

# ANNUAL REPORT FOR 2014



**Tommy's Road Wetland Mitigation Site**  
**Wayne County**  
**TIP No. R-2554BA**  
**COE Action ID: SAW 2008-00252**  
**DWR: 20080570**



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## **SUMMARY**

The following report summarizes the wetland monitoring activities conducted during 2014 at the Tommy's Road mitigation site. This site, situated adjacent to the new NC 44/Future US 70 Goldsboro Bypass near Goldsboro, was designed and constructed during 2011 by the North Carolina Department of Transportation (NCDOT) in order to provide mitigation for wetland impacts associated with the construction of Transportation Improvement Program (TIP) number R-2554BA. This report provides the monitoring results for the third formal year of monitoring (Year 2014). The site must demonstrate hydrologic and vegetative monitoring success for a minimum of five years or until the site is deemed successful.

The site hydrology is monitored with two groundwater gauges including one gauge in the restoration area and one reference gauge in the wetland preservation area. Both of the groundwater gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season) in 2014.

Two vegetation plots were established to monitor the vegetation planted in the 0.11 acre restoration site. The 2014 vegetation monitoring revealed an average density of 534 trees per acre, which is above the minimum success criteria of 320 trees per acre for year three

NCDOT will continue hydrologic and vegetation monitoring at the Tommy's Road mitigation site in 2015.

## 1.0 INTRODUCTION

### 1.1 Project Description

The following report summarizes the wetland monitoring activities that have occurred during 2014 at the Tommy's Road mitigation site. The site is located adjacent to the new NC 44/Future US 70 Goldsboro Bypass near Goldsboro (Figure 1). The site was constructed to provide mitigation for wetland impacts associated with R-2554BA in Wayne County. The 3.91 acre site provides 2.37 acres of wetland preservation, 0.11 acre wetland restoration, 61 linear feet of stream restoration and 691 linear feet of stream preservation. The site also provides 7,792 ft<sup>2</sup> of Neuse buffer restoration (4,459 ft<sup>2</sup> in Zone 1 and 3,333 ft<sup>2</sup> in Zone 2).

### 1.2 Purpose

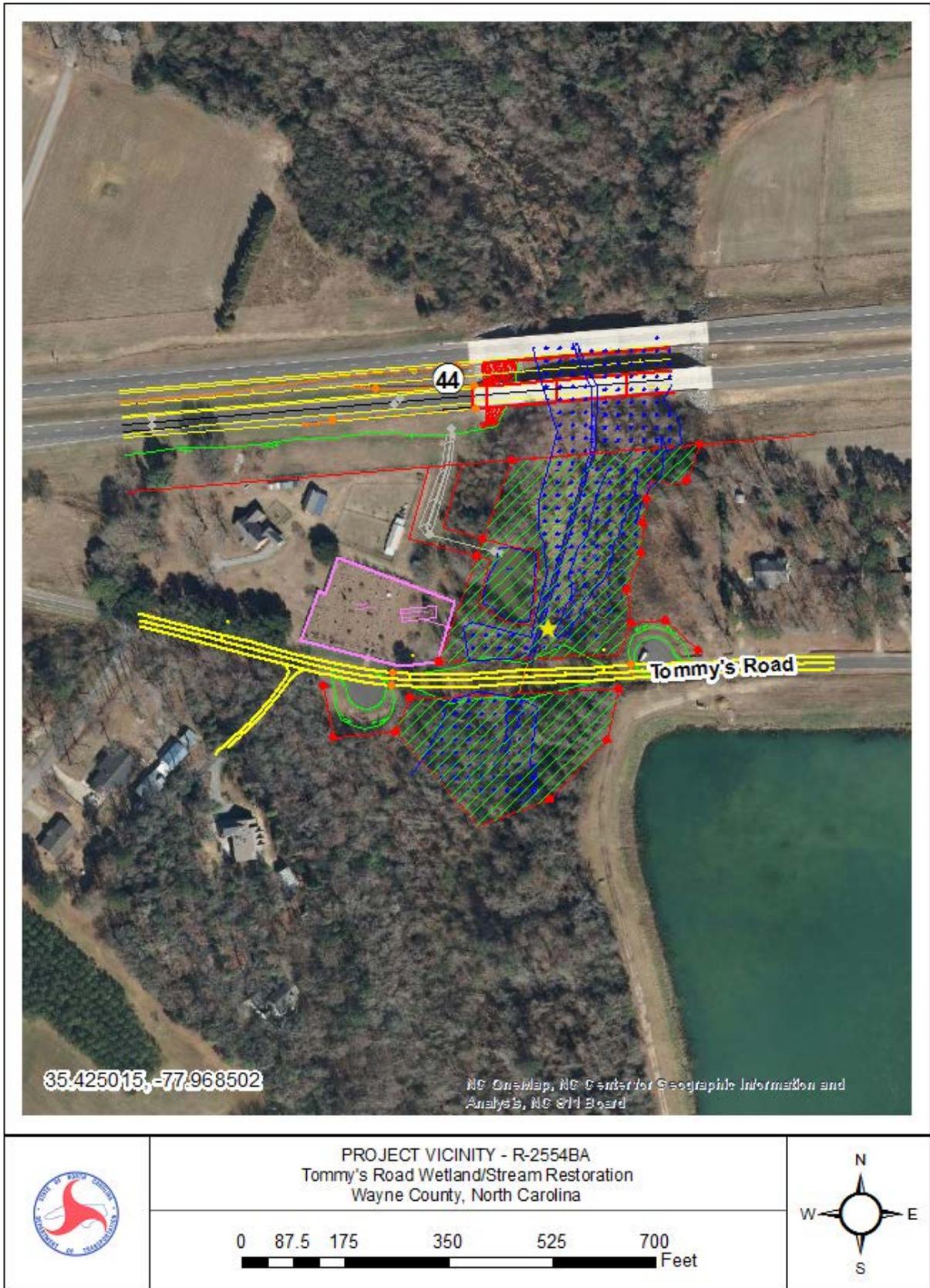
In order to demonstrate successful mitigation, hydrologic and vegetative monitoring must be conducted for a minimum of five years or until success criteria are satisfied. Success criteria are based on federal guidelines for wetland mitigation. Criteria for hydrologic conditions and vegetation survival are included in these documents. The following report details the results of hydrologic and vegetation monitoring during the 2014 growing season at the Tommy's Road mitigation site.

