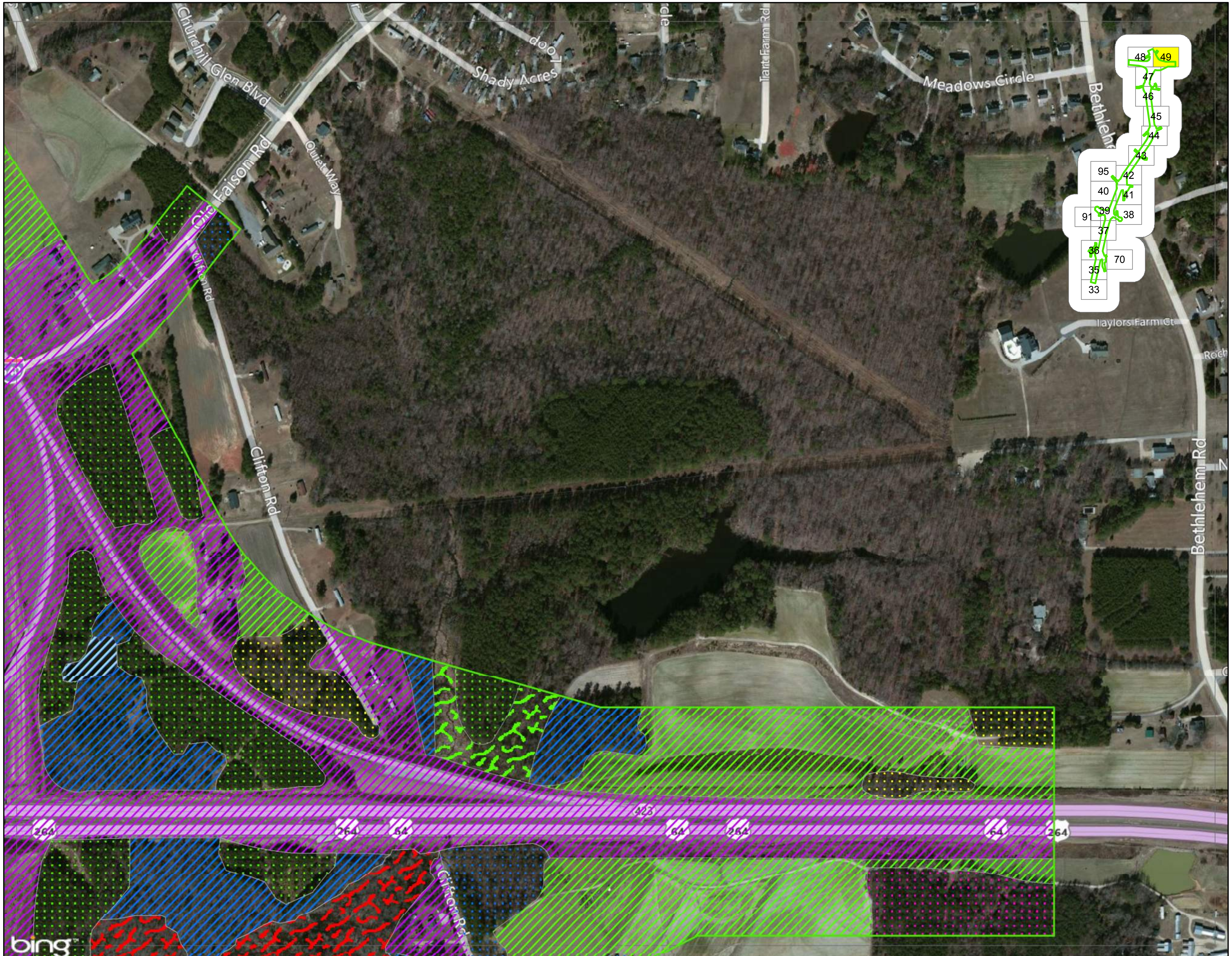
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-48



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

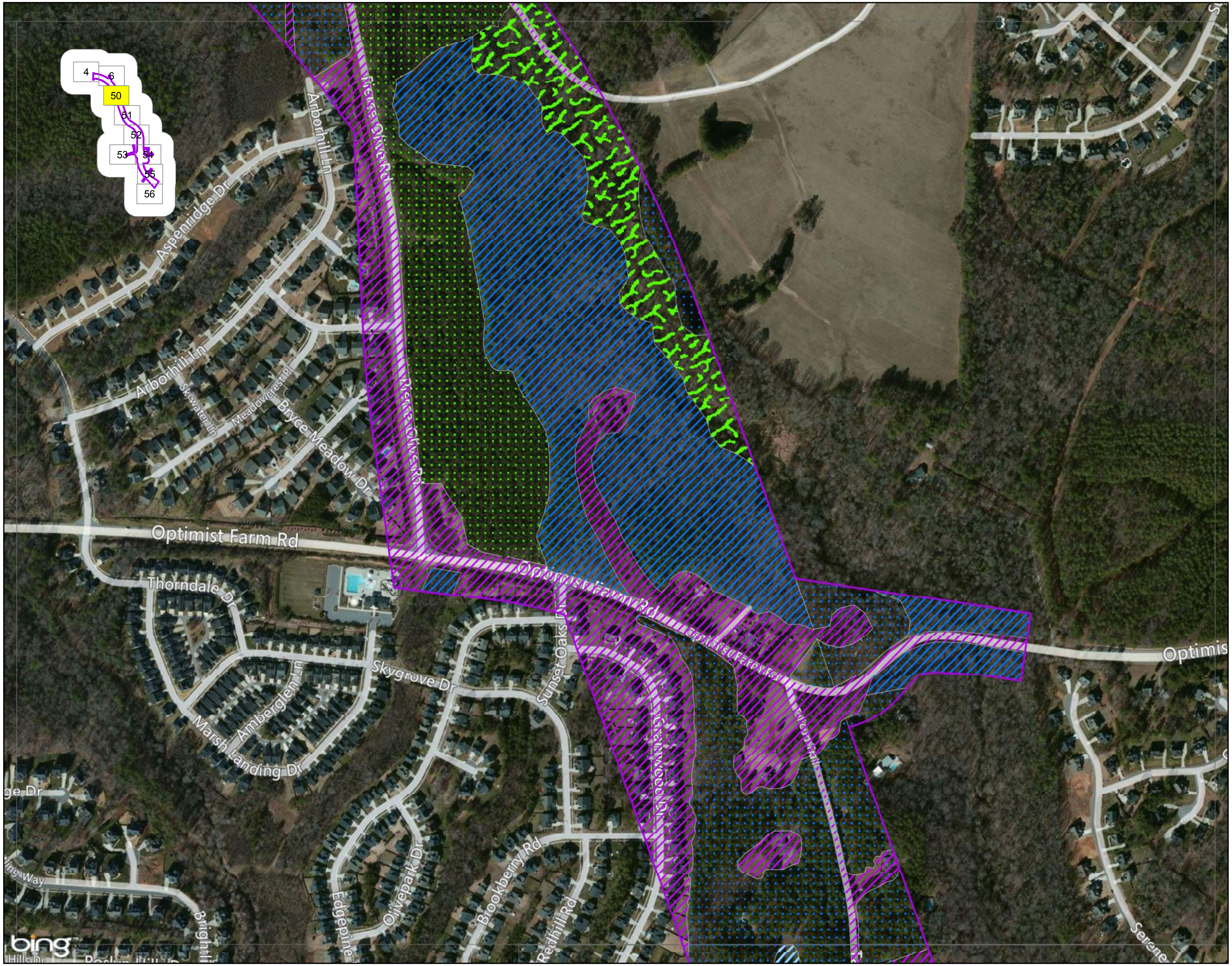
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-49



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-50

Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

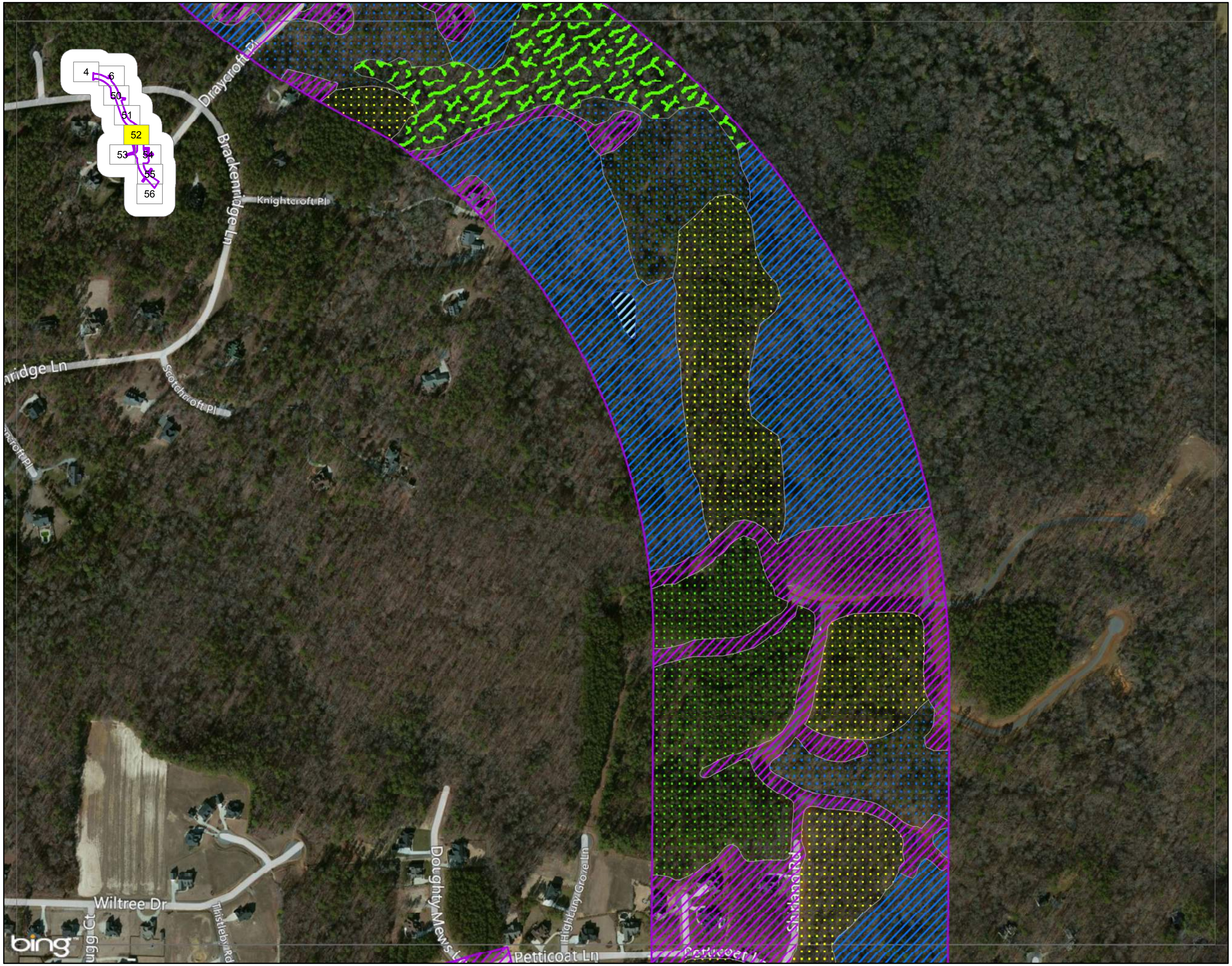
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-51



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

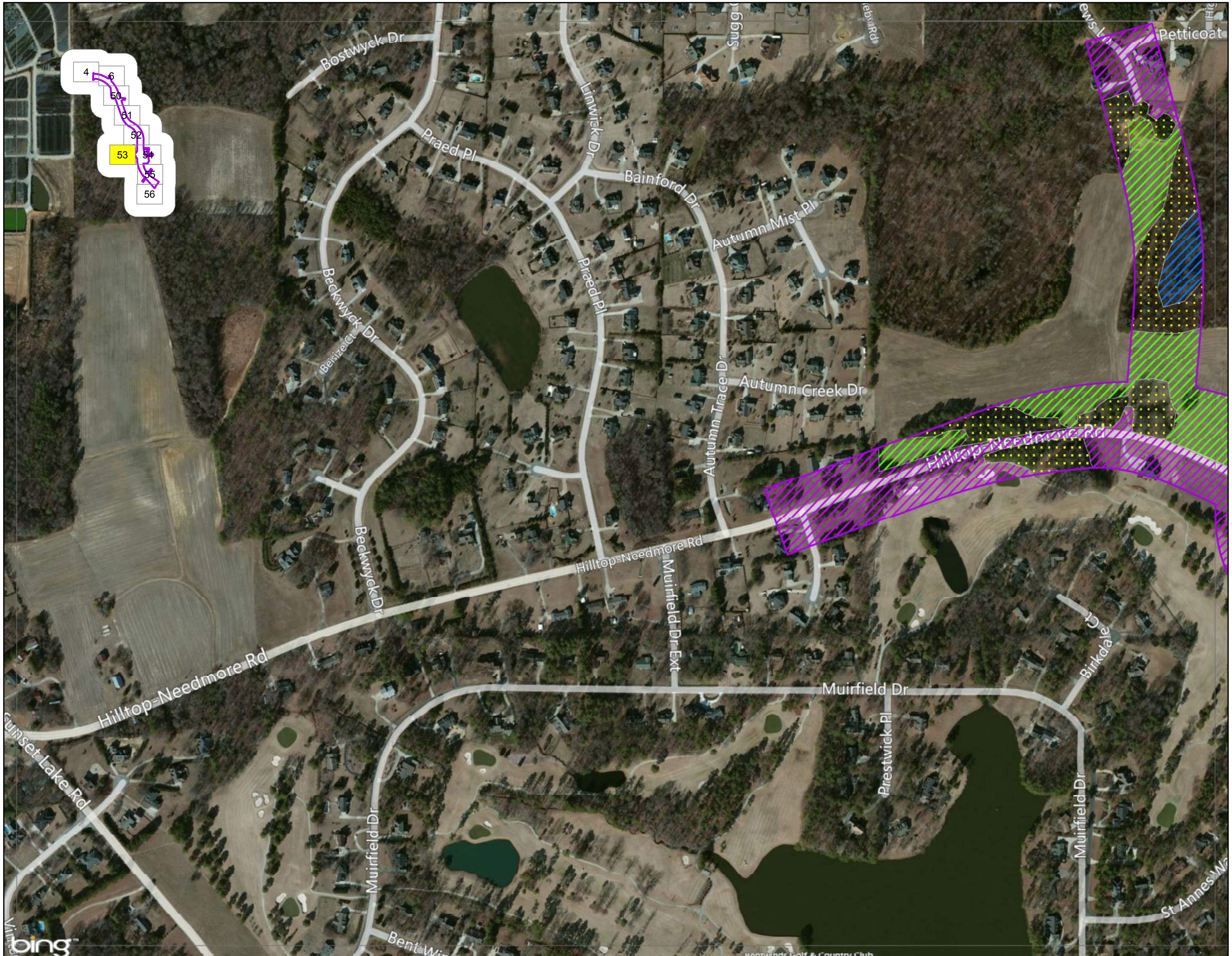
Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

N

Figure 4-52



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

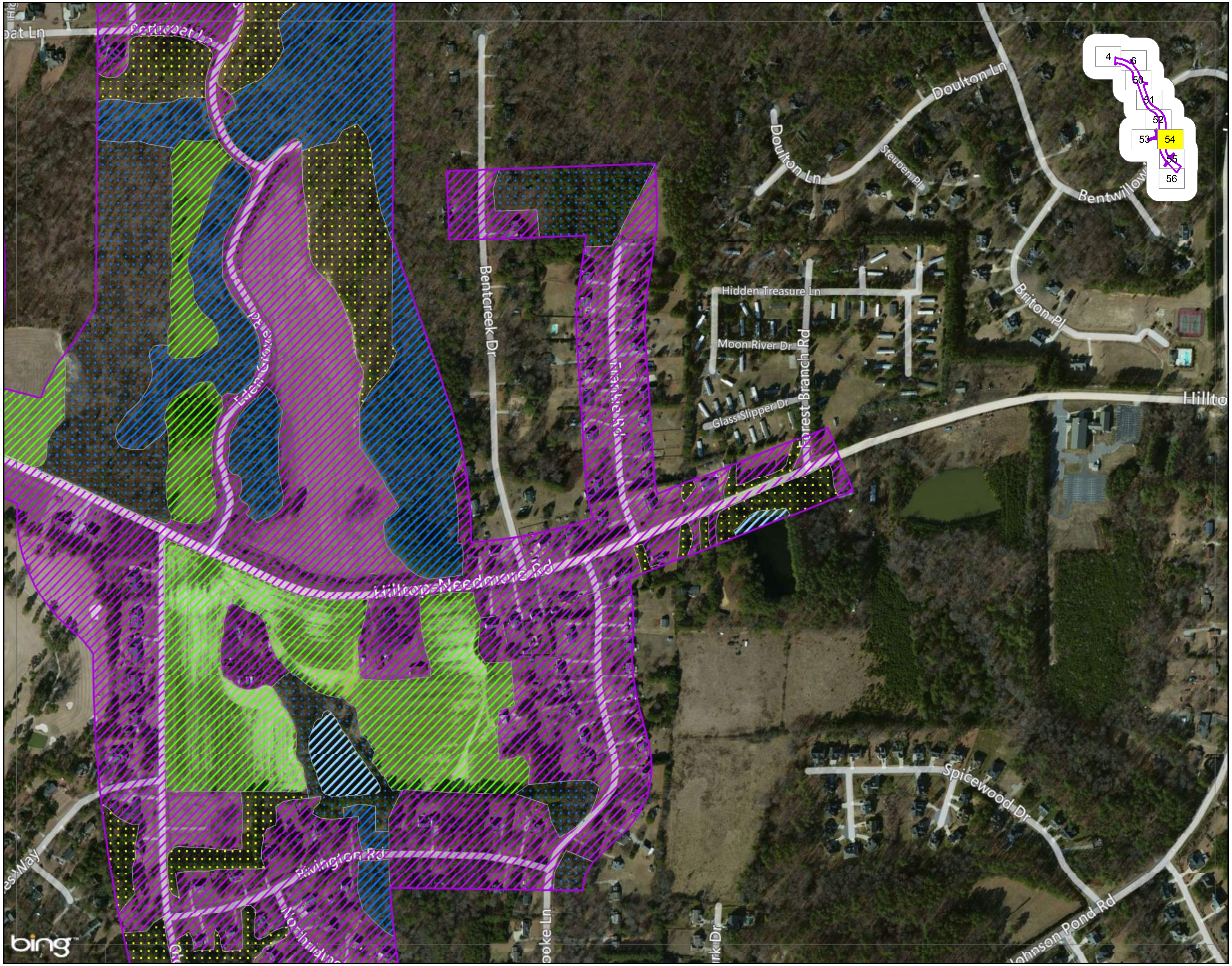
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-53



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

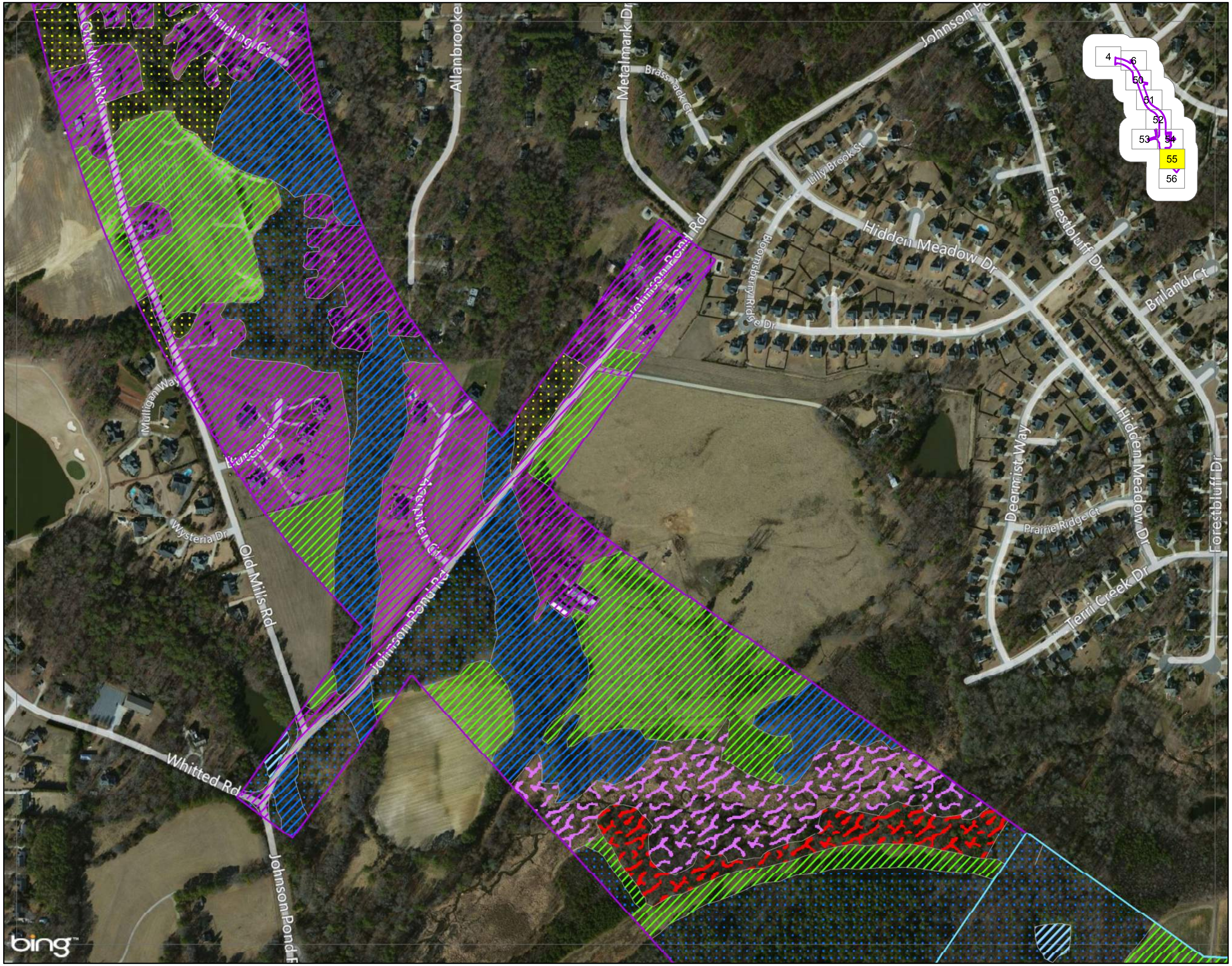
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-54



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

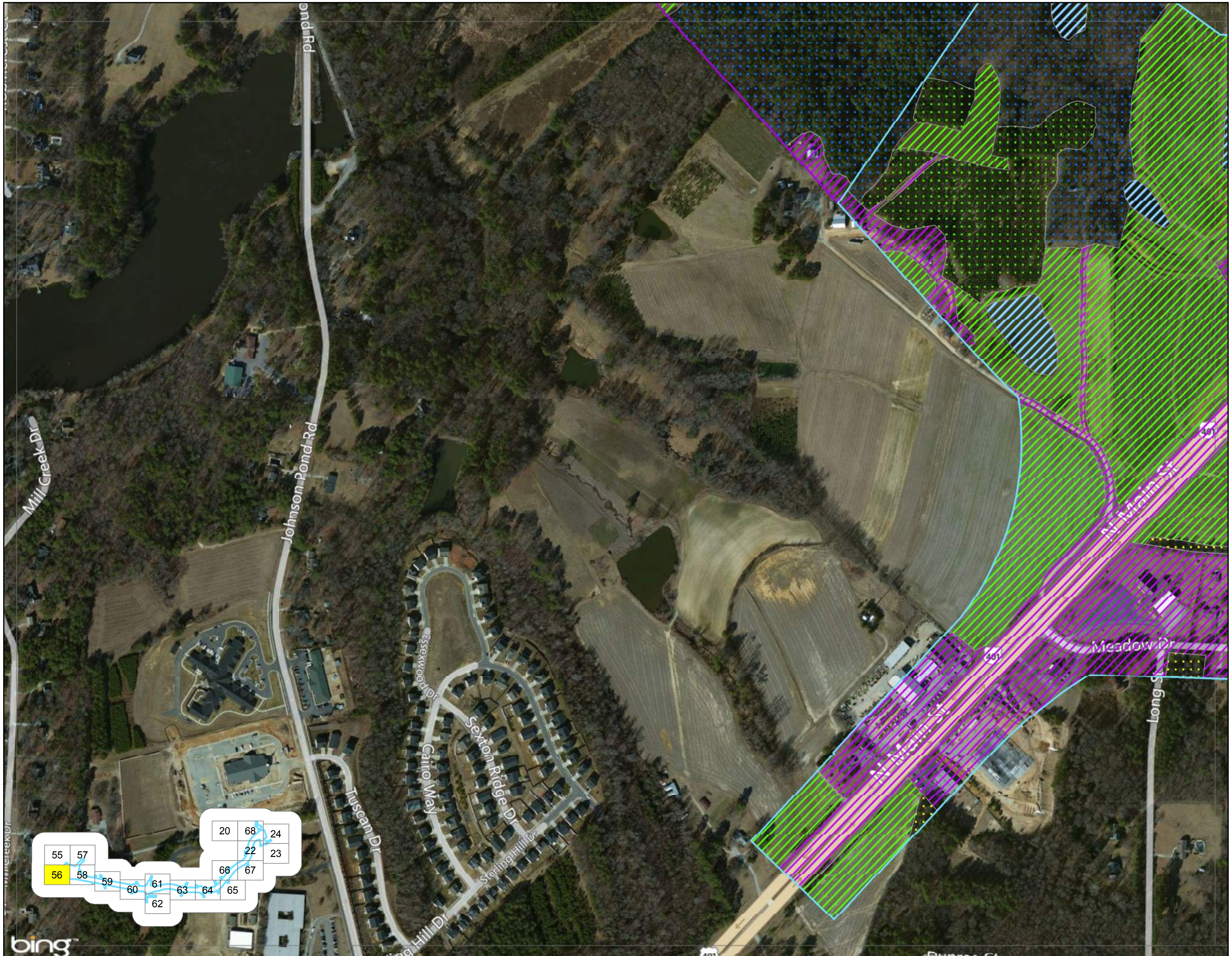
Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-55



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Blue
Green
Brown
Red
Mint
Lilac
Tan
Purple
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

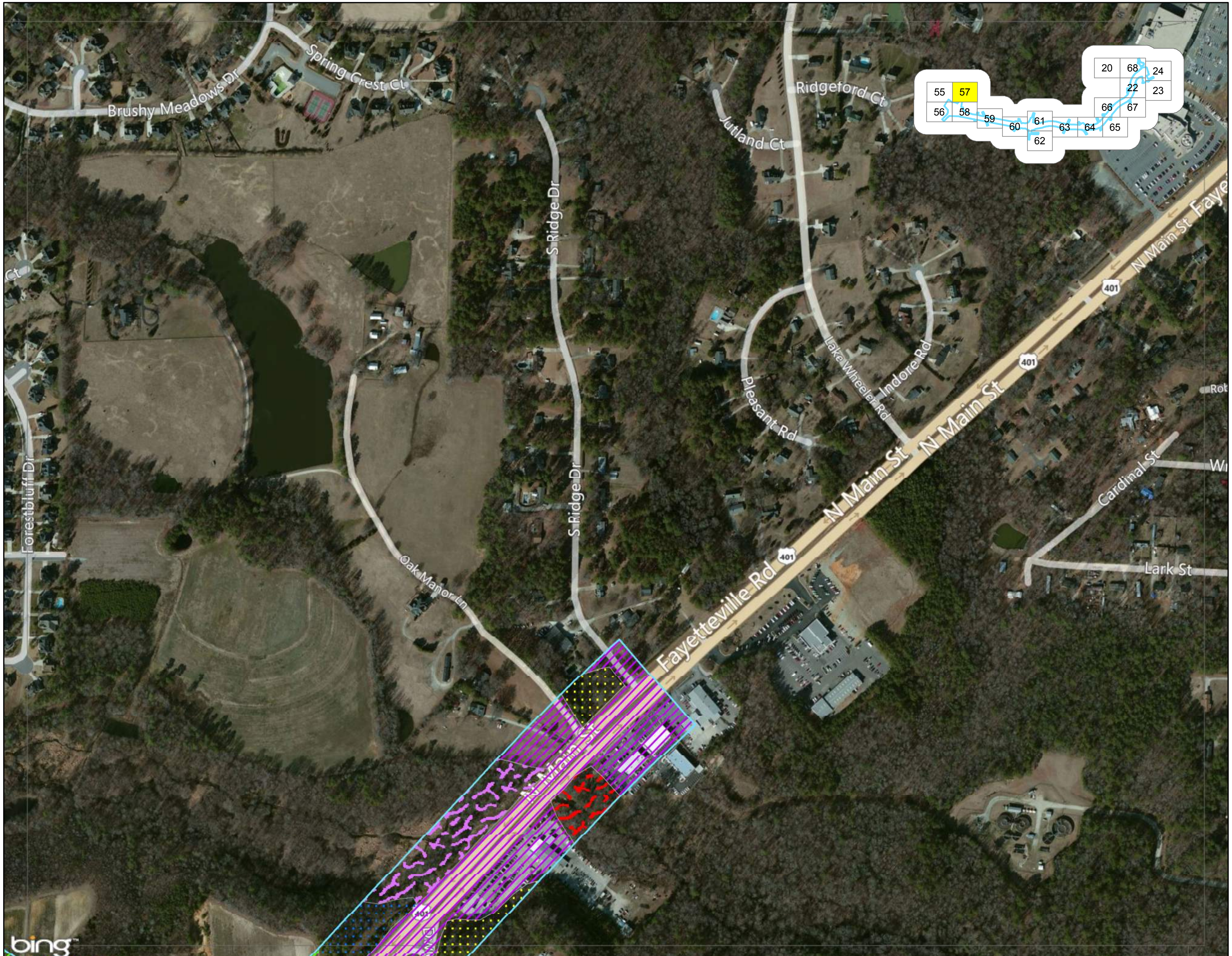
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-56



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

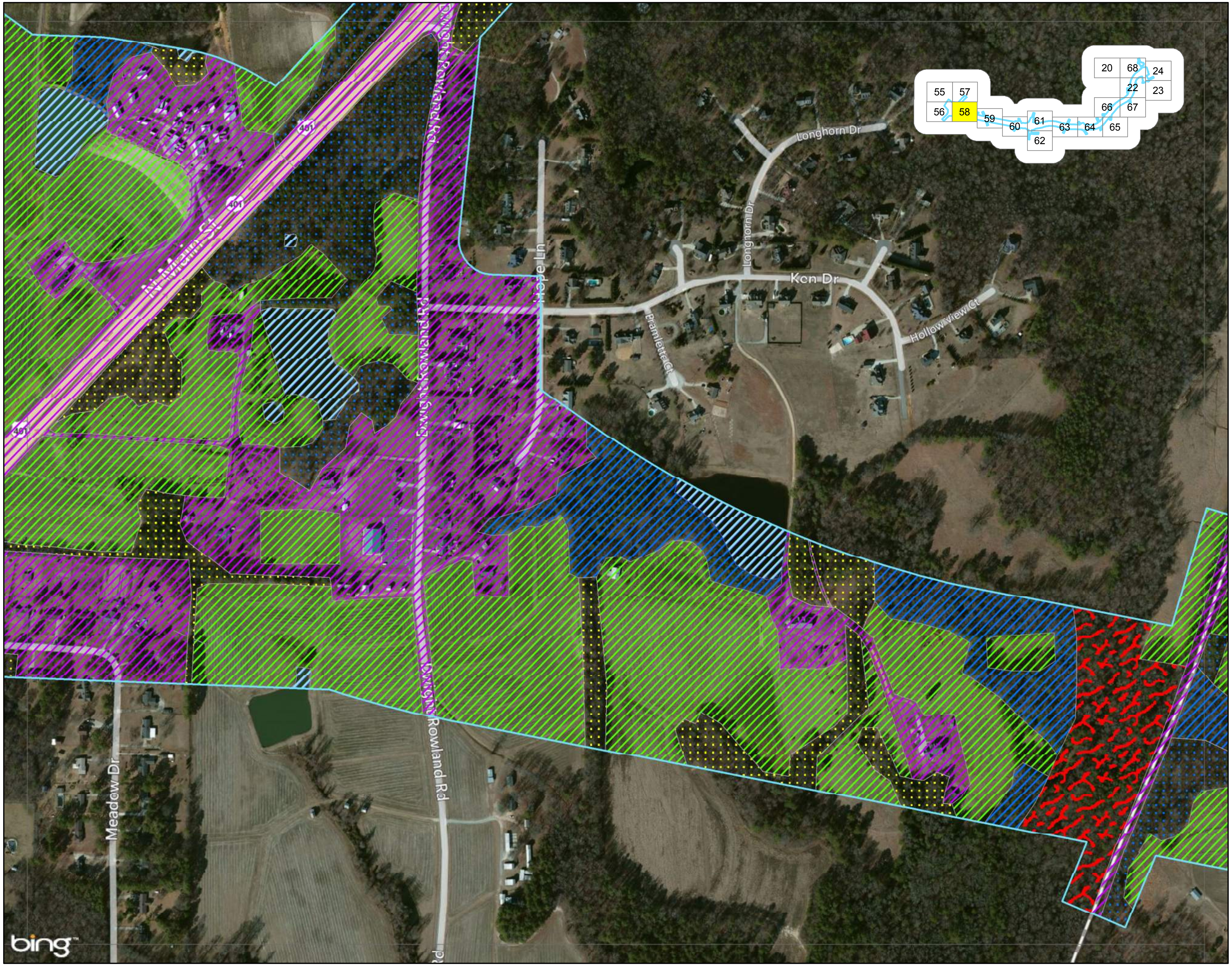
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-57



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS

Map Date: 08/28/2014

N

Figure 4-58

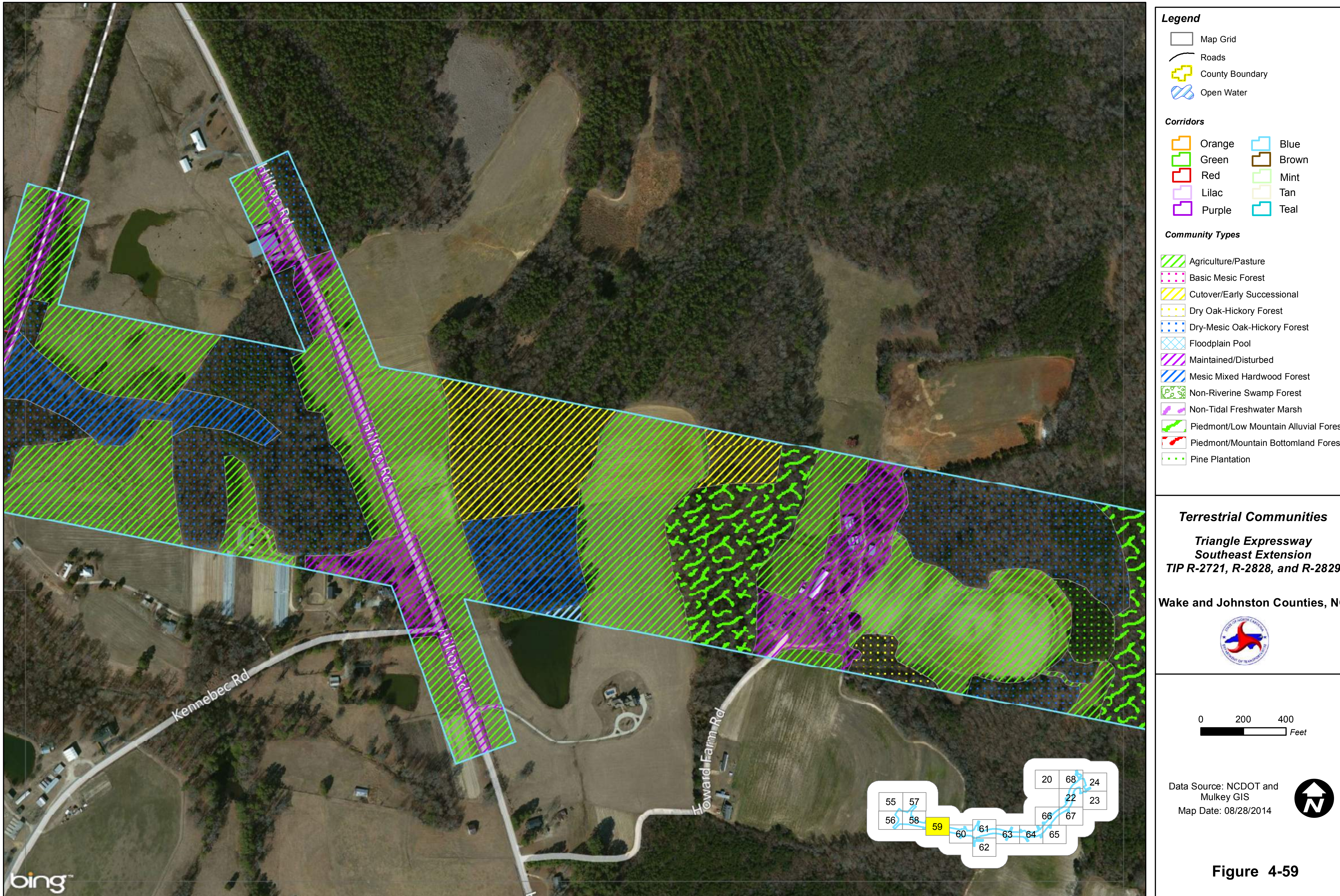
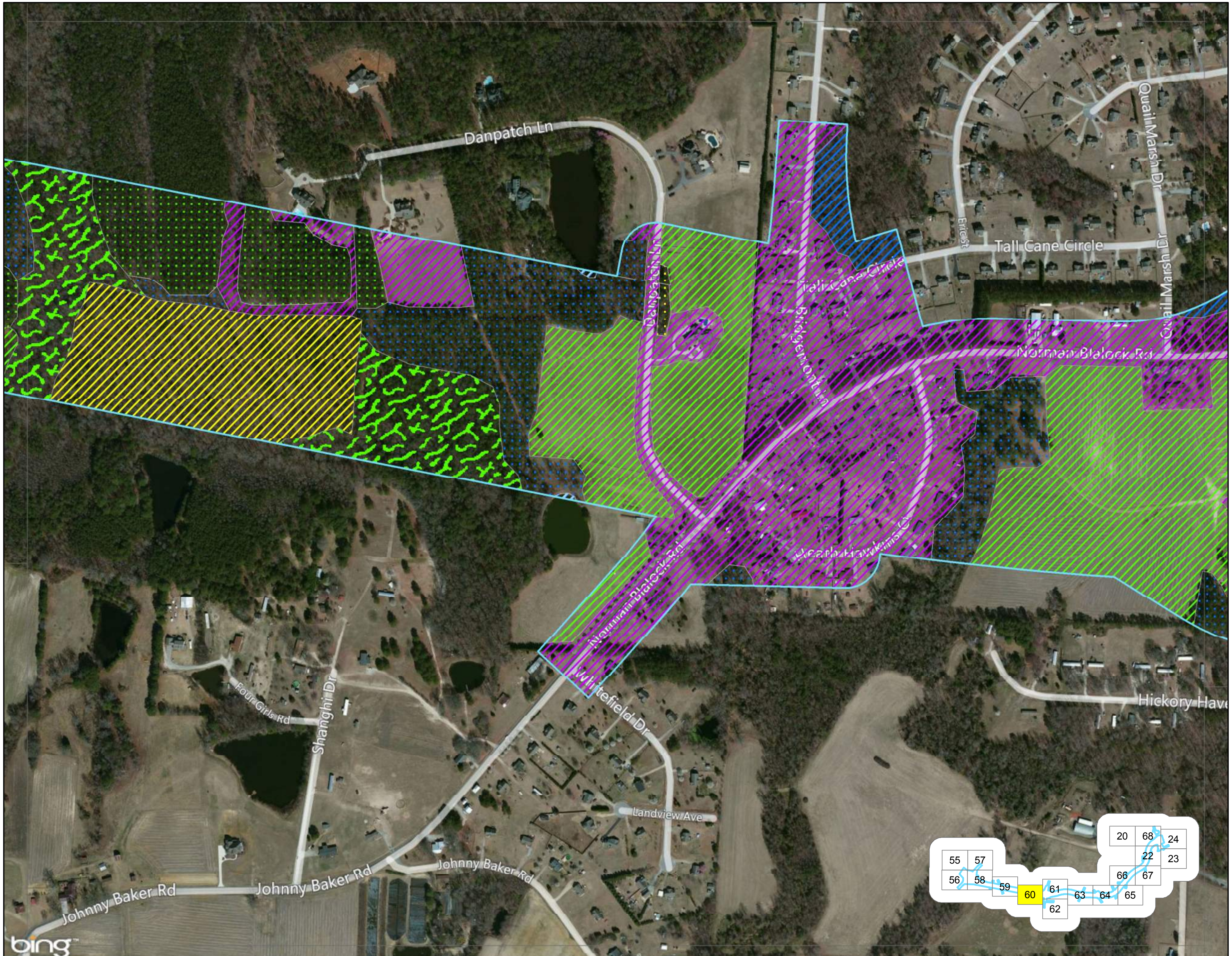

Hilltop Rd
Kennebec Rd
Howard Farm Rd
bing
55
57
56
58
59
60
61
62
63
64
65
66
67
20
68
24
22
23
Legend
Map Grid
Roads
County Boundary
Open Water
Corridors
Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal
Community Types
Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation
Terrestrial Communities
Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829
Wake and Johnston Counties, NC
0 200 400
Feet
Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014
N

Figure 4-59



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

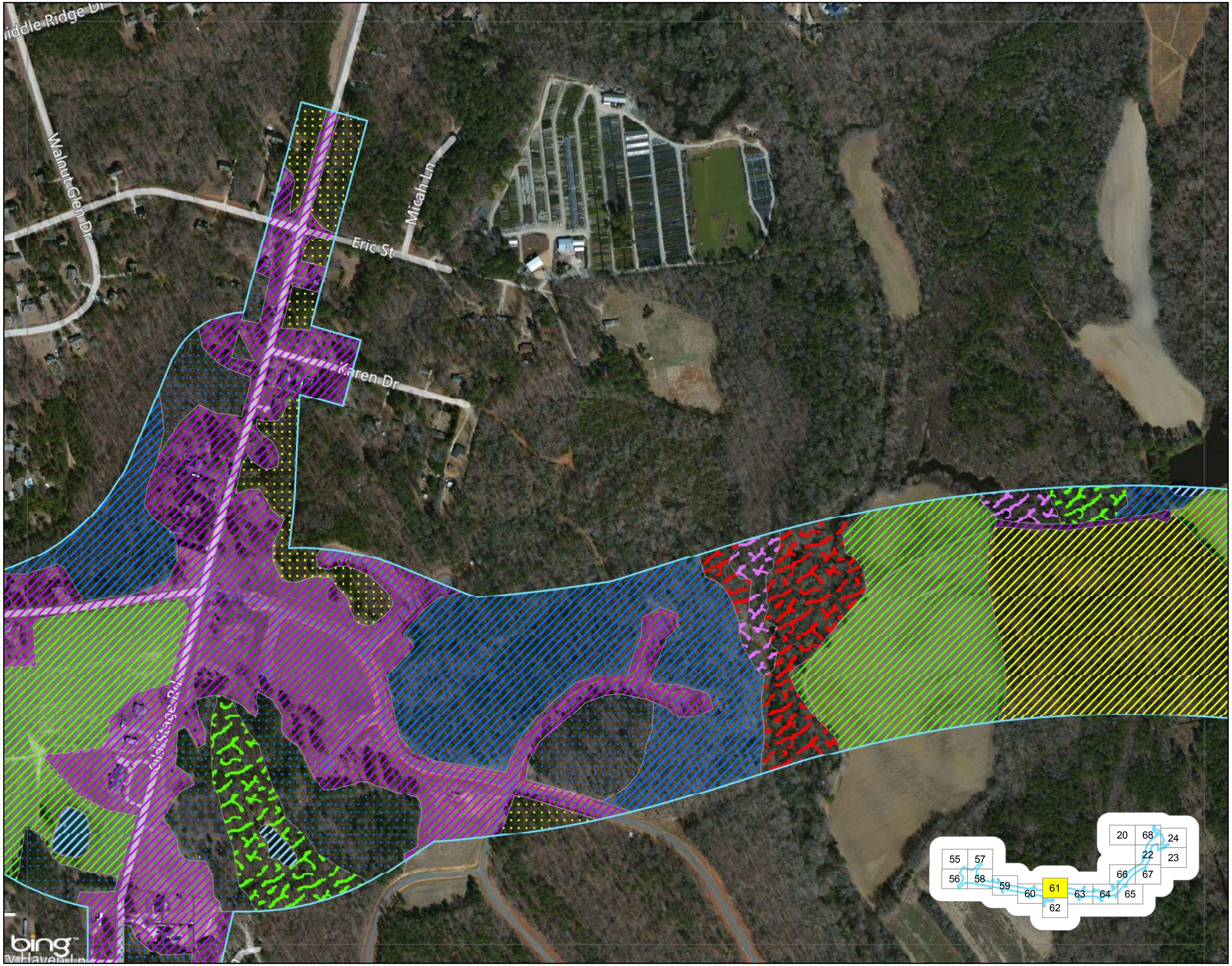
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-60



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

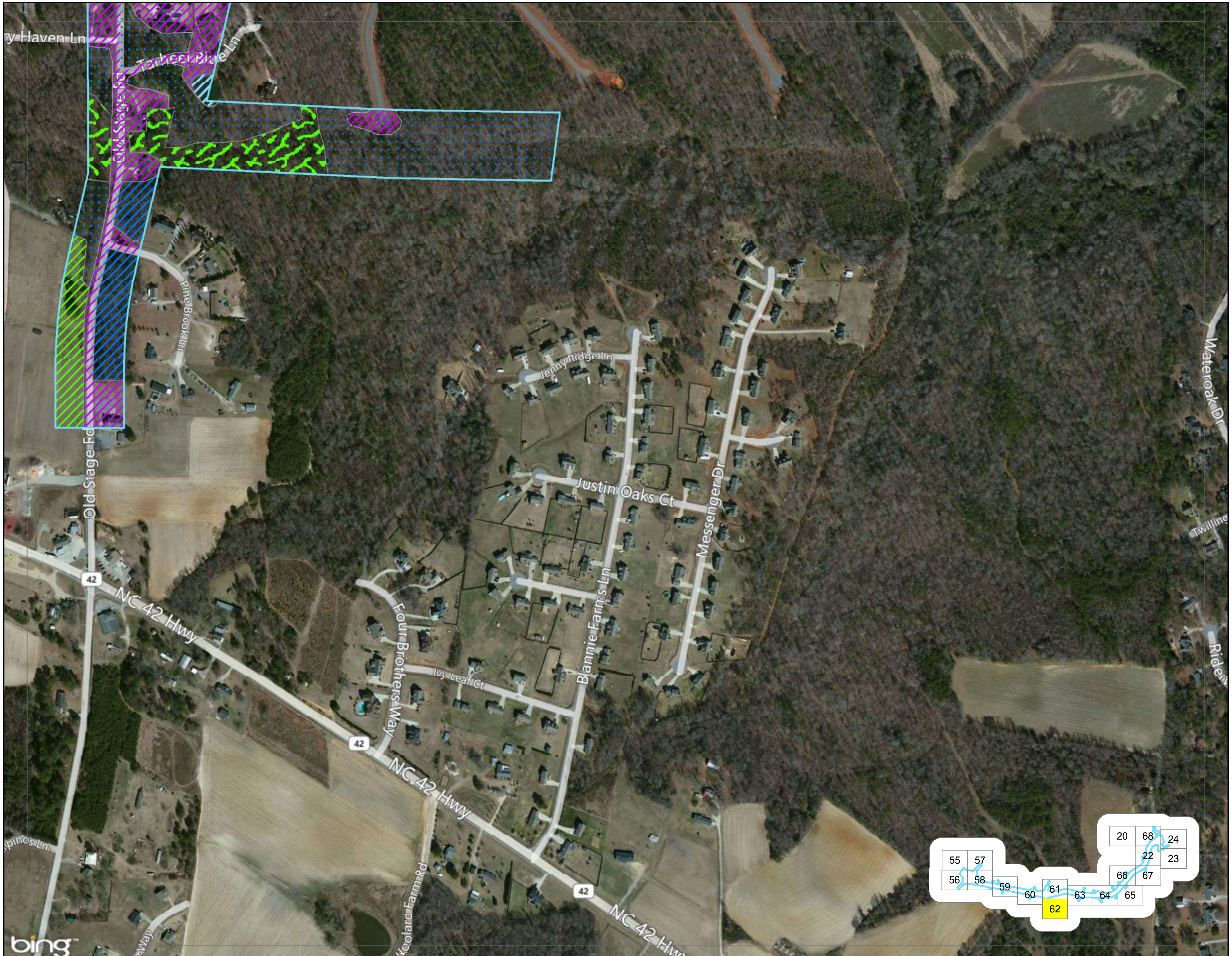
Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

N

Figure 4-61



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Blue
- Green
- Brown
- Red
- Mint
- Lilac
- Tan
- Purple
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

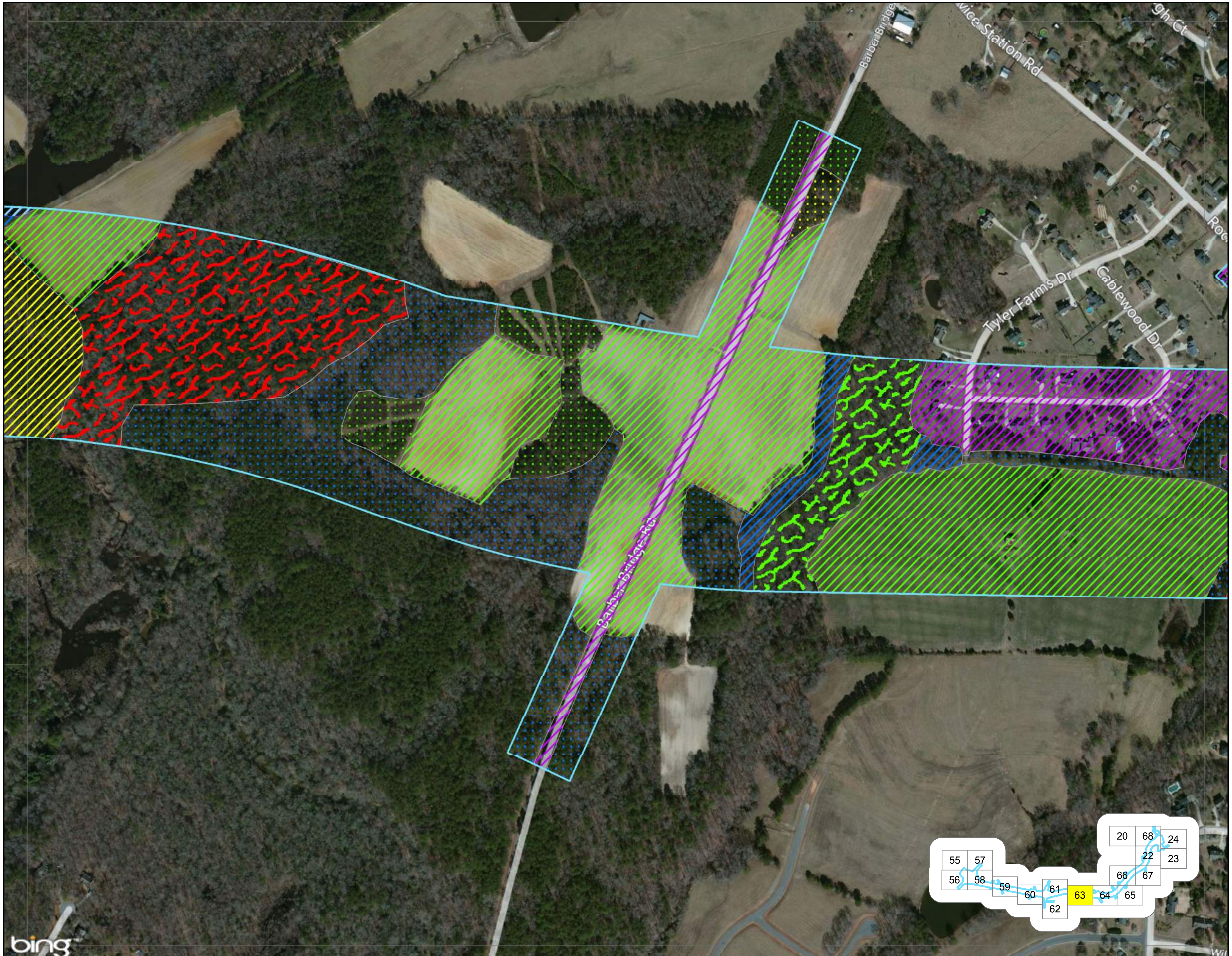
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/28/2014

Figure 4-62



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

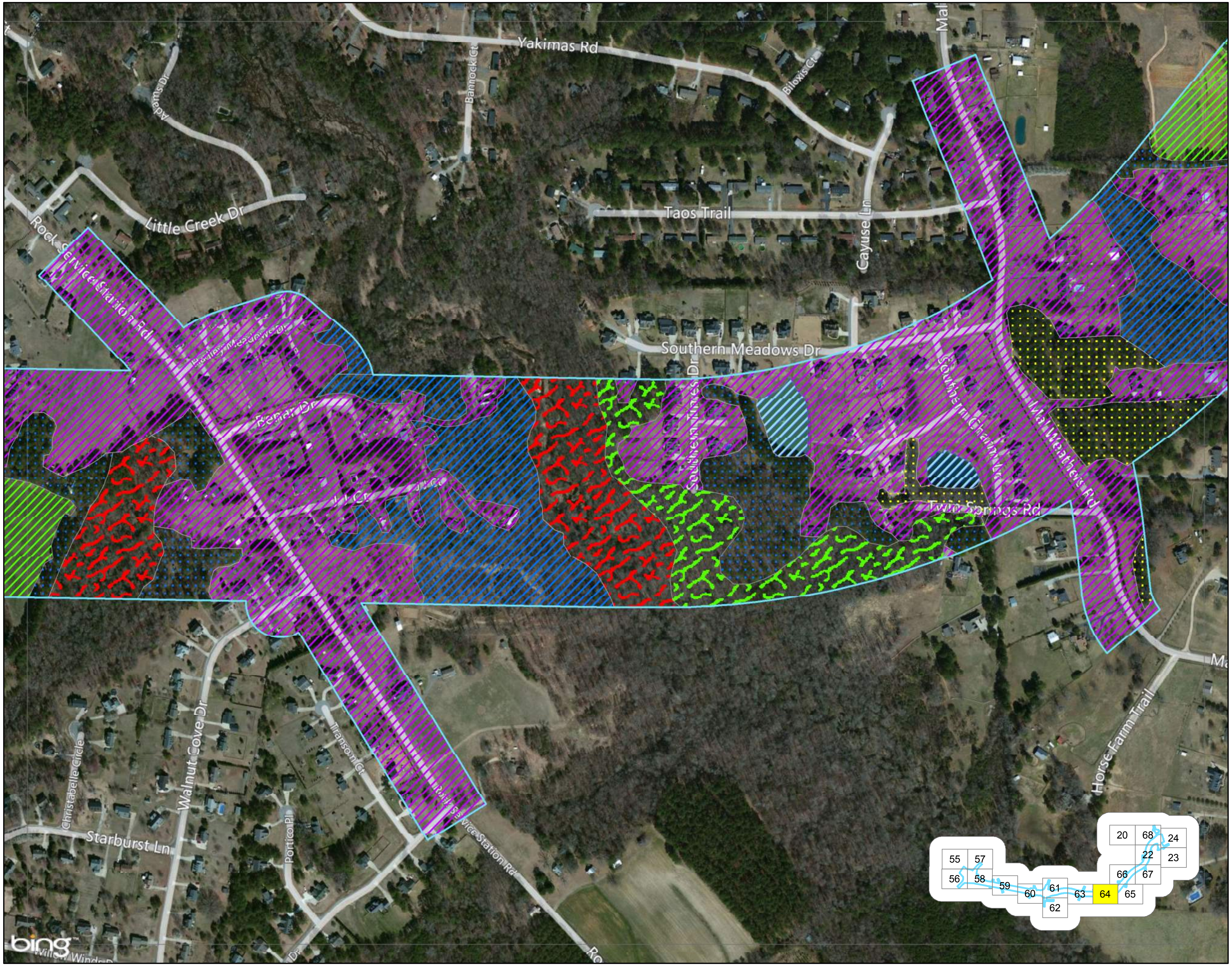
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-63



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

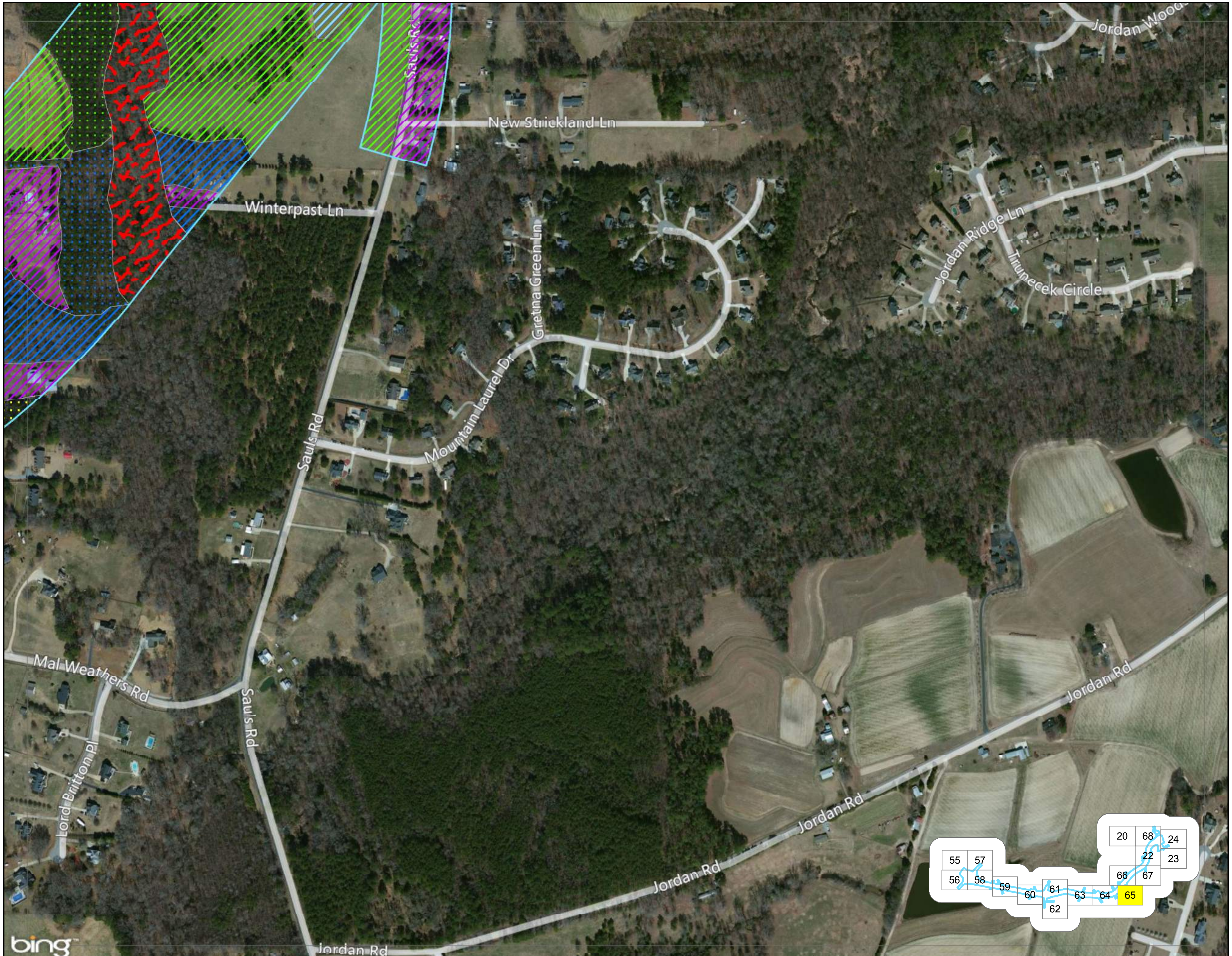
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-64



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

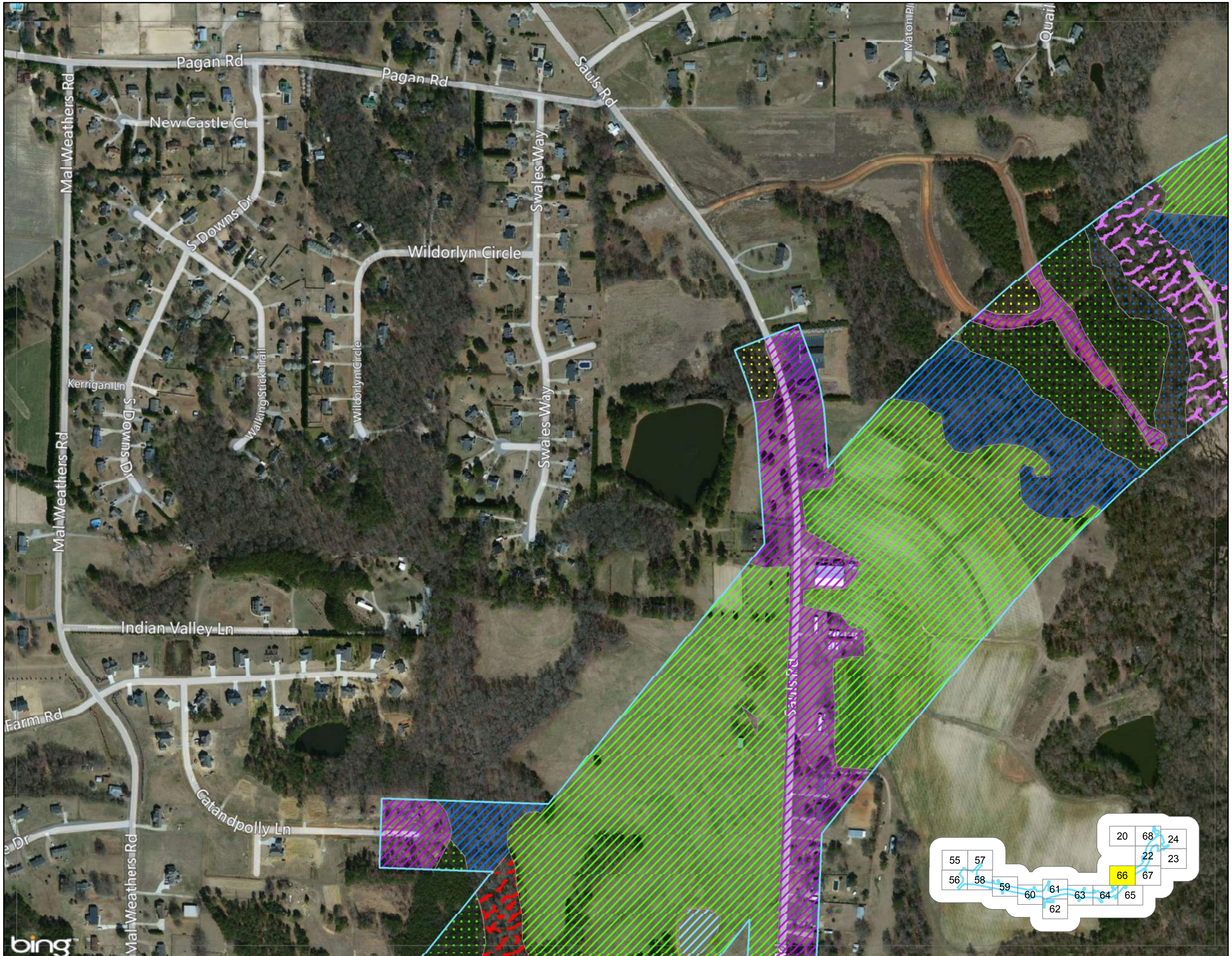
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-65



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

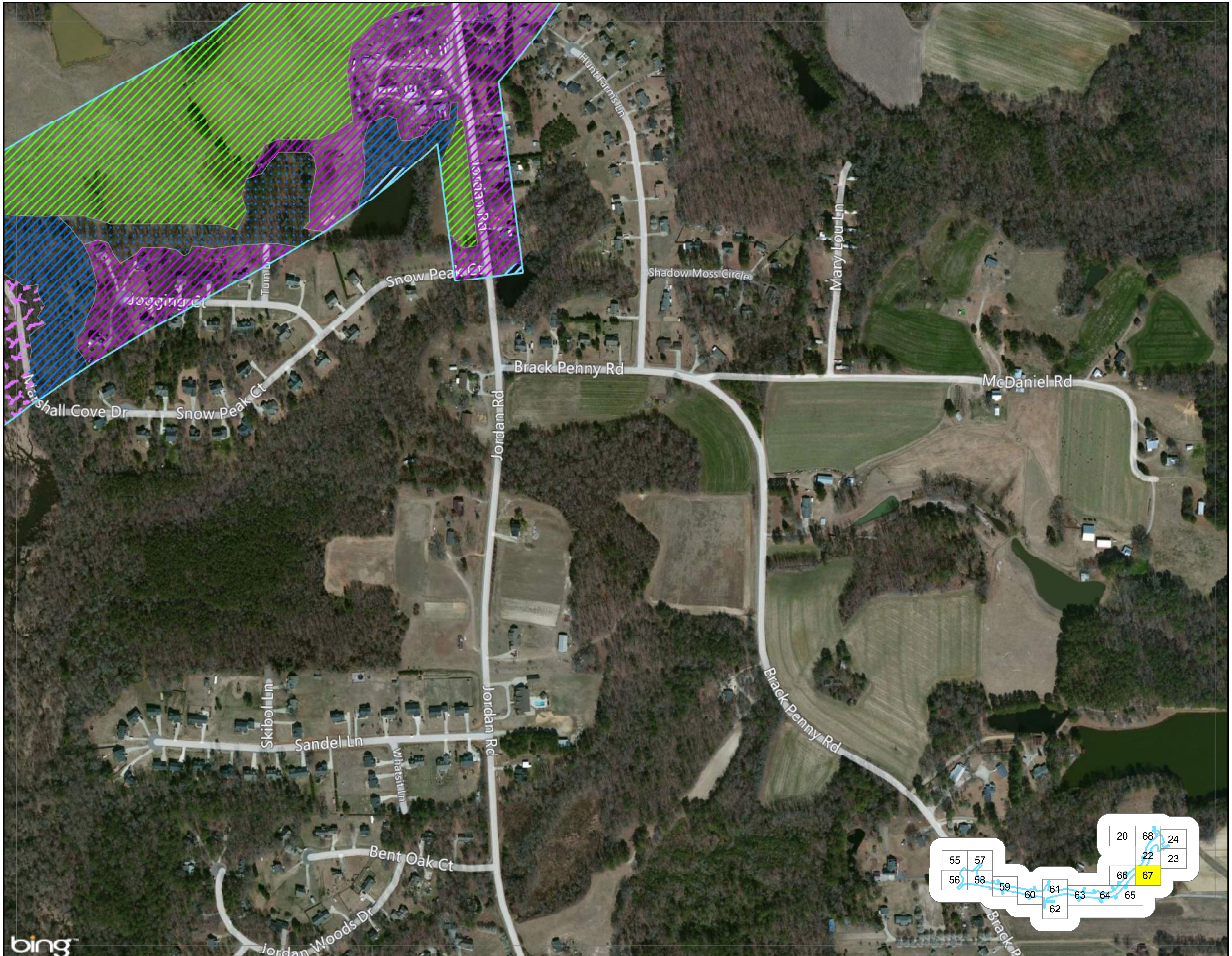
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

N

Figure 4-66



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Blue
- Green
- Brown
- Red
- Mint
- Lilac
- Tan
- Purple
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

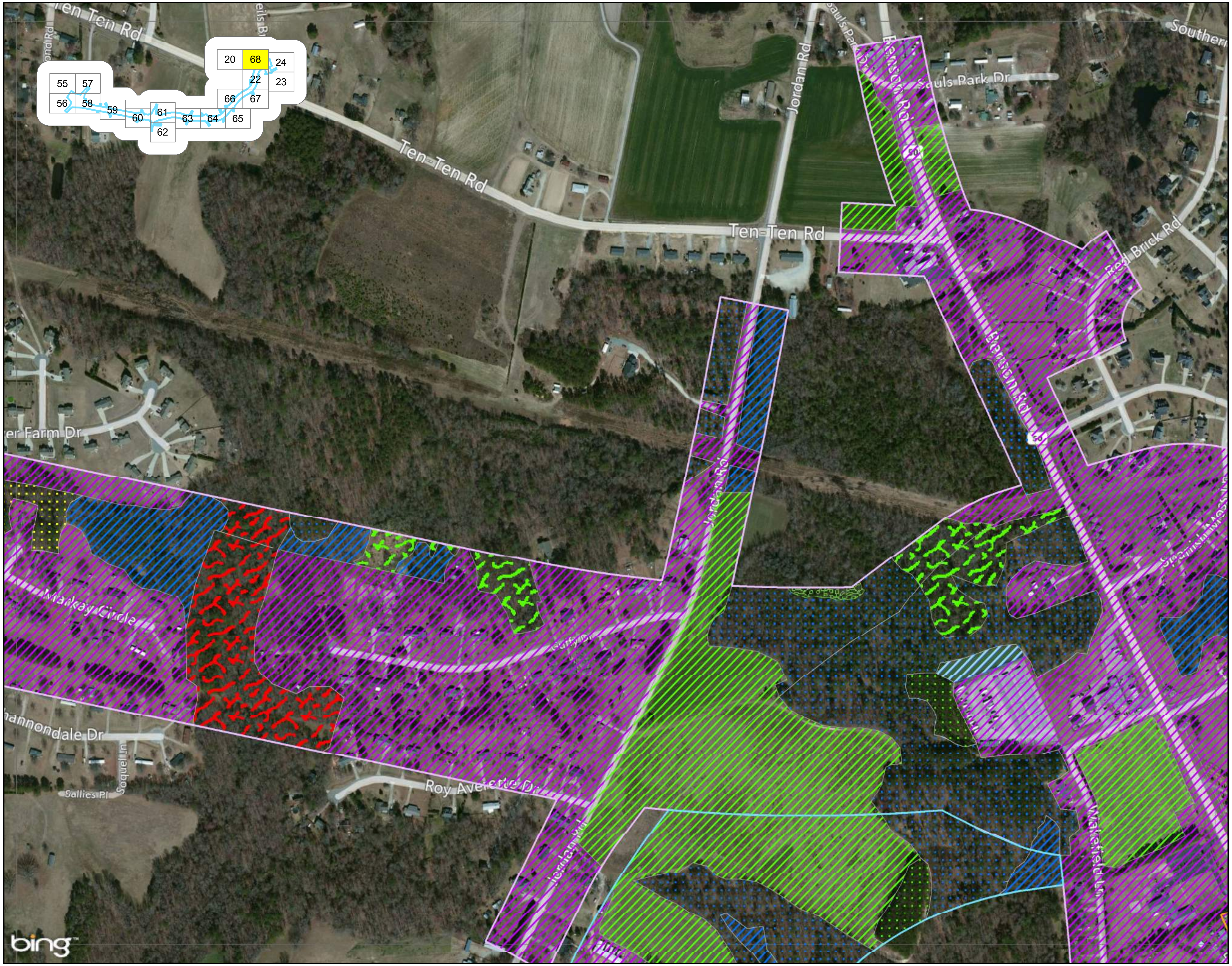
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-67