### 1.3 Project History

September 2011	Site Constructed
January 2012	Gauges Installed
February 2012	Site Planted
March-November 2012	Hydrologic Monitoring (Year 1)
August 2012	Vegetation Monitoring (Year 1)
January 2013	Supplemental Planting
March-November 2013	Hydrologic Monitoring (Year 2)
July 2013	Vegetation Monitoring (Year 2)
March-November 2014	Hydrologic Monitoring (Year 3)
July 2014	Vegetation Monitoring (Year 3)

### 1.4 Debit Ledger

The entire Tommy's Road mitigation site was used for the R-2554BA project to compensate for unavoidable wetland and stream impacts.



**Figure 1. Site Location Map**

## **2.0 HYDROLOGY**

### **2.1 Success Criteria**

In accordance with the mitigation plan and permit for wetland mitigation, the success criteria for hydrology states that the area must be inundated or saturated (within 12" of the surface) by surface or ground water for at least a consecutive 12.5% of the growing season. The hydrologic monitoring shall persist for a total of five years with monitoring reports submitted annually.

The growing season in Wayne County begins March 17 and ends November 14. These dates correspond to a 50% probability that temperatures will remain above 28° F or higher after March 17 and before November 14. The growing season is 243 days; therefore hydrology for 12.5% of the growing season is at least 30 consecutive days. Local climate must represent average conditions for the area in order for the hydrologic data to be valid.