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

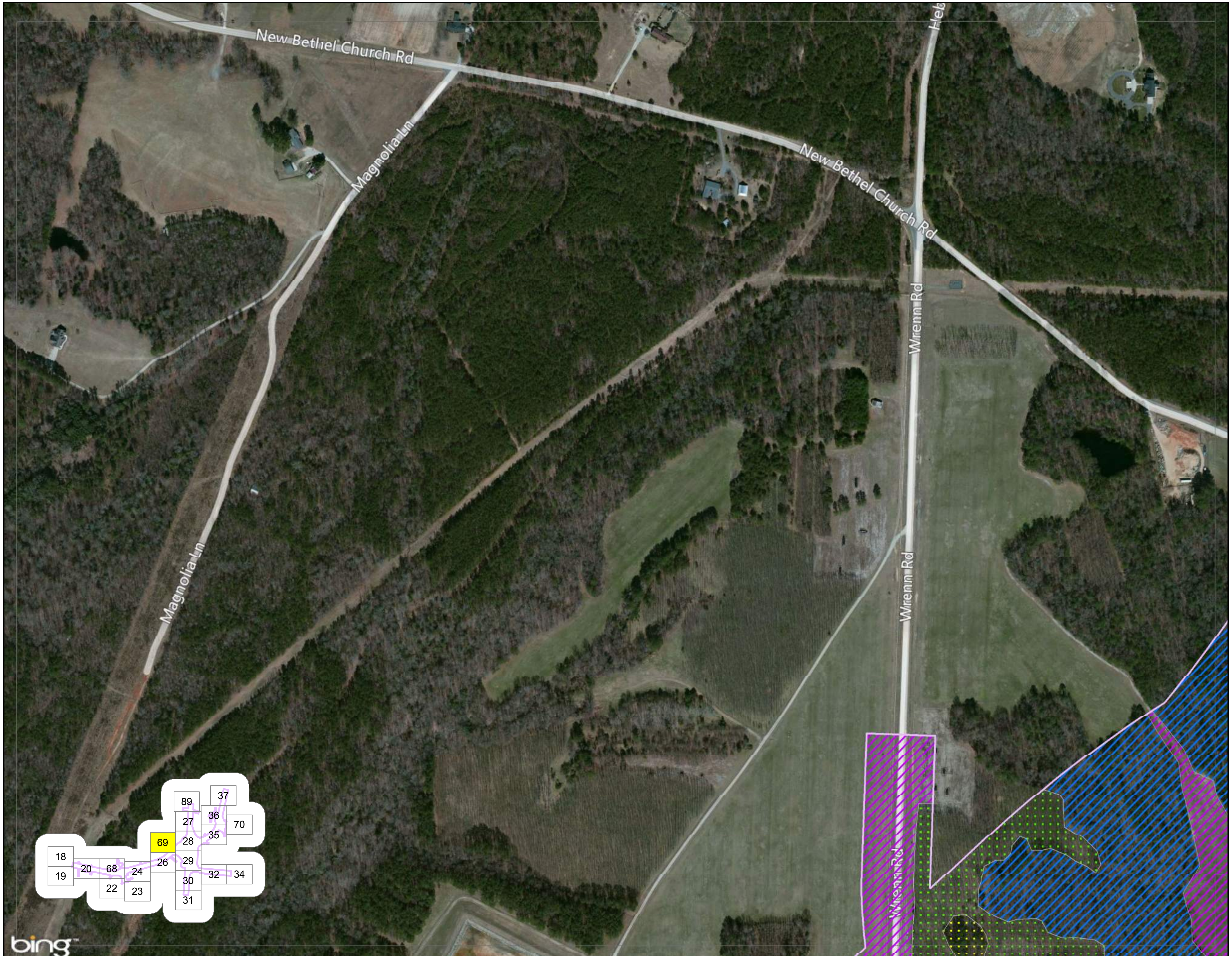
Triangle Expressway Southeast Extension
TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-68



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

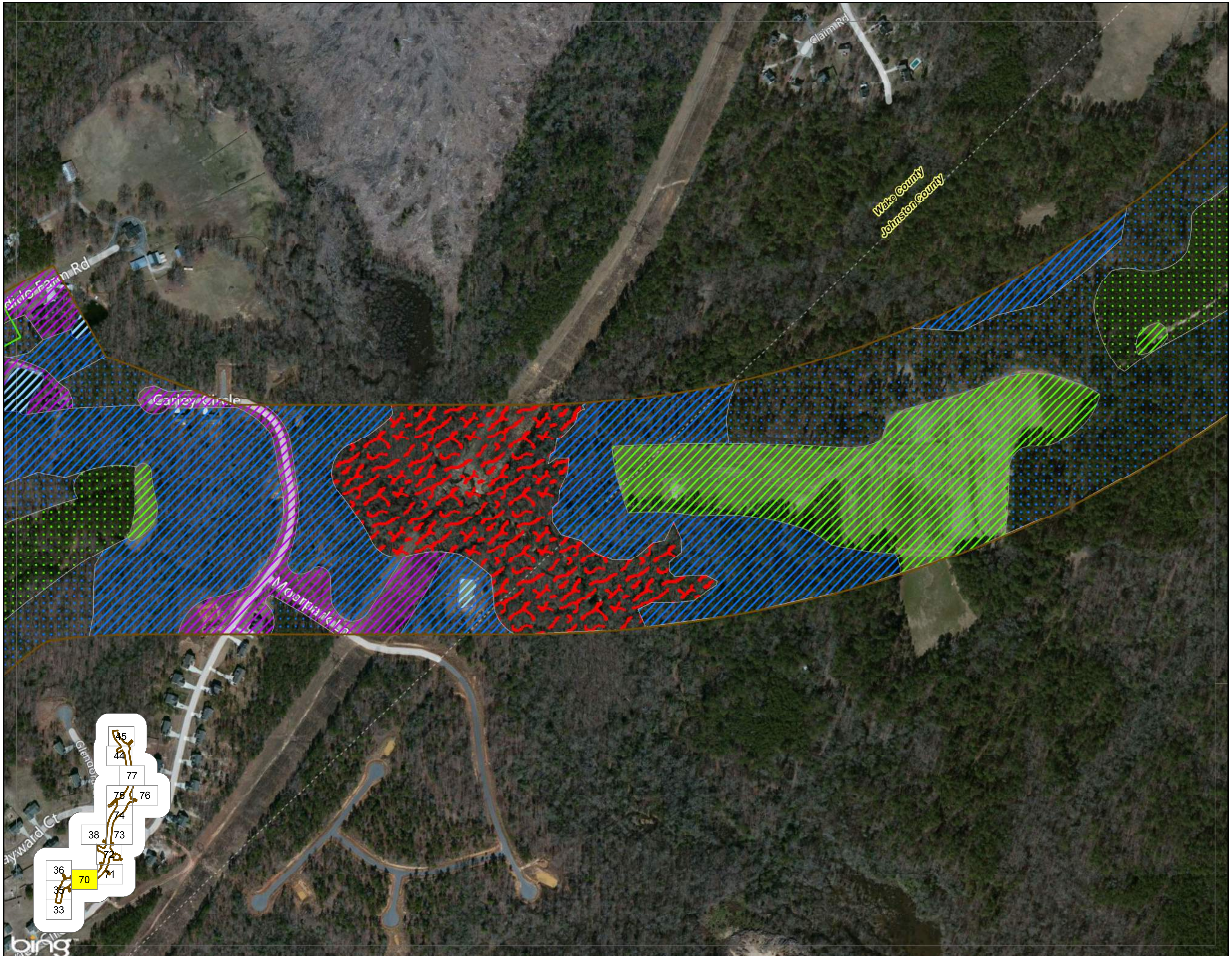
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-69



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-70

Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Blue
Green
Brown
Red
Mint
Lilac
Tan
Purple
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-71

Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

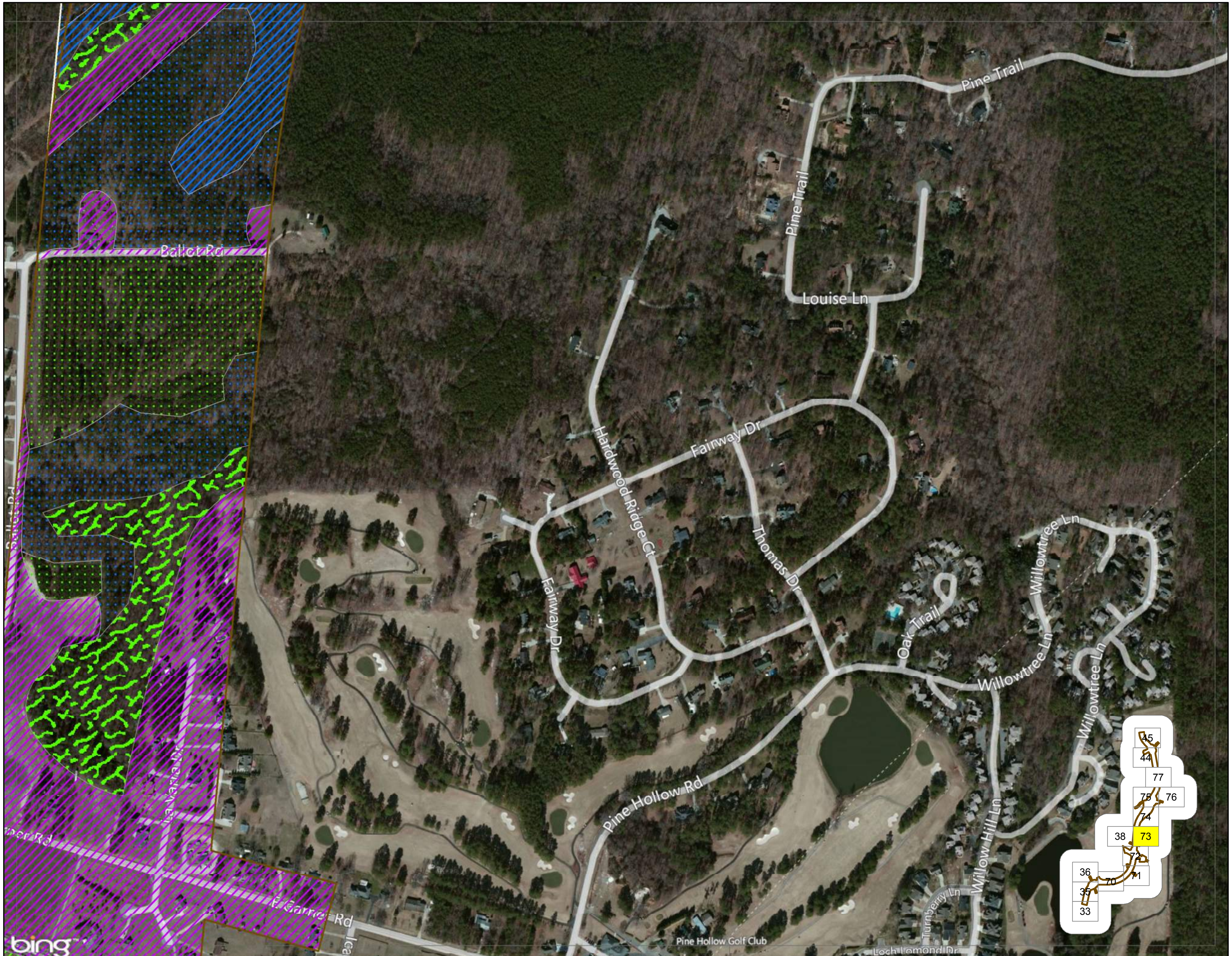
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/28/2014

Figure 4-72



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

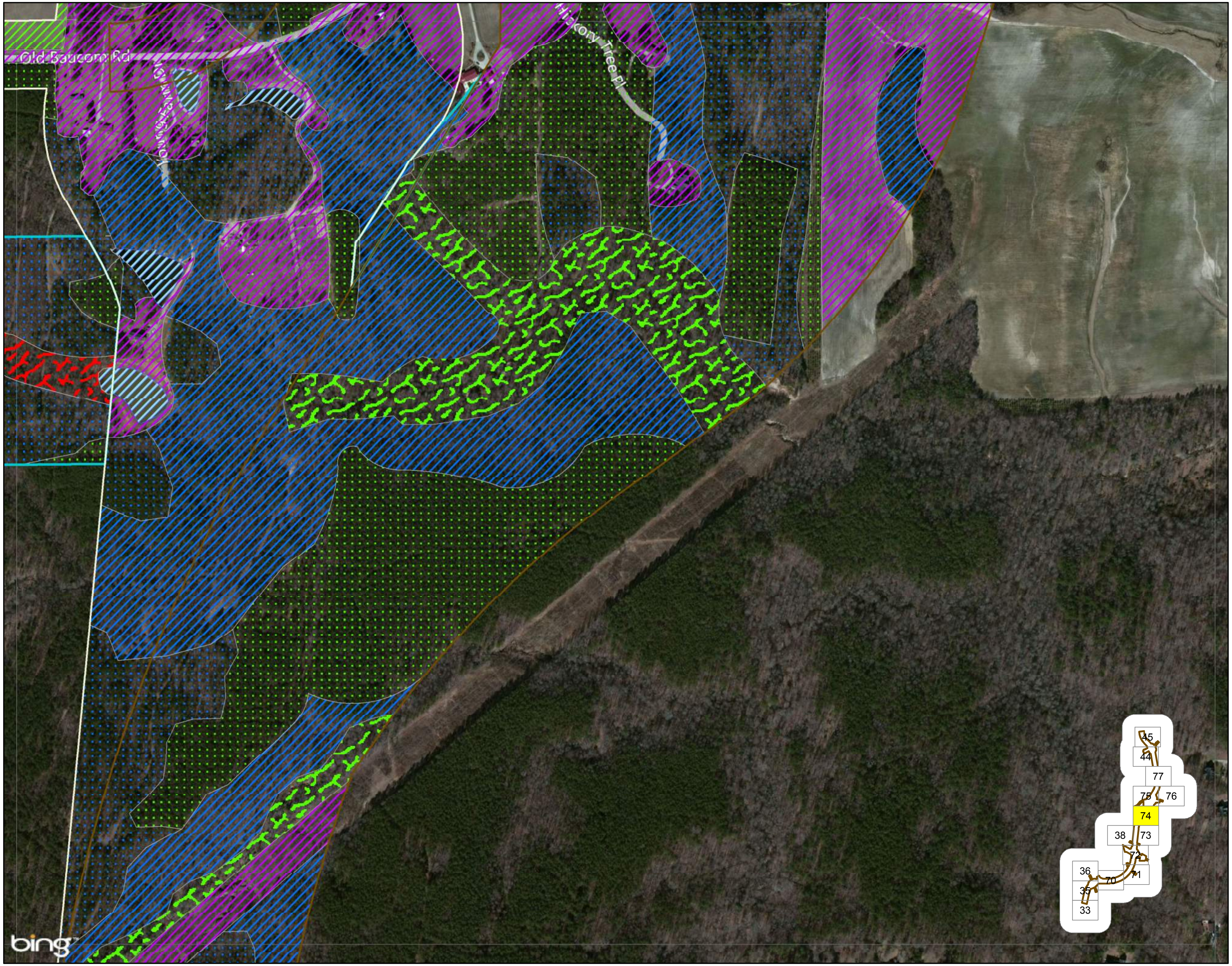
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-73



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

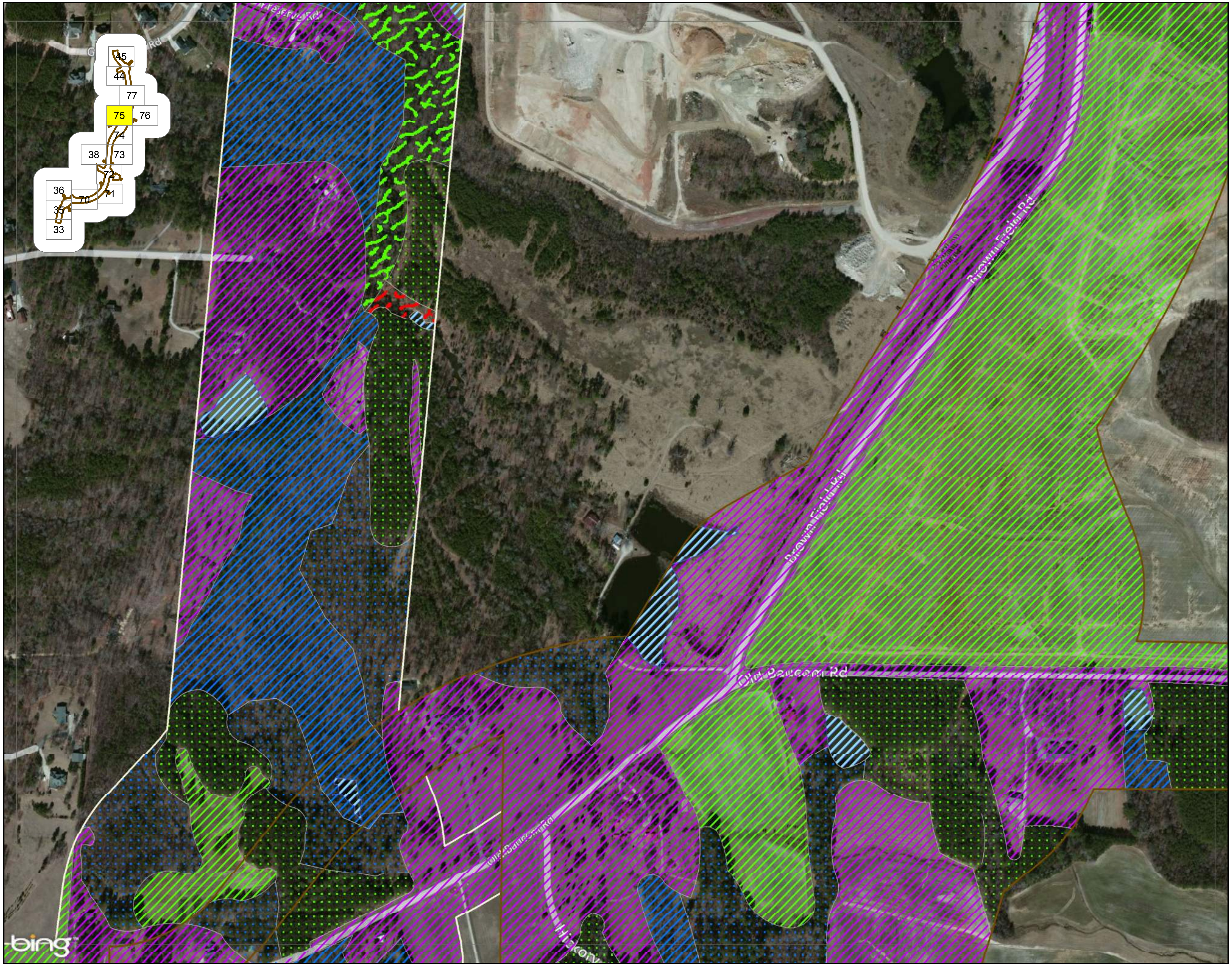
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400
Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-74



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

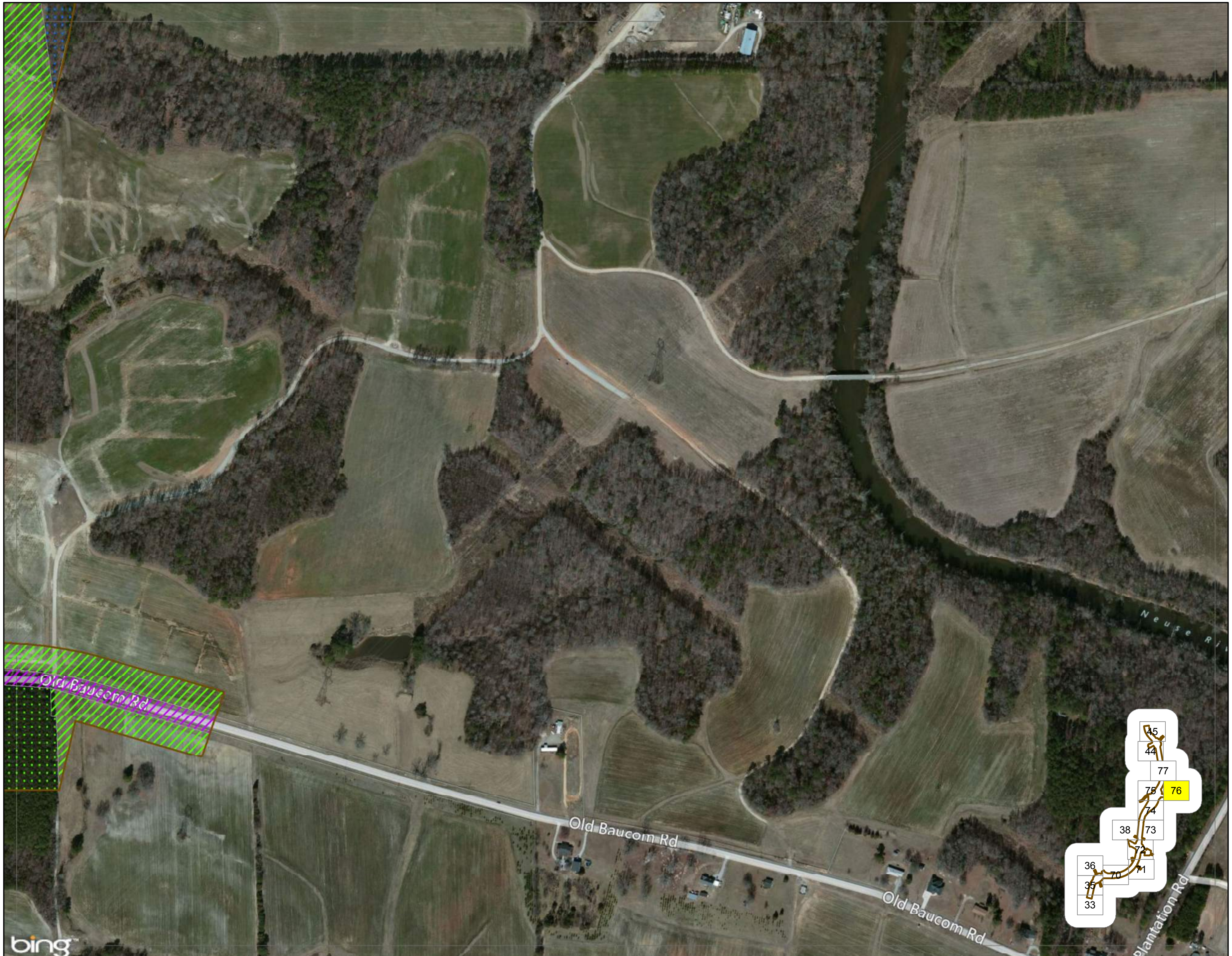
Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

N

Figure 4-75



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

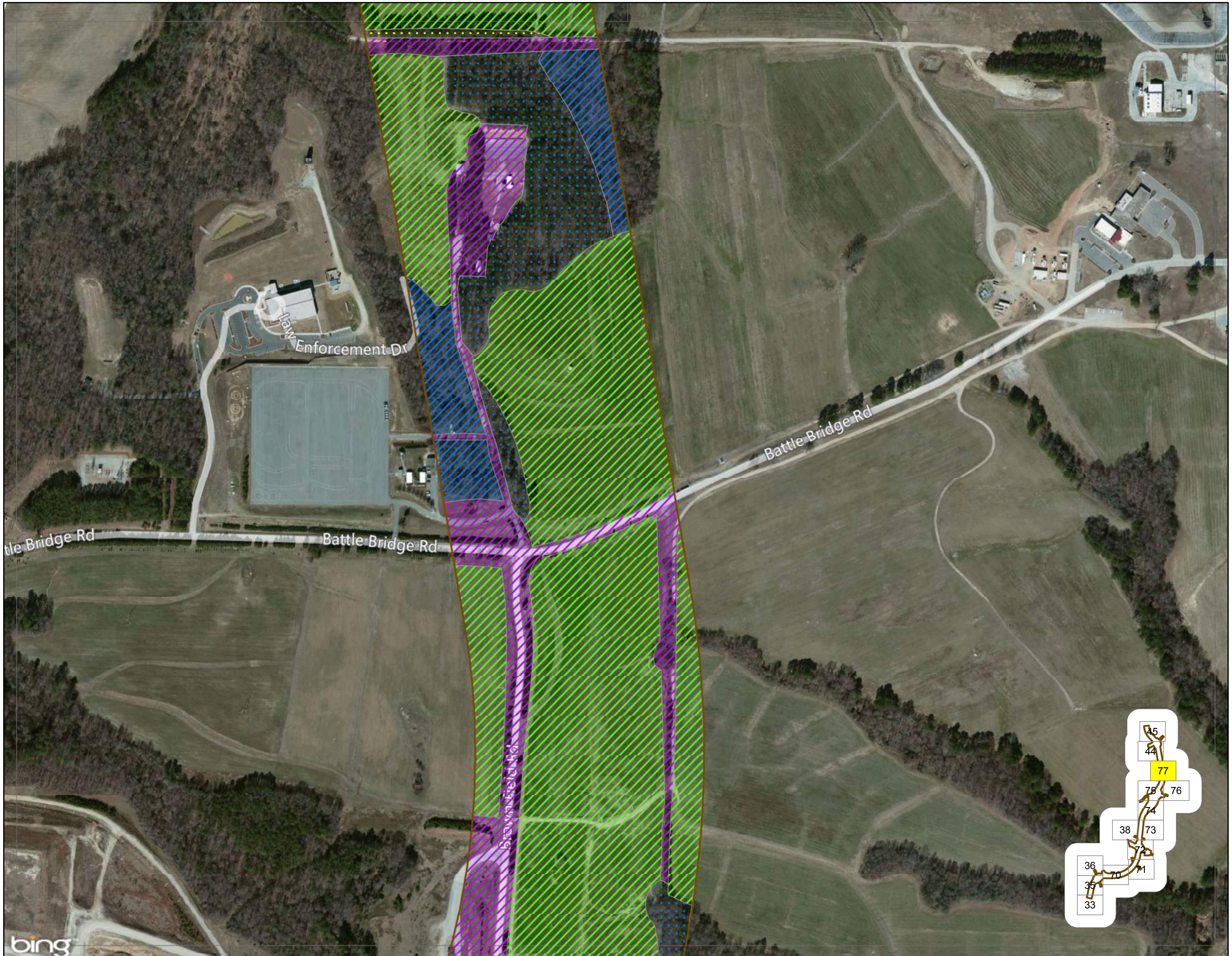
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-76



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Blue
- Green
- Brown
- Red
- Mint
- Lilac
- Tan
- Purple
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

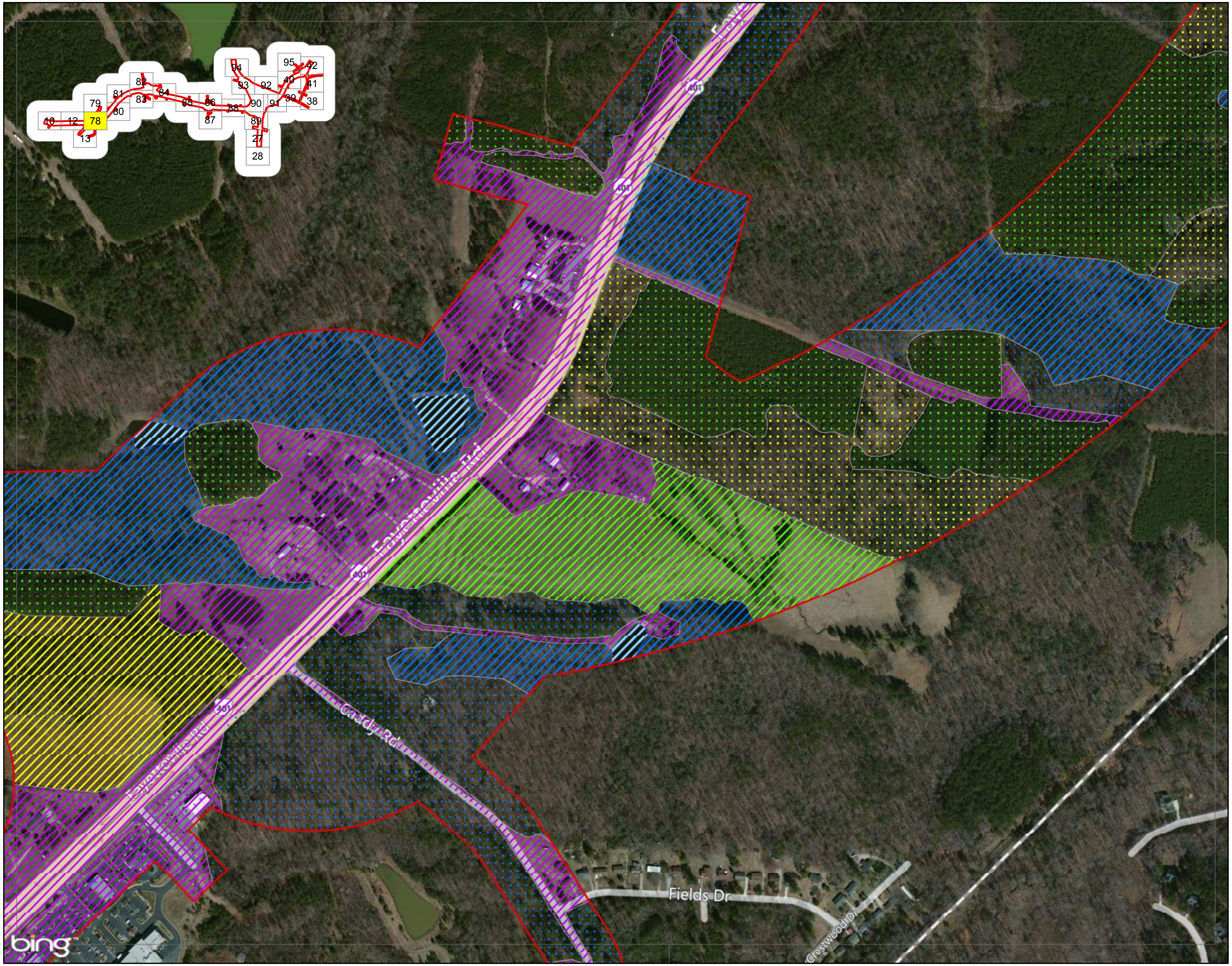
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-77



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

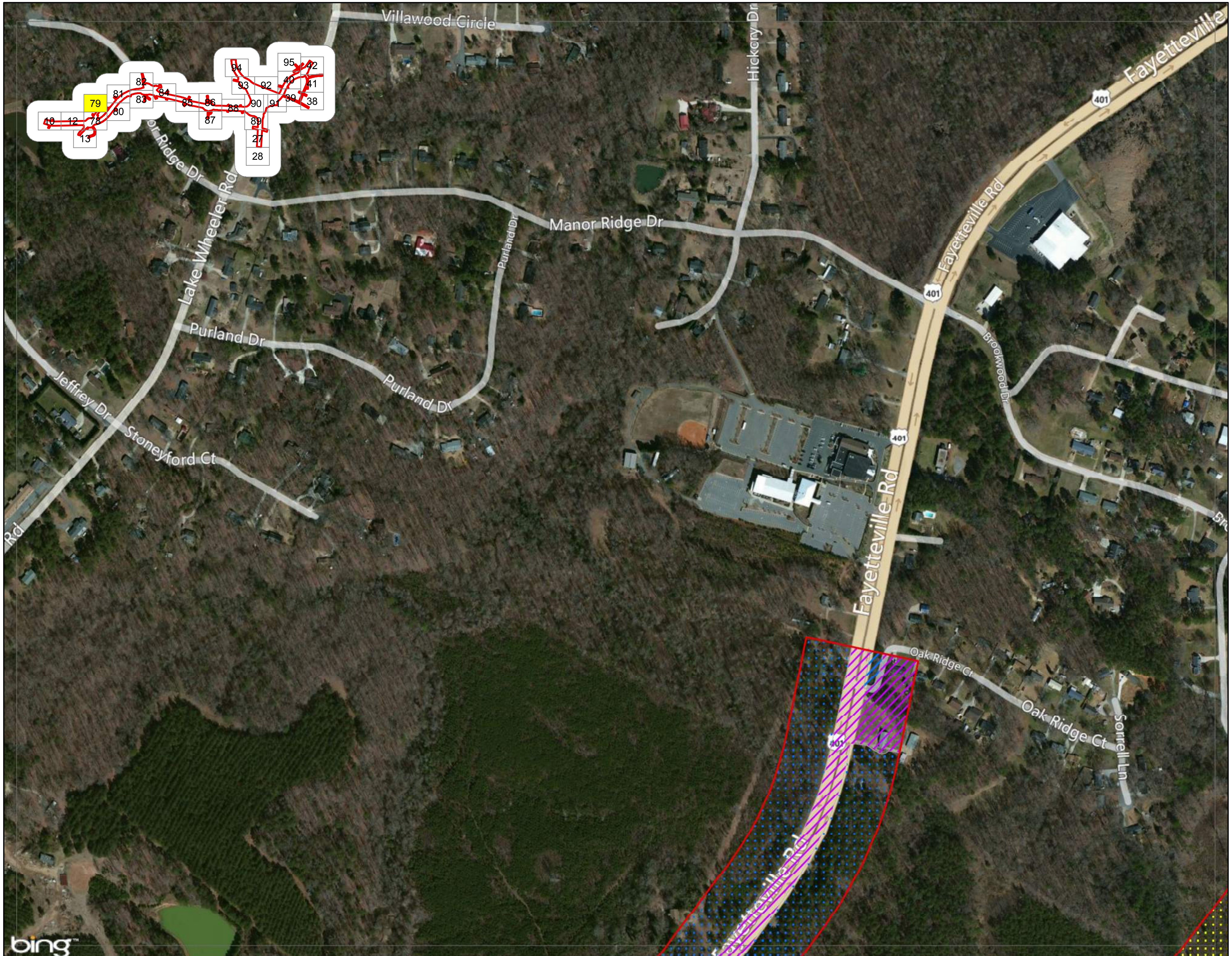
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-78



Legend

Map Grid

Roads

County Boundary

Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

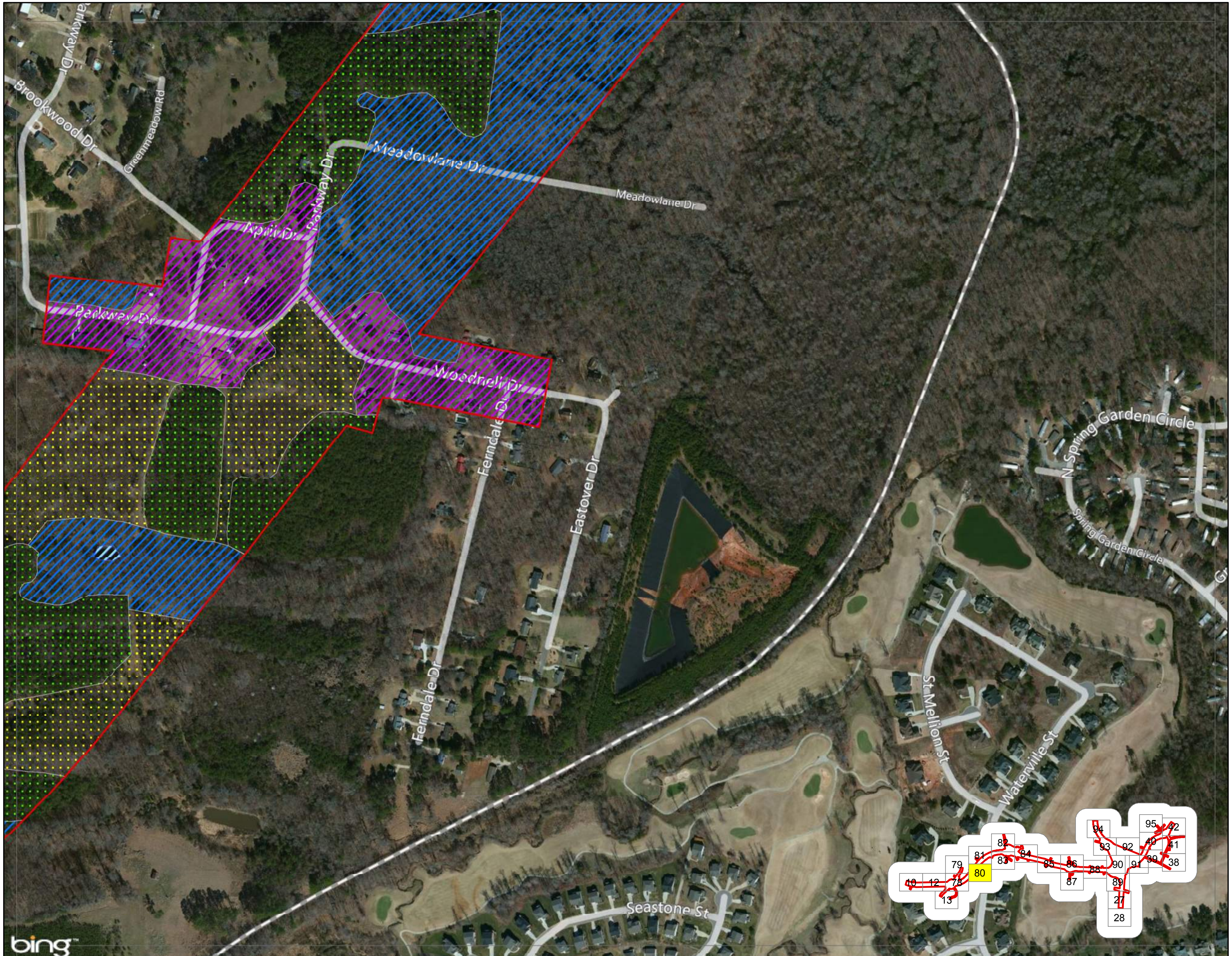
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-79



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

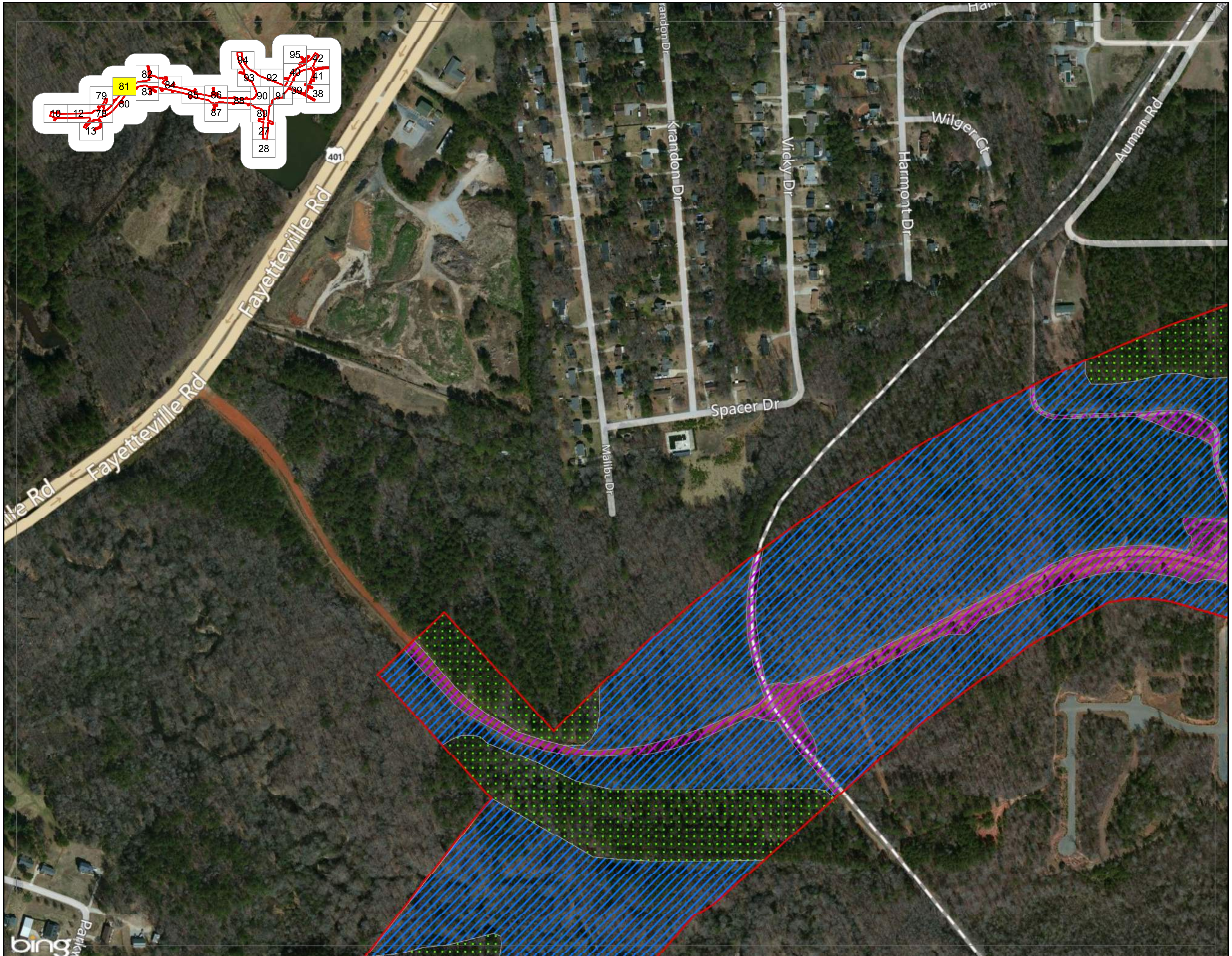
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-80



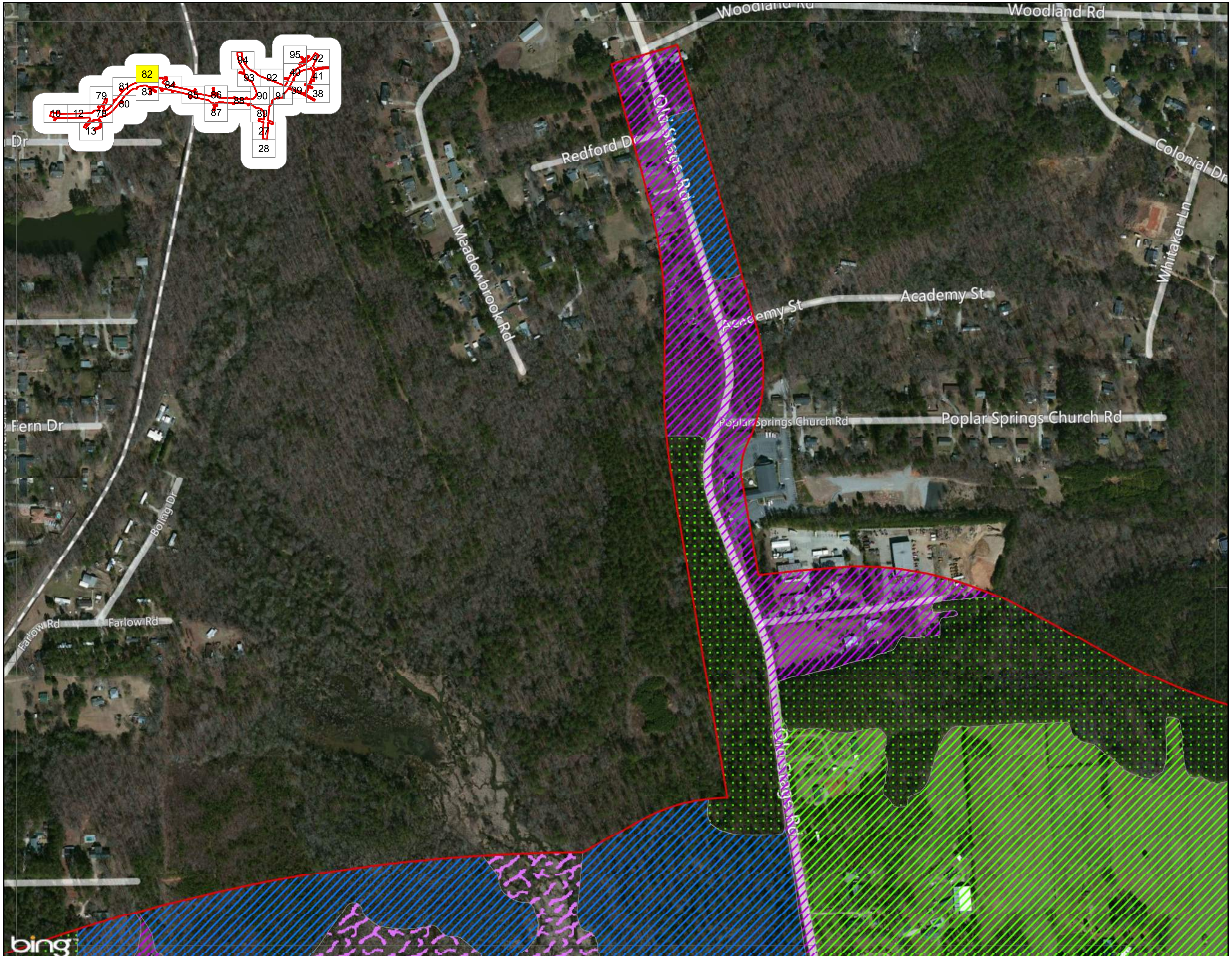
Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-81



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

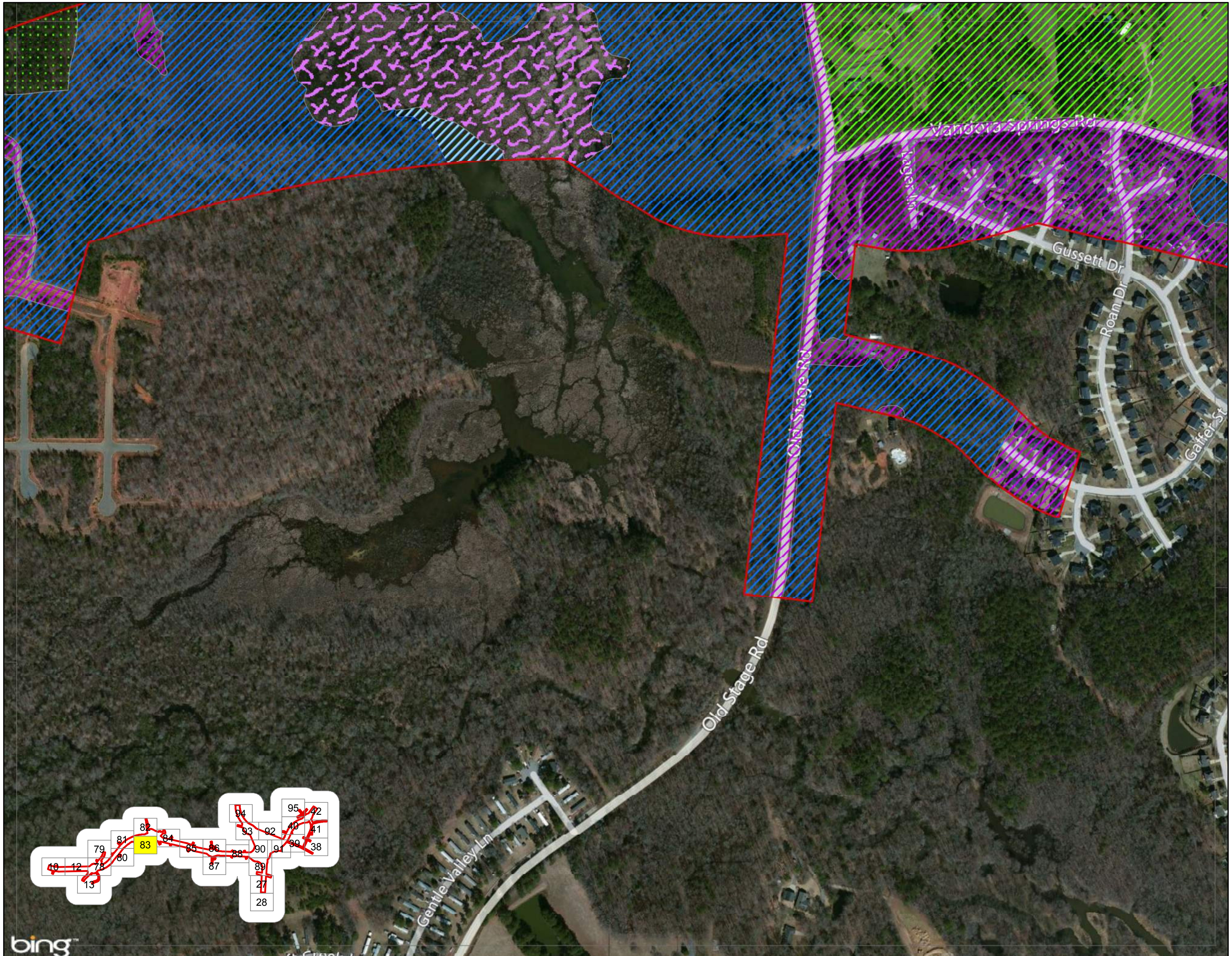
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-82



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

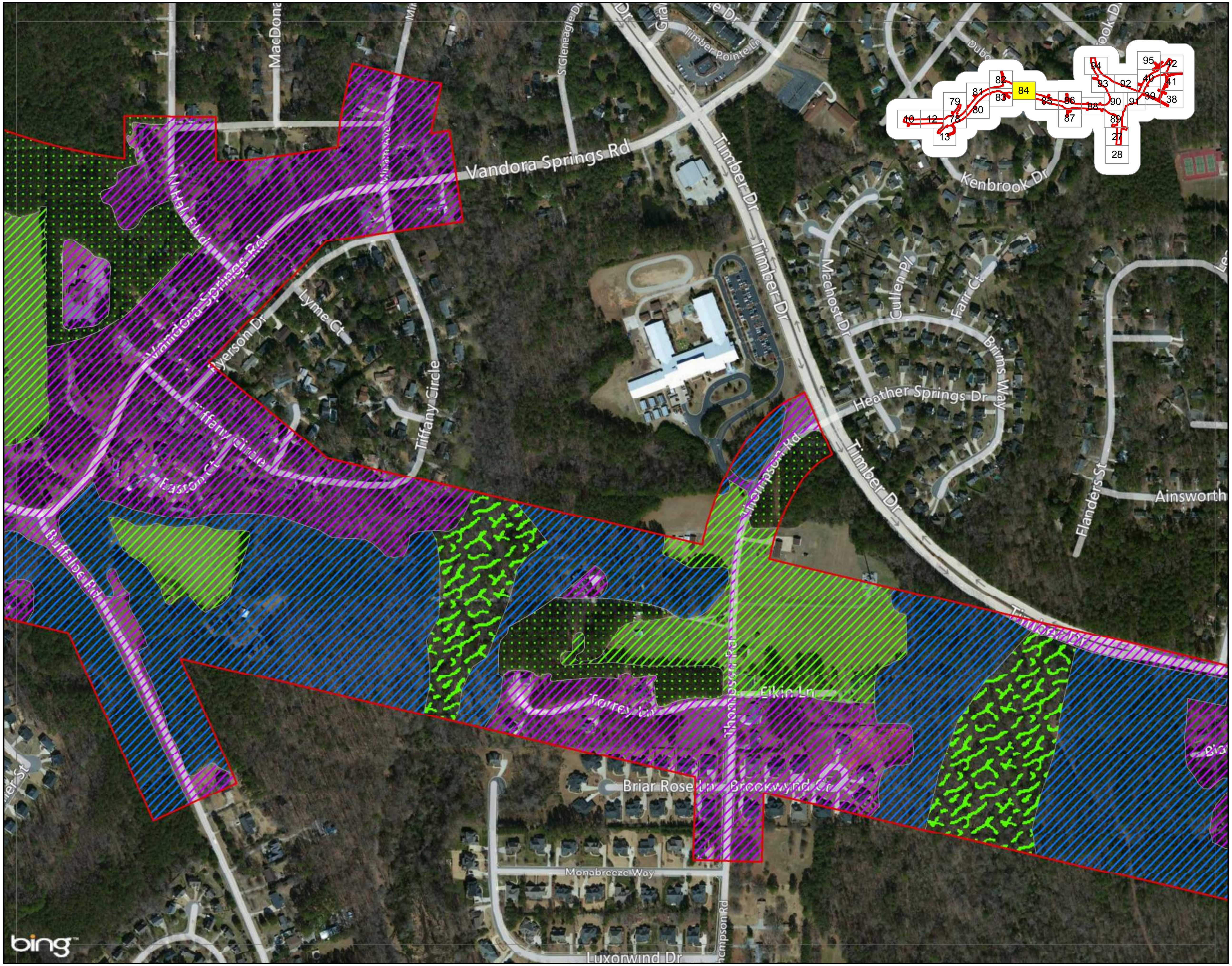
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-83



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

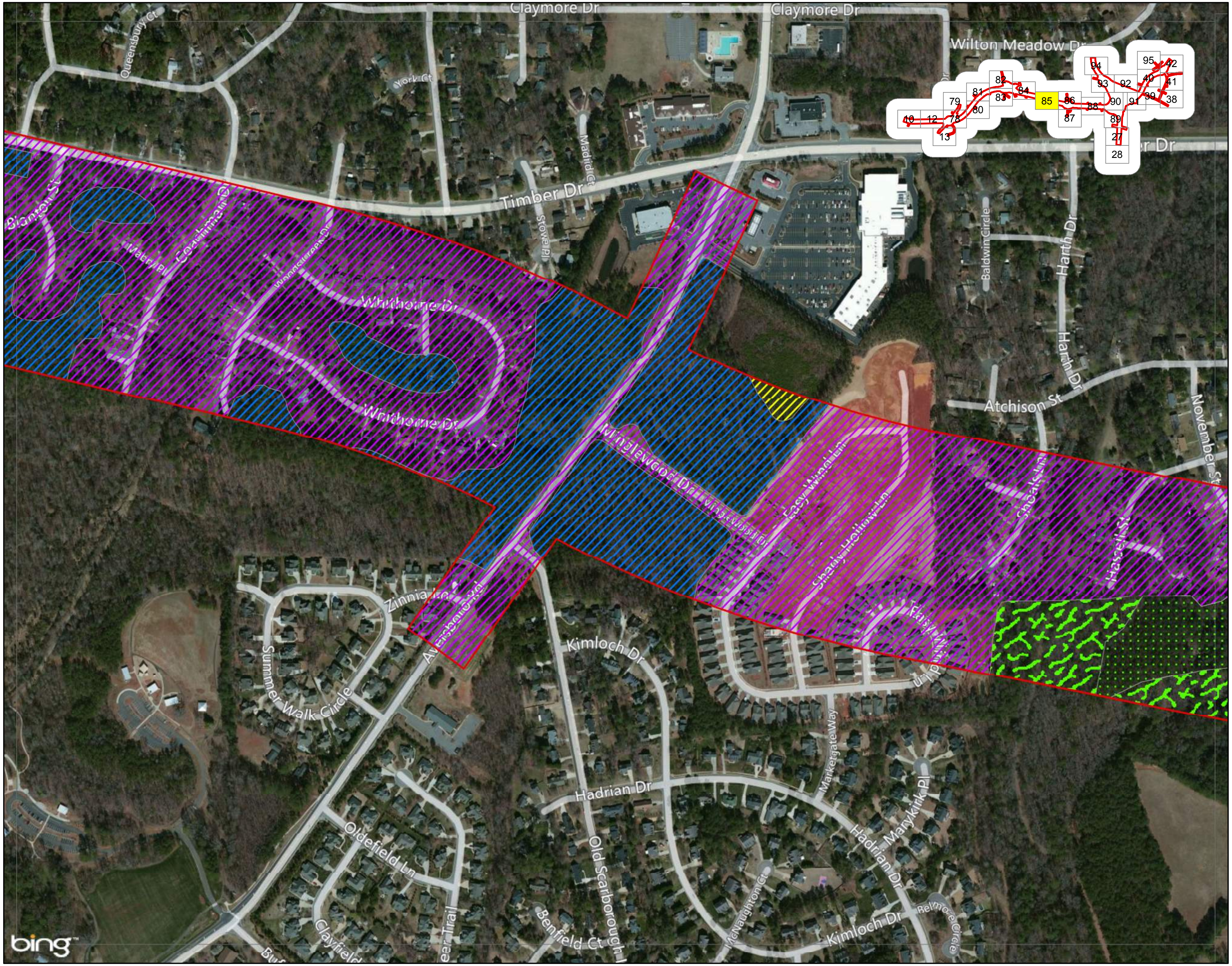
Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS

Map Date: 08/28/2014

Figure 4-84



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

Orange	Blue
Green	Brown
Red	Mint
Lilac	Tan
Purple	Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

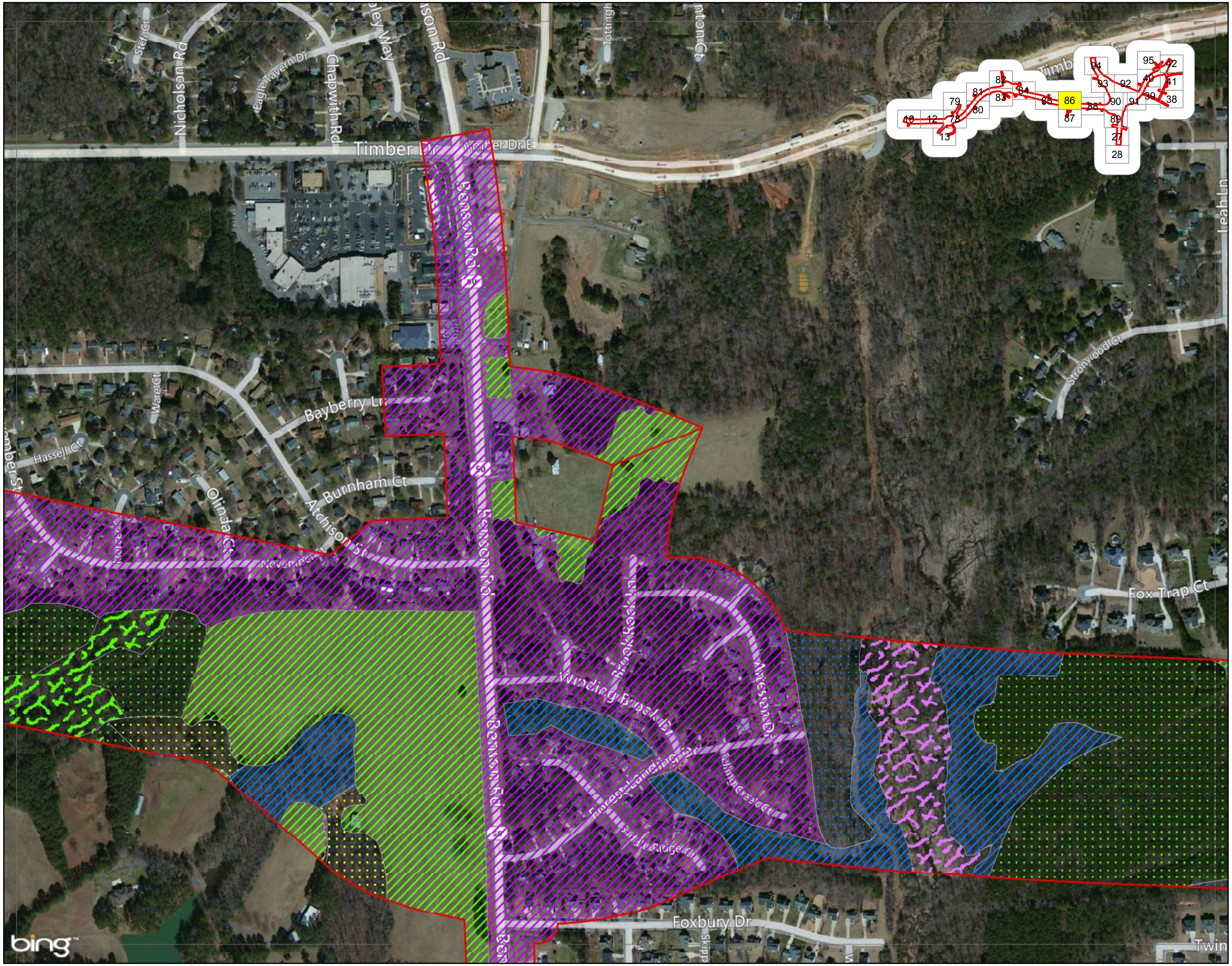
Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

N

Figure 4-85



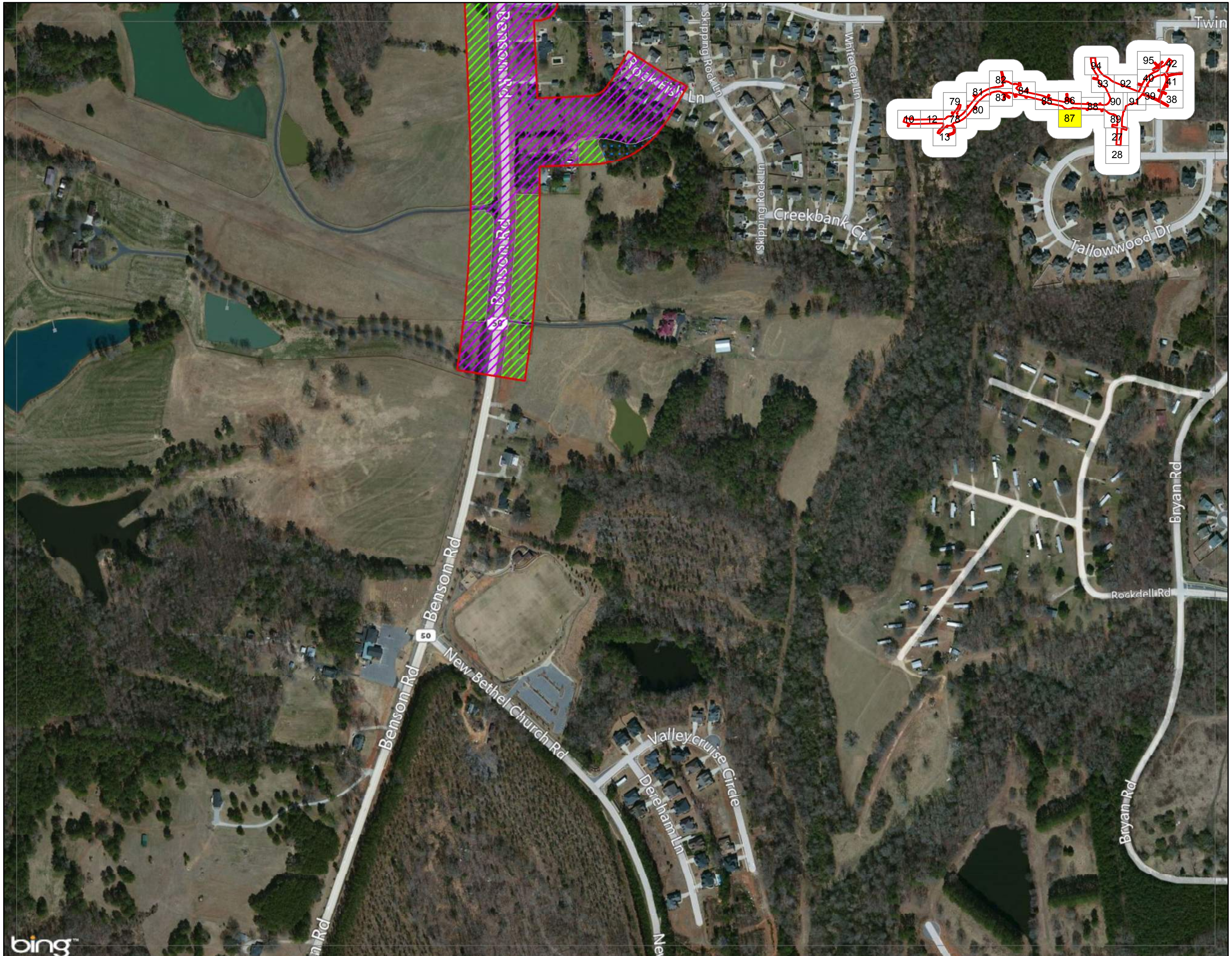
Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-86



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

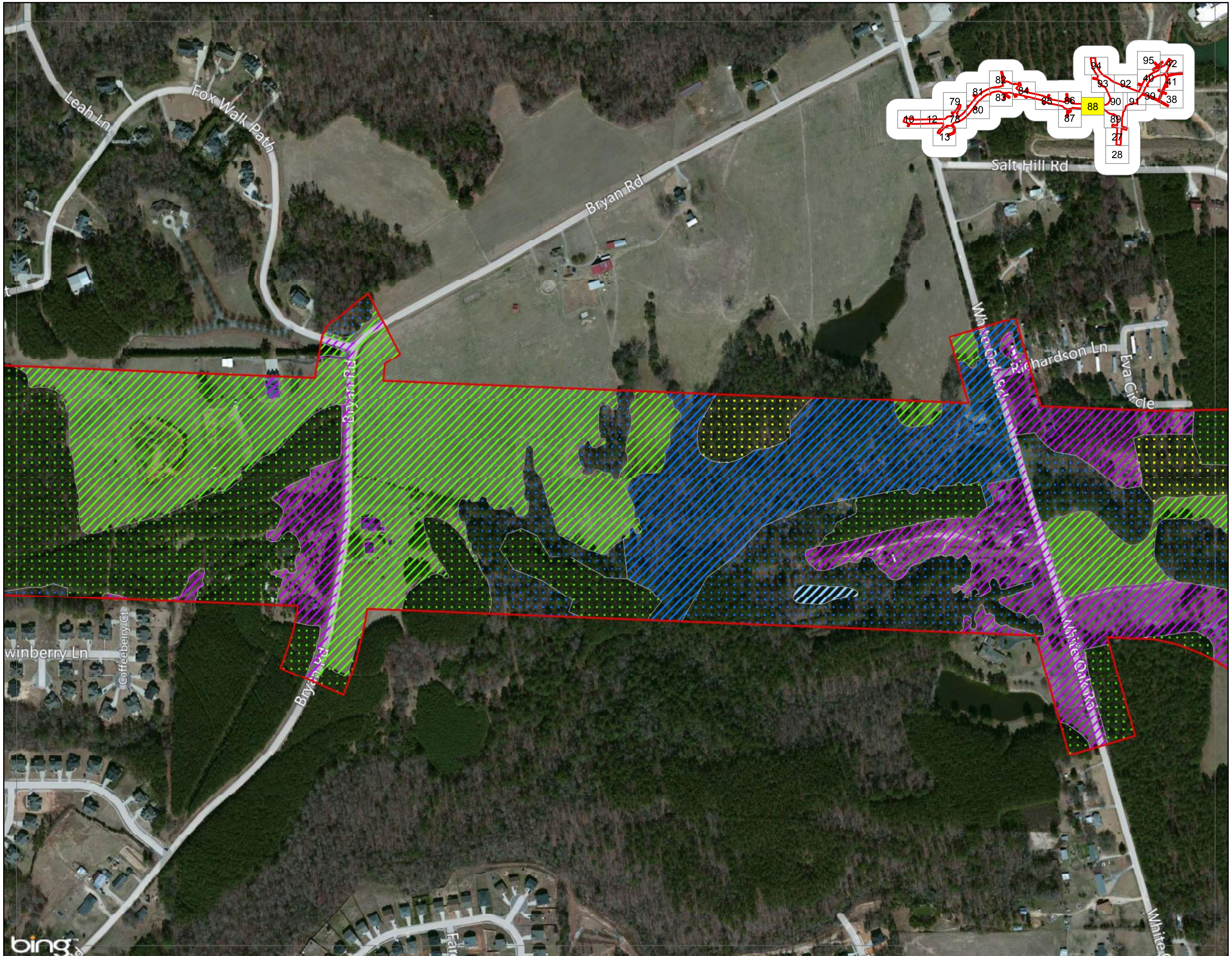
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-87



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

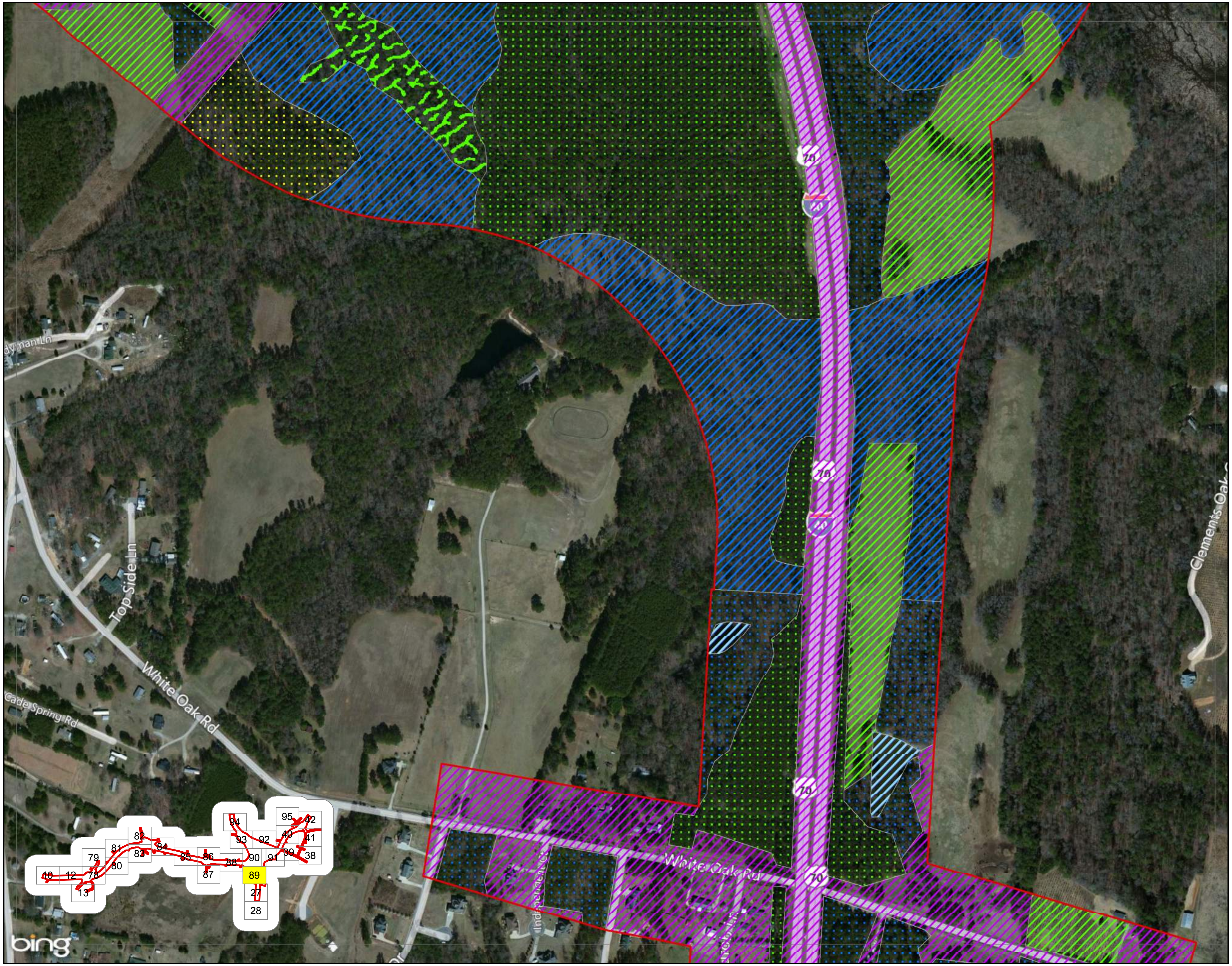
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-88



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-89

Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

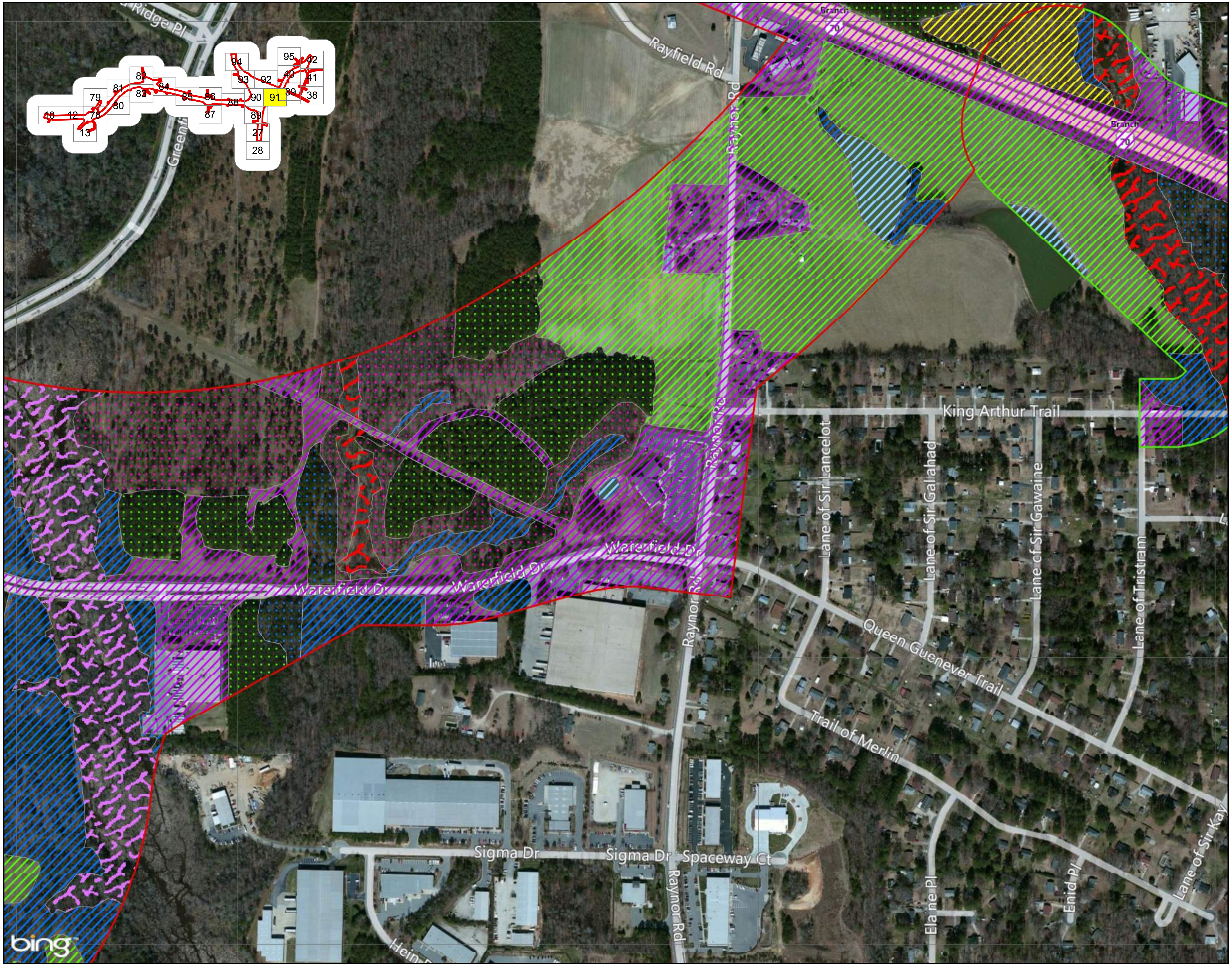
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-90



Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Blue
- Green
- Brown
- Red
- Mint
- Lilac
- Tan
- Purple
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

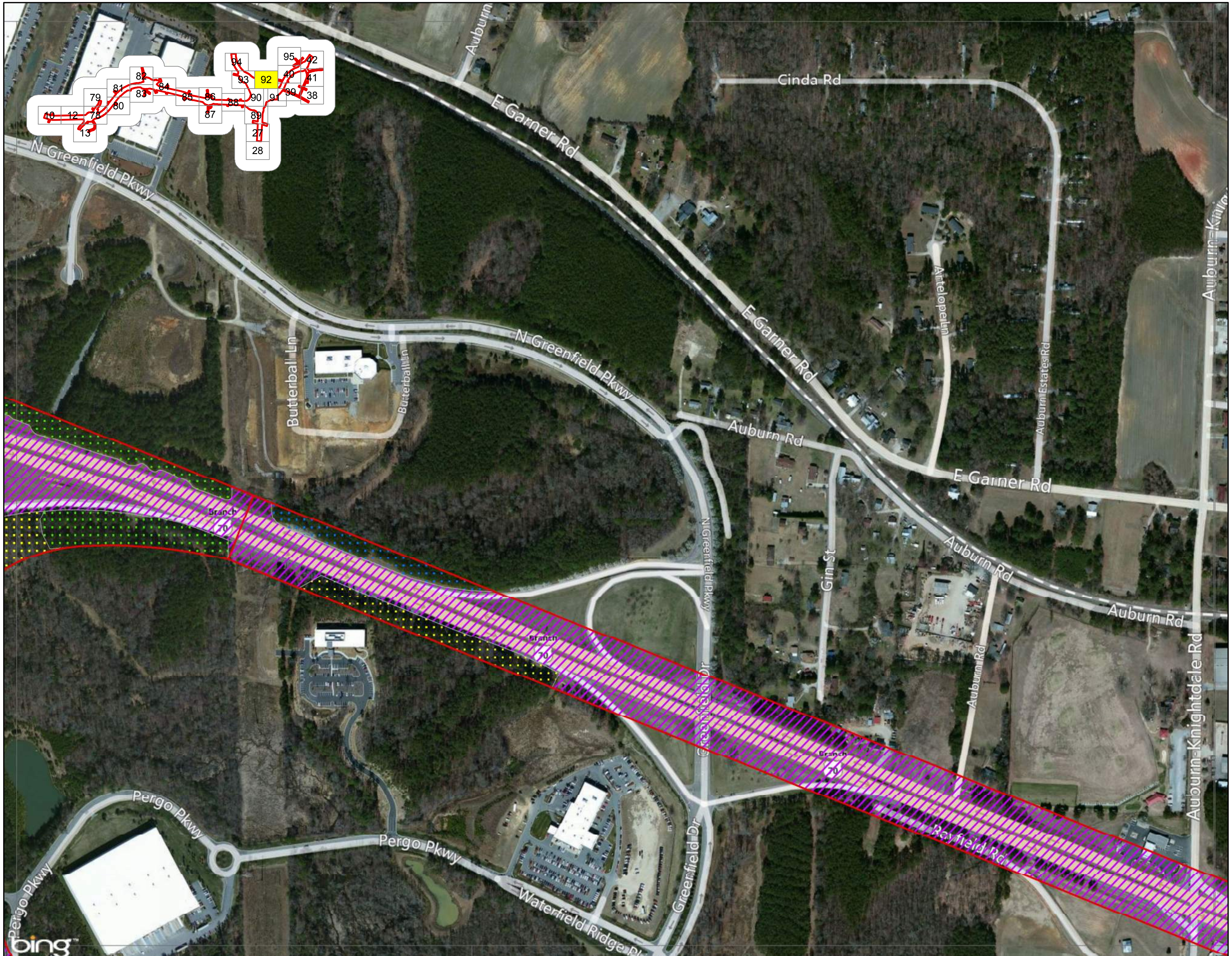
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-91



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

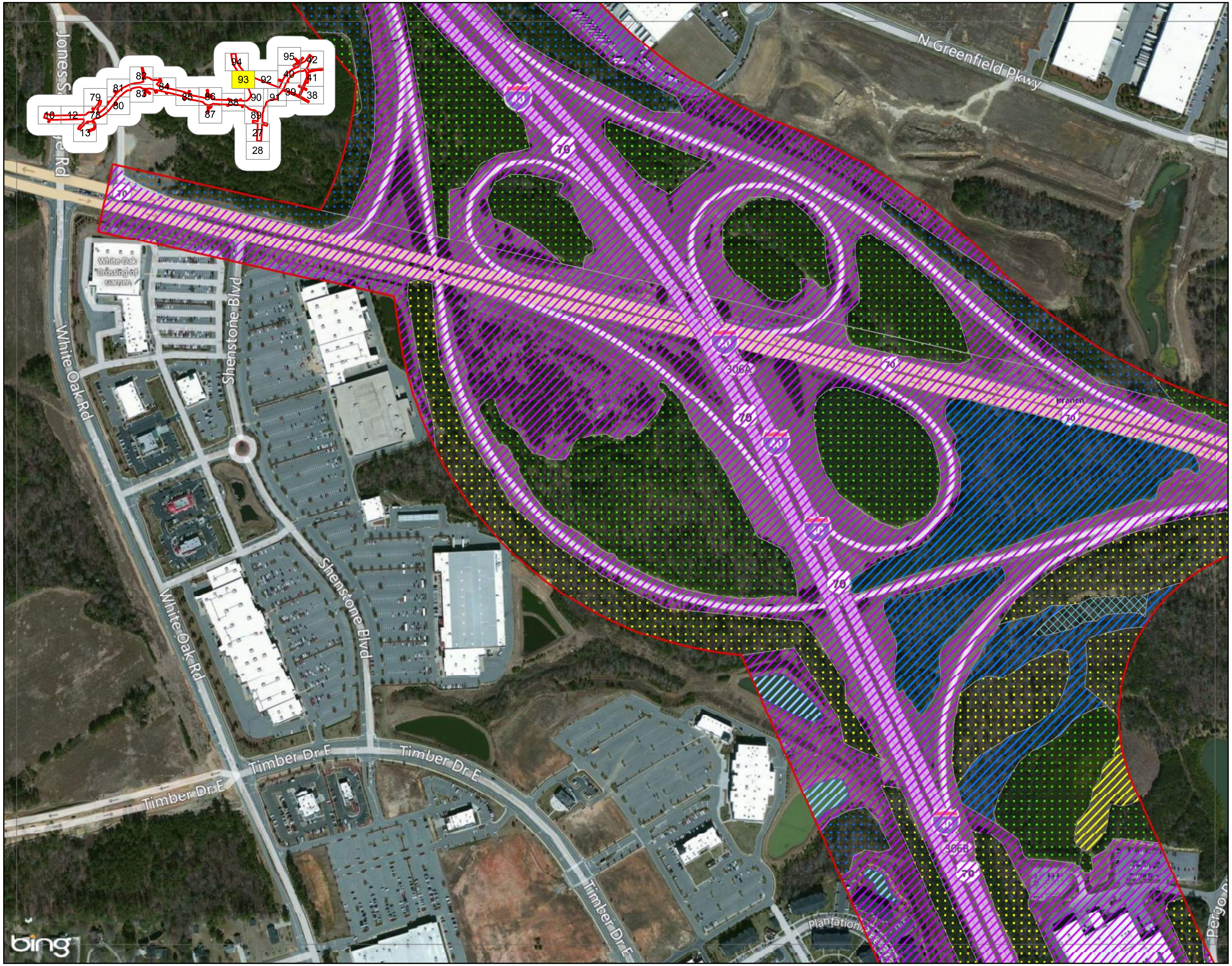
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-92



Legend

Map Grid
Roads
County Boundary
Open Water

Corridors

Orange
Green
Red
Lilac
Purple
Blue
Brown
Mint
Tan
Teal

Community Types

Agriculture/Pasture
Basic Mesic Forest
Cutover/Early Successional
Dry Oak-Hickory Forest
Dry-Mesic Oak-Hickory Forest
Floodplain Pool
Maintained/Disturbed
Mesic Mixed Hardwood Forest
Non-Riverine Swamp Forest
Non-Tidal Freshwater Marsh
Piedmont/Low Mountain Alluvial Forest
Piedmont/Mountain Bottomland Forest
Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 Feet

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-93

Legend

- Map Grid
- Roads
- County Boundary
- Open Water

Corridors

- Orange
- Green
- Red
- Lilac
- Purple
- Blue
- Brown
- Mint
- Tan
- Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

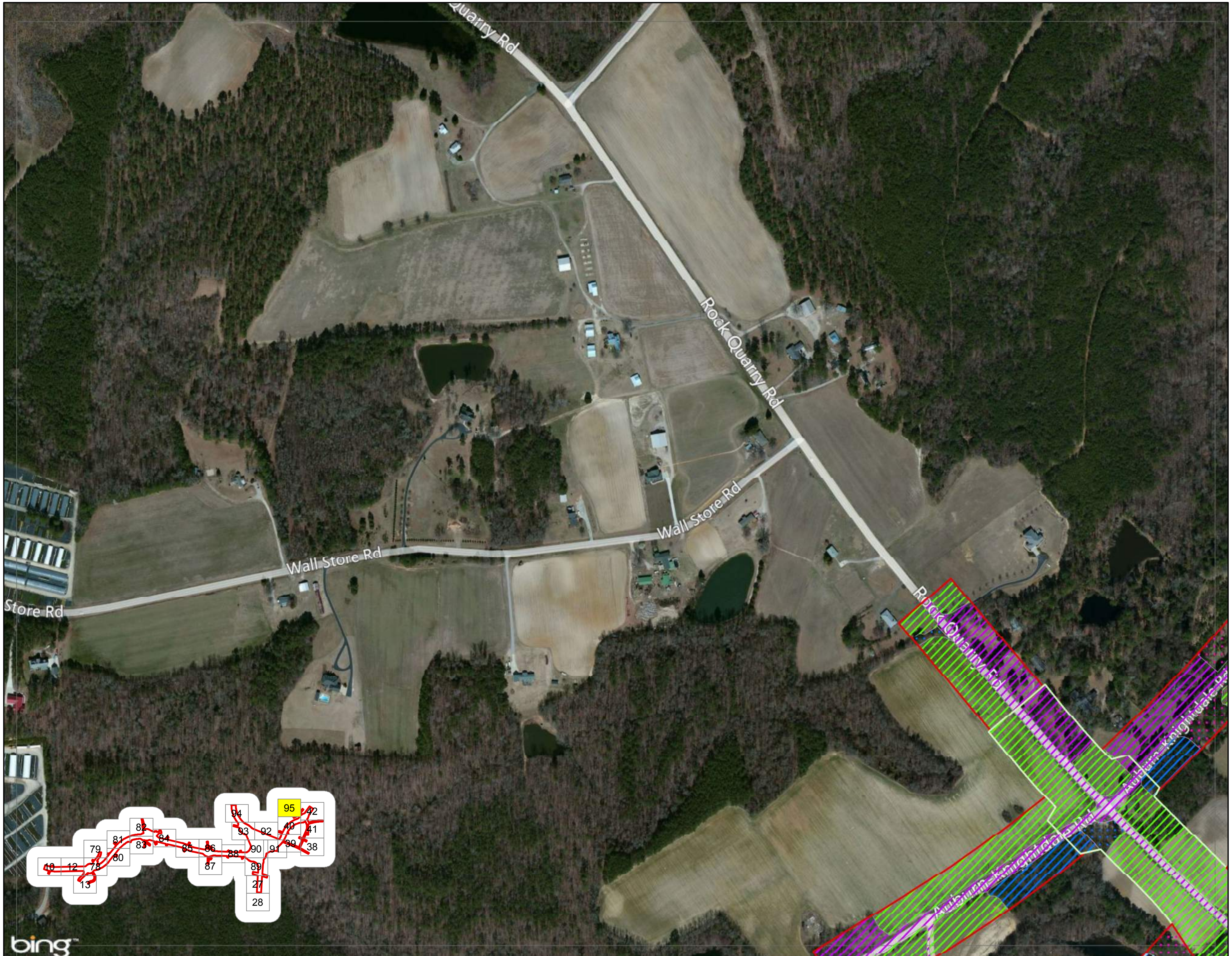
Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS
Map Date: 08/28/2014

Figure 4-94



Legend

Map Grid

Roads

County Boundary

Open Water

Corridors

Orange, Blue, Green, Brown, Red, Mint, Lilac, Tan, Purple, Teal

Community Types

- Agriculture/Pasture
- Basic Mesic Forest
- Cutover/Early Successional
- Dry Oak-Hickory Forest
- Dry-Mesic Oak-Hickory Forest
- Floodplain Pool
- Maintained/Disturbed
- Mesic Mixed Hardwood Forest
- Non-Riverine Swamp Forest
- Non-Tidal Freshwater Marsh
- Piedmont/Low Mountain Alluvial Forest
- Piedmont/Mountain Bottomland Forest
- Pine Plantation

Terrestrial Communities

Triangle Expressway Southeast Extension TIP R-2721, R-2828, and R-2829

Wake and Johnston Counties, NC

0 200 400 *Feet*

Data Source: NCDOT and Mulkey GIS

Map Date: 08/28/2014

Figure 4-95

Appendix B

Scientific Names of Species Identified in Report

Plants

Common Name	Scientific Name
American beech	*Fagus grandifolia*
American elm	*Ulmus americana*
American holly	*Ilex opaca*
Arrow arum	*Peltandra virginica*
Autumn olive	*Elaeagnus umbellata*
Blackberry	*Rubus* spp.
Black cherry	*Prunus serotina*
Black gum	*Nyssa sylvatica*
Black oak	*Quercus velutina*
Black walnut	*Juglans nigra*
Black willow	*Salix nigra*
Broomsedge	*Andropogon virginicus*
Cattail	*Typha* spp.
Chinaberry	*Melia azedarach*
Chinese privet	*Ligustrum sinense*
Christmas fern	*Polystichum acrostichoides*
Cinnamon fern	*Osmunda cinnamomea*.
Clover	*Trifolium* spp.
Common greenbrier	*Smilax rotundifolia*
Common ragweed	*Ambrosia artemisiifolia*
Corn	*Zea mays*
Deerberry	*Vaccinium stamineum*
Duck potato	*Sagittaria* spp.
Eastern red cedar	*Juniperus virginiana*
English ivy	*Hedera helix*
False nettle	*Boehmeria cylindrica*
Fescue	*Festuca* sp.
Flowering dogwood	*Cornus florida*
Giant cane	*Arundinaria gigantea*
Golden bamboo	*Phyllostachys aurea*
Goldenrod	*Solidago* spp.
Green ash	*Fraxinus pennsylvanica*
Heartleaf	*Hexastylis* spp.

Henbit	*Lamium* sp.
High-bush blueberry	*Vaccinium corymbosum*
Hydrilla	*Hydrilla verticillata*
Japanese grass	*Microstegium vimineum*
Japanese honeysuckle	*Lonicera japonica*
Johnson grass	*Sorghum halapense*
Kudzu	*Pueraria montana*
Lizard's tail	*Saururus cernuus*
Loblolly pine	*Pinus taeda*
Longleaf pine	*Pinus palustris*
Mimosa	*Albizia julibrissin*
Mockernut hickory	*Carya tomentosa*
Multiflora rose	*Rosa multiflora*
Muscadine	*Vitis rotundifolia*
Musclewood	*Carpinus caroliniana*
Netted chain-fern	*Woodwardia areolata*
Nightshade	*Solanum* sp.
Northern red oak	*Quercus rubra*
Persimmon	*Diospyros virginiana*
Pignut hickory	*Carya glabra*
Pawpaw	*Asimina triloba*
Plantain	*Plantago* spp.
Posion ivy	*Toxicodendron radicans*
Pumpkin	*Cucurbita maxima*
Queen Anne's lace	*Daucus carota*
Rattlesnake plantain	*Goodyera pubescens*
Redbud	*Cercis canadensis*
Red maple	*Acer rubrum*
River birch	*Betula nigra*
Sedge	*Carex* spp., *Cyperus* spp.
Shagbark hickory	*Carya ovata*
Shrub lespedeza	*Lespedeza bicolor*
Slippery elm	*Ulmus rubra*
Smartweed	*Polygonum* spp.
Soft rush	*Juncus effusus*
Sourwood	*Oxydendron arboreum*
Soybean	*Glycine max*
Spicebush	*Lindera benzoin*
Strawberry bush	*Euonymus americanus*
Swamp chestnut oak	*Quercus michauxii*
Sweet gum	*Liquidambar styraciflua*

Sweet-pepperbush	*Clethra alnifolia*
Sycamore	*Platanus occidentalis*
Tobacco	*Nicotiana tabacum*
Tree-of-heaven	*Ailanthus altissima*
Viburnum	*Viburnum rafinesquianum*
Violet	*Viola* spp.
Virginia chain-fern	*Woodwardia virginica*
Virginia creeper	*Parthenocissus quinquefolia*
White oak	*Quercus alba*
Wild garlic	*Allium vineale*
Wild onion	*Allium canadense*
Wisteria	*Wisteria floribunda*
Yellow jessamine	*Gelsemium sempervirens*
Yellow poplar	*Liriodendron tulipifera*

Animals

Common Name	Scientific Name
American crow	*Corvus brachyrhynchos*
American robin	*Turdus migratorius*
American woodcock	*Scolopax minor*
Banded water snake	*Nerodia fasciata*
Barred owl	*Strix varia*
Beaver	*Castor canadensis*
Black racer	*Coluber constrictor*
Bluegill (Bream)	*Lepomis macrochirus*
Blue jay	*Cyanocitta cristata*
Bobcat	*Felis rufus*
Brown water snake	*Nerodia taxispilota*
Bullfrog	*Rana catesbeiana*
Bullhead catfish	*Ameiurus nebulosus*
Canada goose	*Branta canadensis*
Carolina chickadee	*Poecile carolinensis*
Carolina wren	*Thryothorus ludovicianus*
Cooper's hawk	*Accipiter cooperii*
Copperhead	*Agkistrodon contortix*
Coyote	*Canis latrans*
Crayfish	*Cambaridae spp.*
Downy woodpecker	*Picoides pubescens*
Eastern bluebird	*Sialia sialis*
Eastern box turtle	*Terrapene carolina*
Eastern cottontail	*Sylvilagus floridanus*

Eastern fence lizard	*Sceloporus undulatus*
Eastern king snake	*Lampropeltis getula*
Eastern mosquito-fish	*Gambusia holbrooki*
Five-lined skink	*Eumeces fasciatus*
Gray fox	*Urocyon cinereoargenteus*
Gray squirrel	*Sciurus carolinensis*
Great blue heron	*Ardea herodias*
Green tree-frog	*Hyla cinerea*
Mallard	*Anas platyrhynchos*
Mourning dove	*Zenaida macroura*
Northern bobwhite	*Colinus virginianus*
Northern cardinal	*Cardinalis cardinalis*
Northern flicker	*Colaptes auratus*
Northern mockingbird	*Mimus polyglottos*
Pumpkinseed sunfish	*Lepomis gibbosus*
Raccoon	*Procyon lotor*
Rat snake	*Elaphe obsoleta*
Red-bellied woodpecker	*Melanerpes carolinus*
Redbreast sunfish	*Lepomis auritus*
Redear sunfish	*Lepomis microlophus*
Red-shouldered hawk	*Buteo lineatus*
Red-tailed hawk	*Buteo jamaicensis*
Red-winged blackbird	*Agelaius phoeniceus*
Rough green snake	*Opheodrys aestivus*
Snapping turtle	*Chelydra serpentina*
Southern toad	*Anaxyrus terrestris*
Spring peeper	*Hyla crucifer*
Striped skunk	*Mephitis mephitis*
Tufted titmouse	*Parus bicolor*
Turkey vulture	*Cathartes aura*
Virginia opossum	*Didelphis virginiana*
Warmouth	*Lepomis gulosus*
White-breasted nuthatch	*Sitta carolinensis*
White-footed mouse	*Peromyscus leucopus*
White-tailed deer	*Odocoileus virginianus*
Wild turkey	*Meleagris gallopavo*
Woodchuck	*Marmota monax*
Wood duck	*Aix sponsa*
Wood thrush	*Hylocichla mustelina*
Yellowbelly slider	*Trachemys scripta*
Yellow-rumped warbler	*Dendroica coronata*

Appendix C

Stream and Wetland Forms

(Provided on disk)

Appendix D
Qualifications of Contributors

Investigator:	Brian Dustin
Education:	B.S. Forest Management, 2003
Experience:	Environmental Scientist, Mulkey, Inc., 2007 - Present
	Environmental Biologist, H.W. Lochner, 2003 - 2007
Responsibilities:	Wetland and stream delineations, stream assessment, GPS, T/E species assessment

Investigator:	Sam Beavans
Education:	B.S. Agricultural and Environmental Technology, 2013
Experience:	Environmental Scientist, Mulkey, Inc., 2013 - Present
Responsibilities:	Wetland and stream delineations, stream assessment, GPS, natural community assessment,

Investigator:	Todd Preuninger
Education:	M.S. Zoology, Minor in Forestry, 2000
	B.S. Biology, 1993
Experience:	Environmental Scientist, Mulkey, Inc., July 2013 - March 2014
	Wetland Scientist, Withers & Ravenel Engineering, 2005 - 2009; 2012
	Wetland Scientist, Soil and Environmental Consultants, PA., 2000 - 2005
Responsibilities:	Wetland and stream delineations, stream assessment, natural community assessment

Investigator:	Bill Wollman
Education:	B.S. Environmental Studies, 2013
Experience:	Environmental Technician, Mulkey, Inc., July 2013 - December 2013
	NC Division of Water Quality - Surface Water Section, May 2013 - July 2013
Responsibilities:	Wetland and stream delineations, GPS

Investigator:	Logan Williams
Education:	Ph.D. Forestry, 2008
	M.S. Entomology, 1994
	Associate of Applied Agriculture; Agricultural Pest Control, 1982
	B.A. Philosophy, 1981
Experience:	Senior Scientist, Mulkey, Inc., March 2013 - Present (Part-time)
	Environmental Supervisor/Biological Surveys Group Leader, NCDOT, 2002 - 2012
	Entomology Programs Specialist, NC Department of Agriculture, 2001 - 2002
	Natural Systems Specialist/Endangered Species Coordinator, NCDOT, 2000 - 2001
	Natural Systems Specialist/Lead Technical Specialist, NCDOT, 1995 - 2000
Responsibilities:	Natural community assessment, T/E species assessment

Principal Investigator:	Christopher Dustin
Education:	B.S. Environmental Science, 2009
Experience:	Environmental Technician, Mulkey, Inc., 2010 - Present
Responsibilities:	Wetland and stream delineations, stream assessment, GPS, natural community assessment,

Principal Investigator:	Mark Mickley
Education:	B.S. Biology, 2003
Experience:	Environmental Scientist, Mulkey, Inc., 2004 - Present
Responsibilities:	Wetland and stream delineations, T/E species assessment, document preparation

Principal Investigator:	Cindy Carr, PWS
Education:	B.S. Natural Resources Ecosystem Assessment, 2000
Experience:	Senior Scientist, Mulkey, Inc., 2002 – 2010
	Scientist, ARCADIS, 2000 - 2002
	Senior Program Manager, CH2M HILL, 1989 - 1996
Responsibilities:	Wetland and stream delineations, stream assessment, GPS, natural community assessment;

Appendix E

Mussel Survey Report

Freshwater Mussel Survey Report

Triangle Expressway Southeast Extension
(TIP No R-2721/R-2828/R-2829)

Wake and Johnston Counties, North Carolina

Prepared for:

H.W. Lochner, Inc.
2840 Plaza Place, Suite 202
Raleigh, NC 27612

Prepared by:

The Catena Group, Inc.
410-B Millstone Drive
Hillsborough, NC 27278

March 2011

EXECUTIVE SUMMARY

The freshwater mussel fauna within the project study corridor for the proposed Triangle Expressway Southeast Extension project (TIP #s R-2721, R-2828, R-2829) was evaluated by The Catena Group Inc. (TCG) to establish a planning level baseline status of the freshwater mussel resources within the project study corridor, with particular emphasis on the federally protected Dwarf Wedgemussel and Tar River Spinymussel, and other mussel species with assigned conservation statuses in North Carolina of Endangered. Habitat evaluations and mussel surveys were performed in selected portions of perennial water bodies within the study corridor in an effort to identify particular streams that contain significant freshwater mussel populations, particularly those that support listed species.

A total of 110 separate stream reaches were evaluated for the presence of mussels (Figures 1 and 2, Appendix A), with 15 freshwater mussel species, as well as 2 freshwater clam species and 4 aquatic snail species found. For purposes of data analysis and discussion, the project study area was segmented into three sections based on general watersheds: Western Section (Middle Creek and tributaries), Central Section (Swift Creek and tributaries), and Eastern section (Neuse River and tributaries).

Western Section: Middle Creek drains the western section of the project corridor study area, and from a freshwater mussel standpoint, is the most significant water body in the Western section. Middle Creek was known to support several rare mussel species, including the Dwarf Wedgemussel; however, this species has not been detected during any survey effort since 1992, where it was found at the NC 50 crossing downstream of the study area in Johnston County. In addition, occurrences and numbers of other rare mussel species known from the stream have declined in recent years. The results of this survey effort further support this declining trend, as only very low numbers of four rare mussel species were found. Observations of habitat conditions also support the apparent decline.

The proposed project will cross Middle Creek in the upper limits of the watershed upstream of Sunset Lake. While it is possible that the Dwarf Wedgemussel still occurs in Middle Creek further downstream in Johnston County, the presence of Sunset Lake between the proposed crossing and potentially occupied habitat downstream makes the potential for any direct impacts very unlikely. No rare mussel species were found in any of the tributaries; however, some of these streams such as Basal Creek, Little Creek, and Guffy Branch support fairly high abundances of the Eastern Elliptio, and contain areas of "good" mussel habitat, which may be suitable for the Dwarf Wedgemussel.

Central Section: The Central section of the project study area drains to the Swift Creek Subbasin, which is considered an aquatic habitat of national significance, as it supports the Dwarf Wedgemussel. Historically, at least 18 species of freshwater mussels have been reported to occur in the Swift Creek subbasin. This study confirms the relatively high species diversity (for Atlantic Slope drainages) of this stream, as at least 14 species were collected. The study also confirms the persistence of the Dwarf Wedgemussel in Swift Creek below Lake Benson, as three individuals were found within the study corridor. In addition, two other individuals were found downstream of the project corridor, as part of a concurrent study carried out by TCG for the City of Raleigh. Other targeted mussel species, including the Atlantic Pigtoe and Yellow Lance, were also located along with several other rare mussel species. Thus, direct impacts to these species are possible from project construction within this section of Swift Creek.

Because of the existence of the Dwarf Wedgemussel in Swift Creek, the study corridor for this project was expanded to include an avoidance alternative (Red Route), which would cross Swift Creek upstream of Lake Benson. This section of Swift Creek is not believed to support the Dwarf Wedgemussel, and the results of this study further support this assumption, as it was not found, nor were any of the associate rare mussel species. In addition, Lake Benson occurs between this section of the creek and occupied habitat downstream. As such, direct impacts to the Dwarf Wedgemussel are unlikely to occur if the Red Corridor is constructed; however, conclusions regarding Indirect and Cumulative Impacts to the population cannot be determined at this time, and will need to be addressed with all alternates within the study area.

No rare mussel species were found in any of the tributaries to Swift Creek within the study area; however, both White Oak Creek and Little Creek are known to support Dwarf Wedgemussel and other rare species farther downstream of the study area. In both instances, artificial impoundments are present between any of the proposed crossing locations and occupied habitat downstream; therefore direct impacts are unlikely.

Eastern Section: The Eastern section of the project corridor drains to the Neuse River from the US 64/264 Bypass crossing of the river downstream to the vicinity of the Wake/Johnston County line. Tributaries to the Neuse River within this section include Walnut Creek and Beddingfield Creek to the south; Mango Creek, Unnamed Tributary (UT) to Neuse River, Poplar Creek, and Mark's Creek to the north.

Historically, at least 18 species of freshwater mussels have been reported to occur in the mainstem of the Neuse River within the project study area. While this study indicates relatively high species diversity (for Atlantic Slope drainages) of this section of the river (10 species), including the targeted Green Floater, species like the Dwarf Wedgemussel, Atlantic Pigtoe, Yellow Lance and Notched Rainbow, which historically occurred in this area, were not found. The presence of the Green Floater is the first documented occurrence of this species in this section of the Neuse River since the early 1950's.

While the Dwarf Wedgemussel is unlikely to still occur in this section of the Neuse River, the re-discovery of the Green Floater, which was believed to have extirpated from this area, may indicate that some of the other species formerly reported from this area may still exist in low numbers, as the Green Floater was obviously present, but in such low numbers that it was not found during surveys since that time. The presence of Green Floater at multiple sites (8) and the fact that the majority of individuals found were of the same size (age) class, suggest a recent population expansion. Additional surveys will need to be done once an alternate is chosen. No rare mussel species were found in any of the tributaries in this section. Habitat conditions are generally unsuitable for the Dwarf Wedgemussel; thus it is very unlikely to occur in any of the water bodies within this section of the study corridor.

TABLE OF CONTENTS

1.0 INTRODUCTION

The North Carolina Turnpike Authority (NCTA) a division of the North Carolina Department of Transportation (NCDOT), proposes the construction of a new road corridor from NC-55 near Apex south and east to US-64/264 Bypass near Knightdale within Wake and Johnston Counties, referred to as the Triangle Expressway Southeast Extension. The entire project area occurs within the Neuse River Basin.

Two freshwater mussel species federally designated and protected as Endangered under the Endangered Species Act of 1973 as amended are known to occur within the Neuse River Basin in Wake and Johnston Counties, the Dwarf Wedgemussel (*Alasmidonta heterodon*) and the Tar River Spinymussel (*Elliptio steinstansana*). To assess the potential for these two species to occur within the project area, The Catena Group, Inc. (TCG) was retained by H.W. Lochner (Lochner), to gather updated mussel survey data for streams within the project corridor during the preliminary planning phase of the project in order to assist in selection of potential corridors and to initiate any potential consultation with the agencies as early as possible to avoid project delays.

In addition, four species listed as state Endangered and Federal Species of Concern (FSC), [1] the Atlantic Pigtoe (*Fusconaia masoni*), Green Floater (*Lasmigona subviridis*), Yellow Lampmussel (*Lampsillis cariosa*), and Yellow Lance (*Elliptio lanceolata*), have been previously documented in this portion of the Neuse River Basin, and were also targeted in this survey because the US Fish and Wildlife Service (USFWS) is in the process of putting together "Elevation to Candidate Species Status" packages for some these species as they may be formally listed as Threatened, or Endangered in the near future (John Fridell, USFWS Recovery Biologist, personal communication). In addition, The Center for Biological Diversity (CBD), a nonprofit conservation organization dedicated to the protection of endangered species and wild places (www.biologicaldiversity.org) recently petitioned the USFWS to list 404 aquatic species in the southeastern United States, including three of these four species as either Threatened or Endangered under the Endangered Species Act (CBD 2010). As such, it has been determined that it would be prudent to address these species during this phase of project planning in the event that they become federally listed as Threatened or Endangered. Several other mussel species that are considered to be rare in North Carolina and have assigned various conservation statuses are also known from this portion of the Neuse River Basin (Table 1).

[1] **Federal Species of Concern (FSC)** are defined as species that are under consideration for listing for which there is insufficient information to support listing. FSCs are not afforded federal protection under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. However, the status of these species is subject to change, and so should be included for consideration.

Table 1. Rare Aquatic Species Neuse River Basin in Wake/Johnston Counties

Scientific Name	Common Name	Federal Status	NC Status
Alasmidonta heterodon	Dwarf Wedgemussel	E	E
Alasmidonta undulata	Triangle Floater	~	T
Elliptio congarea	Carolina Slabshell	~	W3/W5
Elliptio lanceolata	Yellow Lance	FSC	E
Elliptio producta	Atlantic Spike	~	W3/W5
Elliptio roanokensis	Roanoke Slabshell	~	T
Fusconaia masoni	Atlantic Pigtoe	FSC	E
Lampsilis cariosa	Yellow Lampmussel	FSC	E
Lampsilis radiata	Eastern Lampmussel	~	T
Lasmigona subviridis	Green Floater	FSC	E
Strophitus undulatus	Creeper	~	T
Villosa constricta	Notched Rainbow	~	SC

See Appendix B for status designations

2.0 MUSSEL SURVEY EFFORTS

Portions of all perennial water bodies within the project study corridor were evaluated for the presence of freshwater mussels and other aquatic mussel species, with particular emphasis on the federally protected Dwarf Wedgemussel and Tar River Spinymussel, as well as four state Endangered /FSC mussel species, three of which have been included in a petition for consideration for federal listing as Endangered or Threatened.

2.1. Mussel Survey Methodology

Survey locations were chosen based on mapping as provided by Lochner, pre-survey investigations, accessibility, and appropriate habitat for the target species as determined in the field. Surveys were conducted by TCG personnel on the following dates in 2010:

- Tim Savidge: April 28; June 11, 16, 18, 23, 24; July 2, 8, 13, 20, 26; October 7, 12, 13, 21, 26, 27; November 23, 24
- Tom Dickinson: April 28; May 7; June 11, 16, 23; July 8, 22, 26; October 7, 19, 21, 26, 27; November 23, 24
- Chris Sheats: June 16, 18, 23; July 8, 20, 26; October 7, 12, 13, 19; November 23, 24
- Jonathan Hartsell: July 8
- Kate Montieth: May 7
- David Zitlow: July 8
- Daniel Savidge: June 23, 24; July 2, 8, 13; October 7, 26
- Ivy Kimbrough: July 20; October 7, 12, 13, 19, 21, 26, 27; November 24
- Maggie Griffin: October 19, 21, 26, 27; November 23, 24

The following non-TCG personnel assisted with the surveys on the following dates:

- Sarah McRae-USFWS: October 7
- John Fridell-USFWS: October 21, 26, 27
- Karen Lynch-NCDOT: October 27
- Jayson Mays-NCDOT: October 7, 21, 27

- Mike Sanderson-NCDOT: October 21, 27
- Logan Williams-NCDOT: October 27
- Hal Bain-RK&K: October 12, 13
- Matt Smith-ESI: November 24

In each stream segment, a habitat evaluation was first performed by accessing a specific stream or stream system downstream of the corridor and walking the drainage for at least 0.5 person-hour. If it was determined by professional judgment that further efforts were not warranted, then survey efforts were stopped. This decision by the respective investigator to discontinue survey effort on a particular stream was based on a lack of suitable habitat for freshwater mussels. Within the surveyed reaches, all habitat types (riffle, run, pool, slack-water, etc.) were sampled by a minimum of a two-person team. The survey team began at the downstream end of the survey reach and proceeded upstream with the team spread across the stream into survey lanes. A combination of visual using bathyscopes (glass-bottom view buckets) or mask and snorkle, and tactile methodologies were employed as appropriate. Upstream and downstream survey limits were recorded using a hand-held Garmin 12 or e-trex Vista GPS unit. Timed searches were employed in each reach to provide a catch per unit effort (CPUE). Searches were also conducted for relict shells. Presence of fresh shell material was equated with species presence, but was not factored into CPUE.

Relative abundance for freshwater snails and the freshwater clam species were estimated using the following criteria:

- Very abundant > 30 observed at survey station
- Abundant 16-30 observed at survey station
- Common 6-15 observed at survey station
- Uncommon 3-5 observed at survey station
- Rare 1-2 observed at survey station
- Patchy indicates an uneven distribution of the species within the sampled site.

2.2. Mussel Survey Results

A total of 111 separate stream reaches within the study corridor were evaluated for the presence of mussels (Figures 1 and 2, Appendix A), with 15 freshwater mussel species, as well as 2 freshwater clam species and 4 aquatic snail species being found (Table 2).

Stream survey segments are reported by USGS stream name, the date surveyed, and respective sequence within that date. Unnamed tributaries are noted as "UT" to the named receiving water body. Habitat descriptions and survey results are summarized below for each site in order from West to East. Site numbers (i.e., 101010.1) dictate the date in YYMMDD (year, month, day) format with survey sequence from that day of sampling listed after the decimal point. Survey segments are depicted in their respective figures in Appendix A.

Table 2. Study Corridor: Mollusk Species Found

Scientific Name	Common Name	# Sites Found	Conservation Status
Freshwater Mussels	~	~	~
Alasmidonta heterodon	Dwarf Wedgemussel	3	Federally E
Alasmidonta undulata	Triangle Floater	28	State T
Elliptio complanata	Eastern Elliptio	100	None
Elliptio congarea	Carolina Slabshell	43	State W
Elliptio icterina	Variable Spike	81	None
Elliptio lanceolata	Yellow Lance	8	State E
Elliptio mediocris	No Common Name	17	None
Elliptio producta	Atlantic Spike	8	State W
Elliptio roanokensis	Roanoke Slabshell	34	State T
Fusconaia masoni	Atlantic Pigtoe	23	State E
Lampsilis radiata	Eastern Lampmussel	44	State T
Lasmigona subviridis	Green Floater	8	State E
Pyganodon cataracta	Eastern Floater	24	None
Strophitus undulatus	Creeper	32	State T
Utterbackia imbecillis	Paper Pondshell	14	None
Freshwater Snails and Clams	~	~	~
Campeloma decisum	Pointed Campeloma	40	None
Corbicula fluminea	Asian Clam	101	Exotic
Helisoma anceps	Two-ridge Ram's Horn	2	Common
Physidae	A Physid Snail	4	None
Planorbella trivolvis	Marsh Ram's Horn	1	None
Sphaeriidae	A Sphaeriid Clam	2	None

For purposes of data analysis and discussion, the project study area was segmented into three sections based on general watersheds: Western Section (Middle Creek and tributaries), Central Section (Swift Creek and tributaries), and Eastern section (Neuse River and tributaries).

2.2.1. Western Section

The western section of the project corridor occurs within the Middle Creek Subbasin between NC 55 and NC 50. Six reaches of Middle Creek, were evaluated, as were portions of all perennial tributaries to Middle Creek within the study corridor (15 sites).

Middle Creek Site-100428.1
This section of Middle Creek was accessed off the Holly Springs Road (SR 1152) crossing. Channel width ranges from 4 to 5 meters with relatively stable 1-meter high banks. In order of dominance, substrate consists of sand, gravel, silt, cobble, and mud. Water levels were normal and water visibility was clear. A wastewater treatment plant (wwtp) discharge was noted and the smell of effluent was present. An extensive natural buffer surrounds the reach. Mussel surveys were conducted for a total of 3.07 person hours.

Table 3. Middle Creek Site-100428.1: Mollusk Species Found

Scientific Name	**Common Name**	**#**	**Abundance/ CPUE**
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	96	31.27/hr
Elliptio icterina	Variable Spike	2	0.65/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Abundant

Middle Creek Site-100428.2

This section of Middle Creek was accessed off Sunset Lake Road (SR 1301). Channel width ranges from 2 to 5 meters with 1-meter high banks showing some signs of erosion. In order of dominance, substrate consists of silt, sand, clay, gravel, and mud. The smell of wwtp effluent was noted. Surveys were conducted for a total of 1.40 person hours.

Table 4. Middle Creek Site-100428.2: Mollusk Species Found

Scientific Name	**Common Name**	**#**	**Abundance/ CPUE**
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	8	5.71/hr
Elliptio icterina	Variable Spike	2	1.43/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon
Corbicula fluminea	Asian Clam	~	Abundant
Physella sp.	A Physid Snail	~	Patchy, Common

Middle Creek Site-100428.3

This section of Middle Creek was located within the tailrace of Sunset Lake. Channel width ranges from 6 to 10 meters with <1-meter high relatively stable banks. In order of dominance, substrate consists of boulder, gravel, sand, cobble, bedrock, and silt. Surveys were conducted for 1.00 person hour.

Table 5. Middle Creek Site-100428.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	6	6.00/hr
Lampsilis radiata	Eastern Lampmussel	2	2.00/hr
Pyganodon cataracta	Eastern Floater	0	Shell only
Utterbackia imbecillis	Paper Pondshell	0	Shell only
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Abundant
Sphaeriidae	A Sphaeriid clam	~	Uncommon

Middle Creek Site-100611.1

This mid section of Middle Creek within the study area was accessed off the Lake Wheeler Road Crossing (SR 1371). Channel width ranges from 6 to 10 meters with 1- to 2-meter high moderately eroded banks. In order of dominance, substrate consists of sand, silt, gravel, clay, and cobble. Mussels were concentrated in small patches of suitable habitat. Surveys were conducted for 4.67 person hours.

Table 6. Middle Creek Site-100611.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	1	0.21/hr
Elliptio complanata	Eastern Elliptio	225	48.18/hr
Elliptio icterina	Variable Spike	154	32.98/hr
Strophitus undulatus	Creeper	2	0.43/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Middle Creek Site-100616.2

This section of Middle Creek occurs off the Old Stage Road (SR 1006) crossing. Channel width ranges from 10 to 12 meters with 2-meter high banks that range from fairly stable to moderately eroded. In order of dominance, substrate consists of sand, silt, clay, cobble, and boulder. Surveys were conducted for 5.15 person hours.

Table 7. Middle Creek Site-100616.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	241	46.80/hr
Elliptio icterina	Variable Spike	121	23.50/hr
Elliptio producta	Atlantic Spike	1	0.19/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Very Abundant

Middle Creek Site-100616.1

This most downstream section of Middle Creek within the study area was accessed off the Barber Bridge Road (SR 2739) crossing. Channel width ranges from 10 to 15 meters with 2-meter high banks that ranged from stable to severely eroded. In order of dominance, substrate consists of sand, clay, gravel, silt, and cobble. Mussels were fairly common in areas associated with stable clay and rock outcrops, and uncommon to absent in the rest. Surveys were conducted for 6.25 person hours.

Table 8. Middle Creek Site-100616.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	393	62.88/hr
Elliptio icterina	Variable Spike	146	23.36/hr
Lampsilis radiata	Eastern Lampmussel	1	0.16/hr
Strophitus undulatus	Creeper	1	0.16/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon
Corbicula fluminea	Asian Clam	~	Very Abundant

Basal Creek Site-100623.3

This section of Basal Creek upstream of Bass Lake was accessed off the NC 55 crossing. Channel width ranges from 3 to 6 meters with <1-meter high moderately eroded banks. In order of dominance, substrate consists of sand, gravel, silt, clay, cobble, and bedrock. There is an extensive wetland complex created by beaver (*Castor canadensis*) dams upstream of the reach. Surveys were conducted for 2.13 person hours.

Table 9. Basal Creek Site-100623.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	414	194.37/hr
Elliptio icterina	Variable Spike	139	65.26/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Common

Basal Creek Site-100618.1

This section of Basal Creek extends from the Basal Creek arm of Sunset Lake upstream to the SR 1393 crossing just below the tailrace of Bass Lake. The stream consists of a series of braided channels within a floodplain wetland created by beaver dams. There is a large amount of detritus and woody debris. The channels range from 2 to 4 meters wide with <1-meter high banks. In order of dominance, substrate consists of sand, clay and gravel. Surveys were conducted for 4.0 person hours.

Table 10. Basal Creek Site-100618.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	51	12.75/hr
Pyganadon cataracta	Eastern Floater	2	0.50/hr
Utterbackia imbecillis	Paper Pondshell	2	0.50/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Uncommon

UT to Middle Creek Site-100507.2

This section of a UT to Middle Creek was accessed from the Optimist Farm Road (SR 1390) crossing. Channel width ranges from 2 to 4 meters with 1-meter high banks that showed signs of erosion. In order of dominance, substrate consists of sand, gravel, and silt. A mixture of residential development and forested landscape occurs adjacent to this reach. Mussel surveys were conducted for 2.5 person hours.

Table 11. UT Middle Creek Site-100507.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	2	0.80/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Rare

Rocky Branch Site-100507.1

This section of Rocky Branch was accessed off the Optimist Farm Road (SR 1390) crossing. Channel width ranges from 2 to 4 meters with 1-meter high banks that showed signs of erosion. Surveys were conducted upstream of a section of the channel that was impounded by beavers. In order of dominance, substrate consists of gravel, sand, cobble, and boulder. Surveys were conducted for 2.17 person hours.

Table 12. Rocky Branch Site-100507.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	1	0.46/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Rare

UT Middle Creek (Bell's Lake Creek) Site-100618.3

This stretch of UT to Middle Creek (Bell's Lake Creek) which originates from Bell's Lake extends from approximately 100 meters below the Optimist Farm Road (SR 1390) crossing to a point approximately 650 meters upstream. The channel ranges from 2 to 4 meters wide, with eroded banks 1 meter high. Substrate is dominated by sand, gravel and cobble. No mussels were located during the 1.5 person hours of search time.

Table 13. UT Middle Creek (Bell's Lake Creek) Site-100618.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
None	~	~	~
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Uncommon

Terrible Creek Site-100618.2

This section of Terrible Creek extends from approximately 0.5 mile downstream of the Johnson Pond Road (SR 1404) crossing upstream to the bridge. The channel, which ranges from 2 to 4 meters with <1-meter high banks, flows through a floodplain marsh wetland system, that appears to be a relict bed of a former impoundment. Numerous small beaver dams are present throughout. In order of dominance, substrate consists of sand, gravel, and cobble. Surveys were conducted for 2.67 person hours.

Table 14. Terrible Creek Site-100618.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	5	1.87/hr
Pyganodon cataracta	Eastern floater	7	2.62/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Patchy, Common

Terrible Creek Site-100624.2
This section of Terrible Creek extends from the WWTP discharge in Terrible Creek above Hilltop Road (SR 2751) upstream to the US 401 crossing. The channel width ranges from 3 to 4 meters, and the fairly stable banks are between 1 and 1.5 meters high. The substrate is dominated by sand, cobble, and gravel. Fairly extensive woodland is present on both sides of the stream. Surveys were conducted for 2.73 person hours.

Table 15. Terrible Creek Site-100624.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	85	31.14/hr
Elliptio icterina	Varaible Spike	8	2.93/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Terrible Creek Site-100624.1
This section of Terrible Creek extends from the Hilltop Road (SR 2751) crossing upstream to the WWTP discharge point. The channel ranges from 3 to 4 meters wide, and the highly eroded banks are between 1 and 1.5 meters high. The substrate is dominated by sand, cobble, and silt. Fairly extensive woodland is present on both sides of the stream. Surveys were conducted for 0.8 person hour.

Table 16. Terrible Creek Site-100624.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	1	1.25/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

UT Middle Creek Site-100611.2

This UT to Middle Creek was accessed from its confluence with Middle Creek near the Lake Wheeler Road (SR 1371) crossing of Middle Creek. Channel is approximately 2 meters wide before it broadens into a larger inundated wetland system with no defined channel. The wetland complex also encompasses another UT to Middle Creek that flows into Middle Creek, approximately 160 meters upstream of this UT confluence. Substrate is dominated by silt and mud. No mollusks were located during the 0.5 person hour of search time. The survey endpoint depicted on Figure 2, Sheet 4 occurs within this wetland complex, and not within a defined channel.

Panther Branch Site-100611.3

This section of Panther Branch was accessed off the Old Stage Road (SR 1006) crossing. The incised channel ranges from 3 to 4 meters wide with unstable 2-meter high banks. In order of dominance, substrate consists of sand, gravel, silt, cobble, and clay. Surveys were conducted for 1.5 person hours.

Table 17. Panther Branch Site-100611.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio icterina	Variable Spike	38	25.33/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon

Little Creek Site-100623.1

This section of Little Creek was accessed off the NC 42 crossing. Channel width ranges from 3 to 5 meters with relatively stable 1- to 2-meter high banks. In order of dominance, substrate consists of sand, pebble, gravel, clay, silt, and cobble. Surveys were conducted for 4.33 person hours.

Table 18. Little Creek Site-100623.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	316	72.98/hr
Elliptio icterina	Variable Spike	173	39.95/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Common

Little Creek Site-100623.2

This section of Little Creek is located just upstream of Site-100623.1. Channel width ranges from 2 to 5 meters with 1-meter high moderately eroded banks. In order of dominance, substrate consists of sand, pebble, gravel, clay, silt, and cobble. Surveys were conducted for 1.5 person hours.

Table 19. Little Creek Site-100623.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	143	95.33/hr
Elliptio icterina	Variable Spike	25	16.67/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Common

Guffy Branch Site-100623.4

This section of Guffy Branch extends from the confluence with Little Creek upstream to the Saul's Road (SR 2727) crossing. The channel width ranges from 3 to 4 meters, and the slightly eroded banks are between 1 and 1.5 meters high. The substrate is dominated by sand, and cobble. A mixture of forest and pastureland occurs along the stream. Surveys were conducted for 3.0 person hours.

Table 20. Guffy Branch Site-100623.4: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	135	45.00/hr
Elliptio icterina	Variable Spike	14	4.67/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon
Corbicula fluminea	Asian Clam	~	Patchy, Common

Guffy Branch Site-100623.5

This section of Guffy Branch extends from the Saul's Road (SR 2727) crossing to a point approximately 600 meters upstream. The channel width ranges from 2 to 3 meters, and the fairly stable banks are 1 meter high. The substrate is dominated by sand, and cobble, with areas of bedrock interspersed. A mixture of forest and fallow agricultural land occurs along the stream. Surveys were conducted for 1.17 person hours.

Table 21. Guffy Branch Site-100623.5: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	95	81. 20/hr
Elliptio icterina	Variable Spike	21	11.95/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon
Corbicula fluminea	Asian Clam	~	Patchy, Common

Buffalo Branch Site-100623.6

This section of Buffalo Branch extends from the NC 50 crossing to a point approximately 450 meters upstream, near the Johnston/Wake County line. The channel width ranges from 3 to 4 meters, and the fairly stable banks are 1 meter high. The substrate is dominated by sand, and cobble. The surrounding landscape is forested. Surveys were conducted for 2.00 person hours.

Table 22. Buffalo Branch Site-100623.6: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	92	46.00/hr
Elliptio icterina	Variable Spike	14	7.00/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Abundant

2.2.2. Central Section

The Central section of the project corridor occurs within the Swift Creek Subbasin between NC 50 and US 70. Two general areas of Swift Creek were evaluated: 1) Swift Creek between Lake Wheeler and Lake Benson (8 sites); and 2) Swift Creek between Lake Benson and the Cornwallis Road (SR 1525) crossing (55 Sites). Tributaries to Swift Creek that were evaluated include Mahler's Creek, UT to Swift Creek, White Oak Creek, and Little Creek (7 sites).

Swift Creek between Lake Wheeler and Lake Benson Site-101124.4

This section of Swift Creek extends from a point approximately 250 meters below the spillway of Lake Wheeler upstream to the spillway. The stream channel ranges from 8 to 10 meters wide, with relatively stable banks up to 2 meters high. The substrate is dominated by sand and gravel, with clay and silt along the banks. Surveys were conducted for 3.58 person hours.

Table 23. Swift Creek Site-101124.4: Mollusk Species Found

Scientific Name	**Common Name**	**#**	**Abundance/ CPUE**
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	105	29.33/hr
Elliptio icterina	Variable Spike	9	2.51/hr
Utterbackia imbecillis	Paper Pondshell	5	1. 40/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Wheeler and Lake Benson Site-101124.3

This site occurs in an extensive riffle habitat in a bend of Swift Creek approximately halfway between the Lake Wheeler spillway and the US 401 crossing of the creek. The stream channel is 6 meters wide, with relatively stable banks 1 meter high. The substrate is dominated by cobble and gravel, with clay and silt along the banks. Surveys were conducted for 3.67 person hours.

Table 24. Swift Creek Site-101124.3: Mollusk Species Found

Scientific Name	**Common Name**	**#**	**Abundance/ CPUE**
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	84	22.89/hr
Elliptio icterina	Variable Spike	33	8.99/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Wheeler and Lake Benson Site-101124.2

This site occurs in a long run and pool habitat sequence approximately 600 meters above the US 401 crossing of the creek. The stream channel is 6 to 9 meters wide, with relatively stable banks 1.5 meters high. The substrate is dominated by sand and gravel, with clay and silt along the banks. Surveys were conducted for 3.5 person hours.

Table 25. Swift Creek Site-101124.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	82	23.43/hr
Elliptio icterina	Variable Spike	17	4.86/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Wheeler and Lake Benson Site-101124.1
This site occurs in an extensive shallow run and riffle habitat approximately 400 meters above the US 401 crossing of the creek. The stream channel is 6 to 8 meters wide, with relatively stable banks 1.5 meters high. The substrate is dominated by sand and gravel, with clay and silt along the banks. Surveys were conducted for 3.08 person hours.

Table 26. Swift Creek Site-101124.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	54	17.53/hr
Elliptio icterina	Variable Spike	23	7.47/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Wheeler and Lake Benson Site-101123.6
This site occurs in a long run, pool and slack-water habitat sequence, approximately 200 meters below the CSX crossing of the creek near US 401. The stream channel is 7 to 9 meters wide, with moderately eroded banks 2 meters high. The substrate is dominated by unconsolidated sand with clay and silt banks. Surveys were conducted for 1.33 person hours.

Table 27. Swift Creek Site-101123.6: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	27	20.30/hr
Elliptio icterina	Variable Spike	7	5.26/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Wheeler and Lake Benson Site-101123.5
This site occurs in a long pool and slack-water section with limited riffle and run habitat, approximately 1,050 meters above the Old Stage Road (SR 1006) crossing of the creek. The stream channel is 8 to 10 meters wide, with moderately eroded banks 2 meters high. The substrate is dominated by unconsolidated sand with clay and silt banks. Surveys were conducted for 2.13 person hours.

Table 28. Swift Creek Site-101123.5: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	21	9.86/hr
Elliptio icterina	Variable Spike	11	5.16/hr
Elliptio producta	Atlantic Spike	1	0.47/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Wheeler and Lake Benson Site-101123.4
This site occurs in a long (60 meter) extensive riffle and run habitat sequence approximately 650 meters above the Old Stage Road (SR 1006) crossing of the creek. The stream channel is 6 to 8 meters wide, with moderately eroded banks 2 meters high. The substrate is dominated by gravel and sand with clay banks. Surveys were conducted for 2.20 person hours.

Table 29. Swift Creek Site-101123.4: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	75	34.09/hr
Elliptio icterina	Variable Spike	96	43.64/hr
Elliptio producta	Atlantic Spike	1	0.45/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Wheeler and Lake Benson Site-101123.3
This site occurs in a long run, pool, and slack-water habitat sequence approximately 400 meters above the Old Stage Road (SR 1006) crossing of the creek. The stream channel is 8 to 10 meters wide, with moderately eroded banks 2 meters high. The substrate is dominated by unconsolidated sand, gravel, and cobble with clay banks. Surveys were conducted for 1.80 person hours.

Table 30. Swift Creek Site-101123.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	4	2.22/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Mahler's Creek Site-101124.5

This section of Mahler's Creek occurs in the vicinity of the New Bethel Church Road (SR 2708) crossing. The channel ranges from 2 to 4 meters wide with 1- to 2-meter high moderately eroded banks. The substrate is dominated by shifting sand and silt. Surveys were conducted for 1.5 person hours.

Table 31. Mahlers Creek Site-101124.5: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	2	1.33/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam		Uncommon

Mahler's Creek Site-101124.8

This section of Mahler's Creek extends from the confluence with Swift Creek to a point approximately 370 meters upstream. The channel ranges from 2 to 3 meters wide with 1- to 2-meter high severely eroded banks. The substrate is dominated by shifting sand and silt. Surveys were conducted for 1.5 person hours.

Table 32. Mahlers Creek Site-101124.8: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	6	4.0/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam		Patchy, Common

Swift Creek between Lake Benson and Cornwallis Road Site-101124.6

This site extends from the Mahler's Creek confluence upstream to a point approximately 250 meters below the NC 50 crossing of Swift Creek. The stream channel is 8 to 10 meters wide, with moderately eroded banks 2.5 meters high. A small beaver dam occurs within this reach, creating slack-water pool habitat. The substrate is dominated by sand and silt, with large amounts of detritus and woody debris. Surveys were conducted for 1.25 person hours.

Table 33. Swift Creek Site-101124.6: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	5	4.00/hr
Elliptio icterina	Variable Spike	1	0.80/hr
Elliptio mediocris	No Common Name	1	0.80/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101124.7
This site occurs in a shallow riffle habitat within an island channel on the left descending side of Swift Creek, approximately 50 meters in length just below the Mahler's Creek confluence. The island stream channel is 5 meters wide, with severely eroded banks 2.5 meters high. The substrate is dominated by shifting sand and pebble. Surveys were conducted for 1.0 person hour.

Table 34. Swift Creek Site-101124.7: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	6	6.00/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-100708.5
This site occurs in a riffle/run/pool habitat sequence approximately 500 meters downstream of the Mahler's Creek confluence. The stream channel is 8 to 10 meters wide, with moderately eroded banks 2.5 meters high. The substrate is dominated by sand and gravel. Surveys were conducted for 2.08 person hours.

Table 35. Swift Creek Site-100708.5: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	110	52.88/hr
Elliptio icterina	Variable Spike	6	2.88/hr
Lampsilis radiata	Eastern Lampmussel	1	0.48/hr
Pyganodon cataracta	Eastern Floater	1	0.48/hr
Utterbackia imbecillis	Paper Pondshell	13	6.25/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-100708.4
This site occurs in wide bend of Swift Creek, approximately 750 meters downstream of the Mahler's Creek confluence. The habitat consists of shallow sandbar/riffles grading to a deep scoured run. The stream channel is 8 to 10 meters wide, with moderately eroded banks 2.5 meters high. The substrate is dominated by sand and gravel, with clay banks. Surveys were conducted for 4.17 person hours.

Table 36. Swift Creek Site-100708.4: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	238	57.07/hr
Elliptio icterina	Variable Spike	4	0.96/hr
Pyganodon cataracta	Eastern Floater	1	0.24/hr
Utterbackia imbecillis	Paper Pondshell	16	3.84/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-100708.3
This site occurs in a shallow sandbar/riffle and run habitat, approximately 920 meters downstream of the Mahler's Creek confluence. The stream channel is 8 to 10 meters wide, with moderately eroded banks 2.5 meters high. The substrate is dominated by sand and pebble, with clay banks. Surveys were conducted for 4.17 person hours.

Table 37. Swift Creek Site-100708.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	575	137.89/hr
Elliptio congarea	Carolina Slabshell	1	0.24/hr
Elliptio icterina	Variable Spike	30	7.19/hr
Elliptio roanokensis	Roanoke Slabshell	1	0.24/hr
Lampsilis radiata	Eastern Lampmussel	3	0.72/hr
Pyganodon cataracta	Eastern Floater	11	2.64/hr
Utterbackia imbecillis	Paper Pondshell	20	4.80/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Patchy, Common
Physella sp.	A Physid Snail	~	Patchy, Common
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-100708.2

This site occurs in a narrow riffle and run habitat, approximately 1,020 meters downstream of the Mahler's Creek confluence. The stream channel is 6 meters wide, with moderately eroded banks 2.5 meters high. The substrate is dominated by sand and pebble, with clay banks. Surveys were conducted for 3.0 person hours.

Table 38. Swift Creek Site-100708.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	250	83.33/hr
Elliptio congarea	Carolina Slabshell	1	0.33/hr
Elliptio icterina	Variable Spike	11	3.67/hr
Lampsilis radiata	Eastern Lampmussel	5	1.67/hr
Strophitus undulatus	Creeper	1	0.33/hr
Utterbackia imbecillis	Paper Pondshell	5	1.67/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-100708.1

This site occurs in a narrowly meandering section of the creek, approximately 1,350 meters downstream of the Mahler's Creek confluence. The stream channel is 6 to 10 meters wide, with moderately eroded banks 2.5 meters high. The habitat consists of a series of short riffle run sequences dominated by cobble, sand, and gravel substrate, with clay banks. Surveys were conducted for 2.92 person hours.

Table 39. Swift Creek Site-100708.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	307	105.14/hr
Elliptio congarea	Carolina Slabshell	3	1.03/hr
Elliptio icterina	Variable Spike	28	9.59/hr
Elliptio roanokensis	Roanoke Slabshell	1	0.34/hr
Lampsilis radiata	Eastern Lampmussel	2	0.68/hr
Pyganodon cataracta	Eastern Floater	1	0.34/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101123.2
This site occurs in a long straight section of Swift Creek, approximately 1,800 meters downstream of the Mahler's Creek confluence. The stream channel is 10 to 12 meters wide, with moderately eroded banks 2 meters high. Habitat consists of a shallow run grading to a slackwater pool created by a small beaver dam. Substrate is dominated by sand, with clay along the banks. Surveys were conducted for 2.13 person hours.

Table 40. Swift Creek Site-101123.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	144	67.60/hr
Elliptio congarea	Carolina Slabshell	2	0.94/hr
Elliptio icterina	Variable Spike	20	9.39/hr
Elliptio mediocris	No Common Name	3	1.41/hr
Elliptio roanokensis	Roanoke Slabshell	1	0.47/hr
Lampsilis radiata	Eastern Lampmussel	1	0.47/hr
Pyganodon cataracta	Eastern Floater	9	4.22/hr
Utterbackia imbecillis	Paper Pondshell	4	1.88/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101123.1
This site occurs adjacent to the Indian Overlook Residential Community and extends from the WWTP discharge point upstream for 167 meters. Habitat consists of a straight relatively shallow pool habitat, with small sandbar and log jam created riffles interspersed. The stream channel is 10 meters wide, with moderately eroded banks 2 meters high. Substrate is dominated by sand and gravel, with clay along the banks. Surveys were conducted for 8.53 person hours.

Table 41. Swift Creek Site-101123.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	578	67.76/hr
Elliptio congarea	Carolina Slabshell	6	0.70/hr
Elliptio icterina	Variable Spike	51	5.98/hr
Elliptio producta	Atlantic Spike	3	0.35/hr
Elliptio roanokensis	Roanoke Slabshell	1	0.12/hr
Lampsilis radiata	Eastern Lampmussel	3	0.35/hr
Pyganodon cataracta	Eastern Floater	47	5.51/hr
Utterbackia imbecillis	Paper Pondshell	2	0.23/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101027.1

This site occurs adjacent to the Indian Overlook Residential Community and extends from a point approximately 167 meters downstream of the WWTP discharge point up to the discharge point. The site occurs in a broad bend of the creek, and contains shallow riffle and run habitats dominated by gravel, sand, and cobble substrate. The stream channel is 10 to 12 meters wide, with moderately eroded banks 2 meters high. Surveys were conducted for 10.58 person hours.

Table 42. Swift Creek Site-101027.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	185	17.48/hr
Elliptio icterina	Variable Spike	17	1.61/hr
Fusconaia masoni	Atlantic Pigtoe	2	0.19/hr
Lampsilis radiata	Eastern Lampmussel	1	0.09/hr
Pyganodon cataracta	Eastern Floater	83	7.84/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101027.4

This site occurs in short, cobble and gravel dominated, riffle habitat, in a narrow bend of the creek, approximately 180 meters below the Indian Overlook WWTP discharge. The stream channel is 8 meters wide, with moderately eroded banks 2 meters high. Surveys were conducted for 0.53 person hours.

Table 43. Swift Creek Site-101027.4: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	5	9.43/hr
Elliptio icterina	Variable Spike	1	1.89/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101027.3
This site occurs in wide straight section of the creek approximately 240 meters below the Indian Overlook WWTP discharge. The stream channel is 15 meters wide, with moderately eroded banks 2 meters high. Habitat consists of a series of small riffle, run, and pool habitats. Surveys were conducted for 1.0 person hour.

Table 44. Swift Creek Site-101027.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	61	61.00/hr
Elliptio icterina	Variable Spike	7	7.00/hr
Pyganodon cataracta	Eastern Floater	3	3.00/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101027.2
This site occurs in wide straight section of the creek approximately 470 meters below the Indian Overlook WWTP discharge. The stream channel is 15 meters wide, with severely eroded banks 2 meters high. Large sandbars and log jams occur throughout this reach, and the habitat consists of shallow runs dominated by shifting sand, and deep pools above the log jams with clay banks. Surveys were conducted for 1.47 person hours.

Table 45. Swift Creek Site-101027.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	29	19.73/hr
Elliptio icterina	Variable Spike	Shell	0.0/hr
Lampsilis radiata	Eastern Lampmussel	Shell	0.0/hr
Pyganodon cataracta	Eastern Floater	4	2.72/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101007.6
This site was accessed from the Garner WWTP Spray Field facility off Wrenn Road, and occurs in a narrow bend of the creek approximately 1,300 meters below the Indian Overlook WWTP discharge. The stream channel is 15 meters wide, with moderately eroded banks 1.5 meters high. Habitat consists of shallow riffles and runs dominated by sand with clay banks. Surveys were conducted for 2.67 person hours.

Table 46. Swift Creek Site-101007.6: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	3	1.12/hr
Elliptio complanata	Eastern Elliptio	219	82.02/hr
Elliptio congarea	Carolina Slabshell	1	0.37/hr
Elliptio icterina	Variable Spike	30	11.24/hr
Elliptio mediocris	No Common Name	1	0.37/hr
Lampsilis radiata	Eastern Lampmussel	1	0.37/hr
Pyganodon cataracta	Eastern Floater	1	0.37/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101007.5
This 30 meter long site was accessed from the Garner WWTP Spray Field facility off Wrenn Road, and occurs in a narrow, straight run habitat approximately 1,370 meters below the Indian Overlook WWTP discharge. The stream channel is 15 meters wide, with moderately eroded banks 1.5 meters high. Substrate is dominated by sand and pebble with clay banks. Surveys were conducted for 1.92 person hours.

Table 47. Swift Creek Site-101007.5: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	154	80.21/hr
Elliptio icterina	Variable Spike	40	20.83/hr
Fusconaia masoni	Atlantic Pigtoe	2	1.04/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101007.1
This 30-meter long site was accessed from the Garner WWTP Spray Field facility off Wrenn Road, and occurs in a bend with shallow riffle/run habitat approximately 1,630 meters below the Indian Overlook WWTP discharge. The stream channel is 15 meters wide, with moderately eroded banks 1.5 meters high. Substrate is dominated by sand and pebble with clay banks. Surveys were conducted for 3.13 person hours.

Table 48. Swift Creek Site-101007.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	211	67.41/hr
Elliptio icterina	Variable Spike	36	11.50/hr
Elliptio mediocris	No Common Name	1	0.32/hr
Elliptio producta	Atlantic Spike	1	0.32/hr
Strophitus undulatus	Creeper	1	0.32/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101007.4
This site was accessed from the Garner WWTP Spray Field facility off Wrenn Road, and occurs in a wide, straight section of the creek approximately 1,830 meters below the Indian Overlook WWTP discharge. The stream channel is 18 meters wide, with severely eroded banks 2 meters high. Habitat is classified as a shallow run dominated by sand and pebble with clay banks. A large amount of woody debris is present. Surveys were conducted for 2.06 person hours.

Table 49. Swift Creek Site-101007.4: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	113	54.85/hr
Elliptio icterina	Variable Spike	18	8.74/hr
Elliptio producta	Atlantic Spike	1	0.48/hr
Fusconaia masoni	Atlantic Pigtoe	1	0.48/hr
Lampsilis radiata	Eastern Lampmussel	1	0.48/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101007.3
This site was accessed from the Garner WWTP Spray Field facility off Wrenn Road, and occurs in a narrow bend at the confluence with an intermittent tributary from the north, approximately 1,930 meters below the Indian Overlook WWTP discharge. The stream channel is 12 meters wide, with severely eroded banks 1.5 meters high. Habitat is classified as a shallow riffle/run dominated by sand and pebble with clay banks. A large amount of woody debris is present. Surveys were conducted for 2.75 person hours.