### **2.2 Hydrologic Description**

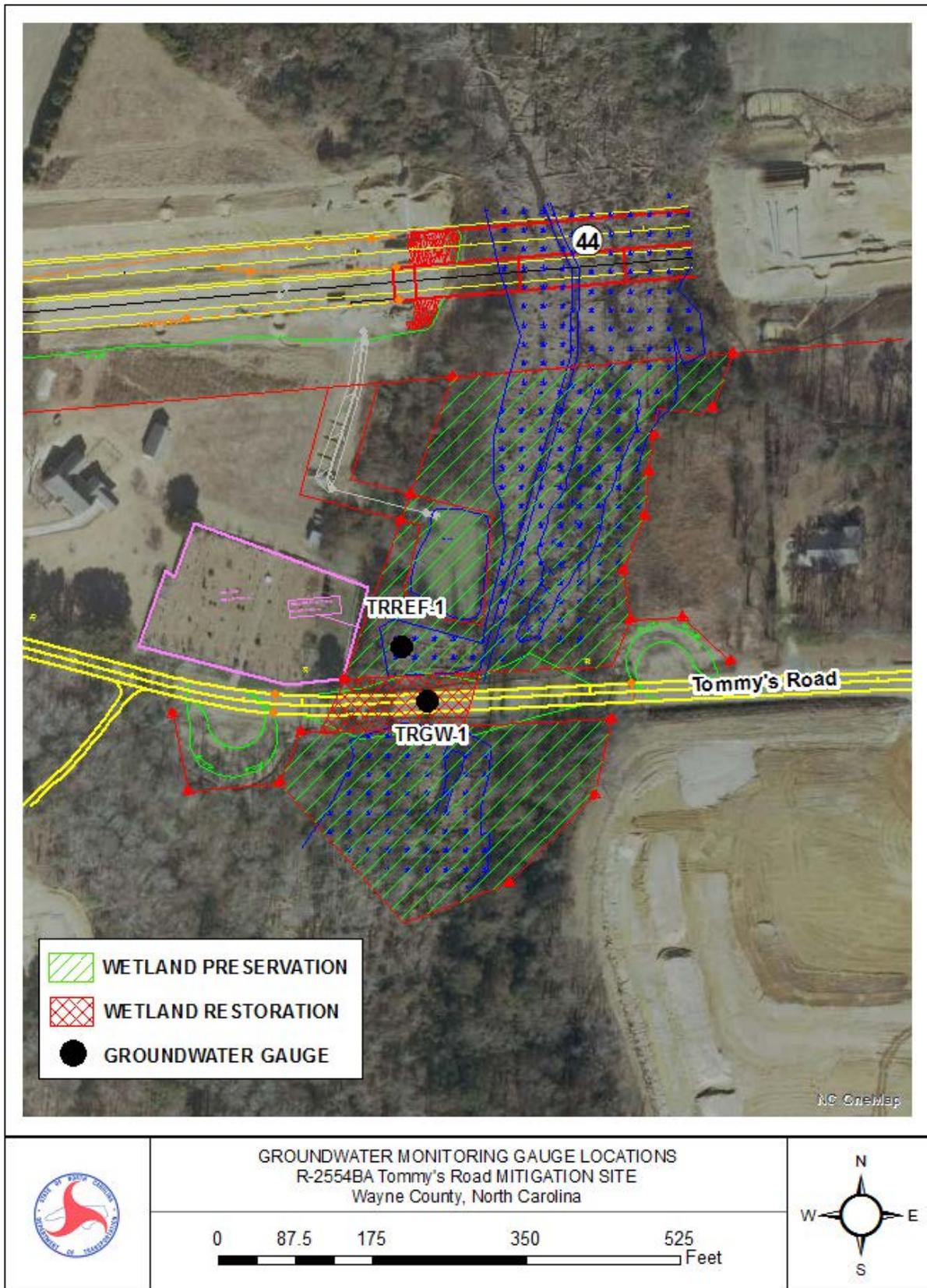
Two groundwater monitoring gauges are used to record site hydrologic data including one in the restoration area and one reference gauge in the preservation area. The groundwater gauges are set to record daily water levels. The hydrologic response (groundwater) to rainfall events is evaluated using data provided by the North Carolina State Climate Office.

Appendix A contains a plot of the water depth for each of the groundwater monitoring gauges for 2014. Precipitation events, provided by the State Climate Office, are included on each groundwater graph as bars.

### **2.3 Results of Hydrologic Monitoring**

#### **2.3.1 Site Data**

The total number of consecutive days that the groundwater was within twelve inches of the surface was determined for each groundwater monitoring gauge. This number was converted into a percentage of the growing season. Table 1 presents the hydrologic results for 2014. Table 2 presents the hydrologic results at the site since construction was completed. Figure 3 is a graphical representation of the hydrologic monitoring results for 2014.



**Figure 2.** Monitoring Gauge Location Map

**Table 1.** 2014 Hydrologic Monitoring Results

Monitoring Gauge	< 5%	5 – 12.5%	> 12.5%	Actual %	Dates of Success
TRGW-1			X	47.3	Mar 17-July 9; July 11-Aug 26; Sept 4-Nov 14
*TRREF-1			X	100.0	Mar 17-Nov 14

\*TRREF-1 is located in the preservation area.

\*Appendix A contains plots of groundwater data during 2014.