Table 50. Swift Creek Site-101007.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	280	101.82/hr
Elliptio congarea	Carolina Slabshell	3	1.09/hr
Elliptio icterina	Variable Spike	48	17.45/hr
Lampsilis radiata	Eastern Lampmussel	1	0.36/hr
Pyganodon cataracta	Eastern Floater	1	0.36/hr
Strophitus undulatus	Creeper	1	0.36/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101007.2
This site was accessed from the Garner WWTP Spray Field facility off Wrenn Road, and occurs in a long, straight section of the stream approximately 1,100 meters above the Wake/Johnston County line. The stream channel is 15 meters wide, with severely eroded banks 1.5 meters high. Habitat consists primarily of deep runs and pools with a few small riffle areas that have formed below fallen trees. The substrate is dominated by sand and pebble with clay banks. Surveys were conducted for 4.0 person hours.

Table 51. Swift Creek Site-101007.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	347	86.75/hr
Elliptio icterina	Variable Spike	14	3.50/hr
Pyganodon cataracta	Eastern Floater	1	0.25/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101027.10
This site was accessed from the I-40 crossing of the creek, and occurs in a wide section of the stream approximately 100 meters above the Wake/Johnston County line. The stream channel is 12 meters wide, with moderately eroded banks 2 meters high. Habitat consists primarily of deep runs and pools with a few small riffle areas that have formed below fallen trees. The substrate is dominated by sand and pebble with clay banks. Surveys were conducted for 2.33 person hours.

Table 52. Swift Creek Site-101027.10: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	2	0.86/hr
Elliptio complanata	Eastern Elliptio	221	94.85/hr
Elliptio congarea	Carolina Slabshell	1	0.43/hr
Elliptio icterina	Variable Spike	35	15.02/hr
Elliptio lanceolata	Yellow Lance	1	0.43/hr
Fusconaia masoni	Atlantic Pigtoe	1	0.43/hr
Strophitus undulatus	Creeper	1	0.43/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101027.9

This site was accessed from the I-40 crossing of the creek, and occurs in a narrow straight section of the stream in the vicinity of the Wake/Johnston County line. The stream channel ranges from 8 to 10 meters wide, with moderately eroded banks 2 meters high. The site consists of a sequence of shallow glide, riffle, and run habitat sequences. The substrate is dominated by sand and gravel with clay banks. Surveys were conducted for 3.73 person hours.

Table 53. Swift Creek Site-101027.9: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	1	0.27/hr
Elliptio complanata	Eastern Elliptio	336	90.08/hr
Elliptio congarea	Carolina Slabshell	3	0.80/hr
Elliptio icterina	Variable Spike	50	13.40/hr
Lampsilis radiata	Eastern Lampmussel	Shell	0.0/hr
Pyganodon cataracta	Eastern Floater	2	0.54/hr
Strophitus undulatus	Creeper	2	0.54/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101027.8

This 30-meter long site was accessed from the I-40 crossing of the creek, and occurs in a broad bend of the stream approximately 280 meters downstream of the Wake/Johnston County line. The stream channel ranges from 6 to 10 meters wide, with moderately eroded banks 2 to 3-meters high. The site consists of a sequence of shallow, glide, riffle and run habitat sequences. The substrate is dominated by bedrock overlain with sand, gravel and cobble with clay banks. Surveys were conducted for 3.67 person hours.

Table 54. Swift Creek Site-101027.8: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta heterodon	Dwarf Wedgemussel	1	0.27/hr
Alasmidonta undulata	Triangle Floater	4	1.09/hr
Elliptio complanata	Eastern Elliptio	915	249.32/hr
Elliptio congarea	Carolina Slabshell	14	3.81/hr
Elliptio icterina	Variable Spike	133	36.24/hr
Elliptio lanceolata	Yellow Lance	1	0.27/hr
Elliptio roanokensis	Roanoke Slabshell	5	1.36/hr
Fusconaia masoni	Atlantic Pigtoe	2	0.54/hr
Lampsilis radiata	Eastern Lampmussel	1	0.27/hr
Strophitus undulatus	Creeper	2	0.54/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101027.7
This site was accessed from the I-40 crossing of the creek, and occurs in a narrow straight section between two bends of the stream in approximately 320 meters downstream of the Wake/Johnston County line. The stream channel ranges from 6 to 8 meters wide, with moderately eroded banks 2 meters high. The site contains a sequence of shallow, glide, riffle and run habitat sequences. The substrate is dominated by sand and pebble with clay banks. Surveys were conducted for 3.0 person hours.

Table 55. Swift Creek Site-101027.7: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	2	0.67/hr
Elliptio complanata	Eastern Elliptio	190	63.33/hr
Elliptio congarea	Carolina Slabshell	5	1.67/hr
Elliptio icterina	Variable Spike	17	5.67/hr
Elliptio mediocris	No Common Name	2	0.67/hr
Elliptio roanokensis	Roanoke Slabshell	3	1.00/hr
Fusconaia masoni	Atlantic Pigtoe	1	0.33hr
Lampsilis radiata	Eastern Lampmussel	1	0.33/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101027.6
This site was accessed from the I-40 crossing of the creek, and occurs between two narrow bends approximately 300 meters upstream of I-40. The stream channel ranges from 6 to 8 meters wide, with moderately eroded banks 2 meters high. Habitat consists

primarily of runs and pools, with limited riffles. The substrate is dominated by sand and pebble with clay banks and scattered boulders. Surveys were conducted for 3.67 person hours.

Table 56. Swift Creek Site-101027.6: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	2	0.54/hr
Elliptio complanata	Eastern Elliptio	284	77.38/hr
Elliptio congarea	Carolina Slabshell	11	3.00/hr
Elliptio icterina	Variable Spike	29	7.90/hr
Elliptio mediocris	No Common Name	2	0.54/hr
Elliptio roanokensis	Roanoke Slabshell	1	0.27/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101027.5
This site was accessed from the I-40 crossing of the creek, and occurs in a long, straight, narrow section of the stream approximately 200 meters upstream of I-40. The stream channel ranges from 5 to 8 meters wide, with moderately eroded banks 2 meters high. Habitat consists primarily of runs and pools, with limited riffles. The substrate is dominated by sand and pebble with clay banks and scattered boulders. Surveys were conducted for 2.87 person hours.

Table 57. Swift Creek Site-101027.5: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	63	21.95/hr
Elliptio congarea	Carolina Slabshell	3	1.04/hr
Elliptio icterina	Variable Spike	13	4.53/hr
Elliptio roanokensis	Roanoke Slabshell	2	0.70/hr
Lampsilis radiata	Eastern Lampmussel	2	0.70/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101021.7
This site occurs just below the I-40 crossing of the creek. The stream channel ranges from 8 to 10 meters wide, with severely eroded banks 2.5 meters high. Habitat consists primarily of runs and pools, with limited riffles created by sandbars and log jams. The substrate is dominated by shifting sand. Surveys were conducted for 2.92 person hours.

Table 58. Swift Creek Site-101021.7: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	1	0.34/hr
Elliptio complanata	Eastern Elliptio	55	18.84/hr
Elliptio congarea	Carolina Slabshell	5	1.71/hr
Elliptio icterina	Variable Spike	8	2.74/hr
Lampsilis radiata	Eastern Lampmussel	1	0.34/hr
Strophitus undulatus	Creeper	1	0.34/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101021.6

This site occurs approximately 380 meters below the I-40 crossing of the creek in a long straight section. The stream channel ranges from 8 to 10 meters wide, with moderately eroded banks 2.5 meters high. The site contains a sequence of shallow, glide, riffle and run habitat sequences. The substrate is dominated by sand and pebble with clay banks. Surveys were conducted for 6.42 person hours.

Table 59. Swift Creek Site-101021.6: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	2	0.31/hr
Elliptio complanata	Eastern Elliptio	200	31.15/hr
Elliptio congarea	Carolina Slabshell	1	0.16/hr
Elliptio icterina	Variable Spike	39	6.07/hr
Elliptio lanceolata	Yellow Lance	1	0.16/hr
Elliptio roanokensis	Roanoke Slabshell	3	0.47/hr
Fusconaia masoni	Atlantic Pigtoe	3	0.47/hr
Lampsilis radiata	Eastern Lampmussel	2	0.31/hr
Pyganodon cataracta	Eastern Floater	1	0.16/hr
Strophitus undulatus	Creeper	1	0.16/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101021.5

This site occurs approximately 480 meters below the I-40 crossing of the creek in a long straight run habitat. The stream channel ranges from 7 to 9 meters wide, with moderately eroded banks 2 meters high. The substrate is dominated by sand and gravel, with clay banks and occasional cobble and boulder. Surveys were conducted for 3.85 person hours.

Table 60. Swift Creek Site-101021.5: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	62	16.10/hr
Elliptio congarea	Carolina Slabshell	9	2.34/hr
Elliptio icterina	Variable Spike	16	4.16/hr
Elliptio roanokensis	Roanoke Slabshell	2	0.52/hr
Fusconaia masoni	Atlantic Pigtoe	2	0.52/hr
Pyganodon cataracta	Eastern Floater	1	0.26/hr
Strophitus undulatus	Creeper	1	0.26/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101021.4
This site occurs approximately 580 meters below the I-40 crossing of the creek in a long, straight section. The stream channel ranges from 8 to 10 meters wide, with moderately eroded banks 2.5 meters high. The site contains a sequence of shallow glide, riffle, and run habitat sequences. The substrate is dominated by sand and pebble with clay banks. Surveys were conducted for 3.25 person hours.

Table 61. Swift Creek Site-101021.4: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	1	0.31/hr
Elliptio complanata	Eastern Elliptio	231	71.08/hr
Elliptio congarea	Carolina Slabshell	10	3.08/hr
Elliptio icterina	Variable Spike	28	8.62/hr
Elliptio roanokensis	Roanoke Slabshell	2	0.62/hr
Fusconaia masoni	Atlantic Pigtoe	2	0.62/hr
Strophitus undulatus	Creeper	1	0.31/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Patchy, Common
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101021.3
This 30 meter long site occurs approximately 620 meters below the I-40 crossing of the creek in a long, straight section. The stream channel ranges from 8 to 10 meters wide, with moderately eroded banks 2.5 meters high. Habitat consists of a shallow riffle transitioning to a deep run. The substrate is dominated by sand and gravel with clay banks. Surveys were conducted for 2.83 person hours.

Table 62. Swift Creek Site-101021.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	126	44.52/hr
Elliptio congarea	Carolina Slabshell	2	0.71/hr
Elliptio icterina	Variable Spike	16	5.65/hr
Lampsilis radiata	Eastern Lampmussel	1	0.35/hr
Strophitus undulatus	Creeper	1	0.35/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Patchy, Common
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101021.2
This site occurs approximately 700 meters below the I-40 crossing of the creek in a long, straight, narrow section. The stream channel ranges from 6 to 8 meters wide, with fairly stable banks 2 meters high. The site contains a braided channel of shallow glide, riffle, and run habitat sequences created by sandbars. The substrate is dominated by sand and pebble with clay banks. Surveys were conducted for 4.67 person hours.

Table 63. Swift Creek Site-101021.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	1	0.21/hr
Elliptio complanata	Eastern Elliptio	234	50.11/hr
Elliptio congarea	Carolina Slabshell	4	0.86/hr
Elliptio icterina	Variable Spike	62	13.28/hr
Elliptio mediocris	No Common Name	1	0.21/hr
Elliptio roanokensis	Roanoke Slabshell	2	0.43/hr
Fusconaia masoni	Atlantic Pigtoe	2	0.43/hr
Lampsilis radiata	Eastern Lampmussel	4	0.86/hr
Strophitus undulatus	Creeper	8	1.71/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101021.1
This site occurs approximately 800 meters below the I-40 crossing of the creek in a long, straight section. The stream channel ranges from 8 to 10 meters wide, with fairly stable banks 2 meters high. The site contains riffle and run habitats. The substrate is dominated by sand and pebble with clay banks. Surveys were conducted for 3.5 person hours.

Table 64. Swift Creek Site-101021.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	2	0.57/hr
Elliptio complanata	Eastern Elliptio	147	42.00/hr
Elliptio congarea	Carolina Slabshell	4	1.14/hr
Elliptio icterina	Variable Spike	23	6.57/hr
Elliptio lanceolata	Yellow Lance	1	0.28/hr
Elliptio producta	Atlantic Spike	1	0.28/hr
Elliptio roanokensis	Roanoke Slabshell	1	0.28/hr
Fusconaia masoni	Atlantic Pigtoe	1	0.28/hr
Strophitus undulatus	Creeper	1	0.28/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101012.8
This site occurs approximately 1,000 meters below the I-40 crossing of the creek in a long straight run. The stream channel ranges from 6 to 8 meters wide, with moderately eroded banks 1.5 meters high. The substrate is dominated by sand and gravel with clay banks. Surveys were conducted for 1.33 person hours.

Table 65. Swift Creek Site-101012.8: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	3	2.26/hr
Elliptio complanata	Eastern Elliptio	140	105.26/hr
Elliptio congarea	Carolina Slabshell	1	0.75/hr
Elliptio icterina	Variable Spike	28	21.05/hr
Elliptio roanokensis	Roanoke Slabshell	1	0.75/hr
Strophitus undulatus	Creeper	1	0.75/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101012.7
This site occurs approximately 1,100 meters below the I-40 crossing of the creek in a broad bend. The stream channel ranges from 6 to 8 meters wide, with eroded banks 2 meters high. Habitat consists of a shallow riffle grading into a deep run. The substrate is dominated by sand and gravel with clay banks. Surveys were conducted for 2.67 person hours.

Table 66. Swift Creek Site-101012.7: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	2	0.75/hr
Elliptio complanata	Eastern Elliptio	243	91.01/hr
Elliptio congarea	Carolina Slabshell	4	1.50/hr
Elliptio icterina	Variable Spike	21	7.86/hr
Elliptio mediocris	No Common Name	4	1.50/hr
Elliptio roanokensis	Roanoke Slabshell	1	0.37/hr
Strophitus undulatus	Creeper	1	0.37/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101012.6
This site occurs approximately 800 meters above the NC 42 crossing of the creek in long straight pool and glide habitat. The stream channel ranges from 6 to 8 meters wide, with eroded banks 3 meters high. The substrate is dominated by sand and silt with clay banks and occasional boulders. Surveys were conducted for 1.62 person hours.

Table 67. Swift Creek Site-101012.6: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	112	69.14/hr
Elliptio icterina	Variable Spike	7	4.32/hr
Fusconaia masoni	Atlantic Pigtoe	1	0.62/hr
Lampsilis radiata	Eastern Lampmussel	1	0.62/hr
Strophitus undulatus	Creeper	2	1.23/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101012.5
This site occurs approximately 700 meters above the NC 42 crossing of the creek in broad bend with glide, riffle, and run habitat sequences. The stream channel ranges from 6 to 8 meters wide, with moderately eroded banks 2 meters high. The substrate is dominated by sand with clay banks. Surveys were conducted for 1.67 person hours.

Table 68. Swift Creek Site-101012.5: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	91	54.49/hr
Elliptio icterina	Variable Spike	7	4.19/hr
Elliptio lanceolata	Yellow Lance	1	0.60/hr
Fusconaia masoni	Atlantic Pigtoe	1	0.60/hr
Strophitus undulatus	Creeper	1	0.60/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101012.4
This site occurs approximately 600 meters above the NC 42 crossing of the creek in straight section between two bends with riffle and run habitats. The stream channel ranges from 6 to 8 meters wide, with moderately eroded banks 2 meters high. The substrate is dominated by sand with clay banks. Surveys were conducted for 2.0 person hours.

Table 69. Swift Creek Site-101012.4: Mollusk Species Found

Scientific Name	Common Name	#	Abundance /CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	88	44.00/hr
Elliptio congarea	Carolina Slabshell	3	1.50/hr
Elliptio icterina	Variable Spike	16	8.00/hr
Elliptio roanokensis	Roanoke Slabshell	2	1.00/hr
Fusconaia masoni	Atlantic Pigtoe	1	0.50/hr
Lampsilis radiata	Eastern Lampmussel	2	1.00/hr
Strophitus undulatus	Creeper	1	0.50/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101012.3
This site occurs approximately 400 meters above the NC 42 crossing of the creek in straight section just below the confluence of an unnamed tributary to the north. The stream channel ranges from 6 to 8 meters wide, with severely eroded banks 2 meters high. Habitat consists of deep pool grading into a swift run. The substrate is dominated by shifting sand with clay banks. Surveys were conducted for 1.0 person hour.

Table 70. Swift Creek Site-101012.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	60	60.00/hr
Elliptio congarea	Carolina Slabshell	1	1.00/hr
Elliptio icterina	Variable Spike	6	6.00/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101012.2
This site occurs approximately 300 meters above the NC 42 crossing of the creek just above a narrow bend of the creek. The stream channel ranges from 6 to 8 meters wide, with severely eroded banks 2 meters high. Habitat consists of a shallow riffle grading into a swift run. The substrate is dominated by shifting sand with clay banks. Surveys were conducted for 1.0 person hour.

Table 71. Swift Creek Site-101012.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	64	64.00/hr
Elliptio congarea	Carolina Slabshell	1	1.00/hr
Elliptio icterina	Variable Spike	12	12.00/hr
Elliptio roanokensis	Roanoke Slabshell	1	1.00/hr
Lampsilis radiata	Eastern Lampmussel	Shell	0.0/hr
Strophitus undulatus	Creeper	1	1.00/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101012.1
This site occurs approximately 200 meters above the NC 42 crossing of the creek in a narrow bend of the creek. The stream channel ranges from 5 to 6 meters wide, with severely eroded banks 2 meters high. Habitat consists of a shallow riffle grading into a swift run. The substrate is dominated by shifting sand with clay banks. Surveys were conducted for 1.5 person hours.

Table 72. Swift Creek Site-101012.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Alasmidonta undulata	Triangle Floater	1	0.67/hr
Elliptio complanata	Eastern Elliptio	116	77.33/hr
Elliptio congarea	Carolina Slabshell	1	0.67/hr
Elliptio icterina	Variable Spike	20	13.33/hr
Lampsilis radiata	Eastern Lampmussel	Shell	0.0/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

UT Swift Creek Site-100713.4

This UT to Swift Creek, which flows into Swift Creek approximately 400 meters upstream of NC 42, extends from the SR 1548 crossing of the stream to a point approximately 260 meters upstream. Numerous beaver dams within the stream and adjacent floodplain have created a braided channel wetland system. Substrate consists of sand and mud, with large amounts of detritus and aquatic vegetation. Surveys were conducted for a total of 1.00 person hour. No freshwater mussels were found; however, three aquatic snail species were common, and the Asian clam was also present.

Table 73. Swift Creek Site-100713.4: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
None	~	~	~
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Uncommon
Helisoma anceps	Two-ridge Ram's Horn	~	Common
Physidae	A Physid Snail		Common

Swift Creek between Lake Benson and Cornwallis Road Site-101013.9

This site occurs approximately 100 meters below the NC 42 crossing of the creek in a narrow bend. The stream channel ranges from 5 to 6 meters wide, with relatively stable banks 2 meters high. Habitat consists of a shallow glide grading into a swift run. The substrate is dominated by gravel and sand with clay banks. Surveys were conducted for 2.0 person hours.

Table 74. Swift Creek Site-101013.9: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	1	0.50/hr
Elliptio complanata	Eastern Elliptio	251	125.50/hr
Elliptio congarea	Carolina Slabshell	2	1.00/hr
Elliptio icterina	Variable Spike	54	27.00/hr
Elliptio mediocris	No Common Name	2	1.00/hr
Elliptio roanokensis	Roanoke Slabshell	2	1.00/hr
Fusconaia masoni	Atlantic Pigtoe	2	1.00/hr
Lampsilis radiata	Eastern Lampmussel	1	0.50/hr
Pyganodon cataracta	Eastern Floater	1	0.50/hr
Strophitus undulatus	Creeper	5	2.50/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101013.8
This site occurs in a long straight section of the stream below a broad bend approximately 170 meters below the NC 42 crossing of the creek. The stream channel ranges from 5 to 6 meters wide, with moderately eroded banks 2 meters high. Habitat consists of a long pool grading into a short riffle. The substrate is dominated by gravel and sand with clay banks. Surveys were conducted for 0.67 person hour.

Table 75. Swift Creek Site-101013.8: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	33	49.25/hr
Elliptio congarea	Carolina Slabshell	1	1.49/hr
Elliptio icterina	Variable Spike	5	7.46/hr
Elliptio mediocris	No Common Name	1	1.49/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101013.7
This site occurs in a long straight section of the stream below a broad bend approximately 200 meters below the NC 42 crossing of the creek. The stream channel ranges from 5 to 6 meters wide, with severely eroded banks 2 meters high. Habitat consists of a long pool grading into a short run. Large amounts of woody debris are present. The substrate is dominated by gravel and sand with clay banks. Surveys were conducted for 0.67 person hour.

Table 76. Swift Creek Site-101013.7: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	12	17.91/hr
Elliptio icterina	Variable Spike	2	2.98/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101013.6

This site occurs in a long, straight, constricted section of the stream approximately 230 meters below the NC 42 crossing of the creek. The stream channel ranges from 5 to 6 meters wide, with moderately eroded banks 2 meters high. Habitat consists of a riffle and run series. The substrate is dominated by gravel and sand with clay banks. Surveys were conducted for 1.33 person hours.

Table 77. Swift Creek Site-101013.6: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Alasmidonta undulata	Triangle Floater	3	2.26/hr
Elliptio complanata	Eastern Elliptio	137	103.00/hr
Elliptio congarea	Carolina Slabshell	1	0.75/hr
Elliptio icterina	Variable Spike	17	12.78/hr
Elliptio mediocris	No Common Name	1	0.75/hr
Fusconaia masoni	Atlantic Pigtoe	1	0.75/hr
Lampsilis radiata	Eastern Lampmussel	1	0.75/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101013.5

This site occurs in a long pool above a broad bend approximately 260 meters below the NC 42 crossing of the creek. The stream channel ranges from 5 to 6 meters wide, with severely eroded banks 2 meters high. The substrate is dominated by sand and silt with clay banks. A large amount of woody debris and detritus is present. Surveys were conducted for 1.0 person hour.

Table 78. Swift Creek Site-101013.5: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	96	96.00/hr
Elliptio congarea	Carolina Slabshell	4	4.00/hr
Elliptio icterina	Variable Spike	11	11.00/hr
Fusconaia masoni	Atlantic Pigtoe	1	1.00/hr
Utterbackia imbecillis	Paper Pondshell	1	1.00/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101013.3
This site occurs in a broad bend approximately 660 meters below the NC 42 crossing of the creek. The stream channel ranges 6 to 7 meters wide, with relatively stable banks 2 meters high. Habitat consists of a shallow glide transitioning to a run. The substrate is dominated by sand and pebble with clay banks. Surveys were conducted for 2.88 person hours.

Table 79. Swift Creek Site-101013.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Alasmidonta undulata	Triangle Floater	4	1.39/hr
Elliptio complanata	Eastern Elliptio	425	147.57/hr
Elliptio congarea	Carolina Slabshell	1	0.35/hr
Elliptio icterina	Variable Spike	38	13.19/hr
Fusconaia masoni	Atlantic Pigtoe	3	1.04/hr
Lampsilis radiata	Eastern Lampmussel	6	2.08/hr
Strophitus undulatus	Creeper	4	1.39/hr
Utterbackia imbecillis	Paper Pondshell	1	0.35/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101013.2
This site occurs in straight wide section approximately 700 meters below the NC 42 crossing of the creek. The stream channel ranges 8 to 9 meters wide, with moderately eroded banks 2 meters high. Habitat is characterized as a glide to riffle to run sequence, with sand and gravel substrate. Surveys were conducted for 1.33 person hours.

Table 80. Swift Creek Site-101013.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	3	2.26/hr
Elliptio complanata	Eastern Elliptio	121	90.98/hr
Elliptio congarea	Carolina Slabshell	1	0.75/hr
Elliptio icterina	Variable Spike	11	8.27/hr
Elliptio lanceolata	Yellow Lance	1	0.75/hr
Elliptio mediocris	No Common Name	3	2.26/hr
Lampsilis radiata	Eastern Lampmussel	6	4.51/hr
Strophitus undulatus	Creeper	2	1.50/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon
Corbicula fluminea	Asian Clam	~	Common
Physidae	A Physid Snail	~	Uncommon

Swift Creek between Lake Benson and Cornwallis Road Site-101013.4
This site occurs in small riffle section at the confluence of an intermittent channel from the south, approximately 730 meters below the NC 42 crossing of the creek. The stream channel ranges from 7 to 8 meters wide, with relatively stable banks 2 meters high. The substrate is dominated by sand and pebble with clay banks. Surveys were conducted for 0.58 person hour.

Table 81. Swift Creek Site-101013.4: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	1	1.72/hr
Elliptio complanata	Eastern Elliptio	25	43.10/hr
Elliptio icterina	Variable Spike	14	24.14/hr
Elliptio mediocris	No Common Name	1	1.72/hr
Lampsilis radiata	Eastern Lampmussel	1	1.72/hr
Strophitus undulatus	Creeper	2	3.45/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Common

Swift Creek between Lake Benson and Cornwallis Road Site-101013.1
This site occurs in straight wide section approximately 750 meters below the NC 42 crossing of the creek. The stream channel ranges from 8 to 9 meters wide, with moderately eroded banks 2 meters high. Habitat is characterized as a glide to riffle to run sequence, with sand and gravel substrate. Surveys were conducted for 2.33 person hours.

Table 82. Swift Creek Site-101013.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta heterodon	Dwarf Wedgemussel	1	0.43/hr
Alasmidonta undulata	Triangle Floater	7	3.00/hr
Elliptio complanata	Eastern Elliptio	180	77.25/hr
Elliptio icterina	Variable Spike	28	12.02/hr
Elliptio roanokensis	Roanoke Slabshell	1	0.43/hr
Lampsilis radiata	Eastern Lampmussel	1	0.43/hr
Strophitus undulatus	Creeper	2	0.86/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon
Corbicula fluminea	Asian Clam	~	Common
Planorbella trivolvis	Marsh Ram's Horn	~	Rare

Swift Creek between Lake Benson and Cornwallis Road Site-101026.4

This site occurs in straight wide section approximately 770 meters below the NC 42 crossing of the creek. The stream channel ranges from 8 to 10 meters wide, with moderately eroded banks 2 meters high. Habitat is characterized as a series of glide to riffle to run sequences, with sand and gravel substrate. Surveys were conducted for 6.50 person hours.

Table 83. Swift Creek Site-101026.4: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta heterodon	Dwarf Wedgemussel	1	0.15/hr
Alasmidonta undulata	Triangle Floater	11	1.69/hr
Elliptio complanata	Eastern Elliptio	489	75.23/hr
Elliptio congarea	Carolina Slabshell	8	1.23/hr
Elliptio icterina	Variable Spike	89	13.69/hr
Elliptio lanceolata	Yellow Lance	1	0.15/hr
Elliptio mediocris	No Common Name	9	1.38/hr
Elliptio producta	Atlantic Spike	1	0.15/hr
Elliptio roanokensis	Roanoke Slabshell	2	0.31/hr
Fusconaia masoni	Atlantic Pigtoe	1	0.15/hr
Lampsilis radiata	Eastern Lampmussel	1	0.15/hr
Pyganodon cataracta	Eastern Floater	2	0.31/hr
Strophitus undulatus	Creeper	5	0.77/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101026.3
This site occurs in narrow bend approximately 950 meters below the NC 42 crossing of the creek. The stream channel ranges from 6 to 8 meters wide, with moderately eroded banks 2 meters high. Habitat is characterized as a riffle to run sequence, with sand and gravel substrate. Surveys were conducted for 5.58 person hours.

Table 84. Swift Creek Site-101026.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulataundulate	Triangle Floater	8	1.43/hr
Elliptio complanata	Eastern Elliptio	515	92.29/hr
Elliptio congarea	Carolina Slabshell	7	1.25/hr
Elliptio icterina	Variable Spike	173	31.00/hr
Elliptio mediocris	No Common Name	10	1.79/hr
Elliptio roanokensis	Roanoke Slabshell	1	0.18/hr
Fusconaia masoni	Atlantic Pigtoe	6	1.08/hr
Pyganodon cataracta	Eastern Floater	1	0.18/hr
Strophitus undulatus	Creeper	6	1.08/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101026.2
This site occurs in a short run between two narrow bends approximately 980 meters below the NC 42 crossing of the creek. The stream channel ranges from 7 to 9 meters wide, with moderately eroded banks 2 meters high. Habitat consists of sand and pebble with clay banks. Surveys were conducted for 1.17 person hours.

Table 85. Swift Creek Site-101026.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	1	0.85/hr
Elliptio complanata	Eastern Elliptio	130	111.11/hr
Elliptio congarea	Carolina Slabshell	2	1.71/hr
Elliptio icterina	Variable Spike	23	19.66/hr
Fusconaia masoni	Atlantic Pigtoe	1	0.85/hr
Lampsilis radiata	Eastern Lampmussel	2	1.71/hr
Strophitus undulatus	Creeper	2	1.71/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101026.1
This site occurs in straight section approximately 1,010 meters below the NC 42 crossing of the creek. The stream channel ranges from 8 to 10 meters wide, with moderately eroded banks 2 meters high. Habitat is characterized as a glide to riffle to run sequence, with sand and pebble substrate. Surveys were conducted for 3.75 person hours.

Table 86. Swift Creek Site-101026.1: Mollusk Species Found

Scientific Name	**Common Name**	**#**	**Abundance/ CPUE**
Freshwater Mussels	**~**	**~**	**CPUE**
Alasmidonta undulata	Triangle Floater	1	0.27/hr
Elliptio complanata	Eastern Elliptio	257	68.53/hr
Elliptio congarea	Carolina Slabshell	5	1.33/hr
Elliptio icterina	Variable Spike	86	22.93/hr
Elliptio lanceolata	Yellow Lance	1	0.27/hr
Elliptio mediocris	No Common Name	4	1.07/hr
Elliptio roanokensis	Roanoke Slabshell	1	0.27/hr
Fusconaia masoni	Atlantic Pigtoe	2	0.53/hr
Lampsilis radiata	Eastern Lampmussel	1	0.27/hr
Strophitus undulatus	Creeper	3	0.80/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Rare
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101019.4
This site occurs in narrow, straight section approximately 1,000 meters above the Cornwallis Road (SR 1525) crossing of the creek. The stream channel ranges from 8 to 10 meters wide, with moderately eroded banks 2 meters high. Habitat is characterized as a scoured run, with sand and pebble substrate with occasional cobble. Surveys were conducted for 3.73 person hours.

Table 87. Swift Creek Site-101019.4: Mollusk Species Found

Scientific Name	**Common Name**	**#**	**Abundance/ CPUE**
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	246	65.95/hr
Elliptio icterina	Variable Spike	23	6.17/hr
Elliptio roanokensis	Roanoke Slabshell	1	0.27/hr
Fusconaia masoni	Atlantic Pigtoe	2	0.54/hr
Strophitus undulatus	Creeper	2	0.54/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Rare
Corbicula fluminea	Asian Clam	~	Abundant

Swift Creek between Lake Benson and Cornwallis Road Site-101019.3
This site occurs in broad bend approximately 600 meters above the Cornwallis Road (SR 1525) crossing of the creek. The stream channel ranges from 8 to 10 meters wide, with moderately eroded banks 2 meters high. Habitat is characterized as a scoured run, with sand and pebble substrate with occasional cobble. Surveys were conducted for 4.0 person hours.

Table 88. Swift Creek Site-101019.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Alasmidonta undulata	Triangle Floater	1	0.25/hr
Elliptio complanata	Eastern Elliptio	291	72.75/hr
Elliptio congarea	Carolina Slabshell	2	0.50/hr
Elliptio icterina	Variable Spike	32	8.00/hr
Elliptio mediocris	No Common Name	1	0.25/hr
Lampsilis radiata	Eastern Lampmussel	2	0.50/hr
Strophitus undulatus	Creeper	3	0.75/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

White Oak Creek Site-100722.1
This section of White Oak Creek was accessed off the Raynor Road (SR 2555) crossing. Channel width ranged from 2 to 4 meters with relatively stable 1-meter high banks. In order of dominance, substrate consisted of sand, clay, silt, and pebble. Water levels were normal and water visibility was clear. Mussel surveys were conducted for a total of 1.83 person hours.

Table 89. White Oak Creek Site-100722.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	34	18.58/hr
Elliptio icterina	Variable Spike	2	1.09/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Uncommon

White Oak Creek Site-100713.1
This section of White Oak Creek extends from the SR 1550 (Winston Road) crossing of the creek to a point approximately 300 meters upstream. The poorly defined channel is approximately 1.5 meters wide and meanders through a marsh wetland system. The substrate consists of firm clay and sand. Surveys were conducted for a total of 2.00 person hours.

Table 90. White Oak Creek Site-100713.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
None	~	~	~
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Patchy Common
Corbicula fluminea	Asian Clam	~	Common

Little Creek Site-100720.4

This section of Little Creek occurs between a point approximately 200 meters upstream of the Amelia Church Road (SR 1553) crossing to a point approximately 600 meters upstream and was accessed off the Raynor Road (SR 2555) crossing. Channel width ranged from 3 to 4 meters with relatively stable 1-meter high banks. Habitat consists of shallow pool to riffle to run sequences, with sand and cobble dominated substrate. Surveys were conducted for a total of 3.0 person hours.

Table 91. Little Creek Site-100720.4: Mollusk Species Found

Scientific Name	Common Name	#	Abundance /CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	262	87.33/hr
Elliptio icterina	Variable Spike	10	3.33/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Patchy, Common
Corbicula fluminea	Asian Clam	~	Rare

Little Creek Site-100713.3

This section of Little Creek extends from the Amelia Church Road (SR 1553) crossing to a point approximately 200 meters upstream. Channel width ranged from 3 to 4 meters with relatively stable 1-meter high banks. Habitat consists of shallow pool to riffle to run sequences, with sand and cobble dominated substrate. Surveys were conducted for a total of 1.0 person hour.

Table 92. Little Creek Site-100713.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	78	78.00/hr
Elliptio icterina	Variable Spike	5	5.00/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Patchy, Common
Corbicula fluminea	Asian Clam	~	Rare

2.2.3. Eastern Section

The Eastern section of the project corridor occurs between Business 70 north to the US 64/US 264 Bypass, and drains to the Neuse River from the US 64/264 Bypass crossing of the river downstream to the vicinity of the Wake/Johnston County line. Tributaries to the Neuse River within this section include: Walnut Creek and Beddingfield Creek to the south; Mango Creek, Unnamed Tributary (UT) to Neuse River, Poplar Creek, and Mark's Creek to the north.

Big Branch Site-100722.2
This section of Big Branch, a tributary to Walnut Creek, was accessed off the Auburn Church Road (SR 2548) crossing. Channel width ranged from 3 to 5 meters with 1-meter high banks that showed signs of erosion. Substrate was dominated by a heavy load of unconsolidated sand. Water levels were normal and water visibility was clear. A few shells of Asian clam were the only evidence of mollusks found in 1.0 person hour.

Table 93. Big Branch Site-100722.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
None	~	~	~
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Rare

Walnut Creek Site-100623.4
This section of Walnut Creek extends from the Barwell Road (SR 2551) crossing to a point approximately 700 meters upstream. Channel width ranges from 10 to 12 meters with moderately eroded banks 2 to 3 meters high. Substrate consists of shifting sand with numerous boulders. No mussels were found in 2.5 person hours of survey time.

Table 94. Walnut Creek Site-100623.4: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
None	~	~	~
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Beddingfield Creek Site-100713.2
This section of Beddingfield Creek extends from approximately 30 meters below the Shotwell Road (SR 1553) crossing to a point approximately 400 meters upstream of the crossing. The channel width ranges from 3 to 4 meters with severely eroded banks 2 to 4 meters high. Substrate consists of shifting sand. No mollusk species were found in 1.5 person hours.

Neuse River Site-100726.1
This site occurs in a slack-water section of Neuse River approximately 50 meters upstream of the Poole Road (SR 1007) crossing at a canoe access. The river is approximately 40 meters wide with moderately eroded banks 2 to 3 meters high. Substrate consists of bedrock overlain with silt and sand. Surveys were conducted for 0.41 person hour.

Table 95. Neuse River Site-100726.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	25	60.98/hr
Elliptio roanokensis	Roanoke Slabshell	2	4.88/hr
Lasmigona subviridis	Green Floater	1 shell	0.0/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Neuse River Site-100726.2
This site occurs at the Poole Road (SR 1007) crossing of the Neuse River in a deep run habitat. The river is approximately 40 meters wide with moderately eroded banks 2 to 3 meters high. Substrate consists of sand and gravel with clay banks, and occasional boulders. Surveys were conducted for 1.05 person hours.

Table 96. Neuse River Site-100726.2: Mollusk Species Found

Scientific Name	**Common Name**	**#**	**Abundance/ CPUE**
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	41	39.05/hr
Elliptio congarea	Carolina Slabshell	2	1.90/hr
Elliptio icterina	Variable Spike	2	1.90/hr
Elliptio roanokensis	Roanoke Slabshell	59	56.19/hr
Lampsilis radiata	Eastern Lampmussel	1	0.95/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Neuse River Site-100726.3

This site occurs approximately 300 meters below the Poole Road (SR 1007) crossing of the Neuse River in a riffle to run habitat sequence. The river is approximately 40 meters wide with moderately eroded banks 2 to 3 meters high. Substrate consists of sand and gravel with clay banks. Surveys were conducted for 2.25 person hours.

Table 97. Neuse River Site-100726.3: Mollusk Species Found

Scientific Name	**Common Name**	**#**	**Abundance/ CPUE**
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	214	95.11/hr
Elliptio congarea	Carolina Slabshell	8	3.56/hr
Elliptio icterina	Variable Spike	16	7.11/hr
Elliptio roanokensis	Roanoke Slabshell	426	189.33/hr
Lampsilis radiata	Eastern Lampmussel	4	1.78/hr
Lasmigona subviridis	Green Floater	23	10.22/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Neuse River Site-100726.4

This site occurs approximately 200 meters below the Walnut Creek confluence with the river. The river is approximately 40 meters wide with moderately eroded banks 2 to 3 meters high. The habitat consists of a bedrock cascade and plunge pool. Mussels were mostly found within bedrock crevices and pockets of accumulated sand. Surveys were conducted for 1.0 person hour.

Table 98. Neuse River Site-100726.4: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	37	37.00/hr
Elliptio congarea	Carolina Slabshell	1 shell	0.0/hr
Elliptio roanokensis	Roanoke Slabshell	19	19.00/hr
Lasmigona subviridis	Green Floater	1	1.00/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Neuse River Site-100726.5

This site occurs approximately 600 meters below the Walnut Creek confluence with Neuse River in a run habitat. The river is approximately 26 meters wide with moderately eroded banks 2 to 3 meters high. Substrate consists of sand and gravel with clay banks. Surveys were conducted for 1.0 person hour.

Table 99. Neuse River Site-100726.5: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	66	66.00/hr
Elliptio congarea	Carolina Slabshell	1	1.00/hr
Elliptio icterina	Variable Spike	1	1.00/hr
Elliptio roanokensis	Roanoke Slabshell	26	26.00/hr
Lampsilis radiata	Eastern Lampmussel	1	1.00/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Neuse River Site-100726.6

This site occurs approximately 1,100 meters below the Walnut Creek confluence with the Neuse River in a riffle to run habitat sequence. The river is approximately 28 meters wide with moderately eroded banks 2 to 3 meters high. Substrate consists mostly of unconsolidated sand with clay banks, and occasional pockets of gravel in the thalweg. Surveys were conducted for 1.75 person hours.

Table 100. Neuse River Site-100726.6: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Alasmidonta undulata	Triangle Floater	2	1.14/hr
Elliptio complanata	Eastern Elliptio	197	112.57/hr
Elliptio congarea	Carolina Slabshell	2	1.14/hr
Elliptio icterina	Variable Spike	2	1.14/hr
Elliptio roanokensis	Roanoke Slabshell	211	120.57/hr
Lampsilis radiata	Eastern Lampmussel	1	0.57/hr
Lasmigona subviridis	Green Floater	5	2.86/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Neuse River Site-100726.7

This site occurs approximately in the middle of a large broad bend of the river, approximately 1,900 meters above the Auburn-Knightdale Road (SR 2555) crossing in a riffle to run habitat sequence. The river is approximately 28 meters wide with moderately eroded banks 2 to 3 meters high. Substrate consists of sand, gravel, and cobble with clay banks, and occasional boulders. A large sandbar occurs along the left descending bank, extending into the river for one-third the width. Surveys were conducted for 1.75 person hours.

Table 101. Neuse River Site-100726.7: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	107	61.14/hr
Elliptio congarea	Carolina Slabshell	2	1.14/hr
Elliptio icterina	Variable Spike	2	1.14/hr
Elliptio roanokensis	Roanoke Slabshell	57	32.57/hr
Lampsilis radiata	Eastern Lampmussel	2	1.14/hr
Lasmigona subviridis	Green Floater	5	2.86/hr
Strophitus undulatus	Creeper	1 shell	0.0/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Neuse River Site-100726.8

This site occurs in a straight section between two broad bends of the river, approximately 1,000 meters above the Auburn-Knightdale Road (SR 2555) crossing. The habitat consists of a riffle to run habitat sequence. The river is approximately 28 meters wide with moderately eroded banks 2 to 3 meters high. Substrate consists of sand, gravel, and cobble with clay banks and occasional boulders. Surveys were conducted for 1.75 person hours.

Table 102. Neuse River Site-100726.8: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	104	59.43/hr
Elliptio roanokensis	Roanoke Slabshell	219	125.14/hr
Lampsilis radiata	Eastern Lampmussel	1	0.57/hr
Lasmigona subviridis	Green Floater	1	0.57/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Neuse River Site-100726.9
This site occurs in a relatively narrow straight section of the river, approximately 300 meters above the Auburn-Knightdale Road (SR 2555) crossing. The river is approximately 24 meters wide with moderately eroded banks 2 to 3 meters high. The habitat consists of a bedrock cascade and plunge pool. Mussels were mostly found within bedrock crevices and pockets of accumulated sand. Surveys were conducted for 1.25 person hours.

Table 103. Neuse River Site-100726.9: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	~	~	**CPUE**
Elliptio complanata	Eastern Elliptio	18	14.40/hr
Elliptio roanokensis	Roanoke Slabshell	52	41.60/hr
Lampsilis radiata	Eastern Lampmussel	1	0.80/hr
Lasmigona subviridis	Green Floater	1	0.80/hr
Freshwater Snails and Clams	~	~	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Neuse River Site-100720.2
This site occurs in the vicinity of the Auburn-Knightdale Road (SR 2555) crossing, in a run and pool habitat sequence. The river is approximately 32 meters wide with moderately eroded banks 2 to 3 meters high. Substrate consists of sand and cobble with clay banks. The right descending bank has been stabilized with rip rap that extends into the channel. Surveys were conducted for 1.16 person hours.

Table 104. Neuse River Site-100720.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	55	47.41/hr
Elliptio roanokensis	Roanoke Slabshell	25	21.55/hr
Lampsilis radiata	Eastern Lampmussel	2	1.72/hr
Lasmigona subviridis	Green Floater	3	2.59/hr
Pyganodon cataracta	Eastern Floater	1	0.86/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Neuse River Site-100720.1

This site occurs approximately 220 meters below the Auburn-Knightdale Road (SR 2555) crossing in a deep run. A large sandbar extends from the left descending bank to the center of the channel. The river is approximately 30 meters wide with moderately eroded banks 2 to 3 meters high. Substrate consists of sand and gravel with some areas of exposed bedrock. Surveys were conducted for 2.83 person hours.

Table 105. Neuse River Site-100720.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	8	2.82/hr
Elliptio roanokensis	Roanoke Slabshell	188	66.43/hr
Lampsilis radiata	Eastern Lampmussel	1	0.35/hr
Utterbackia imbecillis	Paper Pondshell	1	0.35/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Neuse River Site-100720.3

This site occurs in the vicinity of the Mail Plantation Road (SR 2509) crossing in a small riffle to long, deep run habitat sequence. The river is approximately 34 meters wide with moderately eroded banks 2 to 3 meters high. Substrate consists of sand, gravel and cobble with clay banks. A large sandbar occurs along the left descending bank, extending into the river for one-quarter the width. Surveys were conducted for 2.5 person hours.

Table 106. Neuse River Site-100720.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Alasmidonta undulata	Triangle Floater	1	0.40/hr
Elliptio complanata	Eastern Elliptio	45	18.0/hr
Elliptio congarea	Carolina Slabshell	3	1.20/hr
Elliptio roanokensis	Roanoke Slabshell	18	7.20/hr
Lampsilis radiata	Eastern Lampmussel	2	0.80/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Abundant

Mango Creek Site-100702.2

This site occurs approximately 100 meters downstream of the Hodge Road (SR 2516) crossing in a side channel 2 to 3 meters wide of Mango Creek created by a beaver dam across the main channel. Habitat is characterized as a shallow run with a sand and clay substrate. Surveys were conducted for 1.5 person hours.

Table 107. Mango Creek Site-100702.2: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Pyganodon cataracta	Eastern Flaoter	6	4.00/hr
Utterbackia imbecillis	Paper Pondshell	4	2.67/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Abundant

Mango Creek Site-100702.1

This site extends from the Hodge Road (SR 2516) crossing to a point approximately 600 meters upstream. Habitat consists of a large, braided channel, beaver created, wetland complex. Substrate consists of sand, clay, mud, and detritus. Surveys were conducted for 3.0 person hours.

Table 108. Mango Creek Site-100702.1: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Pyganodon cataracta	Eastern Flaoter	12	4.0/hr
Utterbackia imbecillis	Paper Pondshell	4	1.33/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Abundant
Helisoma anceps	Two-ridge Ram's Horn	~	Patchy, Common
Physidae	A Physid Snail	~	Patchy, Uncommon
Sphaeriidae	A Sphaeriid Clam	~	Uncommon

UT Neuse River Site-100722.3

This UT to the Neuse River was accessed off the Poole Road crossing. Channel width ranges from 1 to 2 meters with relatively unstable 1- to 2-meter high banks. In order of dominance, substrate consists of sand, clay, gravel, silt, and pebble. Mussel surveys were conducted for a total of 1.33 person hours.

Table 109. UT Neuse River Site-100722.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	6	4.51/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common
Corbicula fluminea	Asian Clam	~	Abundant
Helisoma anceps	Two-ridge Ram's Horn	~	Patchy, Common
Physidae	A Physid Snail	~	Patchy, Uncommon
Sphaeriidae	A Sphaeriid Clam	~	Uncommon

Poplar Creek Site-100702.3

This site extends from the Grasshopper Road (SR 2511) crossing upstream to the Poole Road (SR 1007) crossing. The channel ranges from 3 to 4 meters wide, with severely eroded banks 3 meters high. The substrate consists of unconsolidated sand with scattered cobble. A WWTP discharge is located near the Poole Road crossing. Surveys were conducted for 2.33 person hours.

Table 110. Poplar Creek Site-100702.3: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
None	~	~	~
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Corbicula fluminea	Asian Clam	~	Common

Marks Creek 100722.4

This section of Marks Creek was accessed off Marks Creek Road (SR 2234). Channel width ranges from 3 to 6 meters with 2-meter high banks that showed signs of erosion. In order of dominance, substrate consists of sand, silt, granitic bedrock, clay, and gravel. Surveys were conducted for a total of 1.0 person hour.

Table 111. Marks Creek Site 100722.4: Mollusk Species Found

Scientific Name	Common Name	#	Abundance/ CPUE
Freshwater Mussels	**~**	**~**	**CPUE**
Elliptio complanata	Eastern Elliptio	12	12.00/hr
Freshwater Snails and Clams	**~**	**~**	**Relative Abundance**
Campeloma decisum	Pointed Campeloma	~	Common

3.0 MUSSEL SPECIES DESCRIPTIONS

Brief descriptions of the six targeted mussel species, four of which were found during this survey effort, are provided below as are descriptions of the 11 other mussel species found.

3.1. *Federally Protected Species*

The two federally endangered freshwater mussel species known to occur within the Neuse River Basin in Wake and Johnston Counties were the main focus of this study. Prior to these surveys, the Dwarf Wedgemussel had been found in Swift Creek and Middle Creek, and was historically known from the Neuse River in Wake County. The only known occurrence of the Tar River Spinymussel in the Neuse River Basin is from the Little River in Johnston County. This species has never been found in Swift Creek, and was not found during this study.

3.1.1. *Alasmidonta heterodon* (Dwarf Wedgemussel)

Characteristics

The Dwarf Wedgemussel was originally described as *Unio heterodon* (Lea 1829). Simpson (1914) subsequently placed it in the genus *Alasmidonta*. Ortmann (1914) placed it in a monotypic subgenus *Prolasmidonta*, based on the unique soft-tissue anatomy and conchology. Fuller (1977) believed the characteristics of *Prolasmidonta* warranted elevation to full generic rank and renamed the species *Prolasmidonta* *heterodon*. Clarke (1981) retained the genus name *Alasmidonta* and considered *Prolasmidonta* to be a subjective synonym of the subgenus *Pressodonta* (Simpson 1900).

The specific epithet *heterodon*, refers to the chief distinguishing characteristic of this species, which is the only North American freshwater mussel that consistently has two lateral teeth on the right valve and only one on the left (Fuller 1977). All other laterally dentate freshwater mussels in North America normally have two lateral teeth on the left valve and one on the right. The Dwarf Wedgemussel is generally small, with a shell length ranging between 25 mm and 38 mm. The largest specimen reported by Clarke (1981) was 56.5 mm long, taken from the Ashuelot River in New Hampshire. The periostracum is generally olive green to dark brown; nacre bluish to silvery white, turning to cream or salmon colored towards the umbonal cavities. Sexual dimorphism occurs in DWM, with the females having a swollen region on the posterior slope, and the males are generally flattened. Clarke (1981) provides a detailed description of the species.

Nearly all freshwater mussel species have similar reproductive strategies; a larval stage (glochidium) becomes a temporary obligatory parasite on a fish. Many mussel species have specific fish hosts, which must be present to complete their life cycle. Based upon laboratory infestation experiments, Michaelson and Neves (1995) determined that potential fish hosts for the Dwarf Wedgemussel in North Carolina include the tesselated darter (*Etheostoma olmstedi*) and the Johnny darter (*E. nigrum*). McMahon and Bogan (2001) and Pennak (1989) should be consulted for a general overview of freshwater mussel reproductive biology.

Distribution and Habitat Requirements

The historic range of the Dwarf Wedgemussel was confined to Atlantic slope drainages from the Peticodiac River in New Brunswick, Canada, south to the Neuse River, North Carolina. Occurrence records exist from at least 70 locations, encompassing 15 major drainages, in 11 states and 1 Canadian Province (USFWS 1993). When the recovery plan for this species was written, the Dwarf Wedgemussel was believed to have been extirpated from all but 36 localities, 14 of them in North Carolina (USFWS 1993). The most recent assessment (2007 5-Year Review) indicates that the Dwarf Wedgemussel is currently found in 15 major drainages, comprising approximately 70 "sites" (one site may have multiple occurrences). At least 45 of these sites are based on less than five individuals or solely on relict shells. It appears that the populations in North Carolina, Virginia, and Maryland are declining as evidenced by low densities, lack of reproduction, or inability to relocate any individuals in follow-up surveys. Populations in New Hampshire, Massachusetts, and Connecticut appear to be stable, while the status of populations in the Delaware River watershed affected by the recent floods of 2005 is uncertain (USFWS 2007).

Strayer et al. (1996) conducted range-wide assessments of remaining Dwarf Wedgemussel populations, and assigned a population status, to each of the populations. The status rating is based on range size, number of individuals and evidence of reproduction. Seven of the 20 populations assessed were considered “poor”, and two others are considered “poor to fair” and “fair to poor” respectively. In North Carolina, populations are found in portions of the Neuse and Tar River basins; however it is believed to have been extirpated from the main-stem of the Neuse River. It was found at 3 sites within the study area, all in Swift Creek.

The Dwarf Wedgemussel inhabits creeks and rivers of varying sizes (down to approximately two meters wide), with slow to moderate flow. A variety of preferred substrates have been described that range from coarse sand, to firm muddy sand to gravel (USFWS 1993). In North Carolina, Dwarf Wedgemussel often occur within submerged root mats along stable streambanks. The wide range of substrate types used by this species suggests that the stability of the substrate is likely as important as the composition.

Threats to Species

The cumulative effects of several factors, including sedimentation, point and non-point discharge, and stream modifications (impoundments, channelization, etc.), have contributed to the decline of this species throughout its range. With the exception of the Neversink River population in New York, which has an estimated population of over 80,000 Dwarf Wedgemussel individuals, all of the other populations are generally small in numbers and restricted to short reaches of isolated streams. The low numbers of individuals and the restricted range of most of the surviving populations make them extremely vulnerable to extirpation from a single catastrophic event or activity (Strayer et al. 1996). Catastrophic events may consist of natural events such as flooding or drought, as well as human influenced events such as toxic spills associated with highways, railroads, or industrial-municipal complexes.

Siltation resulting from substandard land-use practices associated with activities such as agricultural, forestry and land development has been recognized as a major contributing factor to degradation of mussel populations (USFWS 1996). Siltation has been documented to be extremely detrimental to mussel populations by degrading substrate and water quality, increasing potential exposure to other pollutants, and by direct smothering of mussels (Ellis 1936, Markings and Bills 1979). Sediment accumulations of less than 25 mm have been shown to cause high mortality in most mussel species (Ellis 1936). In Massachusetts, a bridge construction project decimated a population of the Dwarf Wedgemussel because of accelerated sedimentation and erosion (Smith 1981).

Sewage treatment effluent has been documented to significantly affect the diversity and abundance of mussel fauna (Goudreau et al. 1988). Goudreau et al. (1988) found that recovery of mussel populations may not occur for up to 3,218 meters (two miles) below points of chlorinated sewage effluent.

The impact of impoundments on freshwater mussels has been well documented (USFWS 1992a, Neves 1993). Construction of dams transforms lotic habitats into lentic habitats, which results in changes in aquatic community composition. The changes associated with inundation adversely affect both adult and juvenile mussels as well as fish community structure, which could eliminate possible fish hosts for upstream transport of glochidia. Muscle Shoals on the Tennessee River in northern Alabama, once the richest site for naiads (mussels) in the world, is now at the bottom of Wilson Reservoir and covered with 5.79 meters (19 feet) of muck (USFWS 1992b). Large portions of all of the river basins within the Dwarf Wedgemussel's range have been impounded and this is believed to be a major factor contributing to the decline of the species (Master 1986, USFWS 1993).

The introduction of exotic species such as the Asian Clam (*Corbicula fluminea*) and zebra mussel (*Dreissena polymorpha*) has also been shown to pose significant threats to native freshwater mussels. The Asian Clam is now established in most of the major river systems in the United States (Fuller and Powell 1973), including those streams still supporting surviving populations of the Dwarf Wedgemussel. Concern has been raised over competitive interactions for space, food and oxygen with this species and native mussels, possibly at the juvenile stages (Neves and Widlak 1987, Alderman 1995). The zebra mussel, native to the drainage basins of the Black, Caspian and Aral Seas, is an exotic freshwater mussel that was introduced into the Great Lakes in the 1980s and has rapidly expanded its range into the surrounding river basins, including those of the South Atlantic slope (O'Neill and MacNeill 1991). This species competes for food resources and space with native mussels, and is expected to contribute to the extinction of at least 20 freshwater mussel species if it becomes established throughout most of the eastern United States (USFWS 1992b). The zebra mussel is not currently known from any river supporting DWM populations.

3.1.2. *Elliptio steinstansana* (Tar River Spinymussel)

Characteristics

The Tar River Spinymussel grows to a maximum length of 60 millimeters. Short spines are arranged in a radial row anterior to the posterior ridge on one valve and symmetrical to the other valve. The shell is generally smooth in texture with as many as 12 spines that project perpendicularly from the surface and curve slightly ventrally. However, adult specimens tend to lose their spines as they mature (USFWS 1992a). The Tar River Spinymussel is distinguished by its shiny periostracum, parallel pseudocardinal teeth, and the linear ridges on the inside surface of the shell.

Little is known about the reproductive biology of the Tar River Spinymussel USFWS 1992c), however, nearly all freshwater mussel species have similar reproductive strategies, which involves a larval stage (glochidium), that becomes a temporary obligatory parasite on a fish. Many mussel species have specific fish hosts, which must be present to complete their life cycle. McMahon and Bogan (2001) and Pennak (1989) should be consulted for a general overview of freshwater mussel reproductive biology.

Distribution and Habitat Requirements

Previously this mussel was believed to be endemic to the Tar River system, currently occurring in relatively short stretches of the Tar River and three creeks (Shocco, Sandy/Swift and Fishing/Little Fishing) in the Tar drainage. Historically, the Tar River Spinymussel was collected in the Tar River from near Louisburg in Franklin County to Falkland in Pitt County, a range of approximately 125.5 kilometers (78 river miles). Clarke (1983) located Tar River Spinymussel in only a 19.31 km (12-mile) stretch of the Tar River in Edgecombe County. Since 1998, five individuals of this species have been found in the Little River of the Neuse River Basin in Johnston (NCWRC unpublished data). This species is also listed as being found in the Little River in site records of Clarke (1983), but was not mentioned in the report. The Tar River Spinymussel has never been found in any of the water bodies in the project area, nor was it found during this study.

The preferred habitat of the Tar River Spinymussel in Swift Creek of the Tar River Basin was described as relatively fast flowing, well oxygenated, circumneutral pH water in sites prone to significant swings in water velocity, with a substrate comprised of relatively silt-free loose gravel and/or coarse sand.

Threats to Species
The cumulative effects of several factors, including sedimentation, point and non-point discharge, and stream modifications (impoundments, channelization, etc.), have contributed to the decline of this species throughout its range. The remaining populations of Tar River Spinymusse are generally small in numbers. The low numbers of individuals and the restricted range of most of the surviving populations make them extremely vulnerable to extirpation from a single catastrophic event or activity (Strayer et al. 1996). Catastrophic events may consist of natural events such as flooding or drought, as well as human influenced events such as toxic spills associated with highways, railroads or industrial-municipal discharges. Other threats are similar to those described above for Dwarf Wedgemussel.

3.2.*Target Federal Species of Concern (FSC)*

The four FSC species targeted have been previously reported in the study area; however, prior to this survey, no recent records of the Green Floater, or Yellow Lampmussel were known.

***3.2.1. Elliptio lanceolata* (Yellow Lance)**
Characteristics
The yellow lance was described from the Tar River at Tarboro, North Carolina by I. Lea in 1828. This species differs from other lance-shaped elliptios by having a “waxy” bright yellow periostracum that lacks rays. The posterior ridge is distinctly rounded and curves dorsally towards the posterior end.

Distribution and Habitat Requirements
This species is distributed from the Neuse River Basin north to the Rappahannock, but is not believed to occur in the Roanoke or James River Basin. It is in considerable decline throughout its range. Extant populations occur in the Neuse, Tar/Pamlico, Chowan and York River basins. This species is found in small streams to large rivers in substrates primarily consisting of clean sand, and occasionally gravel. It was found at 8 sites within Swift Creek during this study.

Threats to Species
Threats to this and many other freshwater mussel species are similar to those described above for the Dwarf Wedgemussel This species is a FSC and is listed as Endangered in North Carolina. Williams et al. (1993) list this species as Endangered. There appears to be sufficient data to warrant elevation of the yellow lance to Candidate status in the very near future (John Fridell, Recovery Biologist USFWS, Personal Communication).

3.2.2. *Fusconaia masoni* (Atlantic Pigtoe)

Characteristics

The Atlantic Pigtoe was described by Conrad (1834) from the Savannah River in Augusta, Georgia. Shells of the Atlantic pigtoe are subrhomboidal in outline, with a parchment-like yellow to dark brown periostracum. The posterior ridge is very distinct, and the umbos extend well above the dorsal margin.

The Atlantic pigtoe is a tachytictic (short-term) breeder, brooding young and releasing glochidia in early summer. The bluegill (*Lepomis macrochirus*) and shield darter (*Percina peltata*) have been identified as potential fish hosts for this species (O'Dee and Waters 2000).

Distribution and Habitat Requirements

The Atlantic Pigtoe ranges from the Ogeechee River Basin in Georgia north to the James River Basin in Virginia. It occurs in medium size streams to large rivers, but has experienced major declines throughout its entire range. The preferred habitat for this species is a substrate composed of gravel and coarse sand, usually at the base of riffles, however, it can be found in a variety of other substrates and habitat conditions (personal observations). It was found at 23 sites within Swift Creek during this study effort.

Threats to Species

Threats to this and many other freshwater mussel species are similar to those described above for the Dwarf Wedgemussel. This species is a FSC and is listed as Endangered in North Carolina. Williams et al. (1993) list this species as Endangered. There appears to be sufficient data to warrant elevation of the Atlantic pigtoe to Candidate status in the very near future (John Fridell, Recovery Biologist USFWS, Personal Communication).

3.2.3. *Lasmigona subviridis* (Green Floater)

Characteristics

The green floater was described by Conrad (1835) from the Schuykill River in Lancaster County, Pennsylvania. The small mussel species has a thin slightly inflated subovate shell that is narrower in front, higher behind. The dorsal margin forms a blunt angle with the posterior margin. The shell is dull yellow or tan to brownish green, usually with concentrations of dark green rays.

Distribution and Habitat Requirements

The Green Floater occurs along the Atlantic slope from the Savannah River in Georgia north to the Hudson River in New York, as well as in the "interior" basins (New, Kanawah, and Wataugua Rivers) of the Tennessee River basin. It occurs in small size streams to large rivers, in quiet waters such as pools, or eddies, with gravel and sand substrates. It has experienced major declines throughout its entire range. It was found at 8 sites within the Neuse River during this study.

Threats to Species

Threats to this and many other freshwater mussel species are similar to those described above for the Dwarf Wedgemussel This species is a FSC and is listed as Endangered in North Carolina. Williams et al. (1993) list this species as Threatened. Based on preliminary genetics research, the southern populations of the Green Floater (Tar

Pamlico, Neuse, and Yadkin/Pee Dee River Basins) appear to be genetically distinct from populations from the Roanoke River to the north and west (Morgan Railey and Arthur Bogan, North Carolina Museum of Natural Sciences, 2007 personal communication). Further research is needed to determine if these differences warrant classification of the southern populations as a distinct species.

3.2.4. *Lampsilis cariosa* (Yellow Lampmussel)

Characteristics

This species was described from the Schuylkill River near Philadelphia (Say 1817). The waxy-yellow shell is obovate in outline, with a rounded anterior margin and slightly curved posterior margin, and is rarely rayed. The shell thickness begins as thin in juveniles becoming thicker with age. The moderately inflated shell attains a length of 120 mm (Bogan 2002). Male shells are elliptical and somewhat elongate in outline with the ventral margin evenly convex. Female shells are subovate to obovate in outline with the ventral margin expanded near the posterior margin, sloping up to a very bluntly rounded posterior margin. Posterior ridge is poorly developed and rounded, posterior slope slightly convex to flat. Beaks moderately swollen but not elevated much above the hinge line, located anterior of the middle of the shell, beak sculpture consist of about five poorly defined bars, the first ridge concentric with the remainder slightly double-looped. The left valve has two compressed pseudocardinal teeth, the posterior tooth low and immediately under the umbo, and two delicate lateral teeth. The right valve has a single compressed pseudocardinal tooth, and a single lamellar lateral tooth. The pseudocardinal teeth tend to become more stumpy and ragged with age. The interdentum is practically absent, and the beak cavity is open and moderately deep. Older specimens become brownish and loose much of the luster. Nacre color is bluish-white, often tinged with cream or salmon.

Distribution and Habitat Requirements

The yellow lampmussel is found from the lower Ottawa River, Canada eastward to the Sydney River, Nova Scotia then south to the Ogeechee River Drainage Basin in Georgia (Johnson 1970). At one time this species probably ranged throughout most of the Atlantic drainages in North Carolina; however, historical records provided by Johnson (1970) and recent records (Bogan 2002, NCWRC Unpublished data) indicate the species occurs in the Catawba, Pee Dee, Waccamaw, Cape Fear, Neuse, Tar/Pamlico, and Chowan drainages.

Threats to Species

Threats to this and many other freshwater mussel species are similar to those described above for the Dwarf Wedgemussel. This species is a FSC and is listed as Endangered in North Carolina. Williams et al. (1993) also list this species as Endangered.

3.3. *Other Mussel Species Located*

3.3.1 Alasmidonta undulata (Triangle Floater)

This species was described from the Schuykill River near Philadelphia (Say 1817). Its range extends from the Catawba River in North Carolina north to the lower St. Lawrence River. The shell shape is subtriangular to ovate and inflated. The anterior and ventral shell margins are rounded. The periostracum is yellowish green with broad green or black rays. This species is considered Special Concern throughout its range (Williams et al. 1993). It is considered Threatened in North Carolina. This species was found at 1 site in Middle Creek, 28 sites in Swift Creek, and 2 sites in the Neuse River.

3.3.2 Elliptio complanata (Eastern Elliptio)

This species was described as *Mya complanata* from the Potomac River in Maryland (Lightfoot 1786). Shell characteristics are highly variable. Shell shape is typically trapezoidal to rhomboid and compressed to inflated. The usually straight ventral margin is mostly parallel with the dorsal margin and the posterior margin is broadly rounded. Shell thickness varies from thin to solid. This species is widely distributed along the Atlantic Slope from Altamaha River Basin in Georgia north to the St. Lawerence River Basin, and west to Lake Superior and parts of the Hudson Bay Basin. It can be found in a variety of habitats from large rivers and, lakes to small headwater streams. The species is widespread and common throughout its range and considered stable (Williams et al. 1993). It was found at 100 sites in all three watershed sections of the study area.

3.3.3 *Elliptio congarea* (Carolina Slabshell)

This species was described from the Congaree River, South Carolina by Lea (1831). The range of this species extends from the Ogeechee River, Georgia north to the Chowan River, North Carolina and Virginia. The shell is rhomboid and subcompressed with moderately full beaks. The front of the shell is wedge-shaped, with the posterior end obliquely truncate above and biangulate below. The posterior slope usually has numerous cross corrugations or wrinkles. The periostracum is greenish-yellow or tawny. (Williams et al. 1993) list this species as Special Concern. It is considered a Watch 2/Watch 5 species, which indicates that the species is rare to uncommon, but probably not in trouble (W2), but has known increasing threats to its habitat, whether populations are known to be declining or not (W5) (LeGrand et al. 2010). This species was found at 43 sites within Swift Creek and the Neuse River.

3.3.4 Elliptio icterina (Variable Spike)

Described from the Savannah River near Augusta Georgia (Conrad 1834), this highly variable species represents a complex of nearly 50 named species (Johnson 1970). The shell shape is oblong, subelliptical, or subrhomboid, with a prominent posterior ridge, and moderately elevated beaks. The periostracum is usually smooth and greenish yellow to tawny-brown. This species is considered common and currently stable throughout its range (Williams et al. 1993). It was found at 81 sites in all three watershed sections of the study area.

3.3.5. Elliptio mediocris (No Common Name)

This species was described from the Neuse River 6 miles east of Raleigh (Lea 1863). Although Johnson (1970) synonomized this into the *E. complanata* complex and even though there has been no subsequent publication recognizing it as a distinct species, most aquatic biologists working with freshwater mussels on the Atlantic slope recognize it as such. Shell shape is typically rhomboid, and inflated. The usually straight ventral margin is mostly parallel with the dorsal margin and the posterior margin is broadly rounded. Unlike most forms of E. complanata, the beaks are moderately full, and the periostrachum is covered with dark green rays of varying width that remain conspicuous even with older individuals. The posterior slope is high, but more rounded than *E. congarea*. This species was found at 17 sites only within Swift Creek.

3.3.6. *Elliptio producta* (Atlantic Spike)

This species was described from the Savannah River, Georgia by Conrad (1836). The range of this species extends from the Savannah River, Georgia north to the Potomac River Basin in Maryland and Virginia. The Atlantic spike was once synonymized with *Elliptio lanceolata* (Johnson 1970), but is now considered a separate species. The anterior shell margin is rounded and the posterior margin roundly pointed with the most posterior point slightly above the midline of the shell. The periostracum is often shiny, dark reddish brown to greenish brown, generally with out rays. Shell nacre is variable shades of purple. Williams et al. (1993) list this species as Special Concern. The Atlantic spike was found at two sites in Middle Creek and six sites in Swift Creek.

3.3.7. Elliptio roanokensis (Roanoke Slabshell)

The Roanoke slabshell was described from the Roanoke River (exact location unknown) by I. Lea (1838). The reported range of this species extends from the Connecticut River in Massachusetts south to the Savannah River in Georgia (Walter 1954). Based on shell morphologies, Johnson (1970) synominized this and 100 other species into the *Elliptio complanata* complex, however it is now widely recognized as being a valid species. The periostracum is generally very smooth, often with placations (furrows) and reddish yellow in color. Shells of this species reach lengths exceeding 150 mm. This species is listed as Threatened in North Carolina. Williams et al. (1993) list this species as Special Concern. This species was found at 22 sites in Swift Creek, and all 12 sites in the Neuse River sites in Swift Creek and the Neuse River

3.3.8. Lampsilis radiata (Eastern Lampmussel)

Lampsilis radiata radiata (eastern lampmussel) and *Lampsilis radiata conspicua* (Carolina fatmucket). Gmelin (1791) described *Mya radiata* and used Malabar, a region of southern India as the type locality. Ortmann (1919) reported this locality as incorrect and noted Lamarck (1819) had listed it from Saratoga Lake in New York and recommended “if there should not be any other earlier record, we might select this as the type locality.” Simpson (1914) had earlier listed Virginia as the type locality, thus Johnson (1970) restricted the type locality to Potomac River, District of Columbia (approximately opposite, Farifax Co., Virginia). Lea (1872) described *Unio conspicuous* from the Yadkin River in Rowan County, North Carolina, which Simpson (1914) treated as a variety of *Lampsilis radiata radiata*, which Johnson (1970) agreed with.

This large mussel is subelliptical to subovate in outline. Shells are generally thick and solid, with rounded anterior and posterior margins and vary from hardly inflated to very inflated. The periostracum is usually yellowish or brownish green with dark green rays over the entire surface. Like other members of this genus, this species is sexually dimorphic, with the shells of the male being more elongate, and the females more rounded and swollen, particularly in the posterior margin. Left valve has two pseudocardinal teeth, the posterior one located under the umbo, and two straight lateral teeth. The right valve has two separate pseudocardinal teeth, the upper is smaller and compressed, and has a single straight lateral tooth. Interdentum is lacking, umbo cavity is shallow, compressed. Nacre color is white, may be tinged with pink or salmon or may be completely pink or salmon. Shells of the Carolina fatmucket are much larger and heavier than the shells of the Eastern lampmussel (Adams et al. 1990) and tend to be more shiny and smooth than the Eastern lampmussel, which is usually rough with close concentric wrinkles (Johnson, 1970, Timothy W. Savidge, personal observations). Also, the posterior ridge is much more broadly rounded in the Carolina fatmucket and, in general, the umbos are not as inflated. Adams et al. (1990) suggested that "because of these differences and because *L. r. radiata* is thought to parasitize an anadromous fish host and *L. r. conspicua* is found in areas without such fish species being present, it is possible that *L. r. radiata* and *L. r. conspicua* are separate species".

The taxonomic status of the *Lampsilis radiata* complex is still uncertain. Both the eastern lampmussel and the Carolina fatmucket forms are known to occur in the Neuse River basin. This large mussel is subelliptical to subovate in outline. Shells are generally thick and solid, with rounded anterior and posterior margins. The periostracum is usually yellowish or brownish green with dark green rays over the entire surface. Like other members of this genus, this species is sexually dimorphic, with the shells of the male being more elongate, and the females more rounded and swollen, particularly in the posterior margin. Williams et al. (1993) consider this species to be Stable; however, both the eastern lampmussel and the Carolina fatmucket are considered Threatened in North Carolina. This species was found at 44 sites, two within Middle Creek, 32 within Swift Creek, and 10 within the Neuse River.

3.3.9. Pyganodon cataracta (Eastern Floater)

Described by Say (1817) in the deep part of a milldam presumably near Philadelphia, this species is wide ranging in the Atlantic drainages from the lower St. Lawrence River Basin south to the Altamaha River Basin, Georgia, and in the Alabama-Coosa River drainage, and the Apalachicola and Coctawhatchee River Basins, Florida. The shells of this species are uniformly thin, and lack hinge teeth. The shell shape is ovate, subelliptical and elongate, with an evenly rounded anterior margin and a broadly rounded ventral margin. The periostracum is light to dark green with broad green rays on the posterior slope. Ortman (1919) recognized three generalized shell forms, the pond form, the creek/small river form and the big river form, that were related to environmental conditions. The pond form occurs in small ponds with muddy substrates, and is characterized by very thin elongate inflated shells. The creek form occurs in riffle-pool habitats in gravel substrates, and is much thicker and more compressed. The big river form is generally short and inflated and occurs in soft substrates. This species is considered common and currently stable throughout its range (Williams et al. 1993). It was found at 24 sites in all three watershed sections of the study area.

3.3.10. Strophitus undulatus (Creeper)

This mussel was described from the Schuylkill River near Philadelphia (Say 1817). Its range extends from throughout much of the Interior River Basin and Atlantic Slope regions. The shell is elliptical to rhomboid in outline and somewhat inflated. The anterior end is rounded, and the posterior end is bluntly pointed. The periostracum is yellowish green to brown, with dark green rays. Williams et al. (1993) consider this species to be Stable; however it is considered Threatened in North Carolina. It was found at two sites within Middle Creek, 29 sites in Swift Creek, and one site in the Neuse River.

3.3.11. Utterbackia imbecillis (Paper Pondshell)

Described from the Wabash River in Indiana (Say 1829), this mussel occurs throughout the Mississippi River and Great Lakes drainages, south to northeastern Mexico and east along the Gulf Coast to Florida, as well as along the Atlantic Slope. It has an extremely thin shell that is oblong and inflated. The dorsal and ventral margins are nearly straight and parallel. The periostracum is greenish yellow with fine green rays. This species is considered common throughout its range (Williams et al. 1993). It was found at 14 sites in all three watershed sections of the study area, although mostly within Swift Creek.

4.0 DISCUSSION

These survey efforts provide a comprehensive updated evaluation of freshwater mussel species occurring within the project study area. This information helps to identify which water bodies within the study area contain significant mussel faunas, and can then be used to minimize impacts to these resources. At least one freshwater mussel species was found in 102 of the 110 stream sites sampled. Four of the six targeted mussel species were found during this study, including: the federally Endangered Dwarf Wedgemussel, which was found only within Swift Creek; the FSC and North Carolina listed Endangered Atlantic Pigtoe (Swift Creek), Yellow Lance which were found only within Swift Creek; and the FSC and North Carolina listed Endangered Green Floater which was found only within the Neuse River. Neither the Tar River Spinymussel, nor the Yellow Lampmussel was found during this study, although habitat that could potentially support both species is present in much of the study area. The Tar River Spinymussel has only ever been found in the Little River in the Neuse River Basin. There are historic records of the Yellow Lampmussel from the Neuse River and an unnamed tributary to Swift Creek in Wake County (Johnson 1970); however, this species has not been found in these areas in recent years (NCWRC Unpublished Data).

Although significant freshwater mussel resources occur within all three sections of the study area, habitat degradation and low relative abundances and species diversity is evident in some areas, particularly in the Western Section. As depicted in Table 111, the highest species diversity and number of rare species (as identified in Table 1) occur in the Central Section (Swift Creek and tributaries), followed by the Eastern Section (Neuse River and tributaries) and then Western Section (Middle Creek and tributaries).

Table 112. Mussel Species by Study Corridor Section

Section	# Species	# Rare Species	# FSC Species	# Federal Species
Western	8	4	0	0
Central	14	9	2	1
Eastern	10	6	1	0

4.1. Western Section

Middle Creek drains the western section of the project corridor study area, and from a freshwater mussel standpoint, is the most significant water body in the Western section. Like Swift Creek, Middle Creek was known to support several rare mussel species, including the Dwarf Wedgemussel; however, this species has not been detected during any survey effort since 1992 (NCWRC unpublished data), where it was found at the NC 50 crossing downstream of the study area in Johnston County. In addition, occurrences and numbers of other rare mussel species known from the stream have declined in recent years (NCWRC Unpublished Database of Aquatic Species 2010). The results of this survey effort further support this declining trend, as only four rare mussel species were found in very low numbers (three Eastern Lampmussel, three Creeper, one Ttriangle Floater, and one Atlantic Spike). Observations of habitat conditions also support the apparent decline, as heavy sediment loads, stream-bed scour and stream-bank instability were evident at all sites sampled in Middle Creek. In addition, numerous WWTP discharges are located within the subbasin. The proposed project will cross Middle Creek in the upper limits of the watershed upstream of Sunset Lake. While it is possible that Dwarf Wedgemussel still occurs in Middle Creek further downstream in Johnston County, the presence of Sunset Lake between the proposed crossing and potentially occupied habitat downstream would eliminate the potential for any direct impacts to occur. Given the fact that the Tar River Spinymussel has never been found in Middle Creek and Swift Creek, despite multiple surveys throughout both stream systems, it is unlikely to occur in this section of the project.

No rare mussel species were found in any of the tributaries; however, some of these streams such as Basal Creek, Little Creek, and Guffy Branch support fairly high abundances of the Eastern Elliptio, and contain areas of “good” mussel habitat, which may be suitable for the Dwarf Wedgemussel. However, given the results of this study, and other survey efforts in these tributaries, its presence is unlikely.

4.2. Central Section

The Central section of the project study area drains to the Swift Creek Subbasin. The NCWRC identified the Swift Creek watershed as one of 25 areas in North Carolina considered essential for the continued survival of endangered or threatened aquatic wildlife species (Alderman et al. 1993). As required by the Nature Preserves Act (NCGS 113A-164 of Article 9), the North Carolina Natural Heritage Program (NHP) compiles the North Carolina Department of Environment and Natural Resources (DENR) priority list of “Natural Heritage Areas” in which natural areas (sites) are inventoried and evaluated on the basis of rare plant and animal species, rare or high quality natural communities, and geologic features occurring in the particular site. The sites are rated with regard to national, state and regional significance, and Swift Creek is rated as having “National Significance”, due to the presence of the Dwarf Wedgemussel. It is noted that sites on the list should be given priority for protection; however, it does not imply that all of the areas currently receive protection (NCDENR 2005).

Historically, at least 18 species of freshwater mussels have been reported to occur in the Swift Creek subbasin. This study confirms the relatively high species diversity (for Atlantic Slope drainages) of this stream, as at least 14 species were collected, including the Dwarf Wedgemussel. It is very possible that the *E. complanata* and *E. icterina* complexes are represented by several species, which would further raise the number of species in the subbasin. The only three species reported to occur in Swift Creek that were not found in this study are the Green Floater, Carolina lance (*Elliptio angustata*) and Notched Rainbow. The green floater was reported as occurring in Swift Creek by Walter

(1956) and one specimen was found by Alderman (1991); however, it has not been found in Swift Creek in subsequent surveys. Taxonomic uncertainties with lanceolate elliptios exist; thus, specimens reported as the Carolina lance in previous surveys may in fact be the same species as what is reported in this study as the Atlantic spike, or the northern lance, two other lanceolate elliptio species. The Notched Rainbow was found in the study area in 2007 (TCG 2008).

The results of this study confirm the persistence of the Dwarf Wedgemussel in Swift Creek below Lake Benson, as three individuals were found within the study corridor. In addition, two other individuals were found downstream of the project corridor, as part of a concurrent study carried out by TCG for the City of Raleigh. The targeted FSC Atlantic Pigtoe and Yellow Lance and several other rare mussel species were also confirmed to persist in this section of Swift Creek. Thus, direct impacts to these species are possible from project construction within this section of Swift Creek.

Because of the existence of the Dwarf Wedgemussel in Swift Creek, the study corridor for this project was expanded to include an avoidance alternative (Red Route), which would cross Swift Creek upstream of Lake Benson. This section of Swift Creek is not believed to support the Dwarf Wedgemussel, and the results of this study further support this assumption, as it was not found, nor were any of the associate rare mussel species. In addition, Lake Benson occurs between this section of the creek and occupied habitat located downstream. As such, direct impacts to the Dwarf Wedgemussel are unlikely to occur if the Red Corridor is constructed; however, conclusions regarding Indirect and Cumulative Impacts to the population cannot be determined at this time, and will need to be addressed with all alternates within the study area.

The Tar River Spinymussel was not found in Swift Creek during this study, and it has never been found in this subbasin, despite the presence of apparently suitable habitat. Given this, it is very unlikely to occur in this section of the project.

No rare mussel species were found in any of the tributaries to Swift Creek within the study area; however, both White Oak Creek and Little Creek are known to support Dwarf Wedgemussel and other rare species further downstream of the study area. In both instances artificial impoundments are present between any of the proposed crossing locations and occupied habitat downstream; therefore direct impacts are unlikely.

4.3. Eastern Section

The Eastern section of the project corridor drains to the Neuse River from the US 64/264 Bypass crossing of the river downstream to the vicinity of the Wake/Johnston County line. Tributaries to the Neuse River within this section include: Walnut Creek and Beddingfield Creek to the south; Mango Creek, Unnamed Tributary (UT) to Neuse River, Poplar Creek, and Mark’s Creek to the north.

Historically, at least 18 species of freshwater mussels have been reported to occur in the mainstem of the Neuse River within the project study area (Walter 1956, Johnson 1970), including the Dwarf Wedgemussel. While this study indicates relatively high species diversity (for Atlantic Slope drainages) of this section of the river (10 species), species like the Dwarf Wedgemussel, Atlantic Pigtoe, Yellow Lance and Notched Rainbow, which historically occurred in this area, were not found. The presence of the Green Floater is the first documented occurrence of this species in this section of the Neuse River since the early 1950's (Walter 1956).

The population of the Dwarf Wedgemussel in the main-stem of the Neuse River has long been considered extirpated (USFWS 1993). This section of the Neuse River is drained by an extensive urban area (City of Raleigh). Given this, and the fact that it has not been found in the Neuse River in recent years, including during this study, it is unlikely to still occur in this section of the Neuse River. However, the re-discovery of the targeted FSC Green Floater, which was also believed to have extirpated from this area, casts some uncertainty on this conclusion. Some of the other species formerly reported from this area like the Dwarf Wedgemussel and Atlantic Pigtoe (Johnson 1970) may still exist in low numbers, as the Green Floater was obviously present, but in such low numbers that it was not detected during surveys in recent years (NCWRC Unpublished Data). The presence of the Green Floater at multiple sites (8) and the fact that the majority of individuals found were of the same size (age) class, suggest a recent population expansion. Unless future surveys detect the Dwarf Wedgemussel in the Neuse River, it should still be considered a "Hitoric" population. However, intensive surveys will need to be conducted at the proposed Neuse River crossing once an alternate is chosen.

The Tar River Spinymussel was not found in the Neuse River during this study, nor has it ever been found in the Neuse River. As mentioned previously, the only population of this species in the Neuse River Basin is the Little River. As such, it is very unlikely that the Tar River Spinymussel occurs within the main-stem of the Neuse River in the study area.

No rare mussel species were found in any of the tributaries in this section. Habitat conditions in these tributaries are generally unsuitable for the Dwarf Wedgemussel, and Tar River Spinymussel, in that they are either highly degraded (Beddingfield Branch, Poplar Creek, Walnut Creek etc.), or they are more lentic (still water) in nature (Mango Creek) than lotic habitats (flowing water) where these species occur. Therefore, it is very unlikely that the Dwarf Wedgemussel, or Tar River Spinymussel occur in any of the Neuse River tributaries within this section of the study corridor.

5.0 LITERATURE CITED

Alderman, J. M. 1991. Annual Performance Report on North Carolina Mussels. In: Annual Report 1990-1991, Nongame and Endangered Wildlife Program, Division of Wildlife Management, North Carolina Wildlife Resources Commission> September 1991.

Alderman, J. M. (1995). Monitoring the Swift Creek Freshwater mussel community. Unpublished report presented at the UMRCC symposium on the Conservation and Management of Freshwater Mussels II Initiative for the Future. Rock Island, IL, UMRCC.

Alderman, J. M., R. C. Wilson and C. McGrath. 1993. Conservation of aquatic critical habitats in North Carolina. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 47:348-352.

Bogan, A. E. (2002). Workbook and key to the freshwater bivalves of North Carolina. North Carolina Freshwater Mussel Conservation Partnership, Raleigh, NC, 101 pp, 10 color plates.

Center for Biological Diversity. 2010. Petition To List 404 Aquatic, Riparian and Wetland Species From The Southeastern United States, As Threatened Or Endangered Under The Endangered Species Act. April 20, 2010, 1,145 pp. Available online at: http://sero.nmfs.noaa.gov/pr/esa/Candiate%20Spp/SE_Petition.pdf

Clarke, A. H. 1981. The Tribe Alasmidontini (Unionidae: Anodontinae), Part I: *Pegias*, *Alasmidonta*, and *Arcidens*. Smithsonian Contributions to Zoology, No. 326. 101 pp.

Clarke, A. H. 1983. Status survey of the Tar River spiny mussel. Final Report to U.S. Fish and Wildlife Service with supplement. 63 pp.

Conrad, T. A. (1834). "Descriptions of some new species of fresh water shells from Alabama, Tennessee, etc." American Journal of Science and Arts **25**(2): 338-343.

Conrad, T. A. (1835). Additions to, and corrections of, the Catalogue of species of American Naiades, with descriptions of new species and varieties of Fresh Water Shells. Pp. 1–8, pl. 9. Appendix to: *Synoptical table to New freshwater shells of the United States, with coloured illustrations; and a monograph of the genus Anculotus of Say; also a synopsis of the American naiades.* J. Dobson, 108 Chestnut Street, Philadelphia, Pennsylvania.

Ellis, M. M. (1936). Erosion Silt as a Factor in Aquatic Environments. Ecology 17: 29-42.

Gmelin, J. F. 1791. *Systema Naturae.* 13th edition. Leipzig. Vol.1 part 6:3021-3910.

Fuller, S. L. H. 1977. Freshwater and terrestrial mollusks. In: John E. Cooper, Sarah S.Robinson, John B. Fundeburg (eds.) *Endangered and Threatened Plants and Animals of North Carolina.* North Carolina State Museum of Natural History, Raleigh.

Fuller, S. L. H. and C. E. Powell (1973). Range extensions of *Corbicula manilensis* (Philippi) in the Atlantic drainage of the United States. Nautilus 87(2): 59.

Goudreau, S. E., R. J. Neves, and R. J. Sheehan (1988). Effects of Sewage Treatment Effluents on Mollusks and Fish of the Clinch River in Tazewell County, Virginia. USFWS: 128 pp.

Johnson, R. I. (1970). The Systematics and Zoogeography of the Unionidae (Mollusca: Bivalva) of the Southern Atlantic Slope Region. Bulletin of the Museum of Comparative Zoology 140(6): 263-449.

Lamarck, J. B. P. A. 1815–1822. Histoire naturelle des Animaux sans Vertébres. volumes.

Lea, I. 1829. Description of a new genus of the family of naïades, including eight species, four of which are new; also the description of eleven new species of the genus Unio from the rivers of the United States: with observations on some of the characters of the naïades. *Transactions of the American Philosophical Society* 3[New Series]:403–457, pls. 7–14.

Lea, I. 1831. Observations on the naïades, and descriptions of new species of that and other families. *Transactions of the American Philosophical Society* 4[New Series]:63–121, pls. 3–18.

Lea, I. 1834. Observations on the naïades; and descriptions of new species of that, and other families. Transactions of the American Philosophical Society 5[New Series]:23–119, pls. 1–19.

LeGrand, H. E., Jr., S. P. Hall, S. E. McRae, and J. T. Finnegan. 2010. Natural Heritage Program List of the Rare Animal Species of North Carolina. North Carolina Natural Heritage Program, Raleigh, North Carolina. 124 pp.

Lightfoot, J. (1786). A catalogue of the Portland Museum, lately the property of the duchess Dowager of Portland, deceased, which will be sold at auction by Mr. Skinner and Co. London. Vii = 194 pp.

Markings, L. L. and T. D. Bills (1979). Acute Effects of Silt and Sand Sedimentation on Freshwater Mussels. UMRCC Symposium on the Upper Mississippi River bivalve Mollusks, Rock Island, IL, UMRCC.

Master, L. 1986. Alasmidonta heterodon: results of a global status survey and proposal to list as an endangered species. A report submitted to Region 5 of the U.S. Fish and Wildlife Service. 10 pp. and appendices.

McMahon, R. F. and A. E. Bogan. (2001). Mollusca: Bivalvia. Pp. 331-429. IN: J.H. Thorpe and A.P. Covich. Ecology and classification of North American freshwater invertebrates. 2nd edition. Academic Press.

Michaelson, D.L. and R.J. Neves. 1995. Life history and habitat of the endangered dwarf wedgemussel *Alasmidonta heterodon* (Bivalvia: Unionidae). *Journal of the North American Benthological Society* 14(2):324-340.

NCDENR-Division of Parks and Recreation, 2005. North Carolina Natural Heritage Program Biennial Protection Plan, Natural Heritage Areas Priority List, Raleigh Dept. of Environment Health and Natural Resources, 115 pp.

Neves, R. J. and J. C. Widlak (1987). Habitat Ecology of Juvenile Freshwater Mussels (Bivalva: Unionidae) in a Headwater Stream in Virginia. American Malacological Bulletin 1(5): 1-7.

Neves, R.J. 1993. A state of the Unionids address. Pp. 1-10 in K.S. Cummings, A.C. Buchanan, and L.M. Kooch, eds. Proc. of the UMRCC symposium on the Conservation and Management of Freshwater Mussels. UMRCC. Rock Island IL.189 pp.

O'Dee, S. H., and G. T. Watters. 2000. New or confirmed host identification for ten freshwater mussels. pp. 77-82 in R.A. Tankersley, D.I. Warmolts, G.T. Watters, B.J. Armitage, P.D. Johnson, and R.S. Butler (eds.). Freshwater Mollusk Symposia Proceedings. Part I. Proceedings of the Conservation, Captive Care and Propagation of Freshwater Mussels Symposium. Ohio Biological Survey Special Publication, Columbus.

O'Neill, C. R., Jr., and D. B. MacNeill. 1991. The zebra mussel (Dreissena polymorpha): an unwelcome North American invader. Sea Grant, Coastal Resources Fact Sheet. New York Sea Grant Extension. 12 pp.

Ortmann, A.E. 1919. A monograph of the naiades of Pennsylvania. Part III: Systematic account of the genera and species. *Memoirs of the Carnegie Museum* 8(1):xvi–384, 21 pls.

Pennak, R. W. (1989). Fresh-water Invertebrates of the United States, Protozoa to Mollusca. New York, John Wiley & Sons, Inc.

Savidge, Timothy W. Personal Observation. The Catena Group, Inc.

Say, T., Ed. (1817). Article Conchology. American Edition of the British Encyclopedia of Dictionary of Arts and Sciences, Comprising an Accurate and Popular View of the Present Improved State of Human Knowledge. Philadelphia, Samuel A. Mitchel and Horace Ames.

Say, T. (1829). Descriptions of some new terrestrial and fluviatile shells of North America. The Disseminator of Useful Knowledge; containing hints to the youth of the United States, from the School of Industry **2**(19-23): 291-356.

Simpson, C.T. 1900. Synopsis of the naiades, or pearly fresh-water mussels. Proceedings of the United States National Museum 22(1205):501–1044.

Simpson, C.T. 1914. A descriptive catalogue of the naiades, or pearly fresh-water mussels. Parts I–III. Bryant Walker, Detroit, Michigan, xii + 1540 pp.

Smith, D. 1981. Selected freshwater invertbrates proposed for special concern status in Massachussetts (Mollusca, Annelida, Arthropoda). MA Dept. of Env. Qual. Engineering, Div. of Water Pollution Control. 26 pp.

Strayer, D. L., S. J. Sprague and S. Claypool, 1996. A range-wide assessment of populations of Alasmidonta heterodon, an endangered freshwater mussel (Bivalva:Unionidae). J.N. Am. Benthol. Soc., 15(3):308-317.

The Catena Group Inc. 2008. Swift Creek Freshwater Mussel Surveys The Dempsey E.Benton Water Treatment Project: Wake and Johnston Counties, North Carolina.Unpublished Final Report prepared for Arcadis, Raleigh, North Carolina. 29 ppplus figures.

USFWS 1992a. Special report on the status of freshwater mussels.

USFWS 1992b. Endangered and Threatened species of the southeast United States (The Red Book). FWS, Ecological Services, Div. of Endangered Species, Southeast Region. Govt Printing Office, Wash, DC: 1,070.

U.S. Fish and Wildlife Service. 1992c. Tar River Spinymussel (*Elliptio (Cathyria) steinstansana)* Recovery Plan. Atlanta, Georgia. 34 pp.

U.S. Fish and Wildlife Service. 1993. Dwarf Wedgemussel Mussel (*Alasmidonta heterodon*) Recovery Plan. Hadley, Massachusetts. 527 pp.

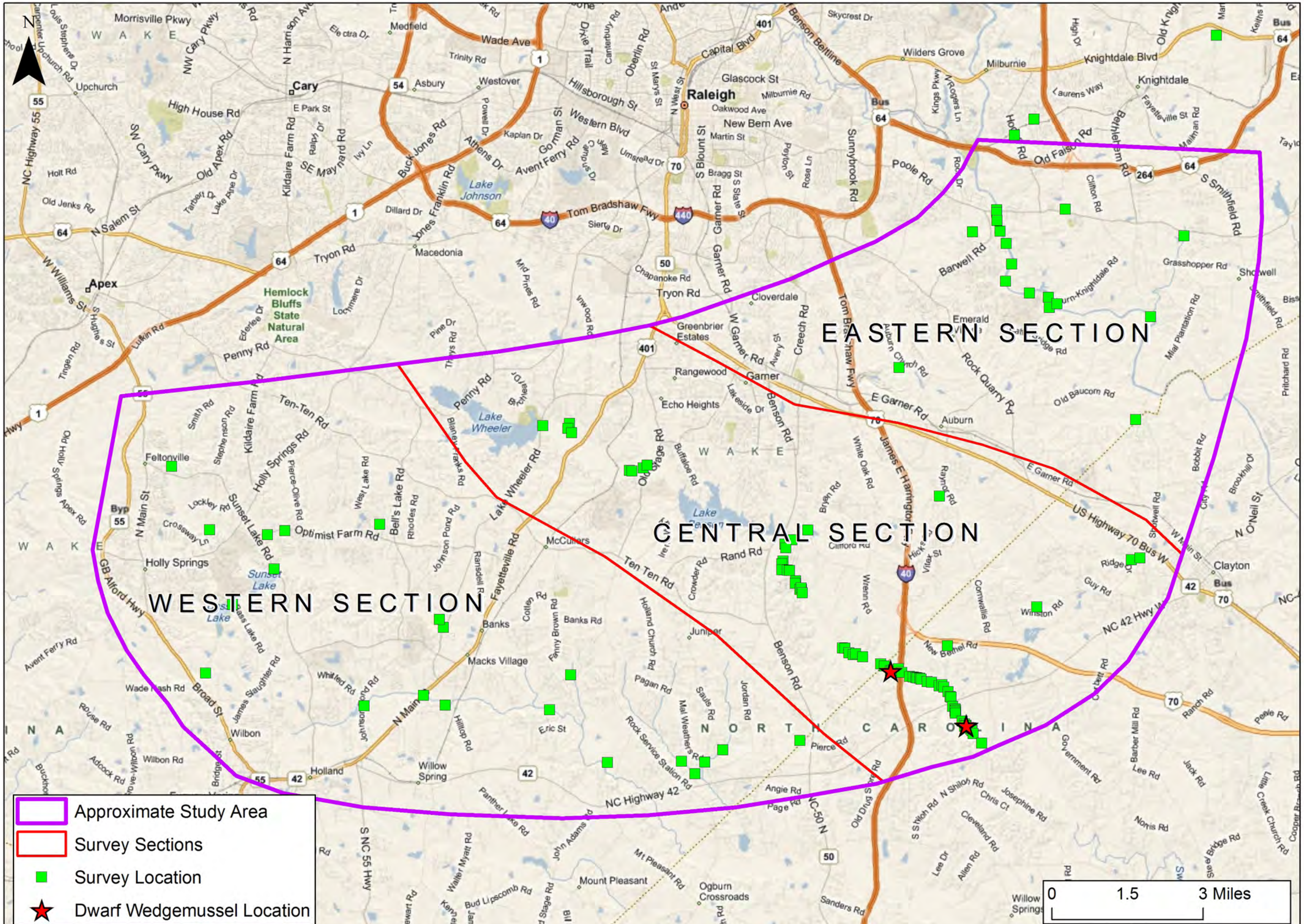
USFWS (1996). Revised Technical/Agency Draft Carolina Heelsplitter Recovery Plan, Atlanta, GA: 47.

Walter, W. M. (1954). Mollusca of the upper Neuse River basin, North Carolina. Durham, North Carolina, Duke University. **Ph. D. dissertation:** i-x + 220.

Walter, W. M. (1956). Mollusca of the upper Neuse River basin, North Carolina. Durham. J. of the Elisha Mitchell Scientific Society (72 (2):262-274.

Williams, J. D., M. L. Warren, Jr., K. S. Cummings, J. L. Harris, and R. J. Neves. (1993). Conservation status of the freshwater mussels of the United States and Canada. Fisheries 18 (9): 6-22.

APPENDIX A
PROJECT FIGURES/SURVEY LOCATION SHEETS



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title:
Triangle Expressway Southeast Extension

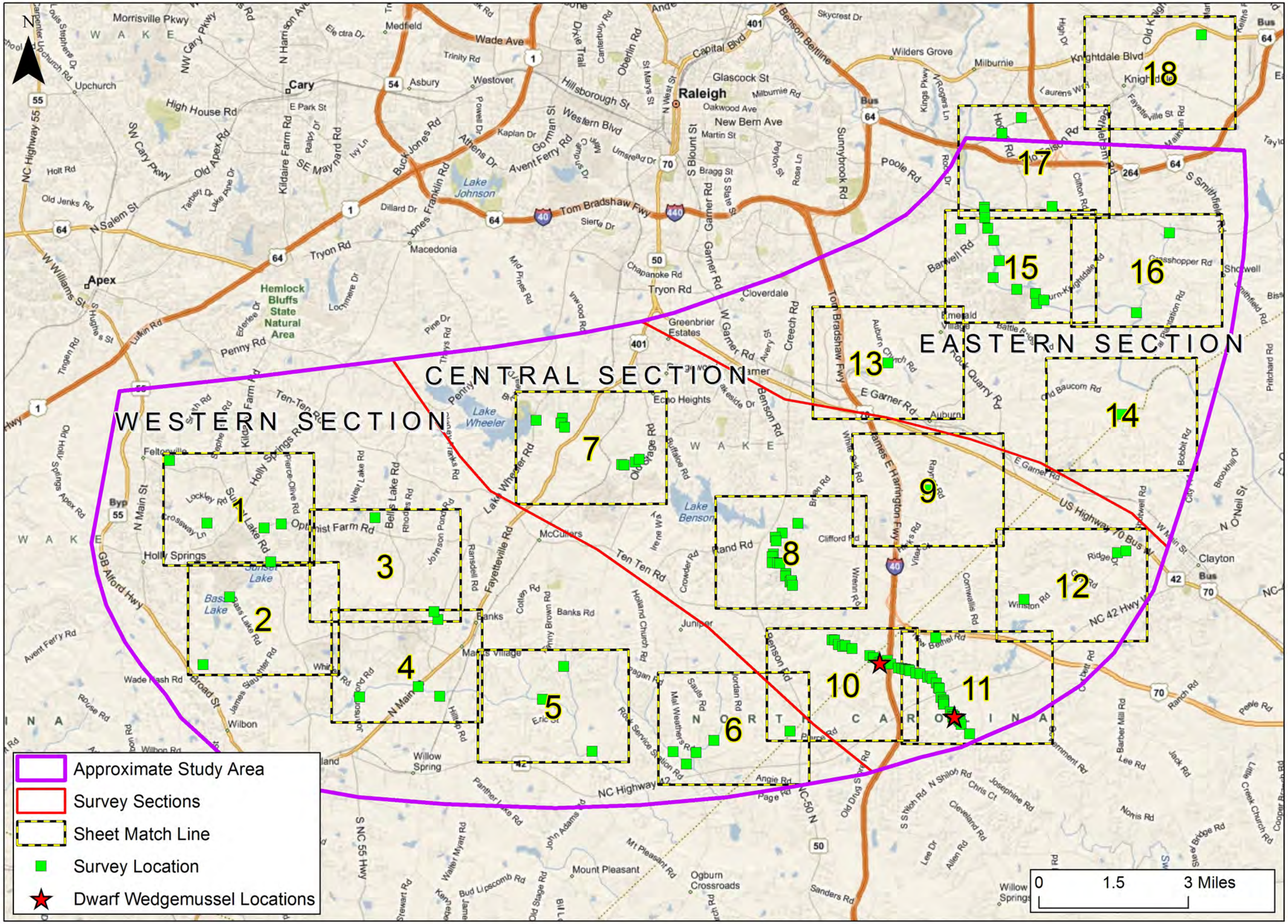
Freshwater Mussel Surveys

Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure 1



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title:
Triangle Expressway Southeast Extension

Freshwater Mussel Surveys

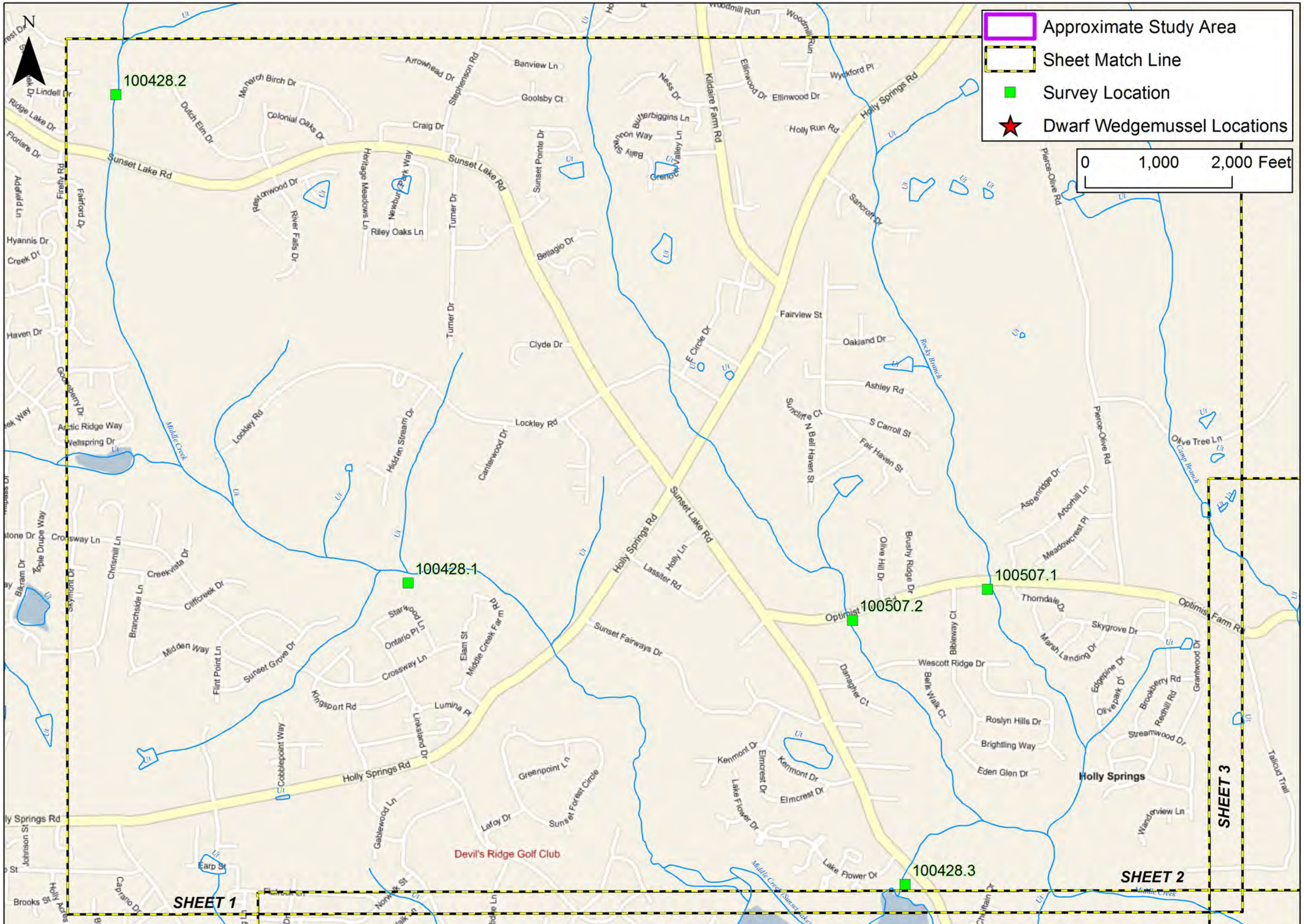
Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure 2

Sheet Index



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title:

Triangle Expressway Southeast Extension

Freshwater Mussel Surveys

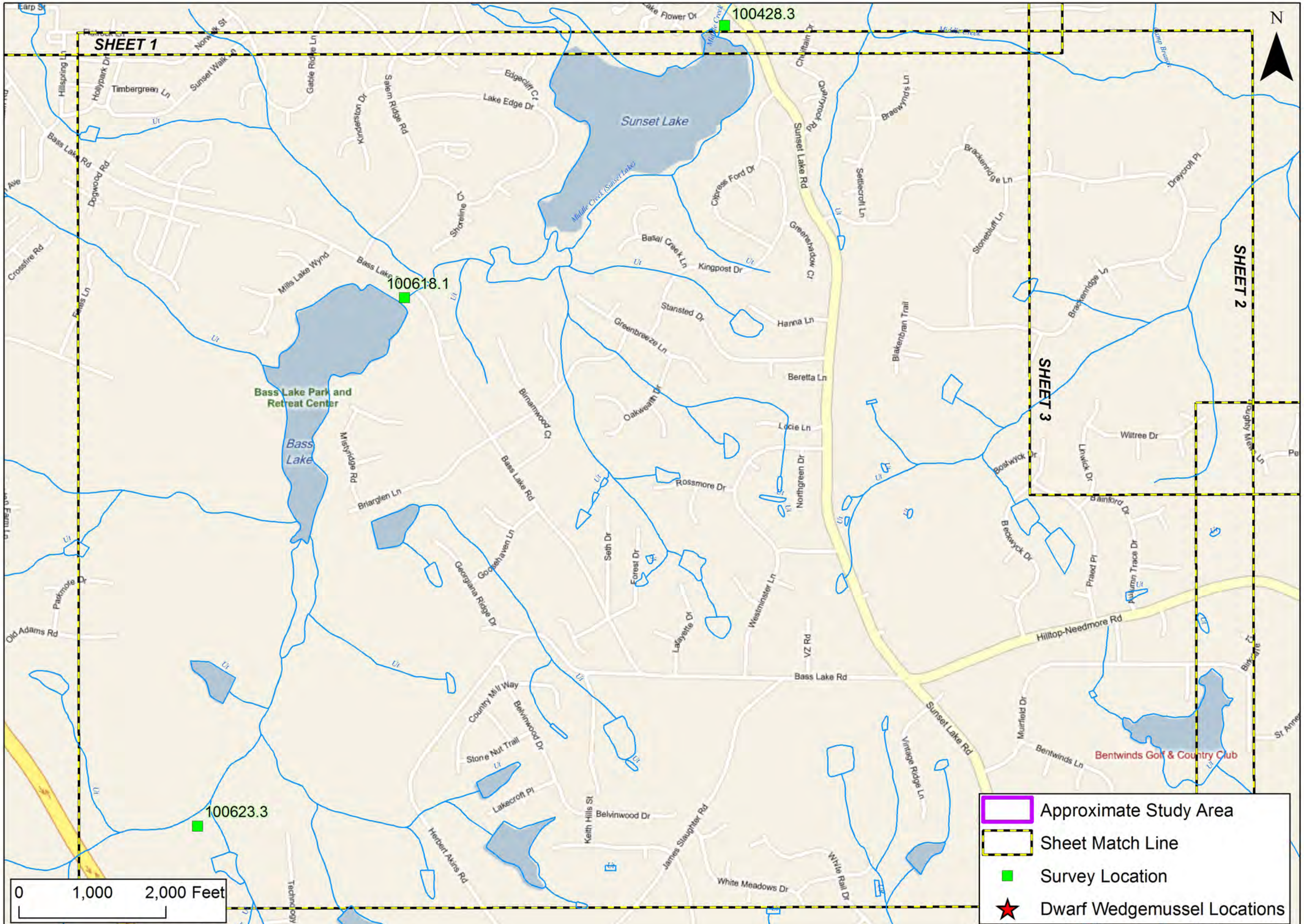
Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure 2

Sheet 1



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title:
Triangle Expressway Southeast Extension

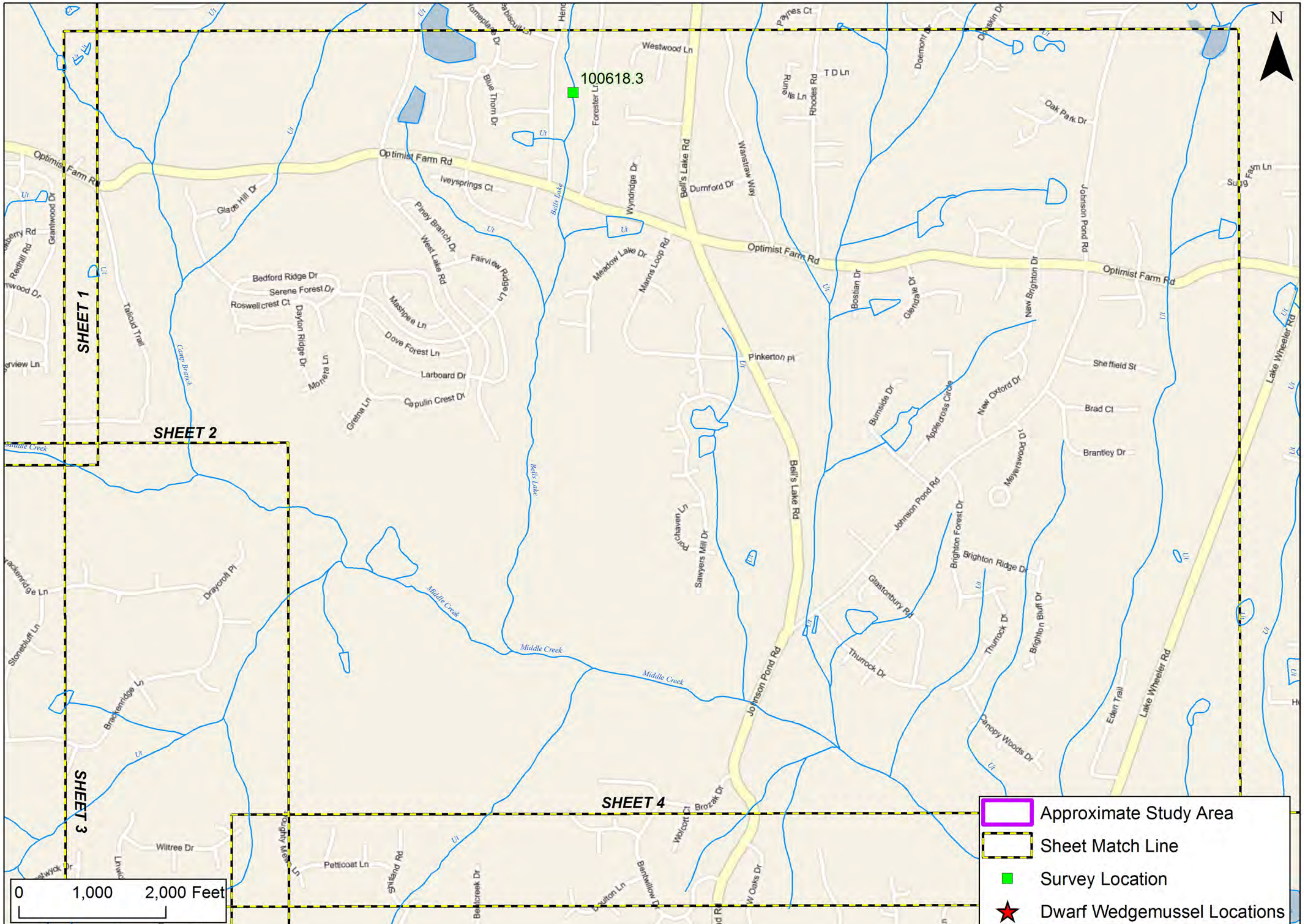
Freshwater Mussel Surveys

Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure 2
Sheet 2



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title: **Triangle Expressway Southeast Extension**

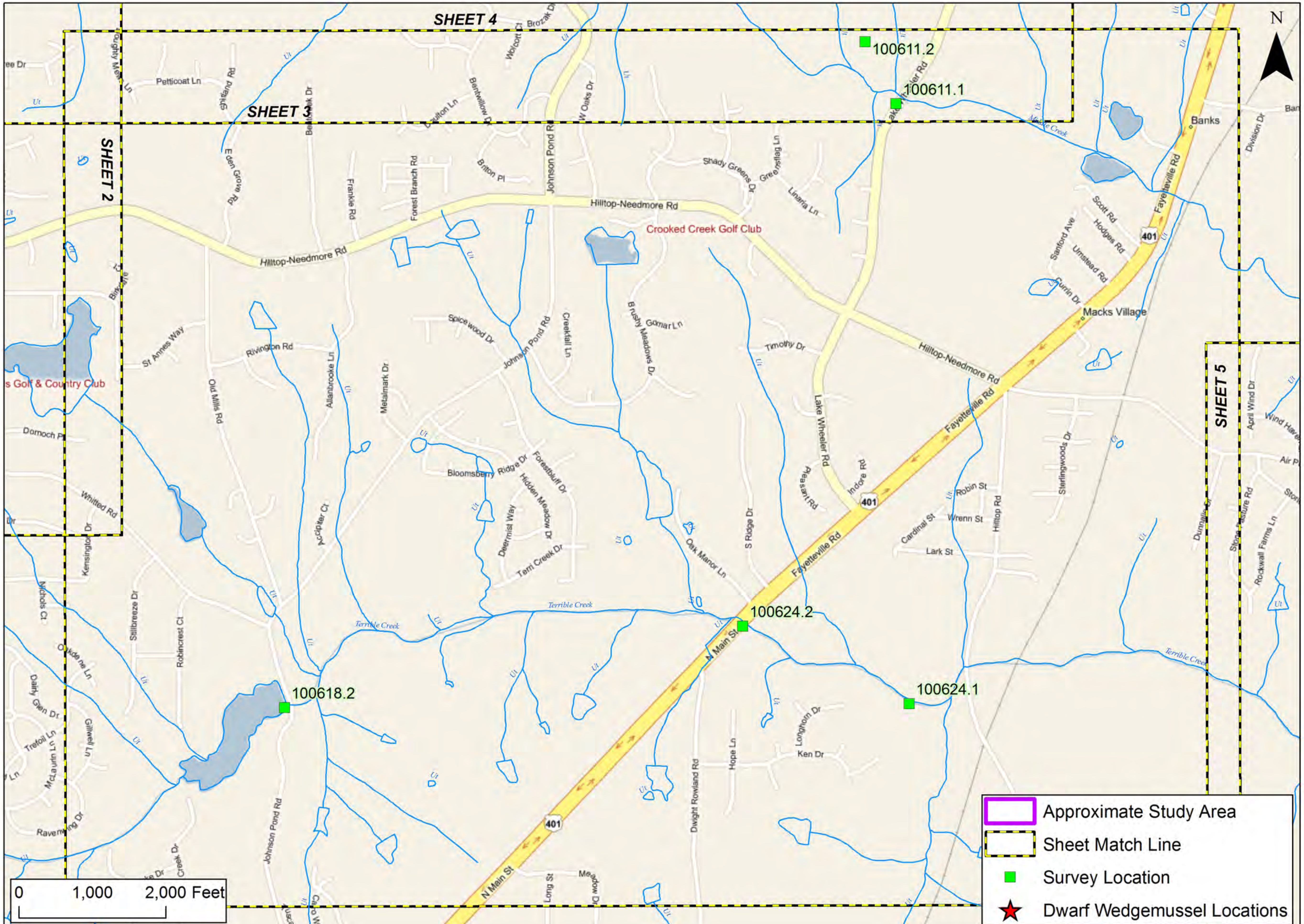
Freshwater Mussel Surveys

Wake and Johnston Counties, North Carolina

Client: North Carolina Turnpike Authority

Figure 2

Sheet 3



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title:
Triangle Expressway Southeast Extension

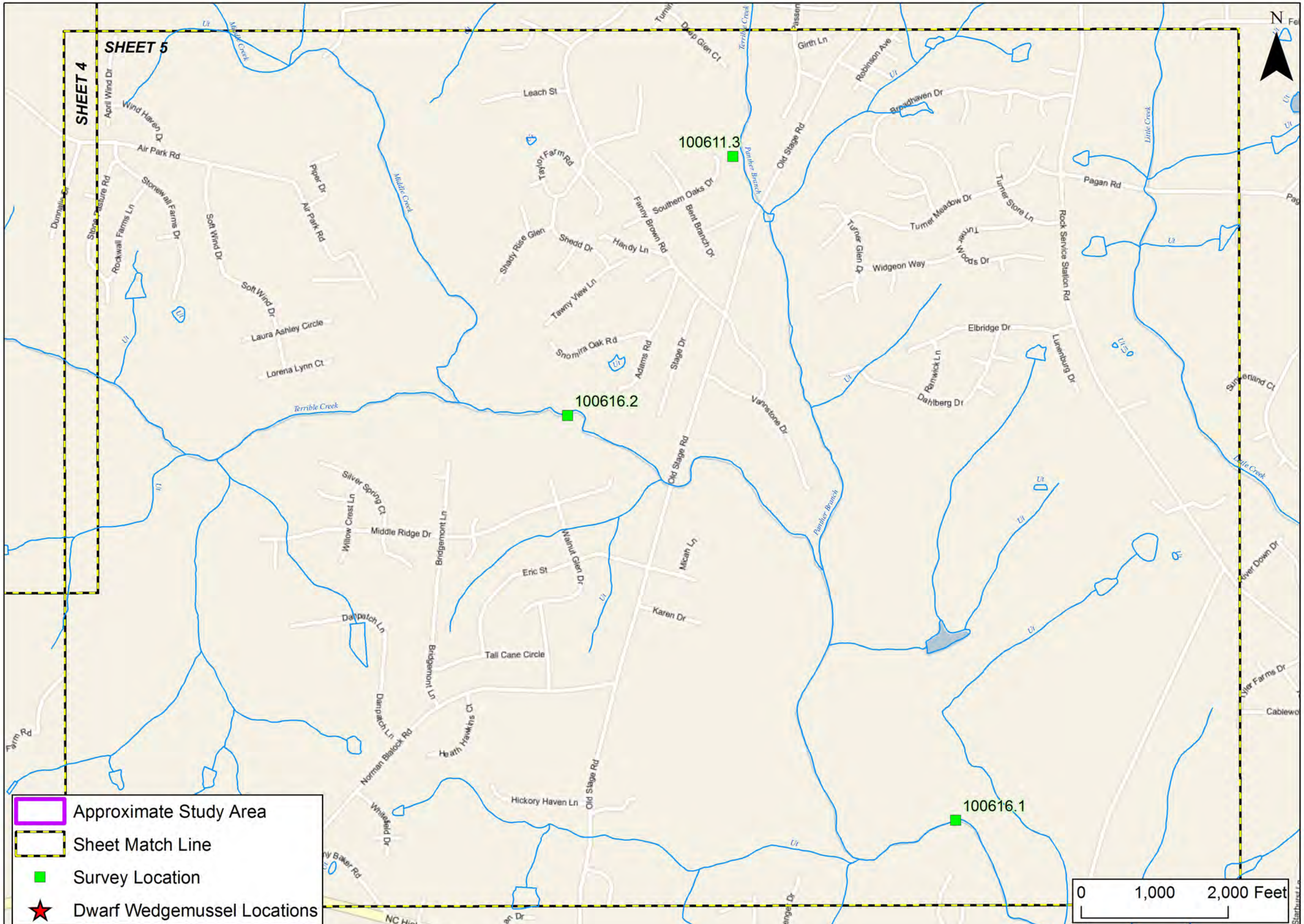
Freshwater Mussel Surveys

Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure
2
Sheet 4



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title: **Triangle Expressway Southeast Extension**

Freshwater Mussel Surveys

Wake and Johnston Counties, North Carolina

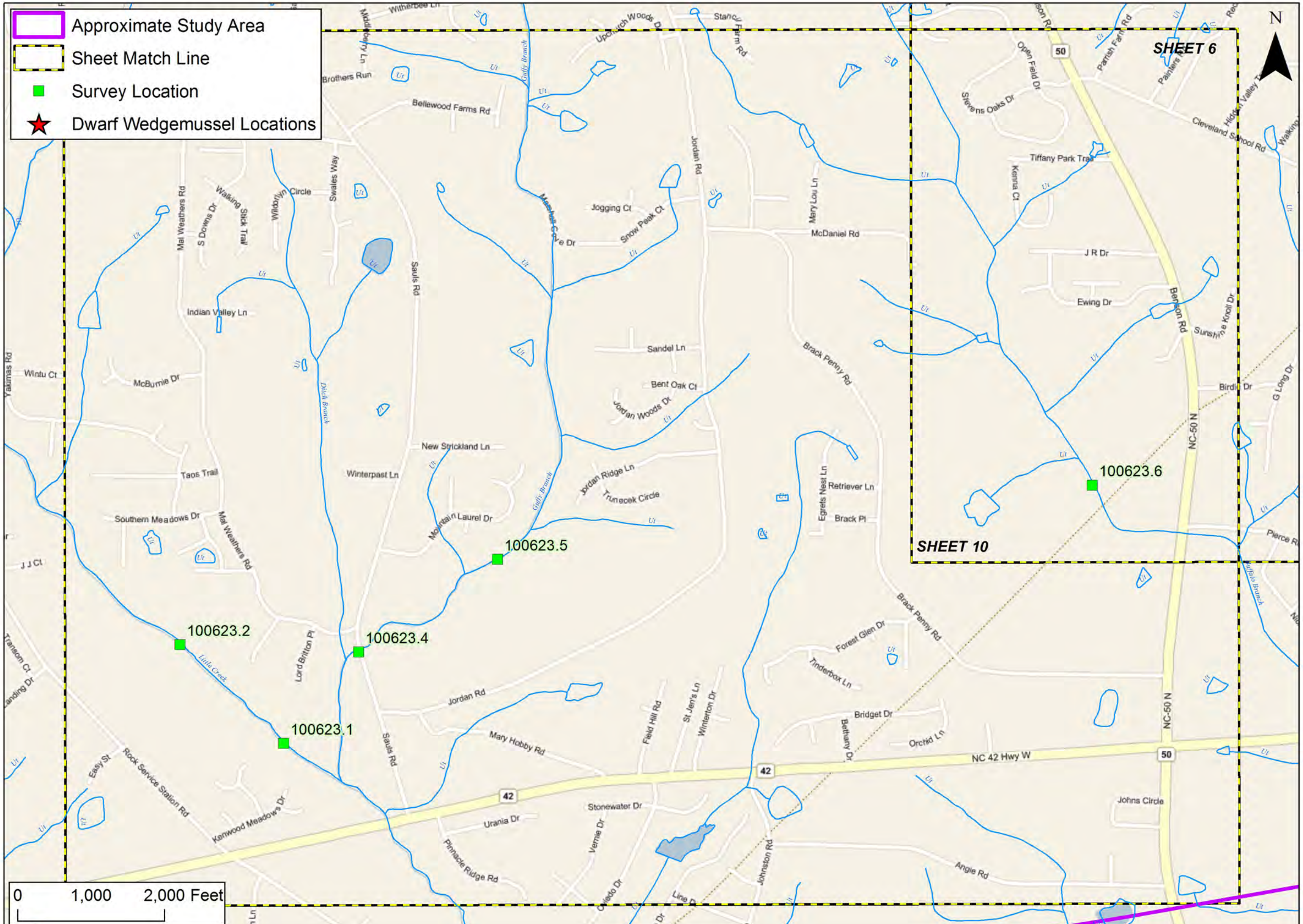
Client:

North Carolina Turnpike Authority

Figure

2

Sheet 5



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title: **Triangle Expressway Southeast Extension**

Freshwater Mussel Surveys

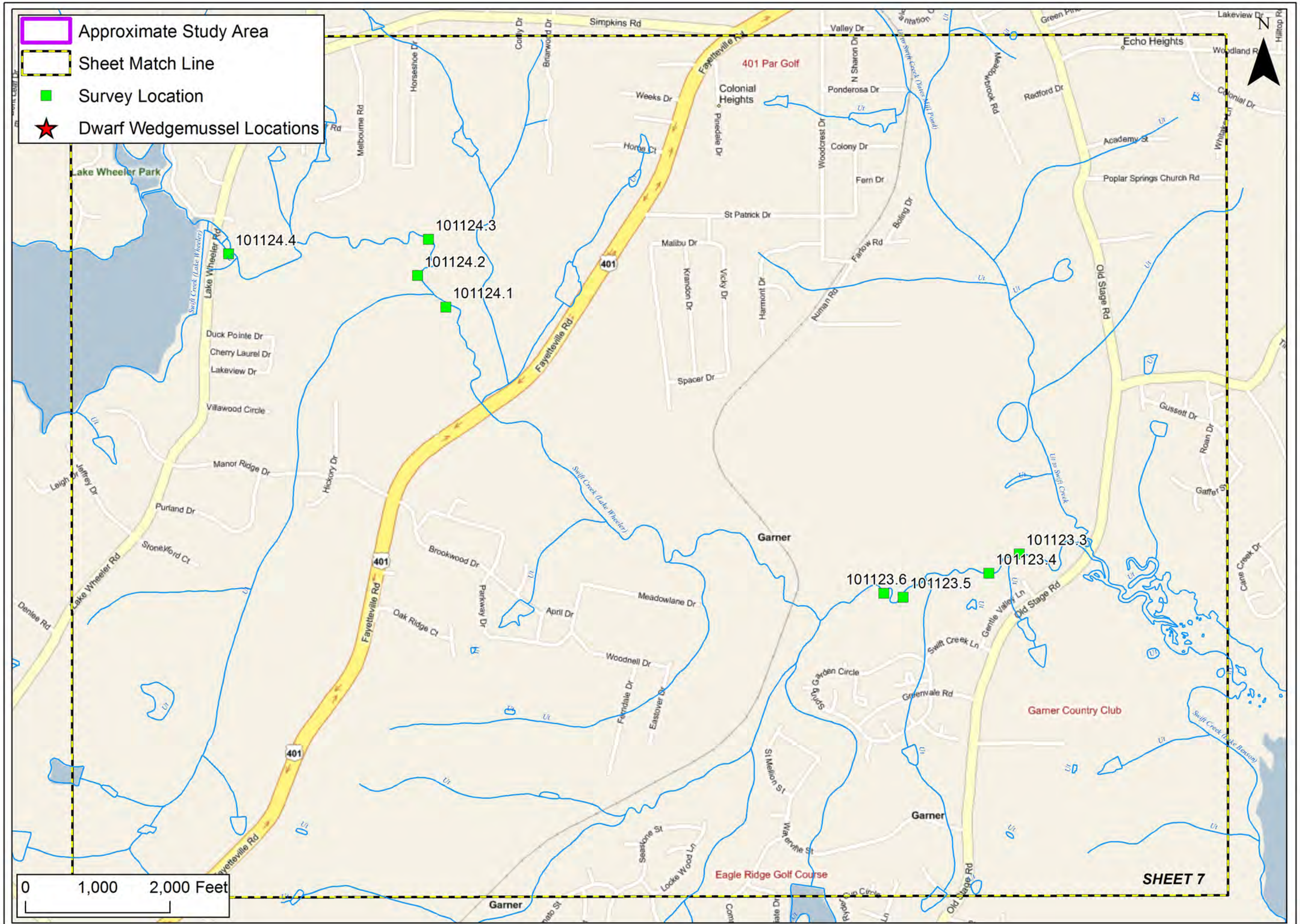
Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure 2

Sheet 6



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title:
Triangle Expressway Southeast Extension

Freshwater Mussel Surveys

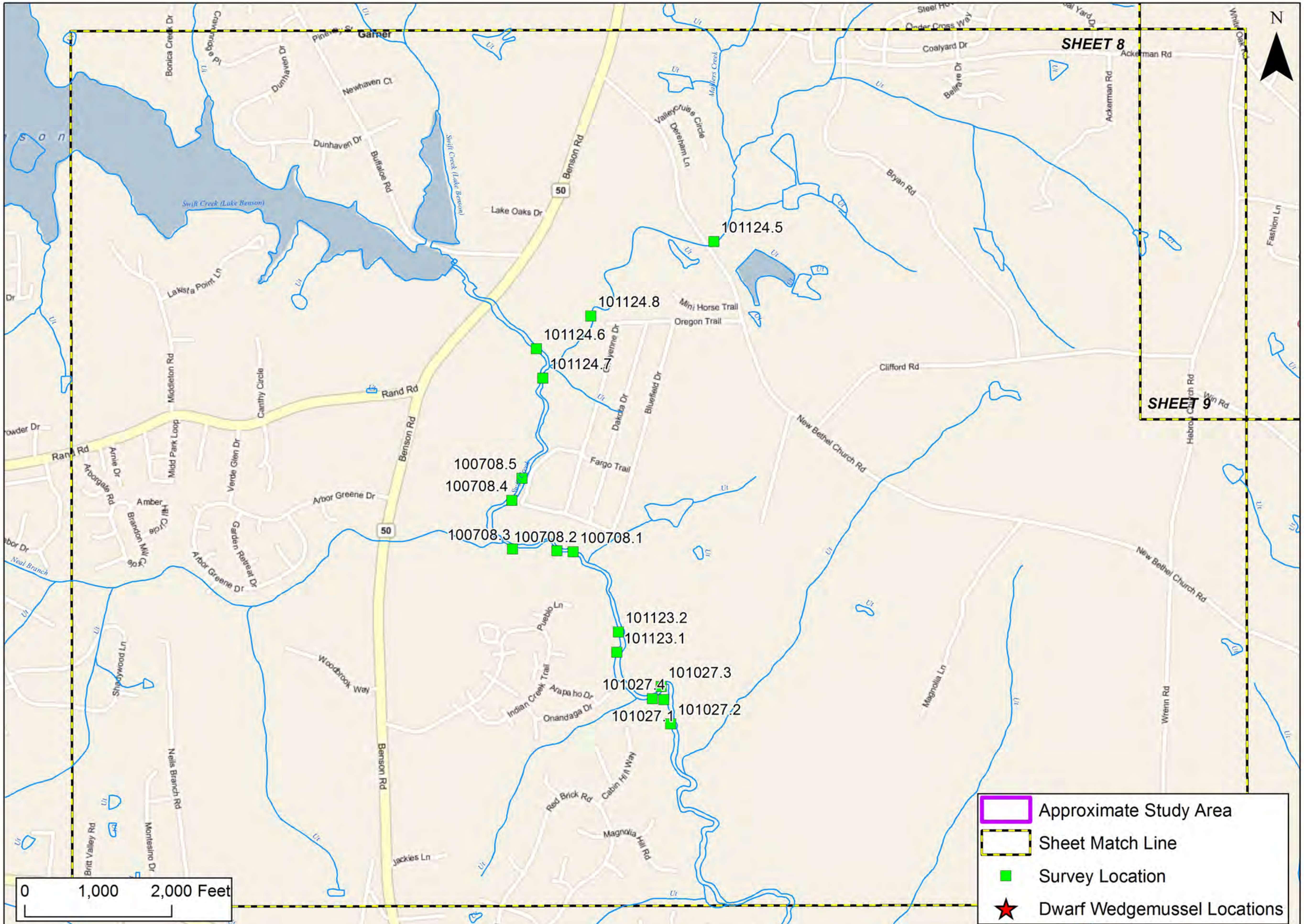
Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure 2

Sheet 7



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title: **Triangle Expressway Southeast Extension**

Freshwater Mussel Surveys

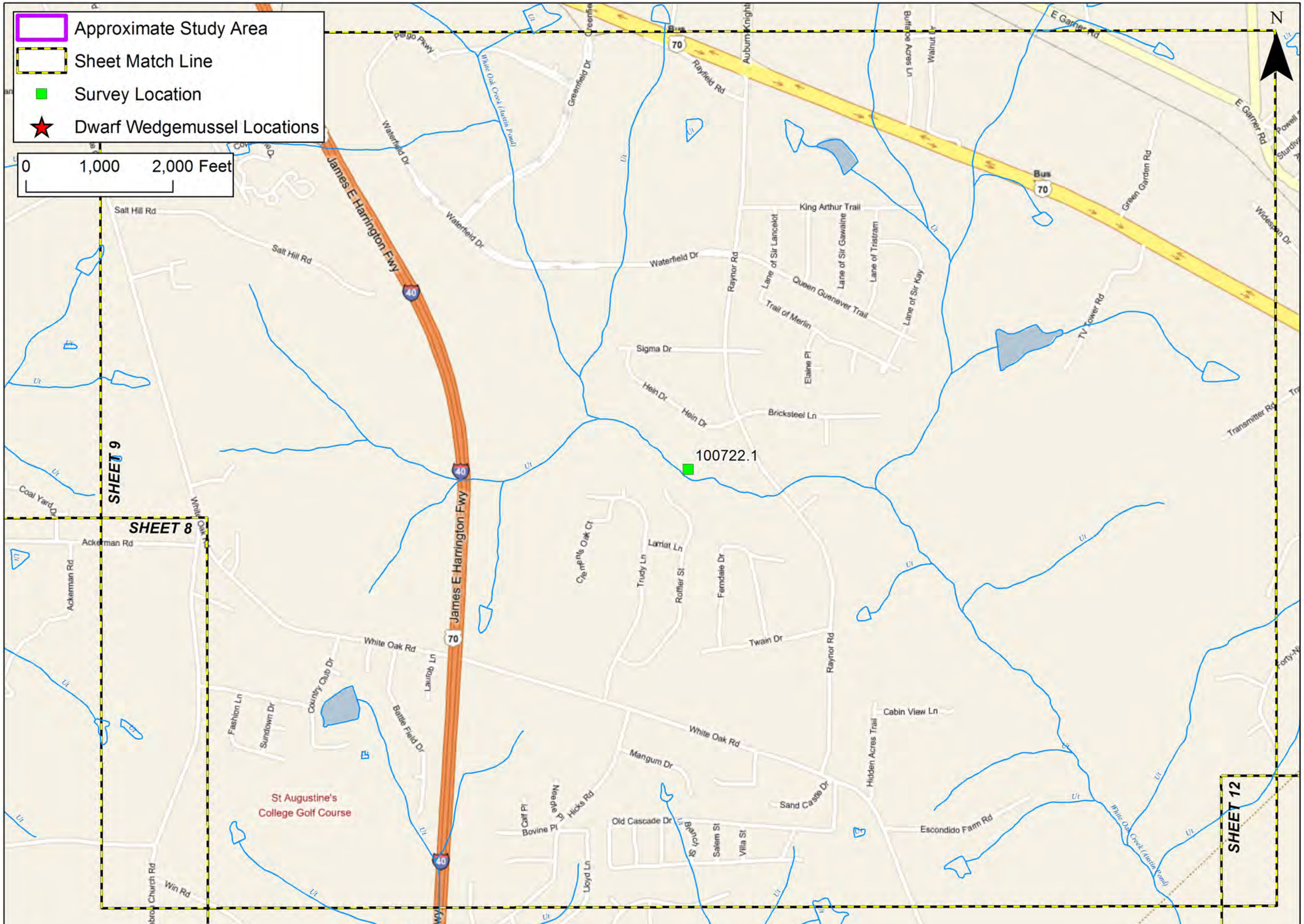
Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure 2

Sheet 8



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title:
Triangle Expressway Southeast Extension

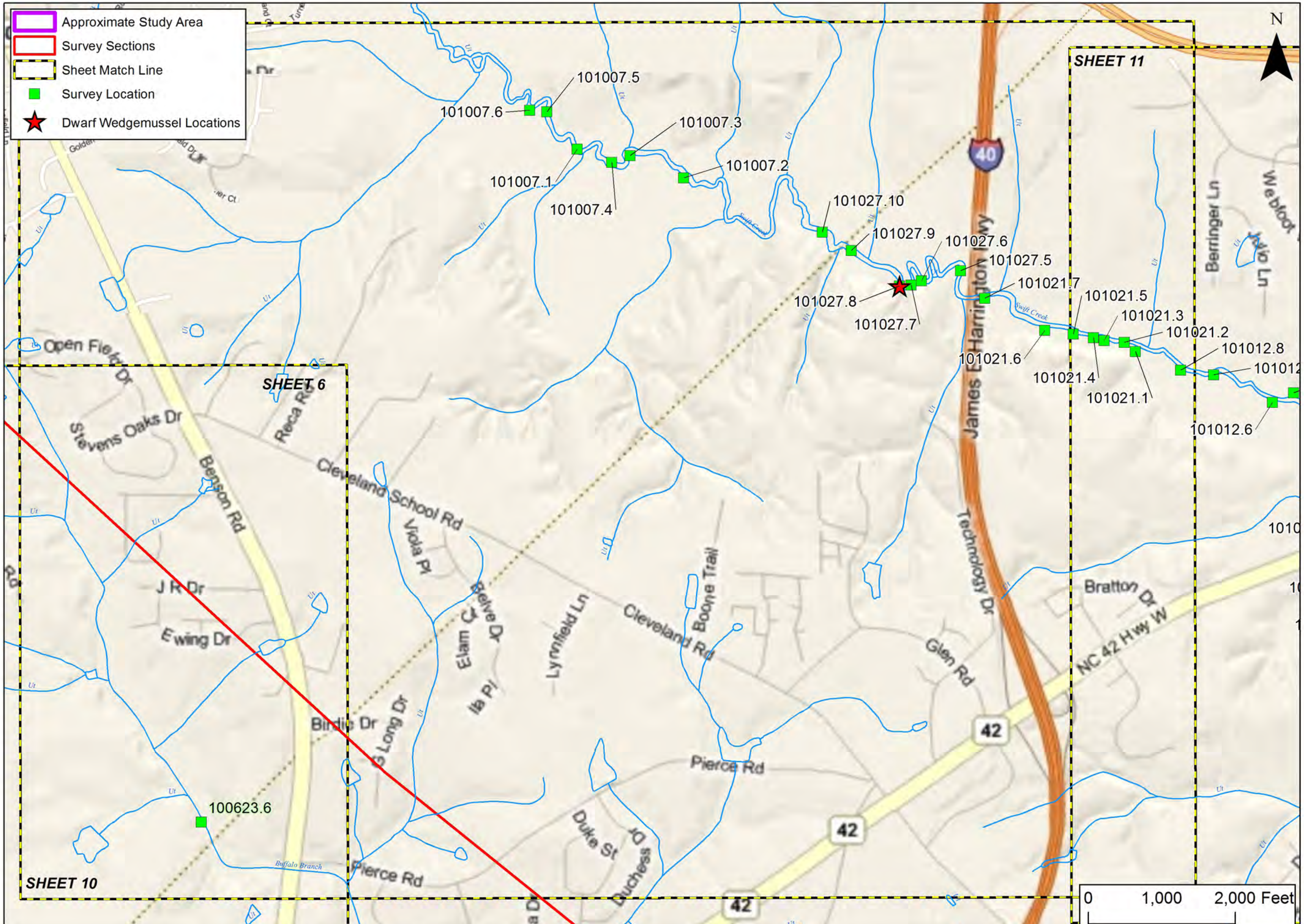
Freshwater Mussel Surveys

Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure
2
Sheet 9



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title:
Triangle Expressway Southeast Extension

Freshwater Mussel Surveys

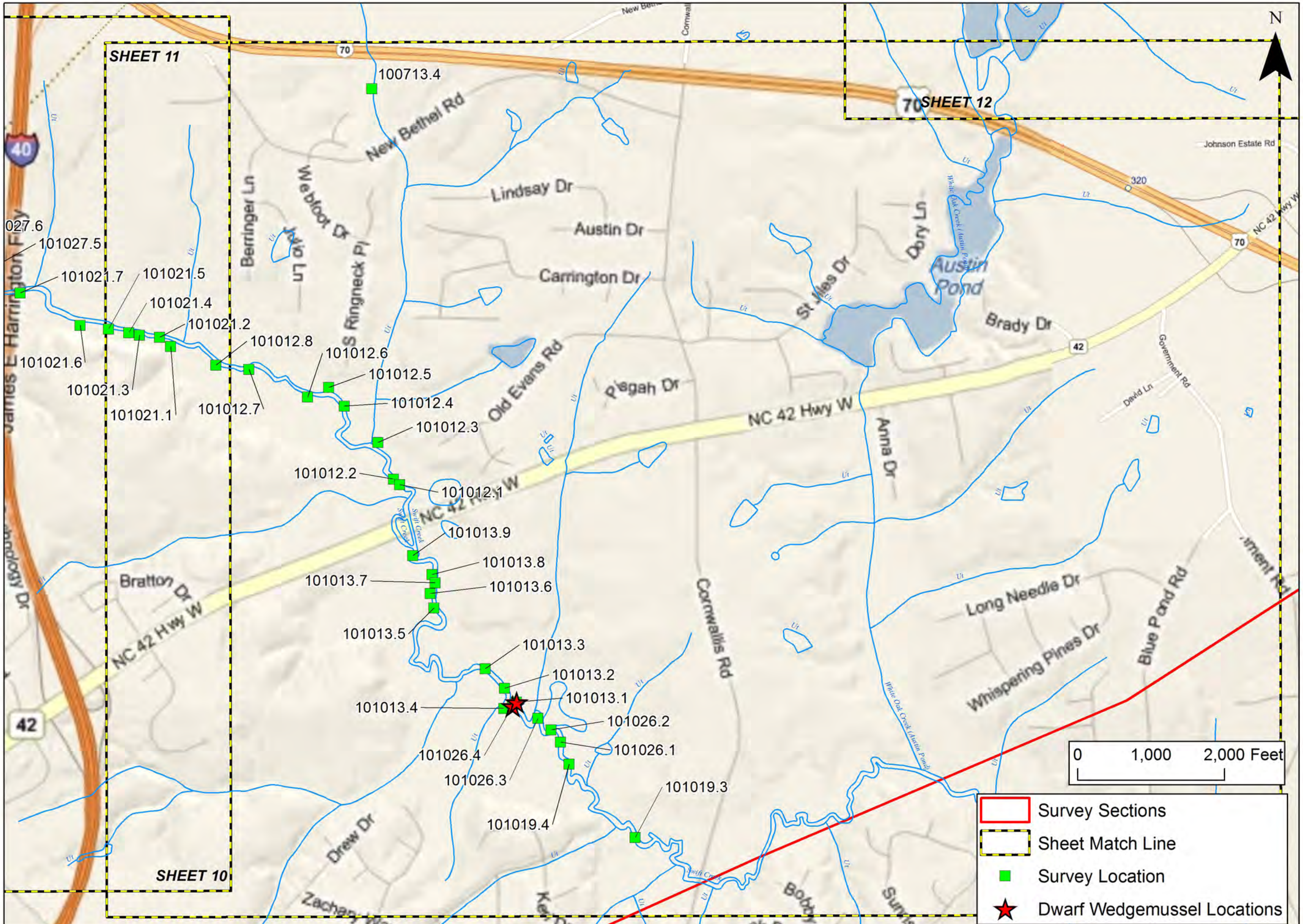
Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure 2