**Table 2.** 2012-2016 Hydrologic Monitoring Results

Monitoring Gauge	2012 Results	2013 Results	2014 Results	2015 Results	2016 Results
TRGW-1	51.4	23.0	47.3		
TRREF-2	100.0	100.0	100.0		
Climate Conditions	Ave./Above Average Rainfall	Ave./Above Average Rainfall	Above Average Rainfall		

### 2.3.2 Climatic Data

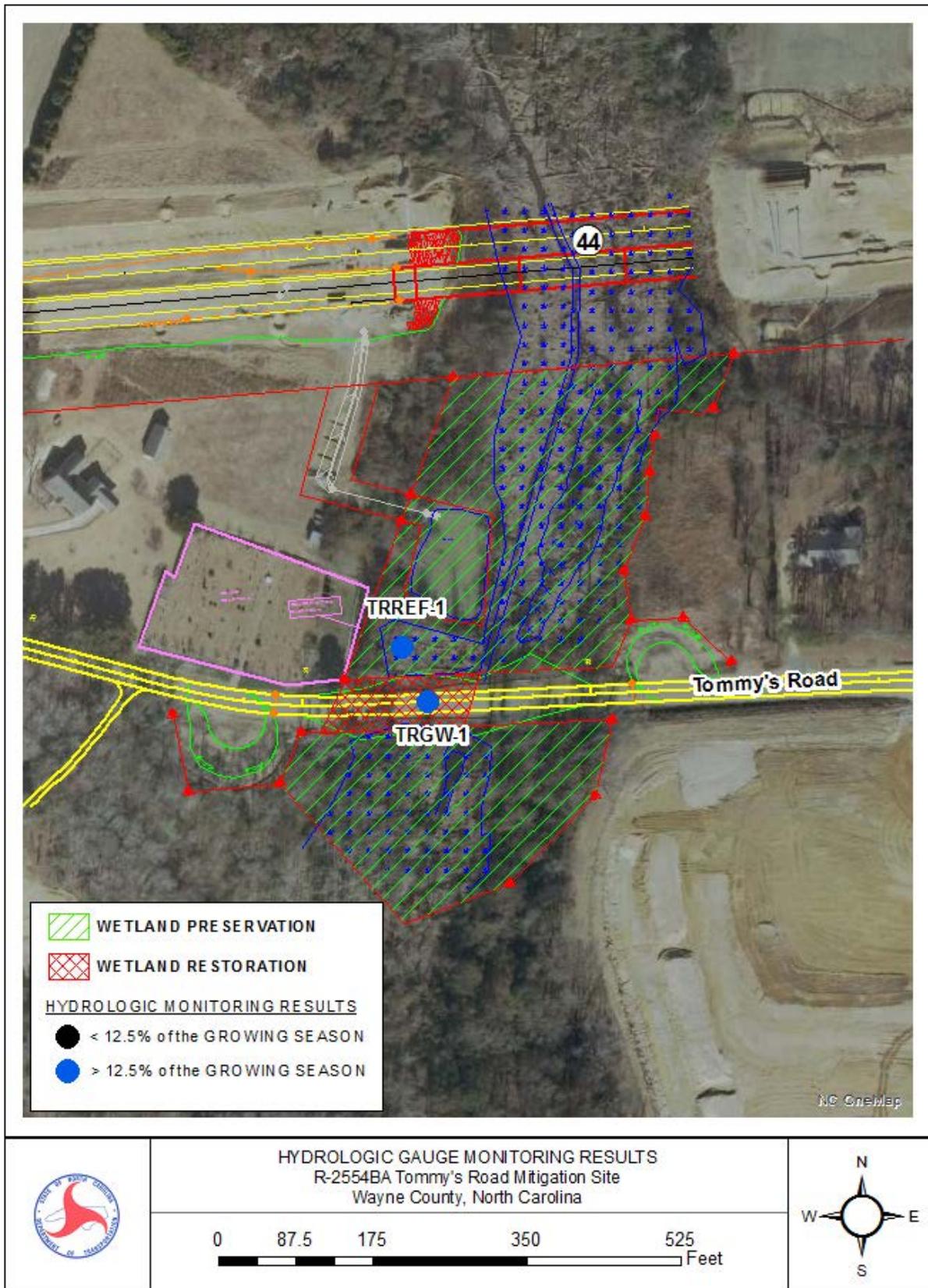
Figure 4 is a comparison of monthly rainfall for the period of January 2014 through November 2014 to historical precipitation (collected between 1984 and 2013) for Cherry Research Station in Wayne County. This comparison gives an indication of how 2014 relates to historical data in terms of climate conditions. The NC State Climate Office provided all local rainfall information.