Sheet 10



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title: **Triangle Expressway Southeast Extension**

Freshwater Mussel Surveys

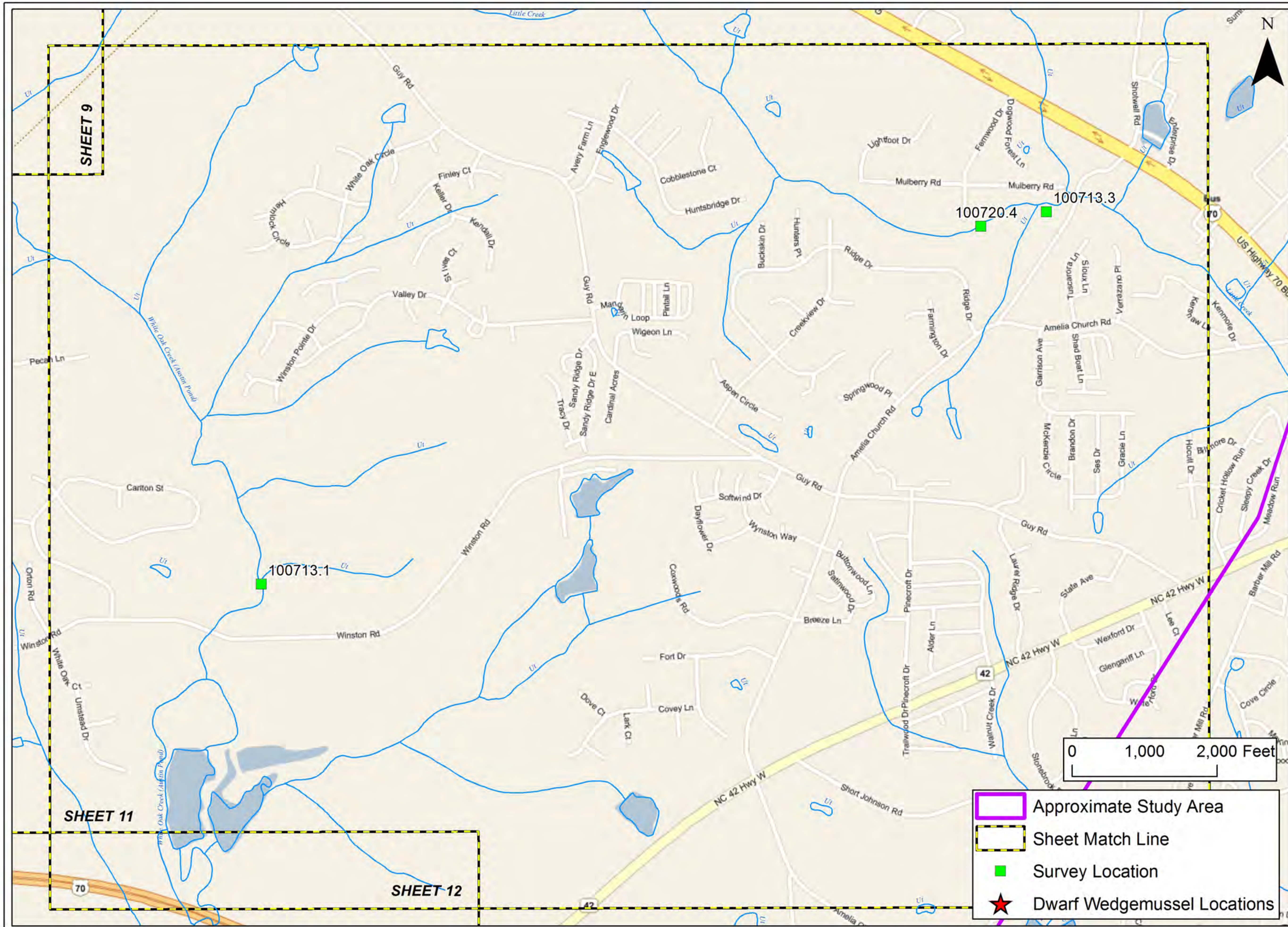
Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure 2

Sheet 11



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title:
Triangle Expressway Southeast Extension

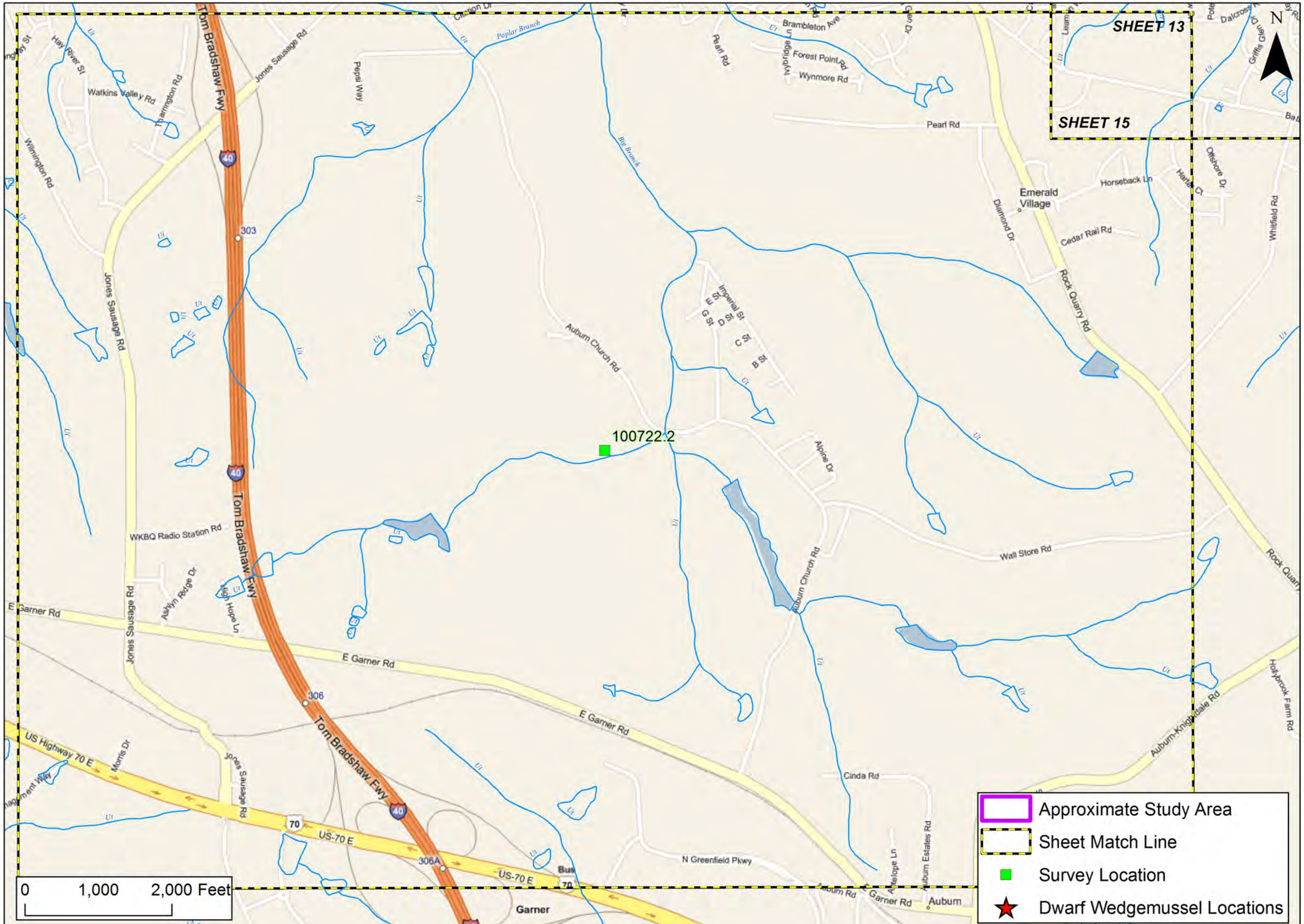
Freshwater Mussel Surveys

Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure
2
Sheet 12



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title:
Triangle Expressway Southeast Extension

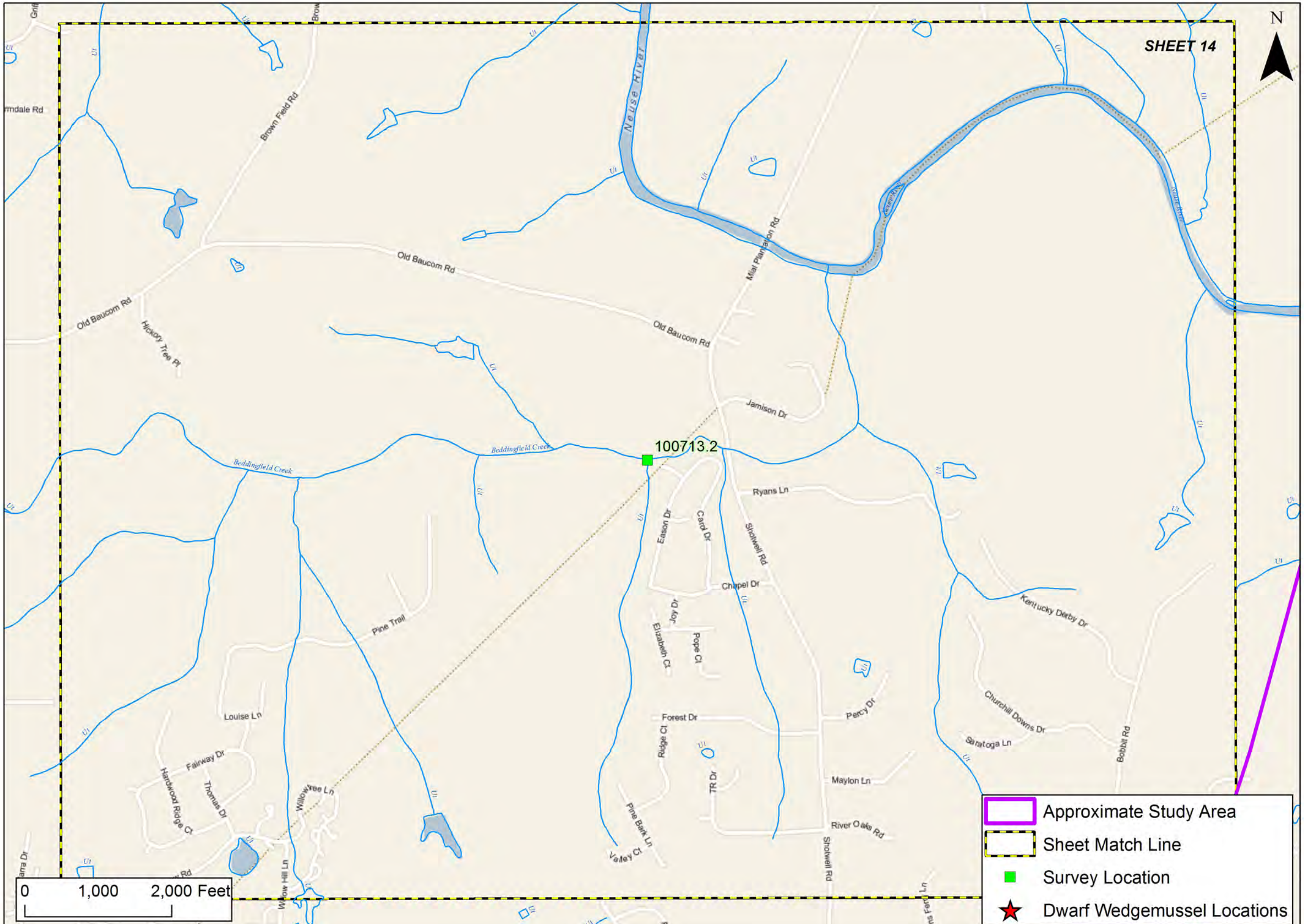
Freshwater Mussel Surveys

Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure 2
Sheet 13



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title:
Triangle Expressway Southeast Extension

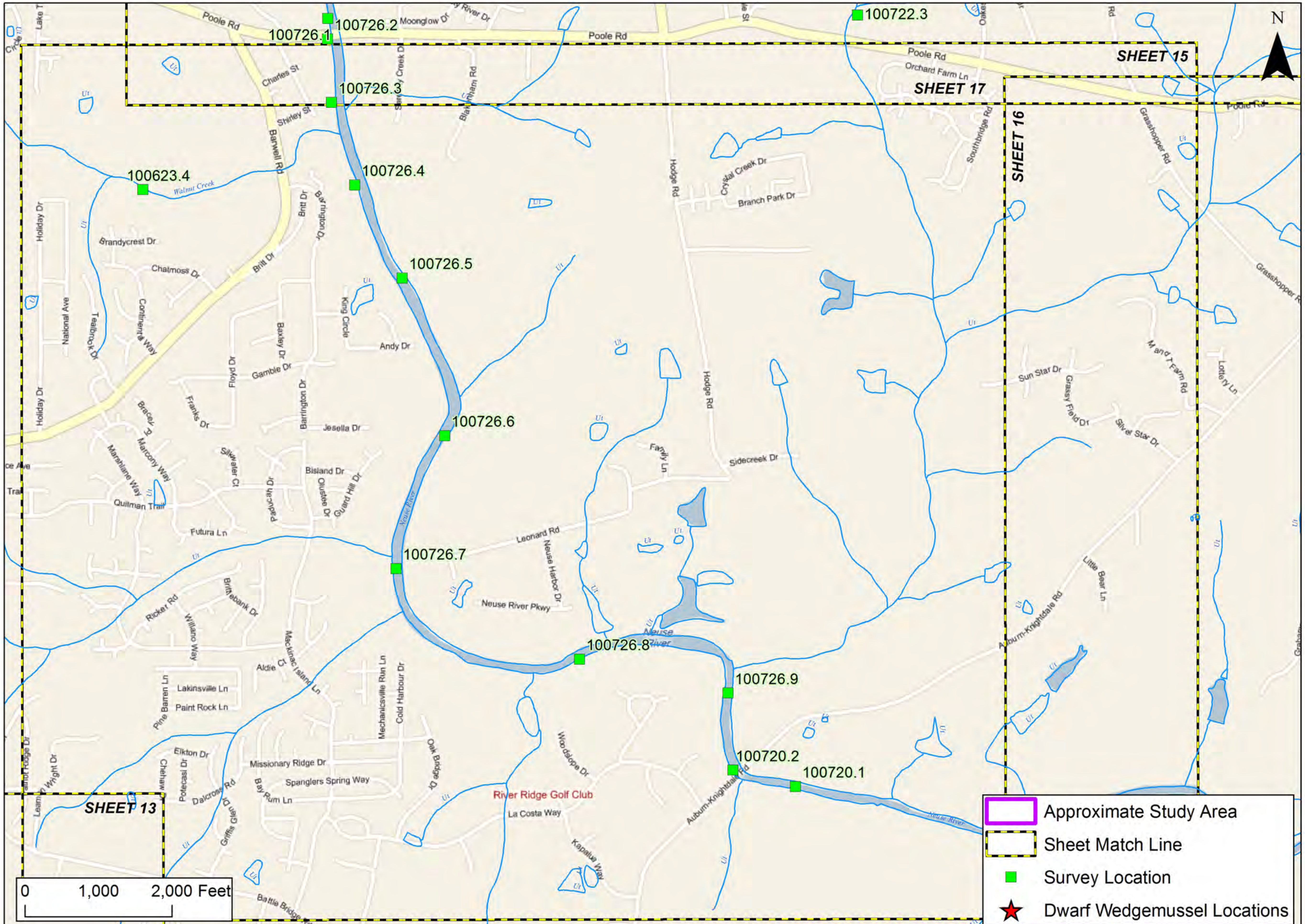
Freshwater Mussel Surveys

Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure
2
Sheet 14



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title:
Triangle Expressway Southeast Extension

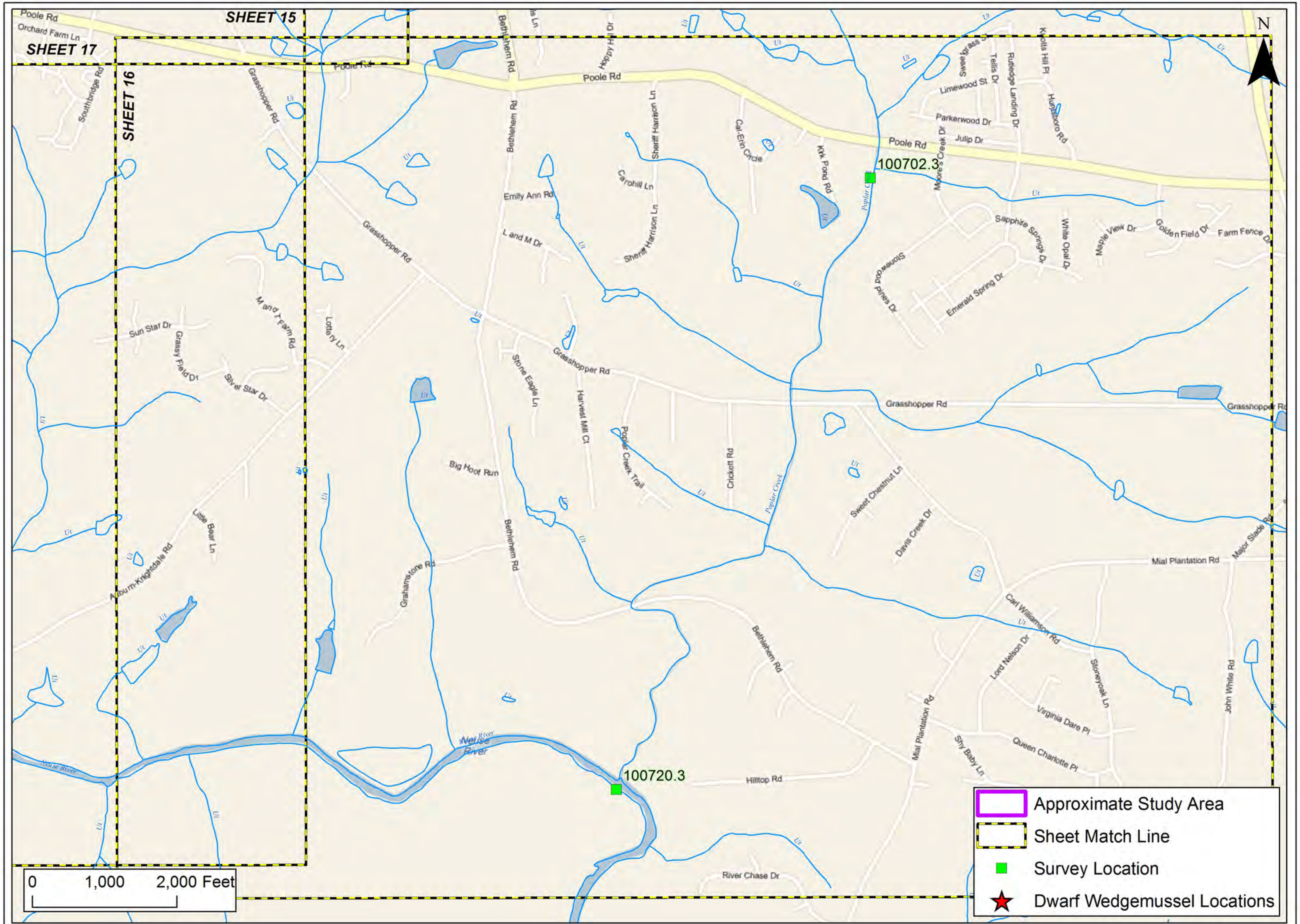
Freshwater Mussel Surveys

Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure
2
Sheet 15



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title: **Triangle Expressway Southeast Extension**

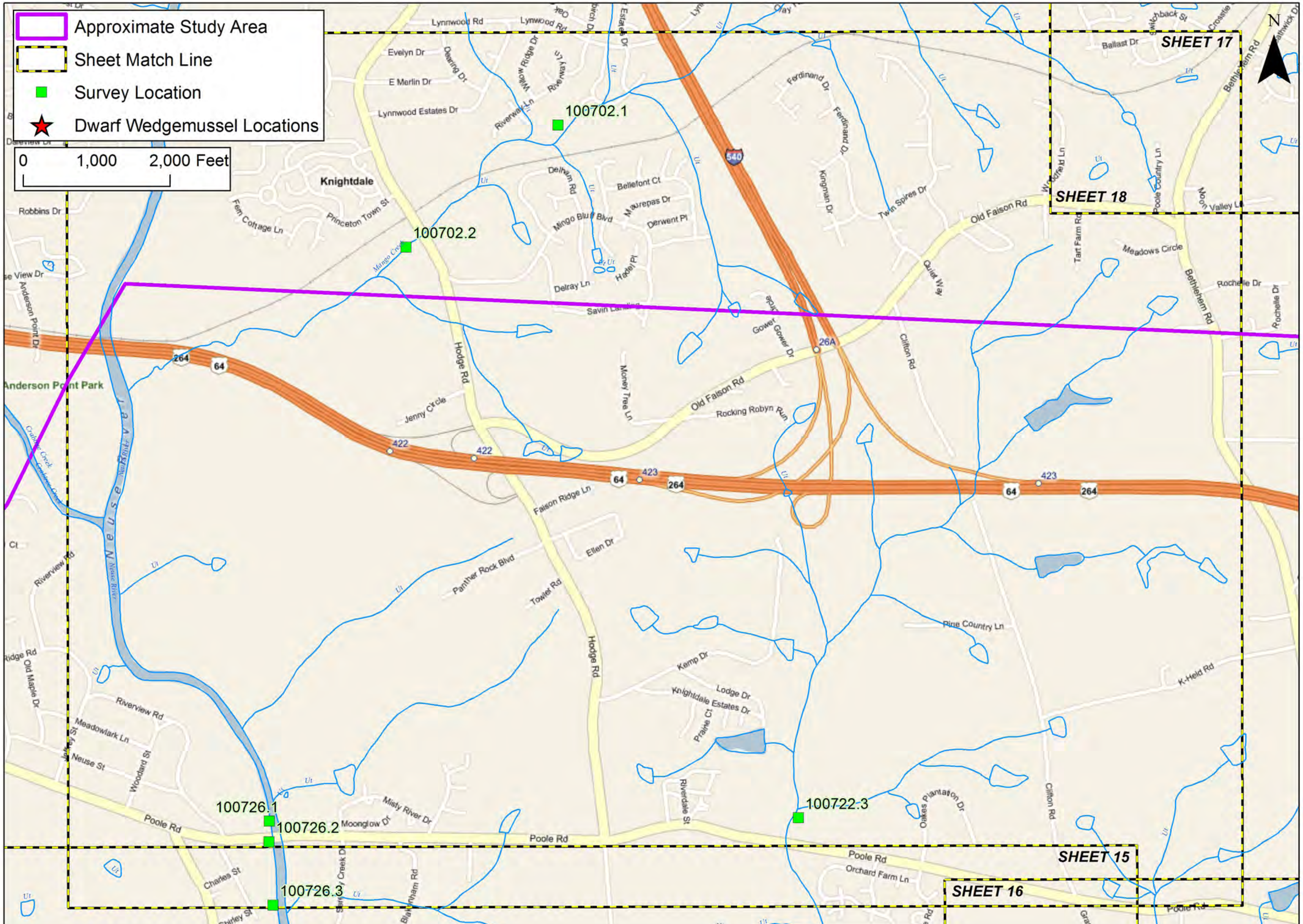
Freshwater Mussel Surveys

Wake and Johnston Counties, North Carolina

Client: North Carolina Turnpike Authority

Figure 2

Sheet 16



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title: **Triangle Expressway Southeast Extension**

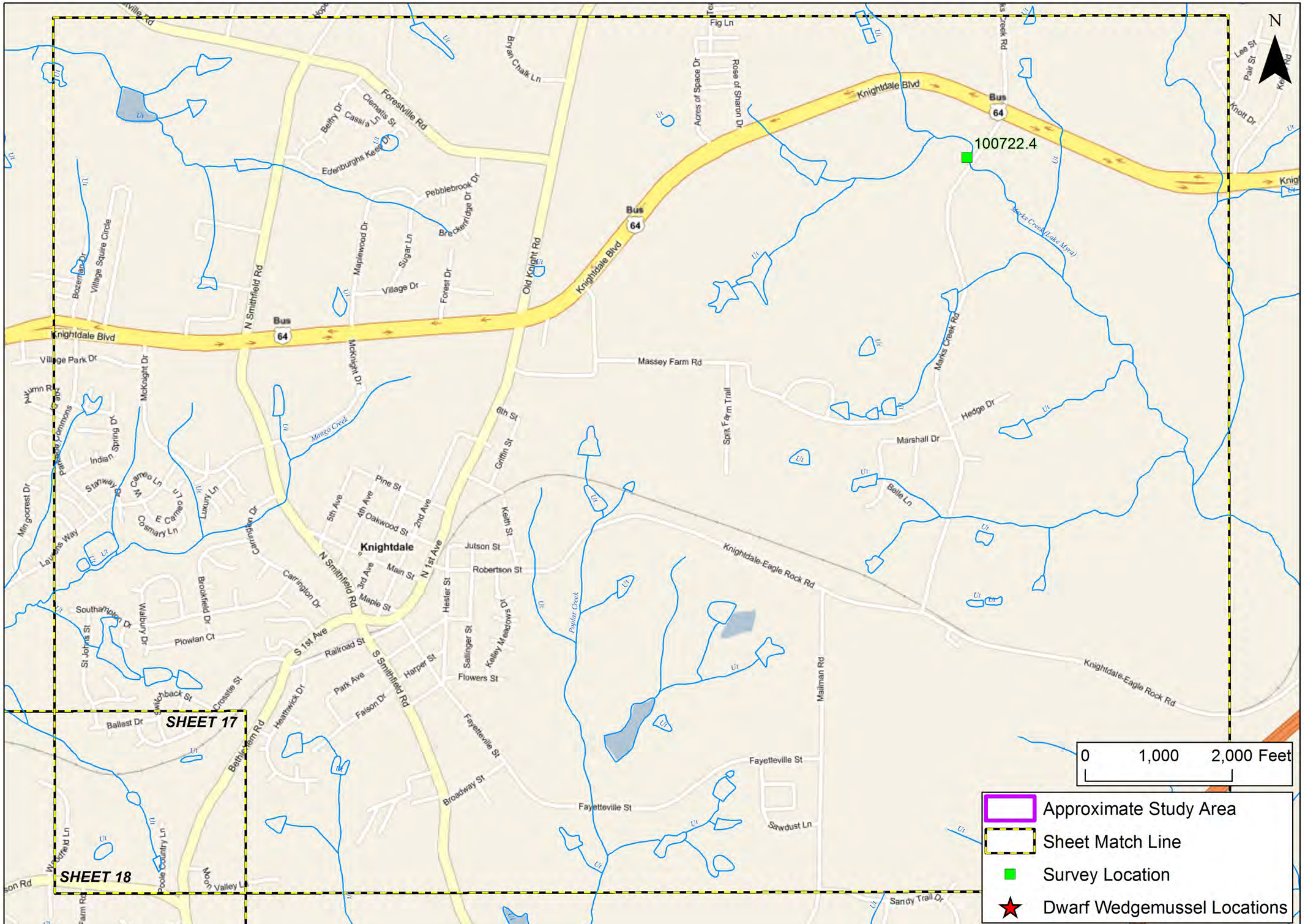
Freshwater Mussel Surveys

Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure
2
Sheet 17



The Catena Group

Date: March 2011

Scale: As Shown

Job No.: 3271

Title:

Triangle Expressway Southeast Extension

Freshwater Mussel Surveys

Wake and Johnston Counties, North Carolina

Client:

North Carolina Turnpike Authority

Figure 2

Sheet 18

APPENDIX B

DEFINITIONS OF FEDERAL AND STATE LISTING CATEGORIES
(FROM LEGRAND ET AL. 2010)

United States Status. This status is designated by the U.S. Fish and Wildlife Service. Federally listed Endangered and Threatened species are protected under the provisions of the Endangered Species Act of 1973, as amended through the 100th Congress. Unless otherwise noted, definitions are taken from the Federal Register, Vol. 56, No. 225, November 21, 1991 (50 CFR Part 17).

STATUS CODE	**STATUS**	**STATUS DEFINITION**
E	Endangered	A taxon "which is in danger of extinction throughout all or a significant portion of its range" (Endangered Species Act, Section 3).
T	Threatened	A taxon "which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range" (Endangered Species Act, Section 3).
FSC	(Federal) Species of Concern [also known as Species at Risk]	"... the Service is discontinuing the designation of Category 2 species as candidates in this notice. The Service remains concerned about these species, but further biological research and field study are needed to resolve the conservation status of these taxa. Many species of concern will be found not to warrant listing, either because they are not threatened or endangered or because they do not qualify as species under the definition in the [Endangered Species] Act. Others may be found to be in greater danger of extinction than some present candidate taxa. The Service is working with the States and other private and public interests to assess their need for protection under the Act. Such species are the pool from which future candidates for listing will be drawn." (Federal Register, February 28, 1996). The Service suggests that such taxa be considered as "Species of Concern" or "Species at Risk", neither of which has official status. The N.C. Natural Heritage Program uses "(Federal) Species of Concern" in this document for those taxa formerly considered as Category 2.
P	Proposed	Species proposed in the Federal Register as a status different from its current Federal status.

STATUS CODE	STATUS	STATUS DEFINITION
T (S/A)	Threatened due to Similarity of Appearance	"Section 4 (e) of the [Endangered Species] Act authorizes the treatment of a species (subspecies or population segment) as endangered or threatened even though it is not otherwise listed as endangered or threatened if -- (a) the species so closely resembles in appearance an endangered or threatened species that enforcement personnel would have substantial difficulty in differentiating between the listed and unlisted species; (b) the effect of this substantial difficulty is an additional threat to an endangered or threatened species; and (c) such treatment of an unlisted species will substantially facilitate the enforcement and further the policy of the Act." (Federal Register, November 4, 1997). [The American Alligator is listed as T (S/A) due to Similarity of Appearance with other rare crocodilians, and the southern population of the Bog Turtle is listed as T (S/A) due to Similarity of Appearance with the northern population of the Bog Turtle (which is federally listed as Threatened and which does not occur in North Carolina).]
XN	Nonessential Experimental Population	"Section 10 (j) of the Endangered Species Act of 1973, as amended, provides for the designation of introduced populations of federally listed species as nonessential experimental. This designation allows for greater flexibility in the management of these populations by local, state, and Federal agencies. Specifically, the requirement for Federal agencies to avoid jeopardizing these populations by their actions is eliminated and allowances for taking the species are broadened." (U.S. Fish and Wildlife Service, 1995).
D	De-listed	Species has been proposed by the U.S. Fish and Wildlife Service for de-listing from the List of Endangered and Threatened Wildlife. However, at the present time, the species is still on the List of Endangered and Threatened Wildlife and is thus protected under the Endangered Species Act. Because such species still have legal Federal protection, the NHP will maintain existing records on the species, though new records might not necessarily be added. If the status becomes law prior to the next publication of the NHP Rare Animal List, the Program will remove the Federal designation from its database (and thus the species will no longer appear on printouts of Federally listed species). NHP may or may not continue to track the species, depending on its legal State status and other factors such as overall abundance and range in the state.

North Carolina Status. Endangered, Threatened, and Special Concern species of mammals, birds, reptiles, amphibians, freshwater fishes, freshwater and terrestrial mollusks, and crustaceans have legal protection status in North Carolina (Wildlife Resources Commission). In addition to the above categories, the Natural Heritage Program maintains computer and map files on Significantly Rare species, as well as species considered Extirpated. Paper files only are maintained for a few of the above species; these species are indicated by the phrase "not tracking."

STATUS CODE	**STATUS**	**STATUS DEFINITION**
E	Endangered	"Any native or once-native species of wild animal whose continued existence as a viable component of the State's fauna is determined by the Wildlife Resources Commission to be in jeopardy or any species of wild animal determined to be an 'endangered species' pursuant to the Endangered Species Act." (Article 25 of Chapter 113 of the General Statutes; 1987).
T	Threatened	"Any native or once-native species of wild animal which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, or one that is designated as a threatened species pursuant to the Endangered Species Act." (Article 25 of Chapter 113 of the General Statutes; 1987).
SC	Special Concern	"Any species of wild animal native or once-native to North Carolina which is determined by the Wildlife Resources Commission to require monitoring but which may be taken under regulations adopted under the provisions of this Article." (Article 25 of Chapter 113 of the General Statutes; 1987).
P	Proposed	Species has been proposed by a Scientific Council as a status (Endangered, Threatened, Special Concern, Watch List, or for Delisting) that is different from the current status, but the status has not yet been adopted by the General Assembly as law. In the lists of rare species in this book, these proposed statuses are listed in parentheses below the current status. Only those proposed statuses that are different from the current statuses are listed.

STATUS CODE	STATUS	STATUS DEFINITION
SR	Significantly Rare	Any species which has not been listed by the N.C. Wildlife Resources Commission as an Endangered, Threatened, or Special Concern species, but which exists in the state in small numbers and has been determined by the N.C. Natural Heritage Program to need monitoring. (This is a N.C. Natural Heritage Program designation.) Significantly Rare species include "peripheral" species, whereby North Carolina lies at the periphery of the species' range (such as Hermit Thrush).
EX	Extirpated	A species which is no longer believed to occur in the state. (This is a N.C. Natural Heritage Program designation, though WRC also uses this status; the NHP list includes those on the WRC list.)
W	Watch List	Any other species believed to be of conservation concern in the state because of scarcity, declining populations, threats to populations, or inadequacy of information to assess its rarity (see page 59 for a more complete discussion). (This is a N.C. Natural Heritage Program designation.)
G		Species is a game animal, and therefore (by law) cannot be listed for State protection as E, T, or SC.

Appendix F

Jurisdictional Determination Letter

(NCDWQ and USACE letters pending)

U.S. Department of Homeland Security
United States Coast Guard

Commander
United States Coast Guard
Fifth Coast Guard District

431 Crawford Street
Portsmouth, Va. 23704-5004
Staff Symbol: dpb
Phone: (757) 398-6557
Fax: (757) 398-6334
Email: James.L.Rouseau2@uscg.mil

16593
19 AUG 2014

Ms. Wendee B. Smith, PWS
Environmental Services Group Manager
Mulkey Engineers and Consultants
6750 Tryon Road
Cary, NC 27518

Dear Ms. Smith:

This responds to your e-mail dated August 15, 2014 for the proposed Triangle Expressway Southeast Extension over several small tributaries and the Neuse River in Wake and Johnston Counties, NC.

The Coast Guard Authorization Act of 1982 exempts bridge projects from Coast Guard Bridge permits when the bridge project crosses non-tidal waters which are not used, susceptible to use in their natural condition, or susceptible to use by reasonable improvement as a means to transport interstate commerce. The information provided with the email and our research describe such a project, therefore the bridges in this vicinity are exempt, and will not require Coast Guard Bridge Permits.

This determination is for the location, study area of the bridges in the proposed project vicinities, and is **valid for five years from the date of this letter**. If construction does not commence within this time period, you must contact this office for reaffirmation of this authorization. Further bridge projects along the same waterways will have to be independently evaluated before they may be considered for this determination.

The fact that a Coast Guard permit is not required does not relieve you of the responsibility for compliance with the requirements of any other Federal, State, or local agency who may have jurisdiction over any aspect of the project.

Sincerely,

Waverly W. Gregory, Jr.

WAVERLY W. GREGORY, JR.
Bridge Program Manager
By direction of the Commander
Fifth Coast Guard District

Copy: CG Sector North Carolina, Waterways Management

Appendix G

Stream, Wetland, and Pond

Tables

Table 2. Water resources in the study area.

Stream Name	Map ID	Figure Number	DWQ Index Number	Best Usage Classification	Hydrologic Unit Code (HUC)
UT To Little Branch	SA	3-1	18-7-6-1-1	C	3030004
UT To Little Branch	SB	3-1	18-7-6-1-1	C	3030004
UT To Little Branch	SC	3-1	18-7-6-1-1	C	3030004
UT To Little Branch	SD	3-1	18-7-6-1-1	C	3030004
UT To Little Branch	SE	3-1	18-7-6-1-1	C	3030004
UT To Middle Creek	SF	3-1	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SG	3-1	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SH	3-1/3-2	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SI	3-1	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SJ	3-2	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SK	3-2	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SL	3-2	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SM	3-2	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SN	3-2	27-43-15-(1)	C;NSW	3020201
Middle Creek	SO	3-2	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SP	3-3	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SQ	3-3	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SR	3-3	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SS	3-3	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	ST	3-3	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SU	3-3	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SV	3-3	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SW	3-3	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SX	3-4/3-5	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SY	3-4	27-43-15-(1)	C;NSW	3020201
UT To Middle Creek	SZ	3-4	27-43-15-(1)	C;NSW	3020201
UT To Rocky Branch	SAA	3-4	27-43-15-4.5	C;NSW	3020201
UT To Rocky Branch	SAB	3-4	27-43-15-4.5	C;NSW	3020201
UT To Rocky Branch	SAC	3-4	27-43-15-4.5	C;NSW	3020201
Rocky Branch	SAD	3-4	27-43-15-4.5	C;NSW	3020201
UT To Rocky Branch	SAE	3-4/3-6	27-43-15-4.5	C;NSW	3020201
UT To Rocky Branch	SAF	3-4	27-43-15-4.5	C;NSW	3020201
UT To Rocky Branch	SAG	3-6	27-43-15-4.5	C;NSW	3020201
UT To Rocky Branch	SAH	3-6	27-43-15-4.5	C;NSW	3020201
UT To Mills Branch	SAI	3-13	27-43-15-7	C;NSW	3020201

Continues

Table 2 Continued					
Stream Name	**Map ID**	**Figure Number**	**DWQ Index Number**	**Best Usage Classification**	**Hydrologic Unit Code (HUC)**
Camp Branch	SAJ	3-6/3-50/3-51	27-43-15-5	C;NSW	3020201
UT To Camp Branch	SAK	3-6	27-43-15-5	C;NSW	3020201
UT To Camp Branch	SAL	3-7	27-43-15-5	C;NSW	3020201
UT To Camp Branch	SAM	3-7	27-43-15-5	C;NSW	3020201
UT To Camp Branch	SAN	3-7	27-43-15-5	C;NSW	3020201
UT To Camp Branch	SAO	3-7	27-43-15-5	C;NSW	3020201
UT To Camp Branch	SAP	3-7	27-43-15-5	C;NSW	3020201
UT To Bells Lake	SAQ	3-9	27-43-15-6	C;NSW	3020201
UT To Bells Lake	SAR	3-7/3-9	27-43-15-6	C;NSW	3020201
Bells Lake	SAS	3-9	27-43-15-6	C;NSW	3020201
UT To Middle Creek	SAT	3-9	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SAU	3-9	27-43-15-(4)	C;NSW	3020201
UT To Mills Branch	SAV	3-11/3-12	27-43-15-7	C;NSW	3020201
UT To Middle Creek	SAW	3-10	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SAX	3-10	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SAY	3-10	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SAZ	3-10/3-11	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SBA	3-10	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SBB	3-11	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SBC	3-10	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SBD	3-10	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SBE	3-10	27-43-15-(4)	C;NSW	3020201
UT To Mills Branch	SBF	3-11/3-14	27-43-15-7	C;NSW	3020201
UT To Mills Branch	SBG	3-11	27-43-15-7	C;NSW	3020201
UT To Mills Branch	SBH	3-11	27-43-15-7	C;NSW	3020201
UT To Mills Branch	SBI	3-13/3-14	27-43-15-7	C;NSW	3020201
UT To Mills Branch	SBJ	3-13/3-14	27-43-15-7	C;NSW	3020201
UT To Mills Branch	SBK	3-13/3-14	27-43-15-7	C;NSW	3020201
UT To Mills Branch	SBL	3-11	27-43-15-7	C;NSW	3020201
Mills Branch	SBM	3-11	27-43-15-7	C;NSW	3020201
UT To Mills Branch	SBN	3-13	27-43-15-7	C;NSW	3020201
UT To Mills Branch	SBO	3-14	27-43-15-7	C;NSW	3020201
UT To Mills Branch	SBP	3-15	27-43-15-7	C;NSW	3020201
UT To Mills Branch	SBQ	3-15	24-43-15-7	C;NSW	3020201
Continues					

Table 2 Continued					
Stream Name	**Map ID**	**Figure Number**	**DWQ Index Number**	**Best Usage Classification**	**Hydrologic Unit Code (HUC)**
UT To Mills Branch	SBR	3-15	24-43-15-7	C;NSW	3020201
UT To Mills Branch	SBS	3-15	24-43-15-7	C;NSW	3020201
UT To Mills Branch	SBT	3-15	27-43-15-7	C;NSW	3020201
UT To Mills Branch	SBU	3-15	27-43-15-7	C;NSW	3020201
UT To Panther Branch	SBV	3-16/3-17	27-43-15-9	C;NSW	3020201
UT To Panther Branch	SBW	3-16	27-43-15-9	C;NSW	3020201
Panther Branch	SBX	3-15/3-16	27-43-15-9	C;NSW	3020201
UT To Panther Branch	SBY	3-15	27-43-15-9	C;NSW	3020201
UT To Panther Branch	SBZ	3-15	27-43-15-9	C;NSW	3020201
UT To Panther Branch	SCA	3-17	27-43-15-9	C;NSW	3020201
UT To Panther Branch	SCB (1)	3-17	27-43-15-9	C;NSW	3020201
Little Creek	SCC	3-17/3-64	27-43-15-10	C;NSW	3020201
UT To Little Creek	SCD	3-17	27-43-15-10	C;NSW	3020201
UT To Little Creek	SCE	3-17	27-43-15-10	C;NSW	3020201
UT To Juniper Branch	SCF	3-18	27-43-15-10-1	C;NSW	3020201
Juniper Branch	SCG	3-18	27-43-15-10-1	C;NSW	3020201
UT To Juniper Branch	SCH	3-18	27-43-15-10-1	C;NSW	3020201
UT To Juniper Branch	SCI	3-18	27-43-15-10-1	C;NSW	3020201
UT To Juniper Branch	SCJ	3-18	27-43-15-10-1	C;NSW	3020201
UT To Little Creek	SCK	3-17	27-43-15-10	C;NSW	3020201
UT To Guffy Branch	SCL	3-20	27-43-15-10-2	C;NSW	3020201
UT To Guffy Branch	SCM	3-20	27-43-15-10-2	C;NSW	3020201
UT To Guffy Branch	SCN	3-20	27-43-15-10-2	C;NSW	3020201
UT To Guffy Branch	SCO	3-20/3-21/3-22	27-43-15-10-2	C;NSW	3020201
Guffy Branch	SCP	3-21/3-22/3-66/3-67/3-68	27-43-15-10-2	C;NSW	3020201
UT To Guffy Branch	SCQ	3-21	27-43-15-10-2	C;NSW	3020201
UT To Buffalo Branch	SCR	3-22	27-43-15-11	C;NSW	3020201
UT To Buffalo Branch	SCS	3-22	27-43-15-11	C;NSW	3020201
Buffalo Branch	SCT	3-22	27-43-15-11	C;NSW	3020201
Continues					

Table 2 Continued					
Stream Name	Map ID	Figure Number	DWQ Index Number	Best Usage Classification	Hydrologic Unit Code (HUC)
UT To Buffalo Branch	SCU	3-22	27-43-15-11	C;NSW	3020201
UT To Buffalo Branch	SCV	3-22	27-43-15-11	C;NSW	3020201
UT To Buffalo Branch	SCW	3-22	27-43-15-11	C;NSW	3020201
UT To Swift Creek	SCX	3-23	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SCY	3-23/3-24	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SCZ	3-23	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDA	3-23/3-24	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDB	3-23	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDC	3-23	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDD (1)	3-23	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDE	3-23	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDF	3-23/3-24	27-43-(8)	C;NSW	3020201
Swift Creek	SDG	3-24/3-25/3-30/3-80/3-81	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDH	3-25	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDI	3-26	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDJ	3-25/3-26	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDK	3-25/3-26	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDL	3-25/3-26	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDM	3-26/3-29/3-30	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDN	3-30	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDO	3-29	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDP	3-28/3-29	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDQ	3-29	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDR	3-29	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDS	3-29	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDT	3-29	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDU	3-29	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDV	3-25/3-29/3-30	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDW	3-29	27-43-(8)	C;NSW	3020201
Continues					

Table 2 Continued					
Stream Name	**Map ID**	**Figure Number**	**DWQ Index Number**	**Best Usage Classification**	**Hydrologic Unit Code (HUC)**
UT To Swift Creek	SDX	3-29	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDY	3-32/3-34	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SDZ	3-32	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEB	3-32	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEC	3-34	27-43-(8)	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SED	3-34	27-43-11	C;NSW	3020201
Rocky Branch	SEE	3-4	27-43-15-4.5	C;NSW	3020201
UT To Swift Creek	SEF	3-32	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEG	3-32	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEH	3-32	27-43-(8)	C;NSW	3020201
UT To Rocky Branch	SEI	3-4	27-43-15-4.5	C;NSW	3020201
UT To Swift Creek	SEJ	3-32	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEK	3-28	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEL	3-28	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEM	3-27/3-28/3-35	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEN	3-27/3-28	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEO	3-31	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEP	3-31	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEQ	3-30/3-31	27-43-(8)	C;NSW	3020201
UT To Mills Branch	SER	3-14	27-43-15-7	C;NSW	3020201
UT To Swift Creek	SES	3-30	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SET	3-29/3-30	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEU	3-31	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEV	3-28	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEW	3-33	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SEY	3-33	27-43-(8)	C;NSW	3020201
UT To Mills Branch	SEZ	3-14	27-43-15-7	C;NSW	3020201
UT To Swift Creek	SFA	3-35	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SFB	3-35	27-43-(8)	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SFC	3-36	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SFD	3-36	27-43-11	C;NSW	3020201
Continues					

Table 2 Continued					
Stream Name	**Map ID**	**Figure Number**	**DWQ Index Number**	**Best Usage Classification**	**Hydrologic Unit Code (HUC)**
UT To Swift Creek	SFE	3-35	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SFF	3-35	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SFG	3-35	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SFH	3-35	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SFI	3-33	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SFJ	3-36	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SFK	3-36	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SFL	3-33	27-43-(8)	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SFN	3-37	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SFP	3-37	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SFQ	3-37	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SFR	3-37	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SFS	3-39	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SFT	3-39	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SFU	3-36	27-43-11	C;NSW	3020201
White Oak Creek (Austin Pond)	SFV	3-36/3-37/3-70	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SFX	3-36	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SFY	3-39/3-91	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SFZ (1)	3-39/3-91	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SFZ (2)	3-39/3-91	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SGA	3-39/3-40	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SGC	3-39	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SGD	3-39	27-43-11	C;NSW	3020201
Continues					

Table 2 Continued					
Stream Name	**Map ID**	**Figure Number**	**DWQ Index Number**	**Best Usage Classification**	**Hydrologic Unit Code (HUC)**
UT To White Oak Creek (Austin Pond)	SGE	3-40/3-41	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SGF	3-40	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SGG	3-40/3-41	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SGH	3-41	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SGI	3-39	27-43-11	C;NSW	3020201
UT To Neuse River	SGJ	3-42/3-43	27-(22.5)	C;NSW	3020201
UT To Neuse River	SGK	3-42	27-(22.5)	C;NSW	3020201
UT To Neuse River	SGM	3-42	27-(22.5)	C;NSW	3020201
UT To Neuse River	SGN	3-43	27-(22.5)	C;NSW	3020201
UT To Neuse River	SGO	3-43	27-(22.5)	C;NSW	3020201
UT To Neuse River	SGP	3-43	27-(22.5)	C;NSW	3020201
UT To Neuse River	SGQ	3-43	27-(22.5)	C;NSW	3020201
UT To Neuse River	SGR	3-44	27-(22.5)	C;NSW	3020201
Neuse River	SGS	3-44	27-(22.5)	C;NSW	3020201
UT To Neuse River	SGT	3-44	27-(22.5)	C;NSW	3020201
UT To Neuse River	SGU	3-44/3-45	27-(22.5)	C;NSW	3020201
UT To Neuse River	SGV	3-45	27-(22.5)	C;NSW	3020201
UT To Neuse River	SGW	3-44/3-45	27-(22.5)	C;NSW	3020201
UT To Neuse River	SGY	3-45	27-(22.5)	C;NSW	3020201
UT To Neuse River	SGZ	3-46	27-(22.5)	C;NSW	3020201
UT To Neuse River	SHA	3-46	27-(22.5)	C;NSW	3020201
UT To Neuse River	SHB	3-46	27-(22.5)	C;NSW	3020201
UT To Neuse River	SHC	3-46/3-47/3-48	27-(22.5)	C;NSW	3020201
UT To Neuse River	SHD	3-46	27-(22.5)	C;NSW	3020201
UT To Neuse River	SHE	3-46/3-47	27-22.5	C;NSW	3020201
UT To Neuse River	SHF	3-47	27-22.5	C;NSW	3020201
UT To Neuse River	SHH	3-47	27-22.5	C;NSW	3020201
UT To Mango Creek	SHK	3-48	27-32	C;NSW	3020201
UT To Neuse River	SHL	3-49	27-22.5	C;NSW	3020201
UT To Neuse River	SHM	3-49	27-22.5	C;NSW	3020201
Continues					

Table 2 Continued					
Stream Name	Map ID	Figure Number	DWQ Index Number	Best Usage Classification	Hydrologic Unit Code (HUC)
UT To Neuse River	SHN	3-48	27-22.5	C;NSW	3020201
UT To Neuse River	SHP	3-48	27-22.5	C;NSW	3020201
UT To Neuse River	SHR	3-47	27-22.5	C;NSW	3020201
UT To Neuse River	SHS	3-47/3-49	27-22.5	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SHT	3-36	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SHU	3-35/3-70	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SHV	3-70	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SHW	3-70	27-43-11	C;NSW	3020201
UT To Little Creek	SHX	3-72	27-43-12	C;NSW	3020201
Little Creek	SHY	3-72	27-43-12	C;NSW	3020201
UT To Little Creek	SHZ	3-72	27-43-12	C;NSW	3020201
UT To Beddingfield Creek	SIB	3-73	27-43-12	C;NSW	3020201
UT To Beddingfield Creek	SIC	3-73	27-37	C;NSW	3020201
UT To Little Creek	SID	3-71	27-43-12	C;NSW	3020201
UT To Beddingfield Creek	SIE	3-73/3-74	27-37	C;NSW	3020201
UT To Beddingfield Creek	SIF	3-73	27-37	C;NSW	3020201
UT To Beddingfield Creek	SIG	3-74	27-37	C;NSW	3020201
UT To Beddingfield Creek	SIH	3-41/3-74	27-37	C;NSW	3020201
Beddingfield Creek	SII	3-74	27-37	C;NSW	3020201
UT To Beddingfield Creek	SIJ	3-74	27-37	C;NSW	3020201
UT To Beddingfield Creek	SIK	3-74	27-37	C;NSW	3020201
UT To Beddingfield Creek	SIL	3-74/3-75	27-37	C;NSW	3020201
UT To Beddingfield Creek	SIN	3-75	27-37	C;NSW	3020201
Continues					

Table 2 Continued					
Stream Name	**Map ID**	**Figure Number**	**DWQ Index Number**	**Best Usage Classification**	**Hydrologic Unit Code (HUC)**
UT To White Oak Creek (Austin Pond)	SIO	3-89/3-90/3-91	27-43-11	C;NSW	3020201
UT To Beddingfield Creek	SIP	3-74	27-37	C;NSW	3020201
UT To Neuse River	SIQ	3-77	27-(22.5)	C;NSW	3020201
UT To Neuse River	SIR	3-76	27-(22.5)	C;NSW	3020201
UT To Neuse River	SIS	3-77	27-(22.5)	C;NSW	3020201
UT To Neuse River	SIT	3-77	27-(22.5)	C;NSW	3020201
UT To Neuse River	SIU	3-77	27-(22.5)	C;NSW	3020201
UT To Neuse River	SIV	3-44	27-(22.5)	C;NSW	3020201
UT To Neuse River	SIW	3-45	27-(22.5)	C;NSW	3020201
UT To Beddingfield Creek	SIX	3-41	27-37	C;NSW	3020201
UT To Beddingfield Creek	SIY	3-41	27-37	C;NSW	3020201
UT To Beddingfield Creek	SIZ	3-41	27-37	C;NSW	3020201
UT To Beddingfield Creek	SJA	3-41	27-37	C;NSW	3020201
UT To Beddingfield Creek	SJB	3-74	27-37	C;NSW	3020201
UT To Neuse River	SJC	3-43/3-75	27-(22.5)	C;NSW	3020201
UT To Neuse River	SJD	3-75	27-(22.5)	C;NSW	3020201
UT To Neuse River	SJE	3-75	27-(22.5)	C;NSW	3020201
UT To Neuse River	SJF	3-75	27-(22.5)	C;NSW	3020201
UT To Neuse River	SJG	3-43/3-75	27-(22.5)	C;NSW	3020201
UT To Neuse River	SJH	3-75	27-(22.5)	C;NSW	3020201
UT To Neuse River	SJI	3-75	27-(22.5)	C;NSW	3020201
UT To Neuse River	SJJ	3-75	27-(22.5)	C;NSW	3020201
UT To Neuse River	SJK	3-43	27-(22.5)	C;NSW	3020201
UT To Neuse River	SJL	3-43	27-(22.5)	C;NSW	3020201
UT To Guffy Branch	SJW	3-20	27-43-15-10-2	C;NSW	3020201
UT To Guffy Branch	SJX	3-68	27-43-15-10-2	C;NSW	3020201
UT To Guffy Branch	SJY	3-68	27-43-15-10-2	C;NSW	3020201
UT To Swift Creek	SJZ	3-24	27-43-(8)a	C;NSW	3020201
Continues					

Table 2 Continued					
Stream Name	**Map ID**	**Figure Number**	**DWQ Index Number**	**Best Usage Classification**	**Hydrologic Unit Code (HUC)**
UT To Swift Creek	SKA	3-24	27-43-(8)a	C;NSW	3020201
UT To Swift Creek	SKB	3-24/3-68	27-43-(8)a	C;NSW	3020201
UT To Swift Creek	SKC	3-24	27-43-(8)a	C;NSW	3020201
UT To Swift Creek	SKD	3-24	27-43-(8)a	C;NSW	3020201
UT To Swift Creek	SKE	3-24/3-26	27-43-(8)a	C;NSW	3020201
UT To Swift Creek	SKF	3-24/3-26	27-43-(8)a	C;NSW	3020201
UT To Swift Creek	SKG	3-26	27-43-(8)a	C;NSW	3020201
UT To Swift Creek	SKH	3-26	27-43-(8)a	C;NSW	3020201
UT To Swift Creek	SKI	3-26	27-43-(8)a	C;NSW	3020201
UT To Swift Creek	SKJ	3-28/3-29/3-69	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SKK	3-28	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SKL	3-28/3-69	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SKM	3-26/3-29/3-69	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SKN	3-28	27-43-(8)a	C;NSW	3020201
UT To Swift Creek	SKO	3-28	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SKP	3-69	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SKQ	3-26	27-43-(8)a	C;NSW	3020201
UT To Swift Creek	SKR	3-35	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SKS	3-28/3-35	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SKT	3-28	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SKU	3-28	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SKV	3-28	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SKW	3-28	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SKX	3-28	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SKY	3-28	27-43-(8)	C;NSW	3020201
UT To Guffy Branch	SKZ	3-20	27-43-15-10-2	C;NSW	3020201
UT To Swift Creek	SLA	3-28	27-43-(8)	C;NSW	3020201
UT To Guffy Branch	SLB	3-68	27-43-15-10-2	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SLC	3-70	27-43-11	C;NSW	3020201
UT To Guffy Branch	SLD	3-68	27-43-15-10-2	C;NSW	3020201
UT To Swift Creek	SLF	3-27	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SLG	3-27	27-43-(8)	C;NSW	3020201
Continues					

Table 2 Continued					
Stream Name	**Map ID**	**Figure Number**	**DWQ Index Number**	**Best Usage Classification**	**Hydrologic Unit Code (HUC)**
UT To Swift Creek	SLH	3-27	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SLI	3-27	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SLJ	3-27	27-43-(8)	C;NSW	3020201
UT To Mills Branch	SLY	3-12	27-43-15-7	C;NSW	3020201
UT To Middle Creek	SLZ	3-10	27-43-15-7	C;NSW	3020201
UT To Swift Creek	SMA	3-78	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek	SMB	3-78	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek	SMC	3-78	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek	SMD	3-12/3-78	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek	SME	3-12	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek	SMF	3-78	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek	SMG	3-78	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek (Yates Mill Pond)	SMH	3-78	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek	SMI	3-78	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek	SMJ	3-80	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek	SMK	3-80	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek	SML	3-81	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek	SMM	3-82/3-83	27-43-5-(2)	WS-III;NSW,CA	3020201
UT To Swift Creek	SMN	3-83	27-43-5-(2)/27-43-(1)d	WS-III;NSW,CA	3020201
UT To Swift Creek (Yates Mill Pond)	SMO	3-82	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek (Yates Mill Pond)	SMP	3-82	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek (Yates Mill Pond)	SMQ	3-82	27-43-5-(1.5)	WS-III;NSW	3020201
UT To Mills Branch	SMR	3-12	27-43-15-7	C;NSW	3020201
UT To Swift Creek	SMS	3-83	27-43-5-(2)	WS-III;NSW,CA	3020201
Buck Branch	SMT	3-84	27-43-6-(2)	WS-III;NSW,CA	3020201
UT To Buck Branch	SMU	3-84	27-43-6-(1)	WS-III;NSW,CA	3020201
UT To Buck Branch	SMV	3-84	27-43-6-(1)	WS-III;NSW,CA	3020201
Continues					

Table 2 Continued					
Stream Name	**Map ID**	**Figure Number**	**DWQ Index Number**	**Best Usage Classification**	**Hydrologic Unit Code (HUC)**
Reedy Branch	SMY	3-84	27-43-7-(1)	WS-III;NSW,CA	3020201
UT To Reedy Branch	SMZ	3-85	27-43-7-(2)	WS-III;NSW,CA	3020201
UT To Reedy Branch	SNB	3-85	27-43-7-(2)	WS-III;NSW,CA	3020201
UT To White Oak Creek (Austin Pond)	SND	3-90	27-43-11	C;NSW	3020201
UT To Swift Creek (Lake Benson)	SNE	3-85	27-43-(5.5)	WS-III;NSW,CA	3020201
UT To White Oak Creek (Austin Pond)	SNF	3-90	27-43-11	C;NSW	3020201
UT To Swift Creek (Lake Benson)	SNG	3-85/3-86	27-43-(5.5)	WS-III;NSW,CA	3020201
UT To White Oak Creek (Austin Pond)	SNH	3-90	27-43-11	C;NSW	3020201
Mahlers Creek	SNI	3-86	27-43-9	C;NSW	3020201
UT To Swift Creek	SNK	3-27	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SNM	3-27	27-43-(8)	C;NSW	3020201
UT To Swift Creek	SNO	3-27	27-43-(8)	C;NSW	3020201
UT To Swift Creek (Lake Benson)	SNQ	3-86	27-43-(5.5)	WS-III;NSW,CA	3020201
UT To Mahlers Creek	SNR	3-86	27-43-9	C;NSW	3020201
UT To Mahlers Creek	SNS	3-86	27-43-9	C;NSW	3020201
UT To Mahlers Creek	SNT	3-88	27-43-9	C;NSW	3020201
UT To Mahlers Creek	SNU	3-88	27-43-9	C;NSW	3020201
UT To Mahlers Creek	SNV	3-88	27-43-9	C;NSW	3020201
UT To Mahlers Creek	SNW	3-88	27-43-9	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SNX	3-89/3-90	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SNY	3-89	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SNZ	3-89	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOA	3-89	27-43-11	C;NSW	3020201
Continues					

Table 2 Continued					
Stream Name	**Map ID**	**Figure Number**	**DWQ Index Number**	**Best Usage Classification**	**Hydrologic Unit Code (HUC)**
UT To Mahlers Creek	SOB	3-88	24-43-9	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOC	3-89	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOD	3-89	27-43-11	C;NSW	3020201
UT to White Oak Creek (Austin Pond)	SOE	3-93	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOF	3-93	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOH	3-93	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOI	3-93	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOJ	3-91/3-92	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOK	3-91	27-43-11	C;NSW	3020201
White Oak Creek (Austin Pond)	SOL	3-90/3-91	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOM	3-90	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SON	3-91	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOO	3-39	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOP	3-90	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOQ	3-40	27-43-11	C;NSW	3020201
UT To Neuse River	SOR	3-42	27-(20.7)	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOS	3-40	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOT	3-89	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOU	3-40	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOV	3-40	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOW	3-40	27-43-11	C;NSW	3020201
Continues					

Table 2 Continued					
Stream Name	**Map ID**	**Figure Number**	**DWQ Index Number**	**Best Usage Classification**	**Hydrologic Unit Code (HUC)**
UT To White Oak Creek (Austin Pond)	SOX	3-40	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOY	3-39/3-40	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SOZ	3-40	27-43-11	C;NSW	3020201
UT To Terrible Creek	SPA	3-55/3-56	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPB	3-55/3-56	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPC	3-58	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPD	3-58	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPE	3-57/3-58	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPF	3-58	27-43-15-8-(2)	C;NSW	3020201
Terrible Creek	SPG	3-55/3-57	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPH	3-57	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPI	3-58	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPJ	3-58	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPK	3-58/3-59	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPL	3-59	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPM	3-59	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPN	3-60	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPO	3-59	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPP	3-60	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPQ	3-60	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPR	3-60	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SPS	3-59/3-60	27-43-15-8-(2)	C;NSW	3020201
UT To Middle Creek	SPT	3-62	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SPU	3-61	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SPV	3-61/3-62	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SPW	3-61	27-43-15-(4)	C;NSW	3020201
Middle Creek	SPX	3-51	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SPY	3-62	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SPZ	3-61	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SQA	3-63	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SQB	3-63	27-43-15-(4)	C;NSW	3020201
Continues					

Table 2 Continued					
Stream Name	Map ID	Figure Number	DWQ Index Number	Best Usage Classification	Hydrologic Unit Code (HUC)
UT To Middle Creek	SQC	3-63	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SQD	3-63	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SQE	3-64	27-43-15-(4)	C;NSW	3020201
UT To Little Creek	SQF	3-64	27-43-15-10	C;NSW	3020201
UT To Ditch Branch	SQG	3-65	27-43-15-10-2	C;NSW	3020201
Ditch Branch	SQH	3-65/3-66	27-43-15-10-2	C;NSW	3020201
UT To Ditch Branch	SQI	3-65	27-43-15-10-2	C;NSW	3020201
UT To Buffalo Branch	SQJ	3-22	27-43-15-11	C;NSW	3020201
UT To Buffalo Branch	SQK	3-22	27-43-15-11	C;NSW	3020201
UT To Guffy Branch	SQL	3-66	27-43-15-10-2	C;NSW	3020201
UT To Guffy Branch	SQM	3-66	27-43-15-10-2	C;NSW	3020201
UT To Guffy Branch	SQN	3-66	27-43-15-10-2	C;NSW	3020201
UT To Guffy Branch	SQO	3-67	27-43-15-10-2	C;NSW	3020201
UT To Buffalo Branch	SQP	3-22	27-43-15-11	C;NSW	3020201
UT To Camp Branch	SQQ	3-50	27-43-15-5	C;NSW	3020201
UT To Camp Branch	SQR	3-50	27-43-15-5	C;NSW	3020201
UT To Camp Branch	SQS	3-50	27-43-15-5	C;NSW	3020201
UT To Camp Branch	SQT	3-50	27-43-15-5	C;NSW	3020201
UT To Middle Creek	SQU	3-52	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SQV	3-52	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SQW	3-52	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SQX	3-52	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SQY	3-52/3-54	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SQZ	3-54	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SRA	3-53/3-54	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SRB	3-52	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SRC (1)	3-52	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SRC (2)	3-52	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SRD	3-54	27-43-15-(4)	C;NSW	3020201
UT To Terrible Creek	SRE	3-55	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SRF	3-54/3-55	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SRG	3-55/3-56	27-43-15-8-(2)	C;NSW	3020201
UT To Terrible Creek	SRH	3-55	27-43-15-8-(2)	C;NSW	3020201
Continues					

Table 2 Continued					
Stream Name	Map ID	Figure Number	DWQ Index Number	Best Usage Classification	Hydrologic Unit Code (HUC)
UT To Terrible Creek	SRI	3-55	27-43-15-8-(2)	C;NSW	3020201
UT To Big Branch	SRJ	3-94	27-34-11	C;NSW	3020201
UT To Big Branch	SRK	3-94	27-34-11	C;NSW	3020201
UT To Big Branch	SRL	3-94	27-34-11	C;NSW	3020201
Poplar Branch	SRM	3-94	27-34-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SRN	3-93	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SRO	3-93	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SRP	3-90	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SRQ	3-38	27-43-11	C;NSW	3020201
UT To White Oak Creek (Austin Pond)	SRR	3-38	27-43-11	C;NSW	3020201
UT To Swift Creek	SRS	3-13	27-43-(1)d	WS-III;NSW	3020201
UT To Swift Creek	SRT	3-13	27-43-(1)d	WS-III;NSW	3020201
UT To Terrible Creek	SRZ	3-58/3-59	27-43-15-8-(2)	C;NSW	3020201
UT To Middle Creek	SSA	3-60	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SSB	3-61	27-43-15-(4)	C;NSW	3020201
UT To Middle Creek	SSC	3-62	27-43-15-(4)	C;NSW	3020201
UT To Camp Branch	SSD	3-50	27-43-15-5	C;NSW	3020201
UT To Camp Branch	SSE	3-50	27-43-15-5	C;NSW	3020201

Table 3a. Physical characteristics of water resources in the study area.

Map ID	Figure Number	Bank Height (ft)	Bankfull Width (in)	Water Depth (in)	Channel Substrate	Velocity	Clarity	Hydrologic Unit Code (HUC)
SA	3-1	1.5	4	1-6	Sand	Moderate	Clear	03030004
SB	3-1	3	6	2-10	Sand/Gravel	Moderate	Clear	03030004
SC	3-1	3	5	2	Sand/Gravel	Slow	Slightly Turbid	03030004
SD	3-1	2	4	2-6	Sand/Gravel	Slow	Slightly Turbid	03030004
SE	3-1	2.5	5	2-8	Sand/Gravel/Cobble	Moderate	Clear	03030004
SF	3-1	0.5-1	3-5	2-10	Sand/Gravel	Moderate	Slightly Turbid	03020201
SG	3-1	0.5-1.5	3	2-4	Silt/Sand/Gravel	Slow	Clear - Slightly Turbid	03020201
SH	3-1/3-2	2-3	8	2-12	Sand/Gravel	Slow	Turbid	03020201
SI	3-1	2	1.5	6	Gravel	Slow	Slightly Turbid	03020201
SJ	3-2	0.5-1	1-2	2-4	Silt/Sand	Slow	Slightly Turbid	03020201
SK	3-2	0.5-1	2-2.5	3-6	Silt/Sand/Gravel	Moderate - Fast	Clear - Turbid	03020201
SL	3-2	3	2	2	Sand/Gravel	Slow	Clear	03020201
SM	3-2	2	8	4-12	Sand/Gravel/Cobble	Moderate	Clear	03020201
SN	3-2	2-3	8-10	6-18	Sand/Gravel	Moderate	Slightly Turbid	03020201
Middle Creek (SO)	3-2	4	25	12-36	Sand/Gravel	Moderate	Slightly Turbid	03020201
SP	3-3	1	2	2	Silt/Sand	Slow	Clear	03020201
SQ	3-3	0.5-1	2-3	4-8	Silt/Sand	Moderate	Slightly Turbid	03020201
SR	3-3	0.5	1	2	Silt	Slow	Clear	03020201
SS	3-3	0.5	1.5	2	Sand/Gravel	Fast	Clear	03020201
ST	3-3	1.5	3	3	Silt	Slow	Slightly Turbid	03020201
SU	3-3	0.5-2	1-4	1-6	Silt/Sand	Slow	Clear - Slightly Turbid	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SV	3-3	3	4	9	Sand	Slow	Slightly Turbid	03020201
SW	3-3	1-3	1-4	1-8	Silt/Sand/Gravel	Slow	Slightly Turbid	03020201
SX	3-4/3-5	3	8-20	2-24	Sand/Gravel/Cobble	Moderate - Fast	Clear - Slightly Turbid	03020201
SY	3-4	1-2	5	8 - 10	Silt/Sand	Slow	Slightly Turbid	03020201
SZ	3-4	0.5 -1	2	1-3	Silt/Sand/Gravel	Slow	Clear	03020201
SAA	3-4	3-5	5-8	2-18	Sand/Gravel	Moderate	Clear	03020201
SAB	3-4	7	8	6-12	Gravel/Cobble	Moderate	Clear	03020201
SAC	3-4	2-4	5	1-2	Sand/Gravel	Slow	Slightly Turbid	03020201
Rocky Branch (SAD)	3-4	3-4	10-12	6-25	Sand/Gravel/Cobble	Slow - Fast	Slightly Turbid	03020201
SAE	3-4/3-6	0.5	2	1	Silt	Slow	Clear	03020201
SAF	3-4	3	4	2	Sand/Gravel	Slow	Slightly Turbid	03020201
SAG	3-6	0.5-1	2	1-2	Silt/Sand	Slow	Slightly Turbid	03020201
SAH	3-6	1-5	2-6	0-10	Silt/Sand/Gravel/Cobble	Slow - Moderate	Clear - Slightly Turbid	03020201
SAI	3-13	1-3	2	5	Silt	Slow	Turbid	03020201
Camp Branch (SAJ)	3-6/3-50/3-51	3-8	4-18	3-36	Silt/Sand/Gravel/Cobble/Bed rock	Slow - Moderate	Clear - Slightly Turbid	03020201
SAK	3-6	3	10-12	4-24	Sand/Gravel	Moderate	Clear	03020201
SAL	3-7	1-3	2-9	3-8	Silt/Clay/Sand/Gravel	Moderate	Clear	03020201
SAM	3-7	3-6	3-6	6-20	Silt/Sand/Gravel	Moderate	Clear	03020201
SAN	3-7	1	3-4	6	Sand/Gravel	Slow	Slightly Turbid	03020201
SAO	3-7	5	3-5	3-8	Silt/Sand/Gravel	Moderate	Clear	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SAP	3-7	3-5	5	2-20	Silt/Sand/Gravel	Moderate	Clear	03020201
SAQ	3-9	3-4	8-10	12-36	Silt/Sand/Gravel	Moderate	Clear	03020201
SAR	3-7/3-9	1-3	4-6	1-6	Silt/Sand	Slow	Slightly Turbid	03020201
Bells Lake (SAS)	3-9	1	1-2	3-6	Silt/Sand	Slow	Clear	03020201
SAT	3-9	0.5	2	0	Sand	Na	Na	03020201
SAU	3-9	0.5	2	0	Sand	Na	Na	03020201
SAV	3-11/3-12	3	8	10	Silt/Sand	Slow	Clear	03020201
SAW	3-10	2	6	3	Gravel	Moderate	Slightly Turbid	03020201
SAX	3-10	1.5-2	6	1-2	Gravel	Slow	Clear	03020201
SAY	3-10	0.5	4	1-2	Silt	Slow	Clear	03020201
SAZ	3-10/3-11	0.5-1.5	3-6	0-12	Sand	Slow - Moderate	Clear - Turbid	03020201
SBA	3-10	1	4	0-1	Sand	Slow	Clear	03020201
SBB	3-11	1-2	4-6	1-2	Silt/Sand	Slow	Clear	03020201
SBC	3-10	0.5	5-6	1-4	Silt/Sand	Slow	Clear	03020201
SBD	3-10	0.5	5-6	1-4	Silt/Sand	Slow	Clear	03020201
SBE	3-10	0.5.-1	4	2-6	Sand	Slow	Clear	03020201
SBF	3-11/3-14	4-5	7	1-2	Sand	Moderate	Clear	03020201
SBG	3-11	1.5	5-6	2-6	Sand/Gravel	Moderate	Slightly Turbid	03020201
SBH	3-11	2-3	5	2 - 12	Sand/Gravel	Fast	Slightly Turbid	03020201
SBI	3-13/3-14	0-1	4	1-4	Silt/Sand	Slow	Clear - Slightly Turbid	03020201
SBJ	3-13/3-14	2	7-8	2 - 12	Sand/Gravel	Moderate	Slightly Turbid	03020201
Continues								

Table 3a Continued								
Map ID	Figure Number	Bank Height (ft)	Bankfull Width (in)	Water Depth (in)	Channel Substrate	Velocity	Clarity	Hydrologic Unit Code (HUC)
SBK	3-13/3-14	1.5	4.5	3	Silt/Sand	Slow (Stagnant)	Turbid	03020201
SBL	3-11	2.5	1.5	1	Sand/Gravel	Slow	Clear	03020201
Mills Branch (SBM)	3-11	4-6	6-8	2-6	Sand/Gravel	Slow	Slightly Turbid	03020201
SBN	3-13	1-3	6	2 - 3	Silt/Sand/Gravel	Slow	Slightly Turbid	03020201
SBO	3-14	1.5	5	1-3	Sand/Gravel	Moderate	Clear	03020201
SBP	3-15	4.5	7	6	Silt/Cobble	Slow	Clear	03020201
SBQ	3-15	1.5	6	4	Sand/Gravel	Moderate	Clear	03020201
SBR	3-15	0.7	4	6	Silt	Moderate	Clear	03020201
SBS	3-15	5	3	2	Silt	Slow	Clear	03020201
SBT	3-15	0.5	3	1	Sand	Moderate	Clear	03020201
SBU	3-15	1	3-4	3	Silt/Sand	Moderate	Clear	03020201
SBV	3-16/3-17	2-3	3-4	4-6	Silt/Gravel	Slow	Clear	03020201
SBW	3-16	0.1	2-3	2	Silt	Slow	Clear	03020201
Panther Branch (SBX)	3-15/3-16	3	10	3-7	Gravel	Moderate	Clear	03020201
SBY	3-15	1	5	3	Silt/Gravel	Moderate	Clear	03020201
SBZ	3-15	1	7	2	Silt/Sand	Slow	Clear	03020201
SCA	3-17	2	5	1-6	Silt/Sand	Slow	Slightly Turbid	03020201
SCB (1)	3-17	2-3	2-8	1-10	Silt/Sand/Gravel	Slow - Moderate	Clear	03020201
Little Creek (SCC)	3-17/3-64	1-2	2-15	5-24	Silt/Sand/Gravel	Slow - Moderate	Clear - Slightly Turbid	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SCD	3-17	1.3	4	5	Sand	Slow	Slightly Turbid	03020201
SCE	3-17	1.3	4	5	Sand	Slow	Slightly Turbid	03020201
SCF	3-18	2.5	3.5	4	Silt/Sand	Slow	Slightly Turbid	03020201
Juniper Branch (SCG)	3-18	1.5-2	4-7	0-10	Sand/Gravel/Cobble	NA - Moderate	NA - Clear	03020201
SCH	3-18	1	6	0	Sand/Gravel	NA	NA	03020201
SCI	3-18	1	4	0	Sand	NA	NA	03020201
SCJ	3-18	0.5	3	2	Sand/Gravel	Slow	Slightly Turbid	03020201
SCK	3-17	0.5	3.5	0	Silt/Sand	NA	NA	03020201
SCL	3-20	1-1.5	6	1-3	Sand	Moderate	Clear	03020201
SCM	3-20	0.5-1.5	3-6	1-4	Sand	Slow - Moderate	Clear - Slightly Turbid	03020201
SCN	3-20	1	4	1	Sand	Slow	Slightly Turbid	03020201
SCO	3-20/3-21/3-22	0.5-1	3	1	Silt/Sand	Slow	Clear	03020201
Guffy Branch (SCP)	3-21/3-22/3-66/3-67/3-68	0.5-3	2-10	2-12	Silt/Sand/Gravel/Cobble	Slow - Fast	Clear - Slightly Turbid	03020201
SCQ	3-21	0.5-2	2-8	1-6	Silt/Sand	Slow	Slightly Turbid - Turbid	03020201
SCR	3-22	0.5-1.5	3-6	0-10	Silt/Sand	NA - Slow	NA - Slightly Turbid	03020201
SCS	3-22	0.5-1	5	0	Silt/Sand	NA	NA	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
Buffalo Branch (SCT)	3-22	2-4	6-10	1-2	Silt/Sand/Gravel	Slow	Clear	03020201
SCU	3-22	1	5	0-2	Silt/Sand/Gravel	Slow	Slightly Turbid	03020201
SCV	3-22	6-8	4	0	Silt/Sand	NA	NA	03020201
SCW	3-22	0.5	4	0	Sand	NA	NA	03020201
SCX	3-23	5	3	0	Silt/Sand/Cobble	NA	NA	03020201
SCY	3-23/3-24	3.5	4-5	2	Silt/Sand/Gravel/Cobble	Slow	Clear	03020201
SCZ	3-23	4-6	4-5	2	Silt/Sand/Gravel	Slow	Clear	03020201
SDA	3-23/3-24	1-12	6-10	0-3	Silt/Sand/Gravel/Cobble	NA - Slow	NA - Clear	03020201
SDB	3-23	5	2	0	Sand/Gravel/Cobble	Na	NA	03020201
SDC	3-23	5-8	3-5	1	Silt/Cobble	Slow	Clear	03020201
SDD (1)	3-23	3.5	7	3-8	Silt/Gravel/Cobble	Slow	Clear	03020201
SDE	3-23	1-3	4-6	2-8	Silt/Gravel/Cobble	Slow - Moderate	Clear	03020201
SDF	3-23/3-24	2	6	1-10	Sand/Gravel	Moderate	Clear	03020201
Swift Creek (SDG)	3-24/3-25/3-30/3-80/3-81	6-10	18-60	4-36	Silt/Sand/Gravel	Slow - Moderate	Clear - Slightly Turbid	03020201
SDH	3-25	0.5-3	3-5	2-6	Silt/Sand	Moderate	Clear	03020201
SDI	3-26	2.5	2	1-2	Silt/Sand	Slow	Slightly Turbid	03020201
SDJ	3-25/3-26	1.5	6	2-10	Sand/Gravel	Moderate	Clear	03020201
SDK	3-25/3-26	6	5	1-2	Sand/Gravel	Moderate	Turbid	03020201
SDL	3-25/3-26	3	4-10	2-6	Sand/Gravel	Slow	Clear	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SDM	3-26/3-20/3-30	1-3	3-8	0-6	Sand/Gravel	NA-Slow	NA-Turbid	03020201
SDN	3-30	5-8	7	6-12	Rip-Rap	Moderate	Slightly Turbid	03020201
SDO	3-29	4-6	4-5	1-2	Sand/Gravel	Slow	Slightly Turbid	03020201
SDP	3-28/3-29	1-3	3	2-4	Sand	Slow	Clear	03020201
SDQ	3-29	2-4	6	1-12	Sand	Moderate	Clear	03020201
SDR	3-29	1-2	3	2	Silt/Sand	Slow	Slightly Turbid	03020201
SDS	3-29	1-3	6	1	Silt	Slow	Slightly Turbid	03020201
SDT	3-29	1-4	10	3-18	Sand/Gravel	Slow	Slightly Turbid	03020201
SDU	3-29	NA	NA	NA	Na	NA	NA	03020201
SDV	3-25/3-29/3-30	0.5-3.5	3-15	2-36	Silt/Sand	Slow	Clear - Turbid	03020201
SDW	3-29	1-3	8	2-12	Sand	Moderate - Fast	Clear	03020201
SDX	3-29	0.5-1	3	0	Sand	NA	NA	03020201
SDY	3-32/3-34	0.5-1.5	2	2-4	Silt	Slow	Slightly Turbid	03020201
SDZ	3-32	2.5-3	4	1-8	Silt/Sand	Slow	Clear	03020201
SEB	3-32	0.5	2.5	1-4	Silt/Sand	Slow	Clear	03020201
SEC	3-34	0.5-3	3	1-12	Silt/Sand	Slow	Clear	03020201
SED	3-34	1-2	4	2-12	Silt/Sand	Moderate	Clear	03020201
Rocky Branch (SEE)	3-4	3	4-6	3-12	Sand/Gravel	Slow	Slightly Turbid	03020201
SEF	3-32	1-3	12-15	36+	Sand	Slow	Slightly Turbid	03020201
SEG	3-32	2-3	3	2-6	Silt/Sand	Slow	Clear	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SEH	3-32	0.5	1.5	2	Sand/Gravel	Slow	Clear	03020201
SEI	3-4	2.5	3	3-8	Silt/Sand	Slow	Slightly Turbid	03020201
SEJ	3-32	1-3	12-15	36+	Sand	Slow	Clear	03020201
SEK	3-28	1-4	3-4	2-6	Silt/Sand	Slow	Clear - Slightly Turbid	03020201
SEL	3-28	2-6	2-10	3-8	Silt/Sand/Gravel/Bedrock	Slow - Moderate	Clear	03020201
SEM	3-27/3-28/3-35	1-10	2-10	2-12	Silt/Sand/Gravel/Cobble	Slow - Moderate	Clear	03020201
SEN	3-27/3-28	3-5	3-5	4-12	Silt/Sand/Gravel/Cobble	Slow - Moderate	Clear	03020201
SEO	3-31	2-4	4-5	3-6	Silt/Sand/Gravel/Cobble/Bedrock	Slow - Moderate	Clear	03020201
SEP	3-31	1	1.5	3-4	Silt/Sand	Slow	Slightly Turbid	03020201
SEQ	3-30/3-31	0.5-2.5	1.5-2	2	Silt/Sand	Slow	Clear	03020201
SER	3-14	3	2	1-3	Silt/Sand/Gravel	Slow	Slightly Turbid	03020201
SES	3-30	3	5	3-5	Silt/Sand	Slow	Clear	03020201
SET	3-29/3-30	3-4	6-15	3-12	Silt/Sand/Gravel	Moderate	Clear	03020201
SEU	3-31	2-3	3-3.5	3-6	Sand/Gravel/Cobble	Slow	Clear	03020201
SEV	3-28	4-8	4-6	3-6	Sand/Gravel/Cobble/Bedrock	Slow	Clear	03020201
SEW	3-33	8-12	1-2	3-6	Silt	Slow	Clear	03020201
SEY	3-33	0.5-4	2-4	0-2	Silt/Sand	Slow	Clear - Slightly Turbid	03020201
SEZ	3-14	2-6	2-4	2-5	Silt/Sand/Gravel	Slow	Slightly Turbid	03020201
SFA	3-35	2	3.5	1	Sand	Stagnant	Turbid	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SFB	3-35	1-2	2-3	1-2	Silt/Sand	Slow	Clear - Slightly Turbid	03020201
SFC	3-36	1	5	1-2	Silt/Sand/Gravel/Cobble	Slow	Clear	03020201
SFD	3-36	0.5	4	1	Silt/Sand/Gravel/Cobble	Slow	Clear	03020201
SFE	3-35	5.5	5	3	Silt/Sand/Gravel	Slow	Clear	03020201
SFF	3-35	3	7	3-36	Silt/Sand/Gravel/Cobble	Slow	Clear	03020201
SFG	3-35	5	3-5	1	Sand/Gravel/Cobble	Slow	Clear	03020201
SFH	3-35	3	4	2	Silt/Sand/Gravel/Cobble/Bed rock	Slow	Clear	03020201
SFI	3-33	3	6	4	Silt/Sand	Slow	Turbid	03020201
SFJ	3-36	6-10	3-4	2-6	Sand/Gravel/Cobble	Slow	Clear	03020201
SFK	3-36	0.5-1	2	2-3	Silt/Sand	Slow	Slightly Turbid	03020201
SFL	3-33	3.5	6	3	Silt/Sand/Gravel	Slow	Clear	03020201
SFN	3-37	4	6-7	6-10	Silt/Sand	Moderate	Clear	03020201
SFP	3-37	3-5	15	12-36	Silt/Sand/Gravel	Slow	Clear	03020201
SFQ	3-37	2-5	2-4	2-24	Silt/Sand/Gravel/Cobble	Moderate	Clear	03020201
SFR	3-37	1	4.5	2	Silt/Sand/Gravel	Slow	Slightly Turbid	03020201
SFS	3-39	2	1.5-2	2-3	Silt/Sand	Slow	Clear	03020201
SFT	3-39	4-6	3-5	1-6	Silt/Sand	Slow	Clear - Slightly Turbid	03020201
SFU	3-36	4-5	2-2.5	2-4	Silt/Sand	Moderate	Clear	03020201
White Oak Creek (SFV)	3-36/3-37/3-70	2-9	13-22	2-24	Silt/Sand/Gravel	Moderate	Clear	03020201
SFX	3-36	4-5	4	2-4	Silt/Sand	Slow	Clear	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SFY	3-39/3-91	2-3	4-18	12-30	Silt/Sand	Slow - Moderate	Slightly Turbid	03020201
SFZ (1)	3-39/3-91	2-3	3-4	2-6	Silt/Sand/Gravel	Slow	Slightly Turbid	03020201
SFZ (2)	3-39/3-91	2-3	2-3	0-6	Silt/Sand/Gravel	Slow	Clear	03020201
SGA	3-39/3-40	0.5-6	1-10	2-18	Silt/Sand/Cobble/Bedrock	Slow - Moderate	Clear	03020201
SGC	3-39	1-1.5	3-4	1-3	Silt/Sand	Slow	Clear	03020201
SGD	3-39	1-2	1-2	6-12	Silt/Sand	Slow	Slightly Turbid	03020201
SGE	3-40/3-41	2	2.5-3	6-16	Silt/Sand	Slow	Clear	03020201
SGF	3-40	3-7	2-5	1-6	Silt/Sand/Gravel	Slow	Clear	03020201
SGG	3-40/3-41	1-2	3-4	6	Silt/Sand	Moderate	Clear	03020201
SGH	3-41	6-7	2-3	3	Silt/Sand/Gravel	Slow	Clear	03020201
SGI	3-39	3-6	5	0	Sand	NA	NA	03020201
SGJ	3-42/3-43	1.5-6	3-8	2-10	Silt/Sand/Gravel/Cobble	Slow - Moderate	Clear	03020201
SGK	3-42	2-6	2-4	2-6	Silt/Sand/Gravel	Slow - Moderate	Clear	03020201
SGM	3-42	1-2	2	3-4	Silt/Sand	Slow	Clear	03020201
SGN	3-43	1.5-3	3	6	Silt/Sand	Slow	Clear	03020201
SGO	3-43	1-10	1-2	6	Silt/Sand	Slow	Clear	03020201
SGP	3-43	2	1.5-2.5	8-12	Silt/Sand	Slow	Clear	03020201
SGQ	3-43	3-4	5-6	2-3	Sand	Moderate	Clear	03020201
SGR	3-44	1	4.5	2-3	Silt/Sand/Gravel	Slow - Moderate	Clear	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
Neuse River (SGS)	3-44	15-25	140-150	12-48	Silt/Sand/Gravel/Bedrock	Moderate	Clear - Slightly Turbid	03020201
SGT	3-44	0.5	4	1	Silt	Moderate	Clear	03020201
SGU	3-44/3-45	3-4	10-15	6-12	Silt/Sand/Gravel	Moderate	Clear	03020201
SGV	3-45	2	1	2-4	Silt/Sand/Gravel	Slow	Clear	03020201
SGW	3-44/3-45	3-6	2-5	1-8	Silt/Sand/Gravel/Cobble	Slow - Moderate	Clear	03020201
SGY	3-45	3-4	3	2-6	Silt/Sand	Slow	Clear	03020201
SGZ	3-46	0.5	4-5	3-4	Silt/Sand	Moderate	Clear	03020201
SHA	3-46	5	3-4	3-6	Sand/Cobble	Moderate	Clear	03020201
SHB	3-46	1	2	3-6	Silt/Sand	Slow	Slightly Turbid	03020201
SHC	3-46/3-47/3-48	1-8	2.5-10	1-8	Silt/Sand	Slow - Moderate	Clear - Slightly Turbid	03020201
SHD	3-46	1-3	3	2-8	Silt/Sand	Slow	Clear	03020201
SHE	3-46/3-47	1	2.5	1-4	Silt/Sand	Slow	Clear	03020201
SHF	3-47	4-5	3	6-8	Silt/Sand	Moderate	Clear	03020201
SHH	3-47	0.5-2	2-3	4-8	Silt/Sand	Moderate	Clear	03020201
SHK	3-48	1	5	1-3	Silt/Sand/Rip-Rap	Slow	Clear	03020201
SHL	3-49	0.5-1.5	3	3-6	Silt/Sand	Moderate	Clear	03020201
SHM	3-49	0.5-1	3	1	Silt/Sand	Slow	Clear	03020201
SHN	3-48	0.5-1	2	2-4	Sand	Slow	Clear	03020201
SHP	3-48	1-4	2	3-4	Sand	Slow	Clear	03020201
SHR	3-47	3	4-5	4-6	Silt/Sand	Slow	Clear	03020201
SHS	3-47/3-49	1-3	4-6	4-6	Silt/Sand	Moderate	Clear	03020201
Continues								

Table 3a Continued								
Map ID	Figure Number	Bank Height (ft)	Bankfull Width (in)	Water Depth (in)	Channel Substrate	Velocity	Clarity	Hydrologic Unit Code (HUC)
SHT	3-36	1	3-4	3-6	Sand	Moderate	Turbid	03020201
SHU	3-35/3-70	2-4	4-6	2-10	Sand/Gravel/Cobble	Slow - Moderate	Clear	03020201
SHV	3-70	3-4	4-5	3-6	Silt/Sand/Gravel/Bedrock	Moderate	Clear	03020201
SHW	3-70	4	4	1-12	Silt/Sand	Slow	Slightly Turbid	03020201
SHX	3-72	3.5-5	3-5	3-6	Silt/Sand/Gravel	Moderate	Clear	03020201
Little Creek (SHY)	3-72	1	4	4-6	Silt/Sand	Moderate	Slightly Turbid	03020201
SHZ	3-72	10	3	3-6	Silt/Sand/Gravel	Moderate	Clear	03020201
SIB	3-73	1-3	3-5	6-8	Sand/Gravel/Cobble/Bedrock	Moderate	Clear	03020201
SIC	3-73	2-3	3-4	3-6	Silt/Sand	Slow	Clear	03020201
SID	3-71	3	12	24-30	Silt/Sand	Slow	Clear	03020201
SIE	3-73/3-74	1-4	5	3-8	Sand/Gravel/Cobble	Moderate	Clear	03020201
SIF	3-73	0.5	1	1-2	Silt/Sand	Slow	Clear	03020201
SIG	3-74	3-6	2-5	1-4	Silt/Sand	Slow - Moderate	Clear	03020201
SIH	3-41/3-74	4-5	3-4	1-2	Sand	Slow	Slightly Turbid	03020201
Beddingfield Creek (SII)	3-74	3-7	6-14	3-6	Silt/Sand	Moderate	Clear	03020201
SIJ	3-74	3-4	5	3-6	Silt/Sand/Gravel	Moderate	Clear	03020201
SIK	3-74	1	4	2-4	Silt/Sand	Slow	Clear	03020201
SIL	3-74/3-75	3	4	6-8	Silt/Sand/Gravel	Moderate	Clear	03020201
SIN	3-75	1	6	0	Sand	NA	NA	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SIO	3-89/3-90/3-91	2-3	2-3	6-12	Silt/Sand	Moderate	Clear	03020201
SIP	3-74	1-2	4	1-2	Sand	Slow	Clear	03020201
SIQ	3-77	4-10	4-5	0.5-1	Sand/Gravel	Slow - Moderate	Clear	03020201
SIR	3-76	6	3	0.5-1.0	Sand	Slow	Clear	03020201
SIS	3-77	5-6	4	1-3	Sand/Gravel/Cobble	Slow	Clear	03020201
SIT	3-77	1-5	3-5	1-3	Sand/Gravel	Slow	Clear	03020201
SIU	3-77	0.5	2-3	1	Sand/Gravel	Slow	Clear	03020201
SIV	3-44	0.5 - 2	3	2-6	Silt	Moderate	Turbid	03020201
SIW	3-45	4-5	4	2-3	Sand/Gravel	Slow	Clear	03020201
SIX	3-41	5-6	4-5	3-5	Sand/Gravel	Slow	Slightly Turbid	03020201
SIY	3-41	4	6	1-2	Sand	Slow	Slightly Turbid	03020201
SIZ	3-41	0.5-2	3	2-8	Sand/Gravel	Slow	Turbid	03020201
SJA	3-41	3-5	3-5	2-10	Silt/Sand	Slow	Turbid	03020201
SJB	3-74	4-6	6	1-2	Sand/Gravel	Slow	Clear	03020201
SJC	3-43/3-75	2-8	4	1-6	Silt/Sand/Gravel	Slow - Moderate	Clear - Turbid	03020201
SJD	3-75	2-3	5-6	1-2	Sand	Moderate	Clear	03020201
SJE	3-75	1-3	4-5	2-18	Silt/Sand	Moderate	Slightly Turbid	03020201
SJF	3-75	2-4	5	2-4	Sand/Gravel/Bedrock	Moderate	Clear	03020201
SJG	3-43/3-75	4	4-5	4-6	Sand	Slow	Turbid	03020201
SJH	3-75	4	3	1-3	Sand	Moderate	Clear	03020201
SJI	3-75	2-3	3	1-2	Sand	Slow	Clear	03020201
Continues								

Table 3a Continued								
Map ID	Figure Number	Bank Height (ft)	Bankfull Width (in)	Water Depth (in)	Channel Substrate	Velocity	Clarity	Hydrologic Unit Code (HUC)
SJJ	3-75	4	2	0.5-1.0	Sand	Slow	Slightly Turbid	03020201
SJK	3-43	0.5-8	3-4	1-6	Sand/Gravel	Slow - Moderate	Clear - Slightly Turbid	03020201
SJL	3-43	4-5	4	1-6	Sand/Gravel	Moderate	Clear	03020201
SJW	3-20	0.5	0.5-2	1-3	Sand	Slow	Slightly Turbid	03020201
SJX	3-68	1	2-4	2-6	Sand	Slow	Slightly Turbid	03020201
SJY	3-68	0-1	1-3	1-3	Sand	Slow	Slightly Turbid	03020201
SJZ	3-24	2-6	4	1	Sand/Gravel/Cobble	Slow	Clear	03020201
SKA	3-24	1-3	4-5	3-12	Sand/Gravel	Slow	Slightly Turbid	03020201
SKB	3-24/3-68	1-3	5	1-3	Sand	Slow	Slightly Turbid	03020201
SKC	3-24	1-2	4-6	1-6	Sand/Gravel	Slow	Slightly Turbid	03020201
SKD	3-24	2-4	5	1-8	Sand/Gravel/Cobble	Slow	Slightly Turbid	03020201
SKE	3-24/3-26	3	6-8	12-18	Sand	Slow	Slightly Turbid	03020201
SKF	3-24/3-26	1	2-3	2-3	Sand/Gravel/Cobble	Slow	Slightly Turbid	03020201
SKG	3-26	2-3	2	1	Sand/Gravel	Slow	Clear	03020201
SKH	3-26	4	2-3	2-4	Silt/Sand/Gravel	Slow	Clear	03020201
SKI	3-26	4-5	1-3	1-2	Silt/Sand/Cobble	Slow	Slightly Turbid	03020201
SKJ	3-28/3-29/3-69	4	3-5	6-12	Sand/Gravel/Cobble	Moderate	Clear	03020201
SKK	3-28	4-5	3-5	0-1	Sand	Slow	Slightly Turbid	03020201
SKL	3-28/3-69	5-6	3-5	6-12	Sand/Gravel/Cobble	Moderate	Clear	03020201
SKM	3-26/3-29/3-69	2-4	2-4	0-1	Sand	Slow	Clear	03020201
SKN	3-28	0.5-1	3-4	4-8	Sand/Gravel/Cobble	Slow	Clear	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SKO	3-28	8	4-6	1-4	Sand	Slow	Slightly Turbid	03020201
SKP	3-69	0.5-1	2-4	0-1	Sand	Slow	Clear	03020201
SKQ	3-26	0.5-1	2-3	3-6	Sand/Gravel	Slow	Slightly Turbid	03020201
SKR	3-35	4-5	5-8	3-5	Sand/Gravel	Moderate	Clear	03020201
SKS	3-28/3-35	2-3	3-4	3-12	Silt/Sand/Gravel/Cobble	Moderate	Clear	03020201
SKT	3-28	0.5	1	2-3	Silt	Slow	Slightly Turbid	03020201
SKU	3-28	1	2-3	3	Silt/Sand	Slow	Slightly Turbid	03020201
SKV	3-28	4	3-4	1-2	Silt/Sand	Slow	Slightly Turbid	03020201
SKW	3-28	0.5	1	2-3	Silt/Sand	Slow	Slightly Turbid	03020201
SKX	3-28	0.5	1	2-3	Silt/Sand	Slow	Slightly Turbid	03020201
SKY	3-28	2-3	2-3	1-2	Sand	Slow	Slightly Turbid	03020201
SKZ	3-20	0.5-1	2-3	6-12	Sand/Gravel	Slow	Clear	03020201
SLA	3-28	1	1-2	3-5	Silt/Sand	Slow	Clear	03020201
SLB	3-68	0.5-1	2-3	2-6	Sand/Gravel	Slow	Clear	03020201
SLC	3-70	2-3	3-4	4-6	Sand	Slow	Clear	03020201
SLD	3-68	0.5-1	1-2	0-6	Silt/Sand	Slow	Clear	03020201
SLF	3-27	2-3	3	3-4	Silt/Sand	Slow	Slightly Turbid	03020201
SLG	3-27	2-3	2	5-10	Silt/Sand	Slow	Slightly Turbid	03020201
SLH	3-27	1	3-4	3-6	Silt	Slow	Slightly Turbid	03020201
SLI	3-27	1	2	2-3	Sand/Gravel	Slow	Clear	03020201
SLJ	3-27	4	3-4	3	Silt	Slow	Turbid	03020201
SLY	3-12	1-2	4-5	0	Sand	NA	NA	03020201
SLZ	3-10	1	4-5	0	Sand	NA	NA	03020201
Continues								

Table 3a Continued								
Map ID	Figure Number	Bank Height (ft)	Bankfull Width (in)	Water Depth (in)	Channel Substrate	Velocity	Clarity	Hydrologic Unit Code (HUC)
SMA	3-78	1-2	2.5-3	2	Sand	Slow	Clear	03020201
SMB	3-78	1-2	2.5-3	2	Sand	Slow	Clear	03020201
SMC	3-78	1-2	3	2-4	Sand	Slow	Clear	03020201
SMD	3-12/3-78	2-3	8	0-6	Sand/Gravel	Slow	Clear	03020201
SME	3-12	0-0.5	2	2-4	Sand	Slow	Clear	03020201
SMF	3-78	0-2	3	1-2	Sand	Moderate	Clear	03020201
SMG	3-78	2-3	6	1-2	Sand/Gravel/Cobble	Slow	Slightly Turbid	03020201
SMH	3-78	1-4	5-6	1-8	Sand/Gravel	Slow	Slightly Turbid	03020201
SMI	3-78	1-2	2	1	Sand	Slow	Clear	03020201
SMJ	3-80	2-4	4-5	4-6	Gravel	Moderate	Clear	03020201
SMK	3-80	2-6	3-10	4-6	Sand/Gravel	Moderate	Clear	03020201
SML	3-81	1.5	2.5	NA	Silt	No Flow	No Flow	03020201
SMM	3-82/3-83	1-4	3-6	2-5	Silt/Gravel/Cobble	Slow	Clear - Slightly Turbid	03020201
SMN	3-83	1-4	4-6	1-3	Silt/Sand/Gravel/Cobble	Slow	Slightly Turbid	03020201
SMO	3-82	1-2	2-3	2-3	Sand	Slow	Clear	03020201
SMP	3-82	2	2-3	2-3	Sand	Slow	Clear	03020201
SMQ	3-82	1.5-5	3-6	1-2	Sand/Gravel	Slow	Slightly Turbid	03020201
SMR	3-12	2.5-3	4	2	Sand	Slow	Slightly Turbid	03020201
SMS	3-83	0.25	2	0	Sand	NA	NA	03020201
Buck Branch (SMT)	3-84	4-6	18-20	1-6	Sand/Gravel	Slow	Slightly Turbid	03020201
SMU	3-84	0.5-1	3.5-4.5	1-2	Silt/Gravel/Cobble	Slow	Slightly Turbid	03020201
SMV	3-84	2-3	12-15	4-12	Sand/Gravel	Slow	Turbid	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
Reedy Branch (SMY)	3-84	1-2	10-12	3-24	Sand/Gravel	Slow	Clear - Turbid	03020201
SMZ	3-85	1	10-15	4-8	Sand/Gravel/Cobble	Slow	Slightly Turbid	03020201
SNB	3-85	0.5	1-3	1-4	Sand	Slow	Slightly Turbid	03020201
SND	3-90	0.5-1	3-5	3-18	Silt/Sand/Gravel	Slow	Slightly Turbid	03020201
SNE	3-85	0.5-1	10-12	3-6	Sand/Gravel	Slow	Slightly Turbid	03020201
SNF	3-90	0.5-6	1-6	3-12	Sand/Gravel	Slow - Moderate	Clear - Slightly Turbid	03020201
SNG	3-85/3-86	0.25-0.5	1-3	0	Sand	NA	NA	03020201
SNH	3-90	0.5-5	1-6	0-3	Sand	Slow	Clear - Slightly Turbid	03020201
Mahlers Creek (SNI)	3-86	2-4	12-15	1-6	Sand/Gravel	Moderate	Clear	03020201
SNK	3-27	1-2	5-10	3-12	Sand/Gravel/Cobble	Slow	Clear	03020201
SNM	3-27	0.5	1-2	0-1	Silt/Sand	Slow	Slightly Turbid	03020201
SNO	3-27	0.5-0.7	3-5	1-5	Sand	Slow	Clear	03020201
SNQ	3-86	0.5	1-2	0-1	Silt/Sand	Slow	Slightly Turbid	03020201
SNR	3-86	0.25	1-2	0-1	Sand	Slow	Slightly Turbid	03020201
SNS	3-86	1	2-5	1-5	Silt/Sand	Slow	Slightly Turbid	03020201
SNT	3-88	0.25-0.5	2-6	1-3	Sand	Slow	Clear	03020201
SNU	3-88	0.5	3-5	1-5	Sand/Gravel	Slow	Clear	03020201
SNV	3-88	0.5	2	1-3	Sand	Slow	Slightly Turbid	03020201
SNW	3-88	0.2-0.4	1-2	0-1	Sand	Slow	Slightly Turbid	03020201
SNX	3-89/3-90	0.5	2-4	0-6	Sand/Gravel/Cobble	Slow	Slightly Turbid	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SNY	3-89	0.5-4	3-10	1-12	Sand/Gravel	Slow - Moderate	Clear - Slightly Turbid	03020201
SNZ	3-89	0.25	2-3	1-2	Sand	Slow	Slightly Turbid	03020201
SOA	3-89	0.5	1-3	0-3	Sand	Slow	Slightly Turbid	03020201
SOB	3-88	1-2	4-8	0-1	Sand	NA	NA	03020201
SOC	3-89	0.5	2-4	1-2	Sand	Slow	Slightly Turbid	03020201
SOD	3-89	0.5	2-4	1-3	Sand	Slow	Slightly Turbid	03020201
SOE	3-93	0.5-5	3-10	1-12	Silt/Sand/Gravel/Cobble/Bed rock	Slow-Moderate	Clear-Slightly Turbid	03020201
SOF	3-93	0.5	1-4	1-10	Sand	Slow	Slightly Turbid	03020201
SOH	3-93	0.5	4-6	1-6	Sand	Slow	Slightly Turbid	03020201
SOI	3-93	0.5-1	1-3	1-6	Silt/Sand	Slow	Slightly Turbid	03020201
SOJ	3-91/3-92	1-4	3-5	2-6	Sand	Slow-Moderate	Clear	03020201
SOK	3-91	1-2	2-3	2-3	Sand	Slow	Clear	03020201
White Oak Creek (SOL)	3-90/3-91	2-4	4-6	4-8	Sand	Moderate	Clear	03020201
SOM	3-90	7-8	3-4	1	Sand	Slow	Clear	03020201
SON	3-91	1	4-5	4-6	Sand	Slow	Clear	03020201
SOO	3-39	1-12	4-5	2-3	Sand	Slow	Clear	03020201
SOP	3-90	4-5	4-5	2	Sand	NA	Clear	03020201
SOQ	3-40	0.5-3	4-5	2-3	Sand	Slow	Clear	03020201
SOR	3-42	0.5-3	4-5	4-6	Sand	Slow	Clear	03020201
SOS	3-40	0.5-3	4-5	2-3	Sand	Slow	Slightly Turbid	03020201
SOT	3-89	2	4	4-6	Sand	Slow	Slightly Turbid	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SOU	3-40	0-2	2-4	0	Sand	NA	NA	03020201
SOV	3-40	2-3	3	0	Sand	NA	NA	03020201
SOW	3-40	1	2	2	Sand	Slow	Slightly Turbid	03020201
SOX	3-40	0.5	5	3	Sand	Slow	Clear	03020201
SOY	3-39/3-40	1-3	3	2-3	Sand	Slow	Clear	03020201
SOZ	3-40	0.5	2	3	Sand	Slow	Clear	03020201
SPA	3-55/3-56	3-5	6-8	0-4	Silt/Cobble	Slow	Clear	03020201
SPB	3-55/3-56	2-3	2-3	0	Sand/Gravel	NA	NA	03020201
SPC	3-58	5-6	8-10	0-6	Silt/Sand/Gravel	Slow	Clear	03020201
SPD	3-58	1-2	1-2	0-3	Silt/Cobble	Slow	Clear	03020201
SPE	3-57/3-58	6-8	8-10	6-12	Silt/Sand/Gravel/Cobble/Bed rock	Moderate	Clear	03020201
SPF	3-58	3-4	3-4	0-6	Sand/Gravel	Slow	Clear	03020201
Terrible Creek (SPG)	3-55/3-57	4-6	8-10	6-12	Silt/Sand/Gravel/Cobble/Bed rock	Fast	Clear	03020201
SPH	3-57	3-4	5-6	0-6	Silt/Sand/Gravel	Slow	Clear	03020201
SPI	3-58	4-6	10-12	6-12	Silt/Sand/Gravel/Cobble/Bed rock	Moderate	Clear	03020201
SPJ	3-58	5-6	8-10	0-6	Silt/Sand/Gravel/Bedrock	Moderate	Clear	03020201
SPK	3-58/3-59	4-6	6-8	0-6	Silt/Sand/Cobble/Bedrock	Slow	Clear	03020201
SPL	3-59	0.5-1	2-3	0-6	Silt	Slow	Clear	03020201
SPM	3-59	0.5-1	2-3	0-6	Sand	Slow	Clear	03020201
SPN	3-60	0.5-1	2-3	0-4	Sand	Slow	Clear	03020201
SPO	3-59	0.5-1	2-3	0-6	Silt/Sand	Slow	Clear	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SPP	3-60	0.5-3	1-8	0-12	Silt/Sand/Gravel/Cobble/Bed rock	Slow - Moderate	Clear	03020201
SPQ	3-60	1-2	2-3	0-6	Silt/Sand/Cobble	Slow	Clear	03020201
SPR	3-60	1-2	4-5	0-6	Silt/Sand/Cobble	Moderate	Clear	03020201
SPS	3-59/3-60	1-2	5-6	6-12	Silt/Sand/Gravel/Cobble/Bed rock	Moderate	Clear	03020201
SPT	3-62	1-6	4-8	6-12	Sand/Gravel/Cobble	Slow - Moderate	Clear - Slightly Turbid	03020201
SPU	3-61	4	3	2-3	Sand	Slow	Clear	03020201
SPV	3-61/3-62	0.25-1	1-3	0-6	Sand/Gravel	Slow - Moderate	Clear - Slightly Turbid	03020201
SPW	3-61	0.5	1-3	1-3	Sand/Gravel/Cobble/Bedrock	Slow	Slightly Turbid	03020201
Middle Creek (SPX)	3-51/3-61	5-10	20-35	12-60	Sand/Gravel	Slow - Moderate	Slightly Turbid	03020201
SPY	3-62	0.5-1	2-4	0-6	Sand/Gravel	Slow	Clear - Slightly Turbid	03020201
SPZ	3-61	0.5	4-6	24-72	Sand	Slow	Slightly Turbid	03020201
SQA	3-63	0.5-1	4-6	3-6	Sand/Cobble	Slow	Clear	03020201
SQB	3-63	1	3-5	3-6	Sand/Gravel/Cobble	Slow	Clear	03020201
SQC	3-63	0.5	1-2	1-2	Silt	Slow	Slightly Turbid	03020201
SQD	3-63	1-2	5-10	24-72	Sand/Gravel/Cobble	Slow	Slightly Turbid	03020201
SQE	3-64	0.5	2-4	12-60	Sand	Slow	Slightly Turbid	03020201
SQF	3-64	0.5-1	3-8	6-18	Sand	Slow	Slightly Turbid	03020201
SQG	3-65	0.5-1	0.5	0	Silt/Sand	Slow	Slightly Turbid	03020201
Ditch Branch (SQH)	3-65/3-66	1-2	8-15	4-12	Sand/Gravel/Cobble	Slow	Clear	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SQI	3-65	0.5	2-4	0-1	Sand/Cobble	Slow	Slightly Turbid	03020201
SQJ	3-22	0.5	1-2	2-5	Sand	Slow	Slightly Turbid	03020201
SQK	3-22	0.5	1-2	2	Sand	Slow	Slightly Turbid	03020201
SQL	3-66	1-1.5	3-4	4-8	Silt/Sand/Gravel/Bedrock	Moderate	Clear	03020201
SQM	3-66	0.5	1-2	0-4	Silt	Slow	Clear	03020201
SQN	3-66	0.5-1	2-3	0-6	Silt/Gravel/Bedrock	Slow	Clear	03020201
SQO	3-67	0.5-1	2-3	0-6	Silt/Sand	Slow	Clear	03020201
SQP	3-22	0.5-3	2-3	0-6	Silt/Sand	Slow	Clear	03020201
SQQ	3-50	3	2-3	0-2	Sand/Gravel	NA	NA	03020201
SQR	3-50	0.5	3-5	0-2	Silt/Sand/Cobble	Slow	Slightly Turbid	03020201
SQS	3-50	0.5	3-5	0-2	Silt/Sand/Cobble	Slow	Slightly Turbid	03020201
SQT	3-50	0.5	3-5	0-2	Silt/Sand/Cobble	Slow	Slightly Turbid	03020201
SQU	3-52	3-4	3-5	6-12	Sand/Gravel	NA	Clear	03020201
SQV	3-52	4-6	8-10	6-12	Silt/Sand/Gravel/Cobble	Moderate	Clear	03020201
SQW	3-52	0.5-1	2-3	0-6	Gravel/Cobble	Slow	Clear	03020201
SQX	3-52	3-4	5-6	0-6	Silt/Sand/Gravel/Cobble	Slow	Clear	03020201
SQY	3-52/3-54	2-4	4-6	3-9	Sand/Gravel/Cobble/Bedrock	Moderate	Clear	03020201
SQZ	3-54	5-7	4-6	4-12	Silt/Sand/Gravel/Cobble/Bed rock	Moderate	Slightly Turbid	03020201
SRA	3-53/3-54	0.5-3	2-5	2-6	Silt/Sand/Gravel/Cobble	Slow - Moderate	Clear	03020201
SRB	3-52	2-4	3	2-4	Sand	Slow	Clear	03020201
SRC (1)	3-52	1-3	3	2	Sand	Slow	Clear	03020201
SRC (2)	3-52	1-3	3	2	Sand	Slow	Clear	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SRD	3-54	0.5	3	2-4	Sand/Gravel/Bedrock	Slow	Slightly Turbid	03020201
SRE	3-55	3-5	4-6	0	Silt/Sand/Gravel	NA	Na	03020201
SRF	3-54/3-54	0.5-4	1-6	2-6	Silt/Sand/Gravel/Cobble	Slow	Clear	03020201
SRG	3-55/3-56	3-5	3-5	0-6	Sand/Gravel	Slow	Clear	03020201
SRH	3-55	3-4	4-8	4-8	Sand/Cobble/Bedrock	Slow	Slightly Turbid	03020201
SRI	3-55	3-4	3-4	0-3	Sand/Gravel	NA	NA	03020201
SRJ	3-94	3-5	3-4	6-12	Sand/Gravel	Slow	Clear	03020201
SRK	3-94	3-5	4-6	6-18	Silt/Sand	Fast	Slightly Turbid	03020201
SRL	3-94	3-5	4-6	0-6	Silt/Sand	Slow	Slightly Turbid	03020201
Poplar Branch (SRM)	3-94	4-5	3-4	0-6	Sand/Gravel	Slow	Clear	03020201
SRN	3-93	3-4	2-3	0-6	Sand/Gravel	Slow	Clear	03020201
SRO	3-93	4-5	3-4	6-12	Sand/Gravel/Cobble/Bedrock	Moderate	Clear	03020201
SRP	3-90	1-2	2-3	0-6	Silt/Sand	Slow	Clear	03020201
SRQ	3-38	4-6	6	4-12	Sand/Gravel	Moderate	Clear	03020201
SRR	3-38	1	4	3	Sand	Slow	Slightly Turbid	03020201
SRS	3-13	1-2	3-4	2-6	Silt/Sand/Gravel	Moderate	Slightly Turbid	03020201
SRT	3-13	5-6	4-6	2-6	Silt/Sand/Gravel	Moderate	Clear	03020201
SRZ	3-58/3-59	0.5-1	1-2	0-6	Silt/Gravel	Slow	Slightly Turbid	03020201
SSA	3-60	0.5-1	2-3	6-12	Sand/Gravel	Slow	Slightly Turbid	03020201
SSB	3-61	0.5-4	1-4	0-6	Sand/Gravel/Cobble	Slow - Moderate	Clear	03020201
SSC	3-62	3-4	2-3	0-6	Sand/Gravel	Moderate	Clear	03020201
Continues								

Table 3a Continued								
Map ID	**Figure Number**	**Bank Height (ft)**	**Bankfull Width (in)**	**Water Depth (in)**	**Channel Substrate**	**Velocity**	**Clarity**	**Hydrologic Unit Code (HUC)**
SSD	3-50	3-5	6-10	18-24	Silt/Sand/Gravel/Cobble	Moderate	Clear	03020201
SSE	3-50	0.5-1	1-2	0-6	Silt/Sand	Slow	Clear	03020201
EPH (1)	3-88	-	-	-	-	-	-	03020201
EPH (2)	3-62	-	-	-	-	-	-	03020201
EPH (3)	3-50	-	-	-	-	-	-	03020201

NA – “Not Applicable” Some characteristics could not be obtained due to site conditions (ex. no water present).

Table 3b. Physical characteristics of ponds in the study area.

Map Id	Figure Number	Appearance	Connecting Feature Map ID	Area (ac)										Subject to Buffers	Hydrologic Unit Code (HUC)
				Southern Section Alternatives					Eastern Section Alternatives						
				Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal		
PA	3-1	Man-made	WB/WE	0.2										Not Subject	03020201
PB	3-4	Man-made	WAE	0.4										Not Subject	03020201
PC	3-4	Man-made	WAK	<0.1										Not Subject	03020201
PD	3-7	Man-made	WAW(1)	0.9										Subject	03020201
PE	3-9	Man-made	WBE/SAS	0.6										Subject	03020201
PF	3-10	Man-made	SAW/SBE	4.4	4.5									Subject	03020201
PG	3-10	Man-made	SAY	1.6										Not Subject	03020201
PH	3-10	Man-made	Ephemeral	1.0	1.0									Not Subject	03020201
PI	3-10	Man-made	SAZ/SBA/SBC	2.3										Subject	03020201
PJ	3-11	Man-made	Connection Outside Study Area	0.2										Subject	03020201
PK	3-11	Man-made	SBF/WBT	3.9										Subject	03020201
PL	3-13	Man-made	SBN/WBU	0.1										Subject	03020201
PM	3-15	Man-made	SBQ/SBR	1.6										Subject	03020201
PN	3-16/3-17	Man-made	SBV	1.2										Subject	03020201
PO	3-15	Man-made	Ephemeral	0.7										Not Subject	03020201
PP	3-17	Man-made	WCZ	1.0										Not Subject	03020201
PQ	3-18	Man-made	WCZ	0.4										Not Subject	03020201
PR	3-18	Man-made	WCZ	1.1										Not Subject	03020201
PS	3-18	Man-made	WDB	<0.1										Not Subject	03020201
PT	3-20	Man-made	WDF	1.0		1.0								Not Subject	03020201
PU	3-20	Man-made	WDB/WDC	1.0		0.3								Not Subject	03020201
PV	3-20	Man-made	SCL/WDG	0.9										Subject	03020201
PW	3-20	Man-made	WDG	0.1										Not Subject	03020201
PX	3-20	Man-made	Connection Outside Study Area	0.2										Subject	03020201
PY	3-21	Man-made	SCQ	1.3										Subject	03020201
PZ	3-22	Man-made	Connection Outside Study Area	1.0										Subject	03020201
PAA	3-22	Man-made	WUG/SCR	0.4				0.4						Not Subject	03020201
PAB	3-24	Man-made	SCV	0.5		1.4		1.4						Subject	03020201
PAC	3-23	Man-made	SDD	0.1										Not Subject	03020201

Continues

Table 3b Continued															
Map Id	**Figure Number**	**Appearance**	**Connecting Feature Map ID**	**Area (ac)**										**Subject to Buffers**	**Hydrologic Unit Code (HUC)**
				Southern Section Alternatives					**Eastern Section Alternatives**						
				Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**		
PAD	3-35	Man-made	Connection Outside Study Area			2.3			2.0	<0.1				Subject	03020201
PAE	3-35	Man-made	WGA/SFE						0.4	0.6				Subject	03020201
PAF	3-37	Man-made	SFQ			1.4			4.2					Subject	03020201
PAG	3-39/3-91	Man-made	SFZ(2)						0.6					Subject	03020201
PAH	3-42	Man-made	SGJ		6.0				4.1		2.8			Subject	03020201
PAI	3-45	Man-made	SGY						1.8	0.9		0.9		Subject	03020201
PAJ	3-46	Man-made	WJC						0.6					Not Subject	03020201
PAK	3-45/3-46	Man-made	WJB						4.6					Not Subject	03020201
PAL	3-46	Man-made	SHB						0.2					Subject	03020201
PAM	3-49	Man-made	SHM						0.8					Subject	03020201
PAN	3-47	Man-made	WJJ						0.1					Not Subject	03020201
PAO	3-36	Man-made	SHT			0.8			0.8	0.8				Subject	03020201
PAP	3-72	Man-made	WKB							0.4		0.4		Subject	03020201
PAQ	3-74	Man-made	SJB/SIG									0.9	0.9	Subject	03020201
PAR	3-74	Man-made	WLJ/SIH									0.9	1.0	Subject	03020201
PAS	3-74	Man-made	SIJ									0.5		Subject	03030004
PAT	3-75	Man-made	Connection Outside Study Area							1.6			1.6	Subject	03020201
PAU	3-44	Man-made	PAV							1.7				Not Subject	03020201
PAV	3-44	Man-made	SIV/WLB							2.8				Not Subject	03020201
PAW	3-45	Man-made	SIW							1.3				Subject	03020201
PAX	3-41	Man-made	SIX										1.7	Subject	03020201
PAY	3-41	Man-made	SIZ/WLG										0.2	Subject	03020201
PAZ	3-75	Man-made	SJC							0.2		0.2	0.2	Subject	03020201
PBA	3-75	Man-made	SJD - Connection Outside Study Area									1.1		Subject	03020201
PBH	3-26	Man-made	SKH			0.5								Subject	03020201
PBI	3-22/3-23/3-24	Man-made	SCV			0.5		0.5						Subject	03020201
PBJ	3-70	Man-made	Connection Outside Study Area							0.1				Subject	03020201
PBK	3-36/3-70	Man-made	SLC							0.6				Subject	03020201
PBM	3-10	Man-made	SAZ		1.0									Subject	03020201
Continues															

Table 3b Continued															
Map Id	Figure Number	Appearance	Connecting Feature Map ID	Area (ac)										Subject to Buffers	Hydrologic Unit Code (HUC)
				Southern Section Alternatives					Eastern Section Alternatives						
				Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal		
PBN	3-10	Man-made	PBO		2.0									Subject	03020201
PBO	3-10	Man-made	PBP		1.3									Subject	03020201
PBP	3-10	Man-made	SBC		0.2									Subject	03020201
PBQ	3-12	Man-made	WOO		5.5									Not Subject	03020201
PBR	3-78	Man-made	SMA		0.4									Subject	03020201
PBS	3-78	Man-made	SMC/WOM		1.0									Subject	03020201
PBT	3-78	Man-made	SMD		0.4									Subject	03020201
PBU	3-12	Man-made	SMD/SME		1.1									Subject	03020201
PBV	3-80	Man-made	SMJ/WOP		0.2									Subject	03020201
PBW	3-13	Man-made	SRS		0.4									Subject	03020201
PBX	3-84	Man-made	SMV		<0.1									Not Subject	03020201
PCB	3-88	Man-made	SNW		0.6									Subject	03020201
PCC	3-89	Man-made	SOC		0.5	0.5								Subject	03020201
PCE	3-40	Man-made	SOW		1.7									Subject	03020201
PCF	3-40	Man-made	SOY		0.8									Subject	03020201
PCG	3-40	Man-made	SOQ/WRM		0.5									Subject	03020201
PCH	3-40	Man-made	SGF/WRW		2.0									Subject	03020201
PCI	3-40	Man-made	PCH		1.5									Subject	03020201
PCJ	3-39/3-91	Man-made	WRJ		1.9									Not Subject	03020201
PCM	3-13	Man-made	SAI	<0.1										Subject	03020201
PCP	3-56	Man-made	WSI/SPA					1.5						Subject	03020201
PCQ	3-56	Man-made	WSH/SPA					0.1						Subject	03020201
PCR	3-55/3-56	Man-made	SPA/SPB/WSG					0.5						Subject	03020201
PCS	3-56	Man-made	SPB					0.4						Subject	03020201
PCT	3-58	Man-made	WSJ/SPC					1.7						Not Subject	03020201
PCU	3-58	Man-made	SPD/WSM/WSN					2.8						Subject	03020201
PCV	3-58	Man-made	SPD/SPE					<0.1						Subject	03020201
PCW	3-58	Man-made	PCU/SPD					0.2						Subject	03020201
PCX	3-58	Man-made	Connection Outside Study Area					0.1						Subject	03020201
PCY	3-58	Man-made	WSP/SPJ					1.8						Subject	03020201
PCZ	3-58	Man-made	Connection Outside Study Area					0.1						Subject	03020201
Continues															

Table 3b Continued															
Map Id	Figure Number	Appearance	Connecting Feature Map ID	Area (ac)										Subject to Buffers	Hydrologic Unit Code (HUC)
				Southern Section Alternatives					Eastern Section Alternatives						
				Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal		
PDA	3-59	Man-made	SPL/WST					0.3						Subject	03020201
PDB	3-60	Man-made	SPP					0.1						Subject	03020201
PDC	3-60	Man-made	Connection Outside Study Area					0.1						Subject	03020201
PDE	3-61	Man-made	WSZ					0.6						Subject	03020201
PDF	3-62	Man-made	WTB					<0.1						Subject	03020201
PDG	3-61	Man-made	WTE/SPV					0.3						Subject	03020201
PDH	3-61/3-63	Man-made	WTK/SPZ - Connection Outside Study Area					0.1						Subject	03020201
PDI	3-64	Man-made	WTU/SQE					<0.1						Not Subject	03020201
PDJ	3-67	Man-made	WUL/SQO - Connection Outside Study Area					0.2						Subject	03020201
PDK	3-67	Man-made	Connection Outside Study Area					0.1						Not Subject	03020201
PDL	3-22	Man-made	WUN/SQP					0.1						Subject	03020201
PDM	3-22	Man-made	WUH/SQJ					0.1						Not Subject	03020201
PDN	3-52	Man-made	WVH/SRC(2)				0.3							Subject	03020201
PDO	3-54	Man-made	WVO				1.7							Not Subject	03020201
PDP	3-55	Man-made	SRH				0.2							Subject	03020201
PDQ	3-35	Man-made	EPH			0.9			0.6	0.1				Subject	03020201
			Total	**28.2**	**34.7**	**9.7**	**2.2**	**13.7**	**20.7**	**11.3**	**2.8**	**4.8**	**5.6**		

Table 5. Jurisdictional characteristics of water resources in the study area.

Map ID	Figure Number	Length (ft)										Classification	Compensatory Mitigation Required	River Basin Buffers
		Southern Section Alternatives					Eastern Section Alternatives							
		Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal			
SA	3-1	68										Intermittent	Yes	Not Subject
SB	3-1	674										Perennial	Yes	Not Subject
SC	3-1	47										Intermittent	Yes	Not Subject
SD	3-1	144										Perennial	Yes	Not Subject
SE	3-1	57										Intermittent	Yes	Not Subject
SF	3-1	1066										Intermittent	Yes	Subject
		215										Perennial	Yes	Subject
SG	3-1	357										Intermittent	Yes	Not Subject
		184										Perennial	Yes	Not Subject
SH	3-1/3-2	3937										Perennial	Yes	Subject
SI	3-1	131										Intermittent	Yes	Not Subject
SJ	3-2	288										Intermittent	Yes	Not Subject
SK	3-2	88										Intermittent	Yes	Subject
		319										Perennial	Yes	Subject
SL	3-2	325										Intermittent	Yes	Not Subject
SM	3-2	594										Perennial	Yes	Subject
SN	3-2	411										Perennial	Yes	Subject
SO	3-2	2360										Perennial	Yes	Subject
SP	3-3	168										Intermittent	Yes	Subject
SQ	3-3	153										Intermittent	Yes	Subject
		1066										Perennial	Yes	Subject
SR	3-3	189										Intermittent	Yes	Subject
SS	3-3	82										Intermittent	Yes	Not Subject
ST	3-3	1448										Perennial	Yes	Subject
SU	3-3	42										Intermittent	Yes	Not Subject
		215										Perennial	Yes	Not Subject
SV	3-3	1138										Perennial	Yes	Subject
SW	3-3	113										Intermittent	Yes	Subject
		144										Perennial	Yes	Subject
SX	3-4/3-5	1583										Perennial	Yes	Subject
SY	3-4	32										Intermittent	Yes	Subject
SZ	3-4	240										Intermittent	Yes	Subject
		559										Perennial	Yes	Subject

Continues

Table 5 Continued														
Map ID	Figure Number	Length (ft)										Classification	Compensatory Mitigation Required	River Basin Buffers
		Southern Section Alternatives					Eastern Section Alternatives							
		Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal			
SAA	3-4	1947			658							Perennial	Yes	Subject
SAB	3-4	879										Perennial	Yes	Subject
SAC	3-4	516										Intermittent	Yes	Subject
		218										Perennial	Yes	Subject
SAD	3-4	1831			2013							Perennial	Yes	Subject
SAE	3-4/3-6	414			414							Intermittent	Yes	Subject
SAF	3-4	365			365							Intermittent	Yes	Subject
SAG	3-6	529										Intermittent	Yes	Subject
SAH	3-6	48			967							Intermittent	Yes	Subject
		449			379							Perennial	Yes	Subject
SAI	3-13	123										Intermittent	Yes	Subject
SAJ	3-6/3-50/3-51	1300			5555							Perennial	Yes	Subject
SAK	3-6	1227										Perennial	Yes	Subject
SAL	3-7	33										Intermittent	Yes	Subject
		789										Perennial	Yes	Subject
SAM	3-7	1081										Perennial	Yes	Subject
SAN	3-7	159										Intermittent	Yes	Not Subject
SAO	3-7	786										Perennial	Yes	Subject
SAP	3-7	398										Perennial	Yes	Subject
SAQ	3-9	1240										Perennial	Yes	Subject
SAR	3-7/3-9	1180										Intermittent	Yes	Subject
SAS	3-9	849										Intermittent	Yes	Subject
SAT	3-9	133										Intermittent	Yes	Subject
SAU	3-9	1250										Intermittent	Yes	Subject
SAV	3-11/3-12	229										Intermittent	Yes	Subject
SAW	3-10	1076	419									Perennial	Yes	Subject
SAX	3-10	212										Intermittent	Yes	Subject
SAY	3-10	174										Intermittent	Yes	Subject
SAZ	3-10/3-11		241									Intermittent	Yes	Subject
		1186	110									Perennial	Yes	Subject
SBA	3-10	159										Intermittent	Yes	Subject
SBB	3-11	833										Intermittent	Yes	Subject
SBC	3-10	59										Perennial	Yes	Subject
SBD	3-10	33										Perennial	Yes	Subject
Continues														

Table 5 Continued

Map ID	Figure Number	Length (ft)										Classification	Compensatory Mitigation Required	River Basin Buffers
		Southern Section Alternatives					Eastern Section Alternatives							
		Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal			
SBE	3-10	111	111									Intermittent	Yes	Subject
SBF	3-11/3-14	24										Intermittent	Yes	Subject
		5046										Perennial	Yes	Subject
SBG	3-11	184										Perennial	Yes	Subject
SBH	3-11	307										Perennial	Yes	Subject
SBI	3-13/3-14	616										Intermittent	Yes	Subject
		568										Perennial	Yes	Subject
SBJ	3-13/3-14	1426										Perennial	Yes	Subject
SBK	3-13/3-14	958										Intermittent	Yes	Subject
SBL	3-11	50										Intermittent	Yes	Not Subject
SBM	3-11	527										Intermittent	Yes	Subject
SBN	3-13	349										Intermittent	Yes	Subject
SBO	3-14	85										Intermittent	Yes	Not Subject
SBP	3-15	1499										Perennial	Yes	Subject
SBQ	3-15	515										Perennial	Yes	Subject
SBR	3-15	533										Intermittent	Yes	Subject
SBS	3-15	28										Perennial	Yes	Subject
SBT	3-15	114										Intermittent	Yes	Subject
SBU	3-15	437										Perennial	Yes	Subject
SBV	3-16/3-17	2246										Perennial	Yes	Subject
SBW	3-16	139										Intermittent	Yes	Subject
SBX	3-15/3-16	1314										Perennial	Yes	Subject
SBY	3-15	1420										Perennial	Yes	Subject
SBZ	3-15	407										Perennial	Yes	Subject
SCA	3-17	203										Intermittent	Yes	Subject
SCB (1)	3-17	362										Intermittent	Yes	Subject
SCC	3-17/3-64	1287				1281						Perennial	Yes	Subject
SCD	3-17	786										Perennial	Yes	Subject
SCE	3-17	112										Perennial	Yes	Subject
SCF	3-18	105										Intermittent	Yes	Not Subject
SCG	3-18	2123										Perennial	Yes	Subject
SCH	3-18	129										Perennial	Yes	Subject
SCI	3-18	534										Intermittent	Yes	Subject
SCJ	3-18	129										Intermittent	Yes	Subject

Continues

Table 5 Continued														
Map ID	Figure Number	Length (ft)										Classification	Compensatory Mitigation Required	River Basin Buffers
		Southern Section Alternatives					Eastern Section Alternatives							
		Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal			
SCK	3-17	168										Intermittent	Yes	Not Subject
SCL	3-20	1567										Perennial	Yes	Subject
SCM	3-20	752		121								Perennial	Yes	Subject
SCN	3-20	316										Intermittent	Yes	Not Subject
SCO	3-20/3-21/3-22	434										Perennial	Yes	Subject
SCP	3-21/3-22/3-66/3-67/3-68	1326		1144		1945						Perennial	Yes	Subject
SCQ	3-21	672										Intermittent	Yes	Subject
		386										Perennial	Yes	Subject
SCR	3-22	257				257						Intermittent	Yes	Subject
		1				1206						Perennial	Yes	Subject
SCS	3-22	653										Intermittent	Yes	Subject
SCT	3-22	1294										Perennial	Yes	Subject
SCU	3-22	307										Perennial	Yes	Not Subject
SCV	3-22	1144										Intermittent	Yes	Subject
SCW	3-22	54										Intermittent	Yes	Subject
SCX	3-23	45										Intermittent	Yes	Subject
SCY	3-23/3-24	6395										Perennial	Yes	Subject
SCZ	3-23	142										Perennial	Yes	Subject
SDA		771										Intermittent	Yes	Subject
	3-23/3-24			547		547						Perennial	Yes	Subject
SDB	3-23	99										Intermittent	Yes	Not Subject
SDC	3-23	79										Intermittent	Yes	Not Subject
SDD (1)	3-23	265										Perennial	Yes	Not Subject
SDE	3-23	148										Perennial	Yes	Subject
SDF	3-23/3-24	1398										Perennial	Yes	Not Subject
SDG	3-24/3-25/3-30/3-80/3-81	3626	1860	3594								Perennial	Yes	Subject
SDH	3-25	226										Intermittent	Yes	Not Subject
SDI	3-26	112										Intermittent	Yes	Subject
SDJ	3-25/3-26	1375										Perennial	Yes	Subject
SDK	3-25/3-26	665										Intermittent	Yes	Subject
SDL	3-25/3-26	1286										Perennial	Yes	Subject
Continues														

Table 5 Continued														
Map ID	**Figure Number**	**Length (ft)**										**Classification**	**Compensatory Mitigation Required**	**River Basin Buffers**
		Southern Section Alternatives					**Eastern Section Alternatives**							
		Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**			
SDM	3-26	353										Intermittent	Yes	Subject
	3-26/3-29/3-30	1411										Perennial	Yes	Subject
SDN	3-30	193		193								Intermittent	Yes	Subject
SDO	3-29	1721		793								Intermittent	Yes	Subject
SDP	3-28/3-29	559		685								Intermittent	Yes	Subject
SDQ	3-29	1941		2307								Perennial	Yes	Subject
SDR	3-29	270		270								Intermittent	Yes	Subject
SDS	3-29	242		242								Intermittent	Yes	Subject
SDT	3-29	331		331								Intermittent	Yes	Subject
		1795		1319								Perennial	Yes	Subject
SDU	3-29	91		91								Perennial	Yes	Subject
SDV	3-25/3-29/3-30	972										Intermittent	Yes	Subject
		850										Perennial	Yes	Subject
SDW	3-29	1474										Perennial	Yes	Subject
SDX	3-29	209		209								Intermittent	Yes	Not Subject
SDY	3-32/3-34	906		906								Intermittent	Yes	Subject
SDZ	3-32	438		438								Intermittent	Yes	Subject
SEB	3-32	240		240								Intermittent	Yes	Not Subject
SEC	3-34	218		218								Intermittent	Yes	Subject
SED	3-34	761										Intermittent	Yes	Subject
SEE	3-4	440										Perennial	Yes	Subject
SEF	3-32	288										Intermittent	Yes	Subject
SEG	3-32	1083		523								Intermittent	Yes	Subject
SEH	3-32	83		83								Intermittent	Yes	Subject
SEI	3-4	214										Intermittent	Yes	Subject
SEJ	3-32	1079		410								Perennial	Yes	Subject
SEK	3-28	1093		1337								Intermittent	Yes	Subject
SEL	3-28	1116		2720								Perennial	Yes	Subject
SEM	3-27		1595	1595								Intermittent	Yes	Subject
	3-27/3-28/3-35	1240	942	6059								Perennial	Yes	Subject
Continues														

Table 5 Continued														
Map ID	Figure Number	Length (ft)										Classification	Compensatory Mitigation Required	River Basin Buffers
		Southern Section Alternatives					Eastern Section Alternatives							
		Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal			
SEN	3-27/3-28	289		881								Intermittent	Yes	Subject
SEO	3-31	1361		1002								Perennial	Yes	Subject
SEP	3-31	566		508								Intermittent	Yes	Subject
SEQ	3-30/3-31	240		480								Intermittent	Yes	Subject
SER	3-14	32										Intermittent	Yes	Not Subject
SES	3-30	1908		1612								Perennial	Yes	Subject
SET	3-29/3-30	4837		1893								Perennial	Yes	Subject
SEU	3-31	444										Perennial	Yes	Subject
SEV	3-28	1157		1157								Intermittent	Yes	Subject
				223								Perennial	Yes	Not Subject
SEW	3-33	366										Intermittent	Yes	Subject
SEY	3-33	1005										Intermittent	Yes	Subject
SEZ	3-14	414										Intermittent	Yes	Not Subject
SFA	3-35			194			194	150				Intermittent	Yes	Subject
SFB	3-35			1641			855	814				Intermittent	Yes	Subject
SFC	3-36			1050			1050					Intermittent	Yes	Subject
SFD	3-36			89			89					Intermittent	Yes	Subject
SFE	3-35						1813	1813				Perennial	Yes	Subject
SFF	3-35						1273	1275				Perennial	Yes	Subject
SFG	3-35						200	200				Intermittent	Yes	Subject
SFH	3-35						1353	1353				Perennial	Yes	Subject
SFI	3-33	1528										Perennial	Yes	Subject
SFJ	3-36			134			134					Intermittent	Yes	Subject
				2			2					Perennial	Yes	Subject
SFK	3-36			116			116					Intermittent	Yes	Subject
SFL	3-33	294										Intermittent	Yes	Subject
SFN	3-37			415			415					Intermittent	Yes	Subject
SFP	3-37			651			651					Perennial	Yes	Subject
SFQ	3-37			353			732					Perennial	Yes	Subject
SFR	3-37			267			267					Intermittent	Yes	Subject
				386			386					Perennial	Yes	Subject
SFS	3-39						623					Intermittent	Yes	Subject
SFT	3-39						1538					Intermittent	Yes	Subject
SFT	3-39		291									Intermittent	Yes	Subject
Continues														

Table 5 Continued														
Map ID	Figure Number	Length (ft)										Classification	Compensatory Mitigation Required	River Basin Buffers
		Southern Section Alternatives					Eastern Section Alternatives							
		Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal			
SFU	3-36			35			35					Intermittent	Yes	Subject
SFV	3-36/3-37/3-70			1579			1579	1551				Perennial	Yes	Subject
SFX	3-36			198			198					Intermittent	Yes	Subject
SFY	3-39/3-91		85				1408					Perennial	Yes	Subject
SFZ (1)	3-39/3-91		104				944					Intermittent	Yes	Not Subject
SFZ (2)	3-39/3-91						400					Intermittent	Yes	Subject
SGA	3-39/3-40		217				1395					Perennial	Yes	Subject
SGC	3-39						838				838	Intermittent	Yes	Subject
SGD	3-39		400				819				794	Intermittent	Yes	Subject
SGE	3-40/3-41						1248				1233	Intermittent	Yes	Subject
SGF	3-40		1250				2246		257		21	Perennial	Yes	Subject
SGG	3-40/3-41						2131		1053		1078	Intermittent	Yes	Subject
SGH	3-41						743		743			Intermittent	Yes	Subject
SGI	3-39						50					Intermittent	Yes	Subject
SGJ	3-42		1586				887		235			Intermittent	Yes	Subject
	3-42/3-43						5521		6023	1592		Perennial	Yes	Subject
SGK	3-42		423				491		491			Intermittent	Yes	Subject
							70		1294			Perennial	Yes	Subject
SGM	3-42						568					Intermittent	Yes	Subject
SGN	3-43						1357					Intermittent	Yes	Subject
SGO	3-43						292					Intermittent	Yes	Subject
SGP	3-43						414		123			Intermittent	Yes	Subject
SGQ	3-43								164			Intermittent	Yes	Subject
SGR	3-44						898		1080	1365		Intermittent	Yes	Subject
SGS	3-44						1025	1034	1004	1009		Perennial	Yes	Subject
SGT	3-44								292			Intermittent	Yes	Subject
SGU	3-44,3-45						1653	1922	1563	1946		Perennial	Yes	Subject
SGV	3-45						1956		1063	1956		Intermittent	Yes	Subject
SGW	3-44/3-45						232	228	232	232		Intermittent	Yes	Subject
							56	910	57	45		Perennial	Yes	Subject
SGY	3-45						482					Intermittent	Yes	Subject
SGZ	3-46						198					Intermittent	Yes	Subject
SHA	3-46						666					Intermittent	Yes	Subject
SHB	3-46						253					Intermittent	Yes	Subject
Continues														