For the 2014-year, January, February, May and November experienced average rainfall. October recorded below average rainfall while March, April, June, July, August and September recorded above average rainfall. Overall 2014 experienced an above average rainfall year.

### 2.4 Conclusions

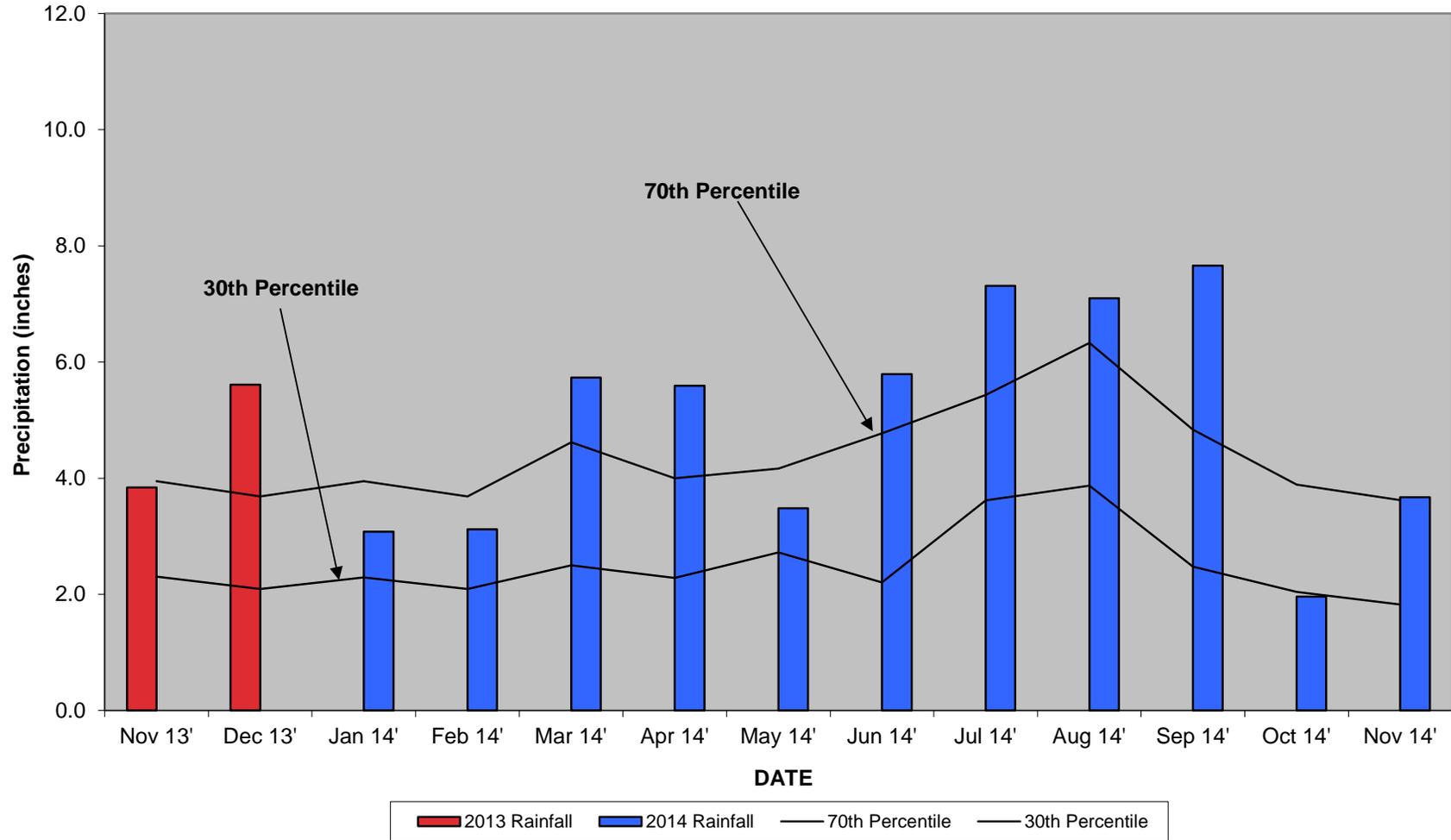
The 2015 year represents the third year that hydrologic data has been collected on the Tommy’s Road mitigation site. Both of the groundwater monitoring gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season) in the 2014 monitoring year.