Table 5 Continued														
Map ID	Figure Number	Length (ft)										Classification	Compensatory Mitigation Required	River Basin Buffers
		Southern Section Alternatives					Eastern Section Alternatives							
		Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal			
SHC	3-47/3-48						1075					Intermittent	Yes	Subject
	3-46/3-47						3739					Perennial	Yes	Subject
SHD	3-46						1649					Intermittent	Yes	Subject
SHE	3-46/3-47						298					Intermittent	Yes	Subject
SHF	3-47						56					Intermittent	Yes	Subject
SHH	3-47						731					Intermittent	Yes	Subject
SHK	3-48						35					Intermittent	Yes	Subject
SHL	3-49						184					Perennial	Yes	Subject
SHM	3-49						113					Intermittent	Yes	Subject
SHN	3-48						158					Intermittent	Yes	Subject
SHP	3-48						385					Intermittent	Yes	Subject
SHR	3-47						370					Perennial	Yes	Subject
SHS	3-47/3-49						314					Perennial	Yes	Subject
SHT	3-36			239			239	239				Intermittent	Yes	Subject
SHU	3-35/3-70							1887				Perennial	Yes	Subject
SHV	3-70							610				Perennial	Yes	Subject
SHW	3-70							691				Intermittent	Yes	Subject
SHX	3-72							1453		1453		Intermittent	Yes	Subject
SHX	3-72							530		530		Perennial	Yes	Subject
SHY	3-72							633		633		Perennial	Yes	Subject
SHZ	3-72							122		122		Intermittent	Yes	Subject
SIB	3-73							1552		1552		Perennial	Yes	Subject
SIC	3-73							563		563		Intermittent	Yes	Subject
SID	3-71							148				Intermittent	Yes	Subject
SIE	3-73/3-74							2306		1752		Perennial	Yes	Subject
SIF	3-73							75		75		Intermittent	Yes	Subject
SIG	3-74							52		938	822	Intermittent	Yes	Subject
SIH	3-41/3-74							77		491	563	Intermittent	Yes	Subject
SII	3-74							4299		1878	3409	Perennial	Yes	Subject
SIJ	3-74							946		484	1194	Perennial	Yes	Subject
SIK	3-74									281	115	Intermittent	Yes	Subject

Continues

Table 5 Continued														
Map ID	Figure Number	Length (ft)										Classification	Compensatory Mitigation Required	River Basin Buffers
		Southern Section Alternatives					Eastern Section Alternatives							
		Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal			
SIL	3-74/3-75							1076			1076	Intermittent	Yes	Subject
	3-74							978			978	Perennial	Yes	Subject
SIN	3-75							173			173	Intermittent	Yes	Subject
SIO	3-89/3-90/3-91		682									Perennial	Yes	Subject
SIP	3-74							387			387	Perennial	Yes	Subject
SIQ	3-77							64			64	Intermittent	Yes	Subject
								155			155	Perennial	Yes	Subject
SIR	3-76							70			70	Intermittent	Yes	Subject
SIS	3-77							177				Intermittent	Yes	Subject
								94				Perennial	Yes	Subject
SIT	3-77							32				Intermittent	Yes	Subject
								859				Perennial	Yes	Subject
SIU	3-77							72				Intermittent	Yes	Not Subject
SIV	3-44							61				Perennial	Yes	Subject
SIW	3-45							1072				Perennial	Yes	Subject
SIX	3-41										563	Intermittent	Yes	Subject
SIY	3-41										712	Intermittent	Yes	Subject
SIZ	3-41										544	Perennial	Yes	Subject
SJA	3-41										109	Intermittent	Yes	Subject
SJB	3-74									181	135	Perennial	Yes	Subject
SJC	3-43									1043		Intermittent	Yes	Subject
SJC	3-43/3-75							81		6452	81	Perennial	Yes	Subject
SJD	3-75									1198		Perennial	Yes	Subject
SJE	3-75									209		Perennial	Yes	Subject
SJF	3-75									291		Perennial	Yes	Subject
SJG	3-43/3-75									1236		Perennial	Yes	Subject
SJH	3-75									33		Perennial	Yes	Not Subject
SJI	3-75									129		Perennial	Yes	Not Subject
SJJ	3-75									129		Intermittent	Yes	Not Subject
SJK	3-43									88		Intermittent	Yes	Subject
										193		Perennial	Yes	Subject
SJL	3-43									9		Perennial	Yes	Subject
SJW	3-20				847							Intermittent	Yes	Subject
Continues														

Table 5 Continued														
Map ID	Figure Number	Length (ft)										Classification	Compensatory Mitigation Required	River Basin Buffers
		Southern Section Alternatives					Eastern Section Alternatives							
		Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal			
SJX	3-68			537								Perennial	Yes	Subject
SJY	3-68			121								Intermittent	Yes	Not Subject
SJZ	3-24			154								Intermittent	Yes	Subject
SKA	3-24			545		545						Intermittent	Yes	Subject
SKB	3-24/3-68			318		318						Intermittent	Yes	Not Subject
SKC	3-24			188		188						Intermittent	Yes	Not Subject
				1258		280						Perennial	Yes	Subject
SKD	3-24			402								Intermittent	Yes	Subject
SKE	3-24/3-26			1477								Perennial	Yes	Subject
SKF	3-24/3-26			921								Intermittent	Yes	Subject
SKG	3-26			109								Intermittent	Yes	Subject
SKH	3-26			1358								Intermittent	Yes	Subject
SKI	3-26			241								Intermittent	Yes	Subject
SKJ	3-28/3-29/3-69			2844								Perennial	Yes	Subject
SKK	3-28			291								Intermittent	Yes	Not Subject
SKL	3-28/3-69			488								Perennial	Yes	Subject
SKM	3-26/3-29/3-69			2236								Intermittent	Yes	Subject
SKN	3-28			951								Perennial	Yes	Subject
SKO	3-28			1084								Perennial	Yes	Subject
SKP	3-69			45								Intermittent	Yes	Not Subject
SKQ	3-26			809								Intermittent	Yes	Subject
SKR	3-35			1993								Perennial	Yes	Subject
SKS	3-28/3-35			1147								Perennial	Yes	Subject
SKT	3-28			52								Intermittent	Yes	Not Subject
SKU	3-28			327								Intermittent	Yes	Not Subject
SKV	3-28			493								Intermittent	Yes	Subject
SKW	3-28			185								Intermittent	Yes	Not Subject
SKX	3-28			33								Intermittent	Yes	Not Subject
SKY	3-28			117								Intermittent	Yes	Subject
SKZ	3-20			274								Intermittent	Yes	Subject
SLA	3-28			280								Intermittent	Yes	Subject
SLB	3-68			53								Intermittent	Yes	Not Subject
SLC	3-70							196				Intermittent	Yes	Subject
Continues														

Table 5 Continued														
Map ID	**Figure Number**	**Length (ft)**										**Classification**	**Compensatory Mitigation Required**	**River Basin Buffers**
		Southern Section Alternatives					**Eastern Section Alternatives**							
		Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**			
SLD	3-68			252								Intermittent	Yes	Not Subject
SLF	3-27		524	524								Intermittent	Yes	Subject
SLG	3-27		314	314								Intermittent	Yes	Subject
SLH	3-27		225	225								Intermittent	Yes	Not Subject
SLI	3-27		309	309								Intermittent	Yes	Subject
SLJ	3-27		120	120								Intermittent	Yes	Not Subject
SLY	3-12		1362									Intermittent	Yes	Subject
SLZ	3-10		119									Intermittent	Yes	Subject
SMA	3-78		1506									Intermittent	Yes	Subject
SMB	3-78		1511									Intermittent	Yes	Subject
SMC	3-78		178									Intermittent	Yes	Subject
SMD	3-12/3-78		2340									Perennial	Yes	Subject
SME	3-12		118									Intermittent	Yes	Not Subject
SMF	3-78		2332									Intermittent	Yes	Subject
SMG	3-78		68									Intermittent	Yes	Subject
SMH	3-78		529									Intermittent	Yes	Subject
			398									Perennial	Yes	Subject
SMI	3-78		151									Intermittent	Yes	Not Subject
SMJ	3-80		1110									Intermittent	Yes	Subject
SMK	3-80		219									Intermittent	Yes	Subject
SML	3-81		164									Intermittent	Yes	Not Subject
SMM	3-82/3-83		1095									Intermittent	Yes	Subject
	3-82		1773									Perennial	Yes	Subject
SMN	3-83		1344									Intermittent	Yes	Subject
SMO	3-82		177									Intermittent	Yes	Subject
SMP	3-82		215									Intermittent	Yes	Subject
SMQ	3-82		463									Intermittent	Yes	Subject
SMR	3-12		2									Intermittent	Yes	Subject
SMS	3-83		17									Intermittent	Yes	Not Subject
SMT	3-84		1314									Perennial	Yes	Subject
SMU	3-84		657									Perennial	Yes	Subject
SMV	3-84		695									Intermittent	Yes	Not Subject
SMY	3-84		1464									Perennial	Yes	Subject
SMZ	3-85		1042									Perennial	Yes	Subject
Continues														

Table 5 Continued														
Map ID	Figure Number	Length (ft)										Classification	Compensatory Mitigation Required	River Basin Buffers
		Southern Section Alternatives					Eastern Section Alternatives							
		Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal			
SNB	3-85		1061									Perennial	Yes	Subject
SND	3-90		398									Perennial	Yes	Subject
SNE	3-85		1047									Perennial	Yes	Subject
SNF	3-90		1374									Perennial	Yes	Subject
SNG	3-85/3-86		1345									Intermittent	Yes	Subject
SNH	3-90		2193									Intermittent	Yes	Subject
SNI	3-86		789									Perennial	Yes	Subject
SNK	3-27		1922	2001								Perennial	Yes	Subject
SNM	3-27		182	182								Intermittent	Yes	Subject
SNO	3-27		619	630								Perennial	Yes	Subject
SNQ	3-86		87									Intermittent	Yes	Subject
SNR	3-86		28									Intermittent	Yes	Subject
SNS	3-86		1427									Perennial	Yes	Subject
SNT	3-88		707									Intermittent	Yes	Subject
			2107									Perennial	Yes	Subject
SNU	3-88		941									Perennial	Yes	Subject
SNV	3-88		456									Perennial	Yes	Subject
SNW	3-88		265									Intermittent	Yes	Subject
SNX	3-90		311									Intermittent	Yes	Subject
	3-89/3-90		1969									Perennial	Yes	Subject
SNY	3-89		250									Intermittent	Yes	Subject
			2190									Perennial	Yes	Subject
SNZ	3-89		328									Intermittent	Yes	Subject
SOA	3-89		295									Intermittent	Yes	Subject
SOB	3-88		495									Intermittent	Yes	Subject
SOC	3-89		1507	109								Perennial	Yes	Subject
SOD	3-89		304									Perennial	Yes	Subject
SOE	3-93		2304									Perennial	Yes	Subject
SOF	3-93		193									Intermittent	Yes	Subject
			623									Perennial	Yes	Subject
SOH	3-93		66									Intermittent	Yes	Subject
SOI	3-93		1358									Perennial	Yes	Subject
SOJ	3-91/3-92		1745									Perennial	Yes	Subject
SOK	3-91		159									Intermittent	Yes	Subject
Continues														

Table 5 Continued														
Map ID	Figure Number	Length (ft)										Classification	Compensatory Mitigation Required	River Basin Buffers
		Southern Section Alternatives					Eastern Section Alternatives							
		Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal			
SOL	3-90/3-91		3776									Perennial	Yes	Subject
SOM	3-90		25									Intermittent	Yes	Not Subject
SON	3-91		960									Intermittent	Yes	Subject
SOO	3-39		1298									Intermittent	Yes	Subject
SOP	3-90		808									Intermittent	Yes	Subject
SOQ	3-40		321									Intermittent	Yes	Subject
SOR	3-42		161									Intermittent	Yes	Not Subject
SOS	3-40		160									Intermittent	Yes	Not Subject
SOT	3-89		119									Intermittent	Yes	Subject
SOU	3-40		326									Intermittent	Yes	Subject
SOV	3-40		173									Intermittent	Yes	Subject
SOW	3-40		156									Intermittent	Yes	Subject
SOX	3-40		109									Intermittent	Yes	Subject
SOY	3-39/3-40		1526									Perennial	Yes	Subject
SOZ	3-40		940									Intermittent	Yes	Subject
SPA	3-55/3-56					559						Intermittent	Yes	Subject
SPB	3-55/3-56					774						Intermittent	Yes	Subject
SPC	3-58					58						Intermittent	Yes	Subject
SPD	3-58					214						Intermittent	Yes	Subject
SPE	3-57/3-58					1792						Perennial	Yes	Subject
SPF	3-58					317						Intermittent	Yes	Subject
SPG	3-55/3-57				3492	890						Perennial	Yes	Subject
SPH	3-57					36						Intermittent	Yes	Subject
SPI	3-58					1099						Perennial	Yes	Subject
SPJ	3-58					1149						Perennial	Yes	Subject
SPK	3-58/3-59					2041						Intermittent	Yes	Subject
SPL	3-59					951						Intermittent	Yes	Subject
SPM	3-59					277						Intermittent	Yes	Not Subject
SPN	3-60					85						Intermittent	Yes	Not Subject
SPO	3-59					1072						Intermittent	Yes	Subject
SPP	3-60					438						Intermittent	Yes	Subject
						1925						Perennial	Yes	Subject
SPQ	3-60					113						Intermittent	Yes	Not Subject
SPR	3-60					67						Intermittent	Yes	Subject
Continues														

Table 5 Continued														
Map ID	Figure Number	Length (ft)										Classification	Compensatory Mitigation Required	River Basin Buffers
		Southern Section Alternatives					Eastern Section Alternatives							
		Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal			
SPS	3-59/3-60					900						Perennial	Yes	Subject
SPT	3-62					1222						Perennial	Yes	Subject
SPU	3-61					56						Intermittent	Yes	Subject
SPV	3-62					285						Intermittent	Yes	Subject
	3-61					1076						Perennial	Yes	Subject
SPW	3-61					1246						Perennial	Yes	Subject
SPX	3-51/3-61				2004	1945						Perennial	Yes	Subject
SPY	3-62					33						Intermittent	Yes	Subject
						422						Perennial	Yes	Subject
SPZ	3-61					143						Perennial	Yes	Subject
SQA	3-63					1498						Perennial	Yes	Subject
SQB	3-63					1010						Perennial	Yes	Subject
SQC	3-63					375						Intermittent	Yes	Not Subject
SQD	3-63					1442						Perennial	Yes	Subject
SQE	3-64					230						Perennial	Yes	Subject
SQF	3-64					192						Perennial	Yes	Subject
SQG	3-65					13						Intermittent	Yes	Subject
SQH	3-65/3-66					2573						Perennial	Yes	Subject
SQI	3-65					172						Intermittent	Yes	Subject
SQJ	3-22					226						Perennial	Yes	Subject
SQK	3-22					217						Intermittent	Yes	Subject
SQL	3-66					1253						Perennial	Yes	Subject
SQM	3-66					166						Intermittent	Yes	Subject
SQN	3-66					243						Intermittent	Yes	Not Subject
SQO	3-67					193						Intermittent	Yes	Not Subject
SQP	3-22					320						Intermittent	Yes	Subject
SQQ	3-50				175							Intermittent	Yes	Subject
SQR	3-50				611							Intermittent	Yes	Subject
SQS	3-50				277							Intermittent	Yes	Not Subject
SQT	3-50				48							Intermittent	Yes	Not Subject
SQU	3-52				1396							Intermittent	Yes	Subject
SQV	3-52				1722							Perennial	Yes	Subject
SQW	3-52				676							Intermittent	Yes	Subject
SQX	3-52				1094							Intermittent	Yes	Subject
Continues														

Table 5 Continued														
Map ID	Figure Number	Length (ft)										Classification	Compensatory Mitigation Required	River Basin Buffers
		Southern Section Alternatives					Eastern Section Alternatives							
		Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal			
SQY	3-52/3-54				2499							Perennial	Yes	Subject
SQZ	3-54				549							Perennial	Yes	Subject
SRA	3-53/3-54				95							Intermittent	Yes	Subject
					1137							Perennial	Yes	Subject
SRB	3-52				37							Intermittent	Yes	Subject
SRC (1)	3-52				440							Intermittent	Yes	Subject
SRC (2)	3-52				120							Intermittent	Yes	Subject
SRD	3-54				599							Perennial	Yes	Subject
SRE	3-55				2651							Intermittent	Yes	Subject
SRF	3-54				114							Intermittent	Yes	Subject
	3-55				1107							Perennial	Yes	Subject
SRG	3-55/3-56				595							Intermittent	Yes	Subject
SRH	3-55				229							Perennial	Yes	Subject
SRI	3-55				422							Intermittent	Yes	Subject
SRJ	3-94		294									Intermittent	Yes	Subject
SRK	3-94		928									Perennial	Yes	Subject
SRL	3-94		473									Intermittent	Yes	Subject
SRM	3-94		315									Intermittent	Yes	Subject
SRN	3-93		436									Intermittent	Yes	Subject
SRO	3-93		200									Perennial	Yes	Subject
SRP	3-90		394									Intermittent	Yes	Subject
SRQ	3-38		153				279					Perennial	Yes	Subject
SRR	3-38						12					Intermittent	Yes	Subject
SRS	3-13		146									Intermittent	Yes	Subject
SRT	3-13		445									Perennial	Yes	Subject
SRZ	3-58/3-59					269						Intermittent	Yes	Subject
SSA	3-60					161						Intermittent	Yes	Subject
SSB	3-61					372						Intermittent	Yes	Subject
						507						Perennial	Yes	Subject
SSC	3-62					31						Intermittent	Yes	Subject
SSD	3-50				184							Perennial	Yes	Subject
SSE	3-50				63							Intermittent	Yes	Not Subject
EPH (1)[1]	3-88		284									Ephemeral	No	Subject
EPH (2)[1]	3-62					199						Ephemeral	No	Subject
Continues														

Table 5 Continued														
Map ID	**Figure Number**	**Length (ft)**										**Classification**	**Compensatory Mitigation Required**	**River Basin Buffers**
		Southern Section Alternatives					**Eastern Section Alternatives**							
		Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**			
EPH (3)[1]	3-50				246							Ephemeral	No	Subject
	Total	**126,830**	**80,143**	**68,325**	**32,934**	**39,413**	**52,382**	**32,981**	**15,675**	**30,084**	**15,112**			

[1]Ephemeral stream determinations were issued by the USACE during the Preliminary Jurisdictional Determination, but because these features appear on USGS and/or soil mapping NCDWR will make their final determination during the Final Jurisdictional Determination process.

*Mitigation ratios will be determined at the time of the Final Jurisdictional Determination.

Table 6. Jurisdictional characteristics of wetlands in the study area.

Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WA	3-1	Maintained/Disturbed	Headwater Forest	Riparian	17	<0.1									
WB	3-1	Dry-Mesic Oak-Hickory Forest	Seep	Riparian	36	0.1									
WC	3-1	Dry-Mesic Oak-Hickory Forest	Seep	Riparian	36	0.2									
WD	3-1	Dry-Mesic Oak-Hickory Forest	Seep	Riparian	36	0.1									
WE	3-1	Dry-Mesic Oak-Hickory Forest	Basin Wetland	Non-Riparian	44	<0.1									
WF	3-1	Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	16	0.1									
WG	3-1	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Pine Plantation; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	76	2.2									
WH	3-1	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	76	0.3									
WI	3-2	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	51	0.3									
WJ	3-2	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	27	<0.1									
WK	3-2	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Piedmont/Mountain Bottomland Forest; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	24	0.2									
WL	3-2	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest; Dry-Mesic Oak-Hickory Forest	Bottomland Hardwood Forest	Riparian	67	1.4									
WM	3-2	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	55	0.1									
WN	3-2	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	71	2.4									
WO	3-2	Piedmont/Mountain Bottomland Forest	Floodplain Pool	Riparian	56	0.2									
WP	3-2	Piedmont/Mountain Bottomland Forest	Floodplain Pool	Riparian	56	0.2									
WQ	3-2	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	52	0.2									
Continues															

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WR	3-2	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	76	3.1									
WS	3-2	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	71	2.8									
WT	3-2	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	71	0.2									
WU	3-2/3-3	Mesic Mixed Hardwood Forest; Pine Plantation	Headwater Forest	Riparian	37	0.7									
WV	3-3	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	48	0.7									
WW	3-3	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	48	0.2									
WX	3-3	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest	Bottomland Hardwood Forest	Riparian	57	1.7									
WY	3-3	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	61	0.8									
WZ	3-3	Mesic Mixed Hardwood Forest; Pine Plantation	Bottomland Hardwood Forest	Riparian	52	0.3									
WAA	3-3	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	60	0.6									
WAB	3-3	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest; Cutover/Early Successional	Bottomland Hardwood Forest	Riparian	42	0.6									
WAC	3-3	Mesic Mixed Hardwood Forest; Pine Plantation; Cutover/Early Successional	Headwater Forest	Riparian	71	2.3									
Continues															

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WAD	3-4	Mesic Mixed Hardwood Forest; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Non-Riparian	25	0.4									
WAE	3-4	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	65-75	4.2									
WAF	3-4	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	64	4.2									
WAG	3-5	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	60	0.5									
WAH	3-5	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	44	0.2									
WAI	3-4	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	32	<0.1									
WAJ	3-4	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	33	0.1									
WAK	3-4	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	64	2.3									
WAL	3-4	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	41	0.2									
WAM	3-4	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	25	<0.1			0.0						
WAN	3-4	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	37	0.2			0.1						
WAO (1)	3-4	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest; Pine Plantation	Bottomland Hardwood Forest	Riparian	76	1.9			2.4						
WAO (2)	3-4/3-6	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	76	1.0			1.0						
Continues															

Table 6 Continued															
Map ID	**Figure Number**	**Community Type**	**NCWAM Classification**	**Hydrologic Classification**	**DWQ Wetland Rating**	**Area (ac)**									
						Southern Section Alternatives					**Eastern Section Alternatives**				
						Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**
WAP	3-6	Mesic Mixed Hardwood Forest; Pine Plantation; Mesic Mixed Hardwood Forest	Headwater Forest	Non-Riparian	23	0.2			0.2						
WAQ	3-6	Mesic Mixed Hardwood Forest; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	56	1.0									
WAR	3-6	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	43	0.2									
WAS	3-6	Piedmont/Mountain Bottomland Forest; Cutover/Early Successional	Bottomland Hardwood Forest	Riparian	79	3.1									
WAT	3-6	Piedmont/Mountain Bottomland Forest; Cutover/Early Successional	Bottomland Hardwood Forest	Riparian	19	<0.1									
WAU	3-6	Piedmont/Mountain Bottomland Forest; Cutover/Early Successional	Basin Wetland	Riparian	19	<0.1									
WAV	3-6	Piedmont/Mountain Bottomland Forest; Cutover/Early Successional	Bottomland Hardwood Forest	Riparian	35	0.6									
WAW (1)	3-7	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	45-63	3.2									
WAW (2)	3-7	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	45	0.4									
WAX	3-7	Mesic Mixed Hardwood Forest	Bottomland Hardwood Forest	Riparian	53	0.2									
WAY	3-7/3-9	Mesic Mixed Hardwood Forest	Bottomland Hardwood Forest	Riparian	53	0.1									
WAZ	3-9	Mesic Mixed Hardwood Forest	Bottomland Hardwood Forest	Riparian	53	0.2									
WBA	3-9	Mesic Mixed Hardwood Forest	Bottomland Hardwood Forest	Riparian	31	<0.1									
WBB	3-9	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	53	0.1									
WBC	3-9	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	49	3.9									
Continues															

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WBD	3-9	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	51	0.2									
WBE	3-9	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	45	0.7									
WBF	3-9	Mesic Mixed Hardwood Forest; Dry-Mesic Oak-Hickory Forest	Bottomland Hardwood Forest	Riparian	45	6.0									
WBG	3-9	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	45	0.3									
WBH	3-9	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	45	0.8									
WBI	3-10	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	33	3.0	0.3								
WBJ	3-10	Agriculture/Pasture	Headwater Forest	Riparian	19	0.5	0.5								
WBK	3-10	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest	Headwater Forest	Non-Riparian	29	0.3									
WBL	3-10	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	24	0.6									
WBM	3-10	Mesic Mixed Hardwood Forest; Pine Plantation; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	26	<0.1									
WBN (1)	3-10/3-11	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	46	2.4									
WBN (2)	3-11	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	46	1.4									
WBO	3-11/3-12	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	35	0.1									
WBP	3-11	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	42	3.6									
WBQ	3-11	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	43	0.1									
WBR	3-11	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	43	0.2									
Continues															

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WBS	3-11	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	43	<0.1									
WBT	3-11	Pine Plantation; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	41	0.3									
WBU	3-13	Maintained/Disturbed	Headwater Forest	Riparian	27	0.1									
WBV	3-11/3-13	Maintained/Disturbed; Cutover/Early Successional	Headwater Forest	Non-Riparian	39	2.2									
WBW	3-14	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	19	<0.1									
WBX	3-13	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Non-Riparian	35	0.1									
WBY	3-13/3-14	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Cutover/Early Successional	Headwater Forest	Riparian	50	3.0									
WBZ	3-13	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	51	0.6									
WCA	3-13	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	39	0.1									
WCB	3-14	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	39	0.1									
WCC	3-13	Maintained/Disturbed	Headwater Forest	Non-Riparian	12	0.2									
WCD	3-15	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Non-Riparian	15	0.2									
WCE (1)	3-15	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	27	0.3									
WCE (2)	3-15	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest; Agriculture/Pasture	Headwater Forest	Riparian	27	0.4									
WCF	3-15	Agriculture/Pasture	Headwater Forest	Non-Riparian	4	0.1									
WCG	3-15	Mesic Mixed Hardwood Forest; Dry-Mesic Oak-Hickory Forest; Agriculture/Pasture	Headwater Forest	Riparian	4	0.2									
Continues															

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WCH	3-15	Mesic Mixed Hardwood Forest; Agriculture/Pasture	Headwater Forest	Riparian	19	0.4									
WCI	3-15	Mesic Mixed Hardwood Forest; Pine Plantation	Headwater Forest	Riparian	19	1.2									
WCJ	3-15	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	19	0.2									
WCK	3-15	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	15	0.3									
WCL	3-15	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	11	0.2									
WCM	3-15	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Non-Riparian	27	0.3									
WCN	3-15	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	15	<0.1									
WCO	3-15	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	15	<0.1									
WCP	3-15	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	19	<0.1									
WCQ	3-16	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	53	1.1									
WCR	3-16	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	4	0.1									
WCS	3-15/3-16	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	19	0.1									
WCT	3-16	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	6	<0.1									
WCU	3-16	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	10	<0.1									
WCV	3-16	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	34	0.7									
WCW	3-16	Maintained/Disturbed	Headwater Forest	Non-Riparian	13	<0.1									
WCX	3-17	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	11	0.1									
WCY	3-17	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	11	<0.1									
Continues															

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WCZ (1)	3-17/3-18	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest; Cutover/Early Successional	Bottomland Hardwood Forest	Riparian	63	11.6									
WCZ (2)	3-17/3-18	Piedmont/Mountain Bottomland Forest; Maintained/Disturbed	Headwater Forest	Riparian	63	3.0									
WDA	3-18	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Non-Riparian	21	0.3									
WDB	3-18/3-19	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest; Dry-Mesic Oak-Hickory Forest; Basic Mesic Forest	Bottomland Hardwood Forest	Riparian	56	12.8									
WDC	3-18	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Pine Plantation	Bottomland Hardwood Forest	Riparian	56	1.3									
WDD	3-18	Mesic Mixed Hardwood Forest	Bottomland Hardwood Forest	Riparian	56	0.1									
WDE	3-18	Dry-Mesic Oak-Hickory Forest	Bottomland Hardwood Forest	Riparian	56	<0.1									
WDF	3-20	Non-Tidal Freshwater Marsh	Non-Tidal Freshwater Marsh	Riparian	50	1.0		1.0							
WDG (1)	3-20	Piedmont/Mountain Bottomland Forest; Mesic Mixed Hardwood Forest; Maintained/Disturbed	Bottomland Hardwood Forest	Riparian	42	6.6		<0.1							
WDG (2)	3-20	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	42	<0.1		0.2							
WDH	3-20	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	55	4.8									
WDI	3-20/3-21	Piedmont/Mountain Bottomland Forest; Agriculture/Pasture	Headwater Forest	Riparian	31	1.3									
WDJ	3-21	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	27	0.8									
WDK	3-22	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	19	<0.1									
Continues															

Table 6 Continued															
Map ID	**Figure Number**	**Community Type**	**NCWAM Classification**	**Hydrologic Classification**	**DWQ Wetland Rating**	**Area (ac)**									
						Southern Section Alternatives					**Eastern Section Alternatives**				
						Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**
WDL	3-22	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	46	0.3									
WDM	3-22	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	33	1.0				0.6					
WDN	3-22	Piedmont/Low Mountain Alluvial Forest; Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	26	1.4				0.8					
WDO	3-22	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	46	1.9									
WDP	3-22	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	29	<0.1									
WDQ	3-22	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	29	0.2									
WDR	3-23	Maintained/Disturbed	Headwater Forest	Non-Riparian	19	0.1									
WDS	3-23	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	11	0.1									
WDT	3-23	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	13	<0.1									
WDU	3-23	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	19	<0.1									
WDV	3-23/3-24/ 3-25	Piedmont/Mountain Bottomland Forest; Dry-Mesic Oak-Hickory Forest; Maintained/Disturbed	Bottomland Hardwood Forest	Riparian	63-81	18.2									
WDW	3-25	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	38	1.6									
WDX	3-25	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	38	<0.1									
WDY	3-25	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	38	0.6									
WDZ	3-25/3-26	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest; Dry-Mesic Oak-Hickory Forest; Piedmont/Low Mountain Alluvial Forest	Bottomland Hardwood Forest	Riparian	44-62	4.3									
WEA	3-26	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	33	0.3									
Continues															

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WEB	3-29	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	45	0.6									
WEC	3-25/3-29/ 3-30	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest; Dry-Mesic Oak-Hickory Forest; Piedmont/Low Mountain Alluvial Forest	Bottomland Hardwood Forest	Riparian	87	19.4									
WED	3-29	Dry-Mesic Oak-Hickory Forest; Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	62	2.0		0.1							
WEE	3-28	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	8	0.1		0.1							
WEF	3-28	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	8	0.0		0.0							
WEG	3-28	Dry-Mesic Oak-Hickory Forest; Maintained/Disturbed	Headwater Forest	Non-Riparian	4	0.1		0.1							
WEH	3-28/3-29	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	24	<0.1		<0.1							
WEI	3-28	Dry-Mesic Oak-Hickory Forest; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	24	<0.1		<0.1							
WEJ	3-29	Maintained/Disturbed; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	25	0.1		0.1							
WEK	3-29	Maintained/Disturbed	Headwater Forest	Riparian	20	<0.1		<0.1							
WEL	3-29	Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	53	0.2		0.2							
WEM	3-30	Piedmont/Mountain Bottomland Forest; Dry-Mesic Oak-Hickory Forest	Non-Tidal Freshwater Marsh	Riparian	53	2.5		2.3							
WEN	3-30/3-31	Piedmont/Mountain Bottomland Forest	Non-Tidal Freshwater Marsh	Riparian	53	1.8		1.8							
WEO (1)	3-31	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	20	0.3		0.3							
WEO (2)	3-31	Piedmont/Mountain Bottomland Forest	Non-Tidal Freshwater Marsh	Riparian	53	1.2		0.8							
WEP (1)	3-30/3-31	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	53	1.1		1.1							
Continues															

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WEP (2)	3-30/3-31	Piedmont/Mountain Bottomland Forest	Non-Tidal Freshwater Marsh	Riparian	53	1.6		1.6							
WEQ	3-30	Piedmont/Mountain Bottomland Forest; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	30	1.2		1.2							
WER	3-30	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	20	0.2									
WES	3-30	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	25	<0.1									
WET	3-30	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	25	0.4									
WEU	3-30	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	25	<0.1									
WEV	3-30	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	25	<0.1		<0.1							
WEW	3-29	Pine Plantation; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	25	<0.1		<0.1							
WEX	3-29	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	25	0.2		0.2							
WEY	3-29	Maintained/Disturbed	Headwater Forest	Riparian	6	0.1		0.1							
WEZ	3-30	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Non-Riparian	*	<0.1		<0.1							
WFA	3-29	Maintained/Disturbed	Headwater Forest	Riparian	53	<0.1		<0.1							
WFB	3-29	Maintained/Disturbed	Headwater Forest	Riparian	*	0.1		0.1							
WFC	3-29	Pine Plantation	Headwater Forest	Riparian	10	<0.1		<0.1							
WFD	3-29	Maintained/Disturbed; Pine Plantation	Headwater Forest	Riparian	10	<0.1		<0.1							
WFE	3-28	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	*	<0.1		<0.1							
WFF	3-28	Mesic Mixed Hardwood Forest; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	10-14	2.0		2.1							
WFG	3-29	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Non-Riparian	10	0.1		0.1							
WFH	3-29	Pine Plantation; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Non-Riparian	29	0.2		0.2							
WFI	3-29	Maintained/Disturbed; Pine Plantation	Headwater Forest	Non-Riparian	29	<0.1		<0.1							
WFJ	3-33	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Non-Riparian	10	0.1									
WFK	3-33	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Non-Riparian	14	0.1									
WFL	3-33	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Non-Riparian	14	<0.1									
WFM	3-33	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	11	0.5									
Continues															

Table 6 Continued															
Map ID	**Figure Number**	**Community Type**	**NCWAM Classification**	**Hydrologic Classification**	**DWQ Wetland Rating**	**Area (ac)**									
						Southern Section Alternatives					**Eastern Section Alternatives**				
						Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**
WFN (1)	3-32/3-33	Dry-Mesic Oak-Hickory Forest; Agriculture/Pasture; Non-Tidal Freshwater Marsh; Pine Plantation; Cutover/Early Successional	Headwater Forest	Riparian	16-56	5.8		3.6							
WFN (2)	3-32/3-33	Maintained/Disturbed; Agriculture/Pasture; Non-Tidal Freshwater Marsh; Mesic Mixed Hardwood Forest; Pine Plantation; Piedmont/Mountain Bottomland Forest; Dry-Mesic Oak-Hickory Forest; Piedmont/Mountain Swamp Forest; Cutover/Early Successional	Non-Tidal Freshwater Marsh	Riparian	56-67	35.7		7.5							
WFO	3-32	Maintained/Disturbed; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	20	<0.1		<0.1							
WFP	3-32	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	20	<0.1		<0.1							
WFQ	3-32	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	20	0.4		0.4							
WFR	3-34	Mesic Mixed Hardwood Forest; Agriculture/Pasture	Headwater Forest	Riparian	33	<0.1		<0.1							
WFS	3-34	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Agriculture/Pasture	Headwater Forest	Riparian	33	<0.1		<0.1							
WFT	3-34	Mesic Mixed Hardwood Forest; Agriculture/Pasture	Headwater Forest	Riparian	33	0.2		0.2							
WFU	3-34	Mesic Mixed Hardwood Forest; Pine Plantation	Headwater Forest	Riparian	6	0.1									
WFV	3-34	Pine Plantation	Headwater Forest	Riparian	22	0.3									
WFW	3-33	Cutover/Early Successional	Headwater Forest	Non-Riparian	11	0.5									
WFX	3-33	Cutover/Early Successional	Headwater Forest	Riparian	25	0.5									
WFY	3-33/3-35	Pine Plantation; Cutover/Early Successional	Headwater Forest	Riparian	11						1.3	1.3			
Continues															

Table 6 Continued

Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WFZ	3-35	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	15						0.2	0.2			
WGA	3-35	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	19						0.1	0.1			
WGB	3-35	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	15			0.1			0.1	0.1			
WGC	3-35	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	11			<0.1			<0.1	<0.1			
WGD	3-35	Mesic Mixed Hardwood Forest; Basic Mesic Forest	Headwater Forest	Riparian	19			1.2			0.4	0.3			
WGE	3-35	Mesic Mixed Hardwood Forest	Headwater Forest	Non-Riparian	19			<0.1			<0.1	<0.1			
WGF	3-35	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	12			<0.1			<0.1				
WGG	3-35	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	19			0.2			0.2	0.1			
WGH	3-36	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	19			0.1			0.1	0.1			
WGI	3-36	Maintained/Disturbed	Headwater Forest	Riparian	10			0.1			0.1				
WGJ	3-36	Mesic Mixed Hardwood Forest; Dry Oak-Hickory Forest	Headwater Forest	Non-Riparian	2			0.2			0.2				
WGM	3-36	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	14			<0.1			<0.1				
WGN	3-36	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	10			<0.1			<0.1				
WGO	3-36	Mesic Mixed Hardwood Forest; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Non-Riparian	6			0.1			0.1				
WGP	3-37	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	48			0.3			0.3				
WGQ	3-37	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	14			<0.1			<0.1				
WGR	3-37/3-39	Piedmont/Mountain Bottomland Forest; Maintained/Disturbed; Dry Oak-Hickory Forest	Headwater Forest	Riparian	85			9.0			9.7				
WGS	3-37	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	10			0.3			0.3				
WGT	3-37	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	11			0.3			0.3				
WGU (1)	3-39	Piedmont/Mountain Bottomland Forest	Headwater Forest	Non-Riparian	6						<0.1				
WGU (2)	3-39	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	20		<0.1				3.5				
WGV (1)	3-39/3-91	Piedmont/Mountain Bottomland Forest; Dry-Mesic Oak-Hickory Forest; Maintained/Disturbed	Non-Tidal Freshwater Marsh	Riparian	27		0.2				0.4				

Continues

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WGV (2)	3-39/3-91	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	40		<0.1				6.8				
WGW	3-39/3-91	Piedmont/Mountain Bottomland Forest; Maintained/Disturbed; Cutover/Early Successional	Non-Tidal Freshwater Marsh	Riparian	43-48		0.1				2.3				
WGX (1)	3-39	Mesic Mixed Hardwood Forest	Headwater Forest	Non-Riparian	36						0.1				
WGX (2)	3-39	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Bottomland Hardwood Forest	Riparian	26						1.1				
WGY	3-39	Mesic Mixed Hardwood Forest	Headwater Forest	Non-Riparian	36						0.1				
WGZ	3-39	Mesic Mixed Hardwood Forest	Headwater Forest	Non-Riparian	36						0.2				
WHA	3-39	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	11						0.1				
WHB	3-39	Mesic Mixed Hardwood Forest; Dry Oak-Hickory Forest	Headwater Forest	Riparian	33						1.7				1.7
WHC	3-39	Dry Oak-Hickory Forest	Headwater Forest	Riparian	5		0.1				0.2				0.2
WHD (1)	3-40/3-41	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	7						0.3				0.3
WHD (2)	3-39/3-40	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	14						2.3				0.5
WHE	3-40	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	7						0.1		<0.1		
WHF	3-41	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	7						0.9		0.2		0.9
WHG	3-41	Dry Oak-Hickory Forest	Headwater Forest	Riparian	11						0.3		0.3		
WHH	3-41	Pine Plantation	Headwater Forest	Non-Riparian	11						0.1		0.1		
WHJ	3-42	Mesic Mixed Hardwood Forest; Non-Tidal Freshwater Marsh	Headwater Forest	Riparian	10								1.0		
WHM	3-42	Mesic Mixed Hardwood Forest; Non-Tidal Freshwater Marsh	Non-Tidal Freshwater Marsh	Riparian									1.0		
WHN	3-42	Mesic Mixed Hardwood Forest	Non-Tidal Freshwater Marsh	Riparian	43								<0.1		
WHO	3-42	Mesic Mixed Hardwood Forest	Non-Tidal Freshwater Marsh	Riparian	43								<0.1		
WHP	3-42	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	10								<0.1		
WHQ	3-42	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	7		0.2				0.2		0.2		
WHR	3-42	Agriculture/Pasture	Headwater Forest	Riparian	7		<0.1				<0.1		<0.1		
Continues															

Table 6 Continued															
Map ID	**Figure Number**	**Community Type**	**NCWAM Classification**	**Hydrologic Classification**	**DWQ Wetland Rating**	**Area (ac)**									
						Southern Section Alternatives					**Eastern Section Alternatives**				
						Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**
WHS	3-42	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	15		0.3				0.3				
WHT	3-42	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	19						0.3				
WHU	3-42	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	10								<0.1		
WHV	3-43	Mesic Mixed Hardwood Forest; Cutover/Early Successional	Headwater Forest	Riparian	14						0.2				
WHW	3-43	Mesic Mixed Hardwood Forest; Cutover/Early Successional	Headwater Forest	Riparian	19						<0.1				
WHX	3-43	Mesic Mixed Hardwood Forest; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	14						<0.1				
WHY	3-43	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	14						<0.1				
WHZ	3-43	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	14						<0.1				
WIA	3-43	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	14						<0.1		<0.1		
WIB	3-43	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	14								0.1		
WIC	3-43	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	14								0.1		
WID	3-43	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	14								0.1		
WIE	3-43	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	14								<0.1		
WIF	3-43	Dry-Mesic Oak-Hickory Forest; Piedmont/Low Mountain Alluvial Forest; Cutover/Early Successional	Headwater Forest	Riparian	18						1.4		<0.1		
WIG	3-43	Dry-Mesic Oak-Hickory Forest; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	6-9						0.1		0.1		
WIH	3-43	Mesic Mixed Hardwood Forest	Headwater Forest	Non-Riparian	8						0.1		0.1		
WII	3-43	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	10						<0.1		0.1		
WIJ	3-43	Piedmont/Low Mountain Alluvial Forest	Seep	Riparian	10								<0.1		
WIK	3-43	Agriculture/Pasture	Headwater Forest	Non-Riparian	30						<0.1				
WIL	3-43	Agriculture/Pasture	Headwater Forest	Non-Riparian	30						<0.1				
WIM	3-43	Agriculture/Pasture	Headwater Forest	Non-Riparian	30						0.2				
Continues															

Table 6 Continued															
Map ID	**Figure Number**	**Community Type**	**NCWAM Classification**	**Hydrologic Classification**	**DWQ Wetland Rating**	**Area (ac)**									
						Southern Section Alternatives					**Eastern Section Alternatives**				
						Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**
WIN	3-44	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	13						<0.1				
WIO	3-44	Mesic Mixed Hardwood Forest; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	13						0.1		0.1	0.1	
WIP	3-44	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Non-Riparian	10								0.3	0.3	
WIQ	3-44	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Non-Riparian	10								0.1	0.1	
WIR	3-44	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	10						<0.1		0.1	0.1	
WIS	3-44	Maintained/Disturbed; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	9						0.2			0.1	
WIT	3-44	Piedmont/Low Mountain Alluvial Forest; Maintained/Disturbed	Headwater Forest	Riparian	9						0.6		0.3	0.6	
WIU	3-44	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest; Floodplain Pool	Non-Tidal Freshwater Marsh	Riparian	52						0.8		0.4	1.5	
WIV	3-44/3-45	Pine Plantation	Headwater Forest	Riparian	23						0.6		0.6	0.7	
WIW	3-44	Mesic Mixed Hardwood Forest; Pine Plantation; Piedmont/Mountain Bottomland Forest	Non-Tidal Freshwater Marsh	Riparian	52						0.8		0.8	0.8	
WIX	3-45	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Pine Plantation; Piedmont/Mountain Bottomland Forest; Dry-Mesic Oak-Hickory Forest; Agriculture/Pasture; Pine Plantation; Floodplain Pool	Non-Tidal Freshwater Marsh	Riparian	43-52						1.9	7.2	1.9	1.7	
WIY	3-45	Mesic Mixed Hardwood Forest; Pine Plantation	Headwater Forest	Non-Riparian	10						0.4	0.4		0.4	
WIZ	3-45	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	11						0.2				
WJA	3-45	Mesic Mixed Hardwood Forest; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	11						0.3				
WJB	3-46	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	23						0.3				
Continues															

Table 6 Continued

Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WJC	3-46	Mesic Mixed Hardwood Forest; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	20						0.1				
WJD	3-46	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	20						0.4				
WJE	3-46	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	20						0.2				
WJF	3-46	Mesic Mixed Hardwood Forest; Piedmont/Low Mountain Alluvial Forest	Bottomland Hardwood Forest	Riparian	30						3.0				
WJG	3-46	Mesic Mixed Hardwood Forest	Headwater Forest	Non-Riparian	10						0.2				
WJH	3-46	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	8						0.3				
WJI	3-47	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Non-Riparian	20						0.1				
WJJ (1)	3-47/3-49	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Piedmont/Mountain Bottomland Forest; Pine Plantation; Piedmont/Low Mountain Alluvial Forest	Bottomland Hardwood Forest	Riparian	12						12.2				
WJJ (2)	3-47/3-49	Mesic Mixed Hardwood Forest; Pine Plantation; Piedmont/Mountain Bottomland Forest; Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest	Non-Tidal Freshwater Marsh	Riparian	76						17.5				
WJK	3-47	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	28						0.8				
WJL	3-48	Maintained/Disturbed	Headwater Forest	Riparian	08						<0.1				
WJM	3-48	Mesic Mixed Hardwood Forest; Dry-Mesic Oak-Hickory Forest; Dry Oak-Hickory Forest	Headwater Forest	Non-Riparian	26						0.4				

Continues

Table 6 Continued															
Map ID	**Figure Number**	**Community Type**	**NCWAM Classification**	**Hydrologic Classification**	**DWQ Wetland Rating**	**Area (ac)**									
						Southern Section Alternatives					**Eastern Section Alternatives**				
						Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**
WJN	3-48	Mesic Mixed Hardwood Forest; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	4						0.0				
WJO	3-48	Floodplain Pool	Headwater Forest	Riparian	24						0.5				
WJP	3-48	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	23						0.3				
WJQ	3-48	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	10						0.3				
WJR	3-48	Maintained/Disturbed	Headwater Forest	Riparian	15						0.2				
WJS	3-48	Maintained/Disturbed	Headwater Forest	Riparian	24						0.2				
WJT	3-49	Maintained/Disturbed; Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	13						<0.1				
WJU	3-49	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	13						<0.1				
WJV	3-48	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	17						<0.1				
WJW	3-48	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	17						<0.1				
WJX	3-49	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	12						0.1				
WJY	3-46/3-47	Mesic Mixed Hardwood Forest	Floodplain Pool	Riparian	39						0.5				
WJZ	3-70	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	69							18.8			
WKA	3-71/3-72	Mesic Mixed Hardwood Forest; Piedmont/Low Mountain Alluvial Forest; Maintained/Disturbed	Bottomland Hardwood Forest	Riparian	69							15.5		4.0	
WKB	3-72	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	69							3.6		3.6	
WKC	3-72	Maintained/Disturbed; Agriculture/Pasture; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	47-63							2.6		2.6	
WKD	3-73	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	25							1.1		1.1	
WKE	3-73	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	14							0.1		0.1	
Continues															

Table 6 Continued															
Map ID	**Figure Number**	**Community Type**	**NCWAM Classification**	**Hydrologic Classification**	**DWQ Wetland Rating**	**Area (ac)**									
						Southern Section Alternatives					**Eastern Section Alternatives**				
						Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**
WKF	3-73/3-74	Maintained/Disturbed; Piedmont/Low Mountain Alluvial Forest	Non-Tidal Freshwater Marsh	Riparian	53							0.3		0.3	
WKG	3-74	Piedmont/Low Mountain Alluvial Forest	Non-Tidal Freshwater Marsh	Riparian	53							<0.1		<0.1	
WKH	3-73	Maintained/Disturbed	Non-Tidal Freshwater Marsh	Riparian	53							<0.1		<0.1	
WKI	3-74	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	14							<0.1		<0.1	
WKJ	3-74	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	10									0.1	
WKK	3-74	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Non Riparian	23									<0.1	
WKL	3-74	Pine Plantation; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Non Riparian	14							0.1			0.1
WKM	3-74	Mesic Mixed Hardwood Forest	Headwater Forest	Non Riparian	10									<0.1	
WKN	3-75	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Non-Riparian	23							0.1			0.1
WKO	3-74/3-75	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest; Agriculture/Pasture	Headwater Forest	Riparian	17							0.6			0.6
WKP	3-74	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Non-Riparian	6							<0.1			<0.1
WKQ	3-75	Maintained/Disturbed; Pine Plantation; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	10							0.3			0.3
WKR	3-75	Mesic Mixed Hardwood Forest; Pine Plantation	Headwater Forest	Riparian	24							0.3			
WKS	3-74	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	4							<0.1			<0.1
WKT	3-75	Maintained/Disturbed; Pine Plantation	Headwater Forest	Riparian	23							0.3			0.3
WKU	3-75	Maintained/Disturbed	Headwater Forest	Non-Riparian	23							<0.1			<0.1
WKV	3-75	Pine Plantation	Headwater Forest	Riparian	23							0.1			0.1
WKW	3-75	Maintained/Disturbed	Headwater Forest	Non-Riparian	39							<0.1			<0.1
WKX	3-77	Maintained/Disturbed	Headwater Forest	Non-Riparian	19							<0.1			
WKY	3-77	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	20							<0.1			
Continues															

Table 6 Continued

Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WKZ	3-44	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest	Non-Tidal Freshwater Marsh	Riparian	45							0.9			
WLA	3-44	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	34							0.2			
WLB	3-44	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	19							<0.1			
WLC	3-44	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	20							<0.1			
WLD	3-45	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	17							<0.1			
WLE	3-41	Basic Mesic Forest	Headwater Forest	Riparian	15						<0.1		<0.1		
WLF	3-41	Basic Mesic Forest; Pine Plantation	Headwater Forest	Riparian	15		<0.1				<0.1		<0.1		
WLG	3-41	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	56										0.2
WLH	3-41	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	56										0.4
WLI	3-41	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	56										0.1
WLJ	3-74	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	53										0.3
WLK	3-41/3-74	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	53										0.6
WLL	3-75	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	20							<0.1		<0.1	<0.1
WLM	3-75	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	20									<0.1	
WLN	3-75	Piedmont/Mountain Bottomland Forest	Non-Tidal Freshwater Marsh	Riparian	54									0.3	
WLO	3-75	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	46									0.2	
WLP	3-43	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	32									0.1	
WMD	3-68	Mesic Mixed Hardwood Forest	Headwater Forest	Non-Riparian	11			0.2							
WME	3-68	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	39			3.6							
WMF	3-20	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	18			0.9							

Continues

Table 6 Continued															
Map ID	**Figure Number**	**Community Type**	**NCWAM Classification**	**Hydrologic Classification**	**DWQ Wetland Rating**	**Area (ac)**									
						Southern Section Alternatives					**Eastern Section Alternatives**				
						Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**
WMG	3-20	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest; Piedmont/Low Mountain Alluvial Forest; Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	43	<0.1		7.7							
WMH	3-68	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	1			0.1							
WMI	3-68	Maintained/Disturbed; Piedmont/Low Mountain Alluvial Forest	Riverine Swamp Forest	Riparian	34			2.2							
WMJ	3-68	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Non-Riverine Swamp Forest	Riparian	29			0.9							
WMK	3-68	Mesic Mixed Hardwood Forest; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	19			0.2		0.5					
WML	3-68	Piedmont/Low Mountain Alluvial Forest; Maintained/Disturbed	Non-Riverine Swamp Forest	Riparian	35			2.2		1.3					
WMM	3-68	Piedmont/Mountain Swamp Forest	Non-Riverine Swamp Forest	Riparian	35			0.3							
WMN	3-24	Mesic Mixed Hardwood Forest	Non-Tidal Freshwater Marsh	Riparian	27			0.0							
WMO	3-24	Piedmont/Mountain Bottomland Forest	Riverine Swamp Forest	Riparian	24			0.3							
WMP	3-24	Piedmont/Mountain Bottomland Forest	Floodplain Pool	Riparian	15			<0.1							
WMQ	3-24	Piedmont/Mountain Bottomland Forest	Non-Tidal Freshwater Marsh	Riparian	32			0.2							
WMR	3-24	Piedmont/Mountain Bottomland Forest	Riverine Swamp Forest	Riparian	35			0.4							
WMS	3-24	Piedmont/Mountain Bottomland Forest	Riverine Swamp Forest	Riparian	32			0.3							
WMT (1)	3-24	Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Floodplain Pool	Riparian	40			2.5							
Continues															

Table 6 Continued															
Map ID	**Figure Number**	**Community Type**	**NCWAM Classification**	**Hydrologic Classification**	**DWQ Wetland Rating**	**Area (ac)**									
						Southern Section Alternatives					**Eastern Section Alternatives**				
						Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**
WMT (2)	3-24/3-26	Piedmont/Mountain Bottomland Forest	Non-Tidal Freshwater Marsh	Riparian	41			1.1							
WMV	3-24	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	10			<0.1		<0.1					
WMW	3-26	Mesic Mixed Hardwood Forest	Non-Tidal Freshwater Marsh	Riparian	35			0.2							
WMX	3-28	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	14			0.1							
WMY	3-26	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	19			0.1							
WMZ	3-28	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	30			0.2							
WNA	3-28	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	30			1.3							
WNB	3-28	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	30			2.5							
WNC	3-28/3-33/3-35	Piedmont/Mountain Bottomland Forest; Mesic Mixed Hardwood Forest; Maintained/Disturbed	Bottomland Hardwood Forest	Riparian	30			2.8							
WND	3-27	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	14			0.1							
WNE	3-28	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	8			0.2							
WNF	3-28/3-35	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	10			<0.1							
WNG	3-35	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	18			0.1							
WNH	3-35	Mesic Mixed Hardwood Forest	Seep	Riparian	8			<0.1							
WNI	3-28	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	10			0.1							
WNJ	3-36	Dry Oak-Hickory Forest	Headwater Forest	Riparian	8			<0.1			<0.1				
WNN	3-70	Mesic Mixed Hardwood Forest	Non-Tidal Freshwater Marsh	Riparian	17							<0.1			
WNO	3-23	Piedmont/Mountain Bottomland Forest; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	10	<0.1									
WNP	3-29	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	10			0.1							
WNQ	3-27	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	12		<0.1	<0.1							

Continues

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WNR	3-27	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	16		0.4	0.4							
WNT	3-31	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	0	<0.1									
WOC	3-94	Dry-Mesic Oak-Hickory Forest	Unknown	Riparian	*		<0.1								
WOD	3-94	Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest	Unknown	Riparian	*		0.2								
WOF	3-12	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	14		0.1								
WOG	3-12	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	14		<0.1								
WOH	3-78	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	19		<0.1								
WOI	3-78	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	19		0.1								
WOJ	3-78	Cutover/Early Successional	Headwater Forest	Riparian	24		1.1								
WOK	3-78	Mesic Mixed Hardwood Forest; Cutover/Early Successional	Headwater Forest	Riparian	24		<0.1								
WOL	3-12/3-78	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	24		2.6								
WOM	3-78	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	19		<0.1								
WON	3-78	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	20		0.4								
WOO	3-12	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	20		0.3								
WOP	3-80	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	16		0.2								
WOQ	3-80	Mesic Mixed Hardwood Forest	Bottomland Hardwood Forest	Riparian	53		3.3								
WOR	3-80/3-81	Mesic Mixed Hardwood Forest; Pine Plantation	Bottomland Hardwood Forest	Riparian	53		1.1								
WOS	3-80	Mesic Mixed Hardwood Forest; Pine Plantation	Bottomland Hardwood Forest	Riparian	53		0.7								
WOT	3-81	Mesic Mixed Hardwood Forest	Bottomland Hardwood Forest	Riparian	53		<0.1								
WOU	3-81	Mesic Mixed Hardwood Forest	Bottomland Hardwood Forest	Riparian	53		0.3								
WOV	3-81	Mesic Mixed Hardwood Forest; Pine Plantation	Bottomland Hardwood Forest	Riparian	53		0.2								
WOW	3-81	Mesic Mixed Hardwood Forest	Bottomland Hardwood Forest	Riparian	53		0.3								
WOX	3-81	Mesic Mixed Hardwood Forest	Bottomland Hardwood Forest	Riparian	53		0.4								
Continues															

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WOY	3-81	Mesic Mixed Hardwood Forest; Pine Plantation	Bottomland Hardwood Forest	Riparian	53		0.6								
WOZ	3-82/3-83	Mesic Mixed Hardwood Forest; Non-Tidal Freshwater Marsh	Non-Tidal Freshwater Marsh	Riparian	62		28.5								
WPA	3-12	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	24		0.7								
WPB	3-12	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	15		0.1								
WPC	3-82	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	12		0.1								
WPD	3-82	Pine Plantation	Headwater Forest	Riparian	11		<0.1								
WPE	3-82	Agriculture/Pasture	Headwater Forest	Riparian	19		0.1								
WPF	3-83	Agriculture/Pasture	Seep	Riparian	24		0.4								
WPG	3-84	Piedmont/Low Mountain Alluvial Forest	Bottomland Hardwood Forest	Riparian	19		0.2								
WPL	3-84	Mesic Mixed Hardwood Forest; Piedmont/Low Mountain Alluvial Forest	Bottomland Hardwood Forest	Riparian	38		0.9								
WPM	3-83	Mesic Mixed Hardwood Forest	Bottomland Hardwood Forest	Riparian	43		0.1								
WPP	3-93	Pine Plantation; Mesic Mixed Hardwood Forest; Piedmont/Low Mountain Alluvial Forest; Maintained/Disturbed	Headwater Forest	Riparian	11		<0.1								
WPQ	3-85	Piedmont/Low Mountain Alluvial Forest	Floodplain Pool	Riparian	11		<0.1								
WPS	3-85	Piedmont/Low Mountain Alluvial Forest	Bottomland Hardwood Forest	Riparian	35		0.4								
WPT	3-93	Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	11		0.1								
WPU	3-86	Pine Plantation; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	15		0.1								
WPV	3-90	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	21		0.1								
		Maintained/Disturbed	Headwater Forest	Riparian	21		<0.1								
Continues															

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WPX	3-27	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	15		<0.1	<0.1							
WPY	3-27	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	15		<0.1	<0.1							
WQA	3-27	Dry-Mesic Oak-Hickory Forest	Bottomland Hardwood Forest	Riparian	19		0.2	0.1							
WQC	3-27	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	13		0.1	0.1							
WQE	3-90	Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest; Dry Oak-Hickory Forest	Headwater Forest	Riparian	19		0.3								
WQF	3-93	Pine Plantation	Headwater Forest	Riparian	9		<0.1								
WQH	3-86	Mesic Mixed Hardwood Forest; Dry-Mesic Oak-Hickory Forest; Non-Tidal Freshwater Marsh	Bottomland Hardwood Forest	Riparian	39		8.3								
WQI	3-88	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	15		0.1								
WQJ	3-88	Mesic Mixed Hardwood Forest	Seep	Riparian	9		<0.1								
WQK	3-88	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	15		<0.1								
WQL	3-88	Mesic Mixed Hardwood Forest	Seep	Riparian	9		<0.1								
WQM	3-88	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	11		0.1								
WQN	3-88	Dry-Mesic Oak-Hickory Forest	Seep	Riparian	5		<0.1								
WQO	3-89	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	19		0.2								
WQP	3-89/3-90	Piedmont/Mountain Bottomland Forest; Piedmont/Low Mountain Alluvial Forest; Maintained/Disturbed	Headwater Forest	Riparian	30		3.7								
WQQ	3-89	Pine Plantation; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	30		0.1								
WQR	3-89	Pine Plantation	Headwater Forest	Riparian	30		0.1								
WQS	3-89	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	15		<0.1								
WQT	3-89	Pine Plantation	Headwater Forest	Riparian	15		0.1								
WQU	3-93	Dry Oak-Hickory Forest	Headwater Forest	Riparian	7		0.1								
WQV	3-93	Maintained/Disturbed; Dry Oak-Hickory Forest	Headwater Forest	Riparian	15		0.2								
WQW	3-93	Dry Oak-Hickory Forest	Headwater Forest	Riparian	15		0.2								
Continues															

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WQX (1)	3-90/3-91/ 3-92/3-93	Mesic Mixed Hardwood Forest; Non-Tidal Freshwater Marsh; Maintained/Disturbed; Dry Oak-Hickory Forest; Basic Mesic Forest	Non-Tidal Freshwater Marsh	Riparian	62		17.3								
WQZ	3-90	Mesic Mixed Hardwood Forest	Bottomland Hardwood Forest	Riparian	34		0.1								
WRD	3-90	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	4		0.2								
WRE	3-91	Basic Mesic Forest	Headwater Forest	Riparian	35		<0.1								
WRF	3-91	Mesic Mixed Hardwood Forest; Basic Mesic Forest	Headwater Forest	Riparian	35		0.1								
WRG	3-91	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Basic Mesic Forest	Headwater Forest	Riparian	35		0.9								
WRH	3-91	Mesic Mixed Hardwood Forest; Basic Mesic Forest	Headwater Forest	Riparian	35		0.1								
WRI	3-91	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Piedmont/Mountain Bottomland Forest; Basic Mesic Forest	Headwater Forest	Riparian	35		2.3								
WRJ	3-39/3-91	Mesic Mixed Hardwood Forest; Agriculture/Pasture	Headwater Forest	Riparian	18		0.2								
WRK	3-39	Mesic Mixed Hardwood Forest	Bottomland Hardwood Forest	Riparian	43		0.9								
WRL	3-40	Basic Mesic Forest	Headwater Forest	Riparian	22		0.2								
WRM	3-40	Basic Mesic Forest	Headwater Forest	Riparian	22		0.3								
WRN	3-40	Basic Mesic Forest	Headwater Forest	Riparian	22		<0.1								
WRO	3-40	Maintained/Disturbed; Agriculture/Pasture; Basic Mesic Forest	Headwater Forest	Riparian	22		<0.1								
WRP	3-40	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	18		0.1								
WRQ	3-40	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	18		0.2								
WRR	3-40	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	18		0.1								
WRS	3-40	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	18		<0.1								
Continues															

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WRT	3-40	Mesic Mixed Hardwood Forest; Basic Mesic Forest	Headwater Forest	Riparian	14		<0.1								
WRU	3-40	Mesic Mixed Hardwood Forest; Basic Mesic Forest	Headwater Forest	Riparian	14		0.1								
WRV	3-42	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	14		0.1								
WRW	3-40	Basic Mesic Forest	Headwater Forest	Riparian	14		0.3								
WRX	3-90	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Non-Tidal Freshwater Marsh	Non-Tidal Freshwater Marsh	Riparian	50		0.9								
WRY	3-90	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	6		0.2								
WRZ	3-40	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	10		0.1								
WSA	3-89	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	8		0.1								
WSB	3-90	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	28		0.2								
WSC	3-93	Mesic Mixed Hardwood Forest; Floodplain Pool	Floodplain Pool	Riparian	38		0.9								
WSD	3-93	Mesic Mixed Hardwood Forest; Pine Plantation	Headwater Forest	Riparian	43		0.8								
WSE	3-38	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	20						0.1				
WSF	3-90	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	30		0.3								
WSG	3-56	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	16					0.1					
WSH	3-56	Pine Plantation; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	16					0.1					
WSI	3-56	Pine Plantation; Agriculture/Pasture	Headwater Forest	Riparian	16					0.1					
WSJ	3-58	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	14					0.1					
WSK	3-57	Dry-Mesic Oak-Hickory Forest; Non-Tidal Freshwater Marsh	Bottomland Hardwood Forest	Riparian	52					0.7					
WSL	3-57	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	10					0.1					
WSM	3-58	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	6					<0.1					
WSN	3-58	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	4					<0.1					
WSO	3-58	Dry-Mesic Oak-Hickory Forest; Agriculture/Pasture	Headwater Forest	Riparian	8					<0.1					
Continues															

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WSP	3-58	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	24					0.6					
WSQ	3-58	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	24					0.2					
WSR	3-59	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	18					0.1					
WSS	3-59	Cutover/Early Successional	Headwater Forest	Riparian	20					0.4					
WST	3-59	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	20					0.7					
WSU	3-59	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	12					0.1					
WSV	3-59	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	12					0.1					
WSW	3-59	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	12					0.3					
WSX	3-60	Cutover/Early Successional	Headwater Forest	Riparian	4					<0.1					
WSY	3-60	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	6					0.4					
WSZ	3-61	Dry-Mesic Oak-Hickory Forest; Agriculture/Pasture	Headwater Forest	Riparian	10					0.1					
WTA	3-60	Piedmont/Low Mountain Alluvial Forest	Bottomland Hardwood Forest	Riparian	29					1.3					
WTB	3-62	Maintained/Disturbed; Agriculture/Pasture	Headwater Forest	Riparian	9					0.1					
WTC	3-60	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	29					0.3					
WTD	3-60/3-61	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	27					0.5					
WTE	3-61	Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	20-26					1.5					
WTF	3-61	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	16					0.4					
WTG	3-61	Piedmont/Mountain Bottomland Forest; Non-Tidal Freshwater Marsh	Bottomland Hardwood Forest	Riparian	24					1.2					
WTH	3-62	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	12					0.3					
WTI	3-61	Piedmont/Mountain Bottomland Forest	Floodplain Pool	Riparian	10					<0.1					
WTJ	3-61	Non-Tidal Freshwater Marsh; Piedmont/Low Mountain Alluvial Forest	Non-Tidal Freshwater Marsh	Riparian	34					0.7					
Continues															

Table 6 Continued															
Map ID	Figure Number	Community Type	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Area (ac)									
						Southern Section Alternatives					Eastern Section Alternatives				
						Orange	Red	Lilac	Purple	Blue	Green	Brown	Mint	Tan	Teal
WTK	3-61	Mesic Mixed Hardwood Forest; Non-Tidal Freshwater Marsh	Headwater Forest	Riparian	20					<0.1					
WTK	3-61	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	20					1.0					
WTL	3-63	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	47					3.8					
WTM	3-63	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	19					0.2					
WTN	3-61/3-63	Cutover/Early Successional; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	23-43					1.6					
WTO	3-61	Maintained/Disturbed; Cutover/Early Successional	Bottomland Hardwood Forest	Riparian	43					0.2					
WTP	3-61/3-63	Cutover/Early Successional	Bottomland Hardwood Forest	Riparian	43					2.2					
WTQ	3-63	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	12					0.7					
WTR	3-63	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	29					0.9					
WTS	3-63	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	29					0.1					
WTT	3-63	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	29					0.2					
WTU	3-64	Piedmont/Mountain Bottomland Forest	Headwater Forest	Riparian	30					1.8					
WTV	3-64	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	26					1.1					
WTW	3-64	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	26					<0.1					
WTX	3-64	Piedmont/Mountain Bottomland Forest	Floodplain Pool	Riparian	13					<0.1					
WTY	3-64	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	16					0.1					
WTZ	3-64	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	26					1.6					
WUA	3-64	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	27					1.0					
Continues															

Table 6 Continued															
Map ID	**Figure Number**	**Community Type**	**NCWAM Classification**	**Hydrologic Classification**	**DWQ Wetland Rating**	**Area (ac)**									
						Southern Section Alternatives					**Eastern Section Alternatives**				
						Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**
WUB	3-65	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	11					0.1					
WUC	3-65	Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	11					0.1					
WUD	3-65	Piedmont/Mountain Bottomland Forest	Floodplain Pool	Riparian	15					0.1					
WUE	3-61	Piedmont/Mountain Bottomland Forest	Floodplain Pool	Riparian	10					0.1					
WUF	3-62	Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	15					0.3					
WUG	3-22	Mesic Mixed Hardwood Forest; Piedmont/Low Mountain Alluvial Forest	Headwater Forest	Riparian	30					1.7					
WUH	3-22	Mesic Mixed Hardwood Forest; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	31					2.1					
WUI	3-22/3-68	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	31					0.5					
WUJ	3-66/3-67	Mesic Mixed Hardwood Forest; Dry-Mesic Oak-Hickory Forest; Agriculture/Pasture; Non-Tidal Freshwater Marsh	Non-Tidal Freshwater Marsh	Riparian	49					5.9					
WUK	3-66	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	14					0.9					
WUM	3-22	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	10					0.3					
WUN	3-22	Mesic Mixed Hardwood Forest; Maintained/Disturbed	Headwater Forest	Riparian	10					0.8					
WUO	3-6	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest	Non-Tidal Freshwater Marsh	Non-Riparian	9				0.2						
WUP	3-6	Pine Plantation; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	12				0.5						
WUQ	3-50	Dry-Mesic Oak-Hickory Forest; Piedmont/Low Mountain Alluvial Forest	Basin Wetland	Riparian	20				0.2						
Continues															

Table 6 Continued															
Map ID	**Figure Number**	**Community Type**	**NCWAM Classification**	**Hydrologic Classification**	**DWQ Wetland Rating**	**Area (ac)**									
						Southern Section Alternatives					**Eastern Section Alternatives**				
						Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**
WUR	3-50	Piedmont/Low Mountain Alluvial Forest	Seep	Riparian	16				<0.1						
WUS	3-50	Mesic Mixed Hardwood Forest	Seep	Riparian	16				<0.1						
WUT	3-50	Piedmont/Low Mountain Alluvial Forest	Floodplain Pool	Riparian	1				<0.1						
WUU	3-50	Mesic Mixed Hardwood Forest	Floodplain Pool	Riparian	18				<0.1						
WUV	3-50	Mesic Mixed Hardwood Forest; Piedmont/Low Mountain Alluvial Forest	Floodplain Pool	Riparian	18				0.3						
WUW	3-51	Piedmont/Mountain Bottomland Forest	Non-Tidal Freshwater Marsh	Riparian	29				0.3						
WUX	3-51	Piedmont/Mountain Bottomland Forest	Floodplain Pool	Riparian	7				<0.1						
WUY	3-51	Piedmont/Mountain Bottomland Forest	Floodplain Pool	Riparian	20				0.2						
WUZ	3-51	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Floodplain Pool	Riparian	19				0.6						
WVA	3-51	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Piedmont/Mountain Bottomland Forest	Bottomland Hardwood Forest	Riparian	31				2.5						
WVB	3-51	Piedmont/Mountain Bottomland Forest; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	24				1.5						
WVC	3-51	Piedmont/Mountain Bottomland Forest	Floodplain Pool	Riparian	11				0.1						
WVD	3-54	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Agriculture/Pasture	Headwater Forest	Riparian	36				3.8						
WVE	3-54	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	20				1.6						
WVF	3-54	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	16				0.4						
WVG	3-52	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	14				<0.1						
WVH	3-52	Mesic Mixed Hardwood Forest	Headwater Forest	Non-Riparian	10				<0.1						
WVI	3-52	Mesic Mixed Hardwood Forest	Headwater Forest	Non-Riparian	12				0.1						
Continues															

Table 6 Continued															
Map ID	**Figure Number**	**Community Type**	**NCWAM Classification**	**Hydrologic Classification**	**DWQ Wetland Rating**	**Area (ac)**									
						Southern Section Alternatives					**Eastern Section Alternatives**				
						Orange	**Red**	**Lilac**	**Purple**	**Blue**	**Green**	**Brown**	**Mint**	**Tan**	**Teal**
WVJ	3-53	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	26				0.3						
WVK	3-54	Mesic Mixed Hardwood Forest	Headwater Forest	Riparian	18				0.1						
WVL	3-55	Mesic Mixed Hardwood Forest; Piedmont/Mountain Bottomland Forest; Dry-Mesic Oak-Hickory Forest; Agriculture/Pasture; Non-Tidal Freshwater Marsh	Non-Tidal Freshwater Marsh	Riparian	36				7.9						
WVM	3-55	Piedmont/Mountain Bottomland Forest; Non-Tidal Freshwater Marsh	Non-Tidal Freshwater Marsh	Riparian	36				1.6						
WVN	3-55	Agriculture/Pasture	Non-Tidal Freshwater Marsh	Riparian	36				<0.1						
WVO	3-54	Mesic Mixed Hardwood Forest; Maintained/Disturbed; Dry-Mesic Oak-Hickory Forest	Headwater Forest	Non-Riparian	18				0.7						
WVP	3-56	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Non-Riparian	16				0.1						
WVQ	3-55	Mesic Mixed Hardwood Forest	Headwater Forest	Non-Riparian	18				0.9						
WVR	3-55	Mesic Mixed Hardwood Forest	Headwater Forest	Non-Riparian	18				0.3						
WVS	3-54	Dry-Mesic Oak-Hickory Forest	Headwater Forest	Riparian	17				0.1						
					Total	**236.9**	**102.4**	**69.1**	**27.9**	**43.3**	**80.7**	**55.0**	**7.3**	**18.9**	**6.6**

[1]Pre-eisting jurisdictional determination completed by others (I-5111)