NCDOT will continue to monitor the hydrology at the Tommy’s Road mitigation site in 2015.



**Figure 3.** 2014 Hydrologic Monitoring Results

**Tommy's Road 30-70 Graph  
Goldsboro, NC Monthly Precipitation**



**Figure 4. 30-70 Percentile Graph 2014**

### **3.0 VEGETATION: TOMMY'S ROAD MITIGATION SITE (YEAR 3 MONITORING)**

#### **3.1 Success Criteria**

For the onsite wetland mitigation sites, the permittee shall plant 680 stems/acre. Vegetation success shall be measured by survivability over a 5 year monitoring period. Survivability will be based on 320 stems/acre after three (3) years and 260 stems after five (5) years. A survey of vegetation during the growing season shall be conducted annually over the five-year monitoring period and submitted to the NC division of Water Quality. If the surviving vegetation densities are below the required thresholds after the five-year monitoring period, the site may still be declared successful at the discretion of and with written approval from the NC Division of Water Quality.

For the onsite buffer mitigation sites, the permittee shall monitor the sites. An annual report shall be submitted to DWQ for a period of 5 years showing monitoring results survival rate/success of tree and vegetation establishment, and that diffuse flow through the riparian buffer has been maintained. The first annual report shall be submitted within one year of final planting. Failure to achieve a buffer density of 320 trees per acre after 5 years will require the annual report to provide appropriate remedial actions to be implemented and a schedule for implementation. Approval of the final annual report, and a formal "close out" of the mitigation site by the DWQ is required.

#### **3.2 Description of Species**

The following live stakes were planted along Streambank:

*Salix nigra*, Black Willow

*Cornus amomum*, Silky Dogwood

The following tree species were planted in the Wetland Restoration and Buffer Areas:

*Platanus occidentalis*, American Sycamore

*Fraxinus pennsylvanica*, Green Ash

*Betula nigra*, River Birch

*Liriodendron tulipifera*, Tulip Poplar

### 3.3 Results of Vegetation Monitoring

**Table 3.** Vegetation Monitoring Statistics

Plot #	Sycamore	Green Ash	River Birch	Tulip Poplar	Total (Year 3)	Total (at planting)	Density (Trees/Acre)
1	12	7	8	5	32	53	411
2	26	28		4	58	60	657
<b>Year 3 Average Density (Trees/Acre)</b>							<b>534</b>
Year 2 Average Density							642
Year 1 Average Density							327

Site Notes: A supplemental planting took place at this site on January 17, 2013 due to low plant survival in 2012. Other species noted onsite included: *Juncus* sp., woolgrass, cattail, baccharis, woolgrass, sweetgum, red maple, lespedeza, fennel, alder, pine, fennel, pokeberry, briars, and various grasses. The stream restoration is stable at this time and the black willow and silky dogwood live stakes are surviving along the streambank. There have been no bankfull events visually documented during the past 3 years of the monitoring period.

### 3.4 Conclusions

There were two vegetation monitoring plots established throughout the wetland restoration and buffer areas. The 2014 vegetation monitoring of the site revealed an average tree density of 534 trees per acre. This average is well above the minimum success criteria of 320 trees per acre for the third year of monitoring.

NCDOT proposes to continue monitoring vegetation at the Tommy's Road Mitigation Site for 2015.

#### **4.0 OVERALL CONCLUSIONS/ RECOMMENDATIONS**

The 2014 year represents the third year that hydrologic data has been collected on the Tommy's Road mitigation site. Both of the groundwater monitoring gauges met the jurisdictional criteria for wetland hydrology (>12.5% of the growing season) during the 2014 growing season.

There were two vegetation monitoring plots established throughout the wetland restoration area. The 2014 vegetation monitoring revealed an average density of 534 trees per acre, which is well above the minimum success criteria of 320 trees per acre.

NCDOT will continue hydrologic and vegetation monitoring at the Tommy's Road mitigation site in 2015.

**APPENDIX A**  
**GROUNDWATER GAUGE DATA**

**APPENDIX B**

**SITE PHOTOS, PHOTO LOCATIONS, AS-BUILT PLAN SHEETS  
AND PLOT LOCATIONS MAP**

# Tommy's Road



Photo Point #1 Looking at Vegetation Plot 1



Photo Point #2 Looking Upstream



Photo Point #2 Looking Downstream



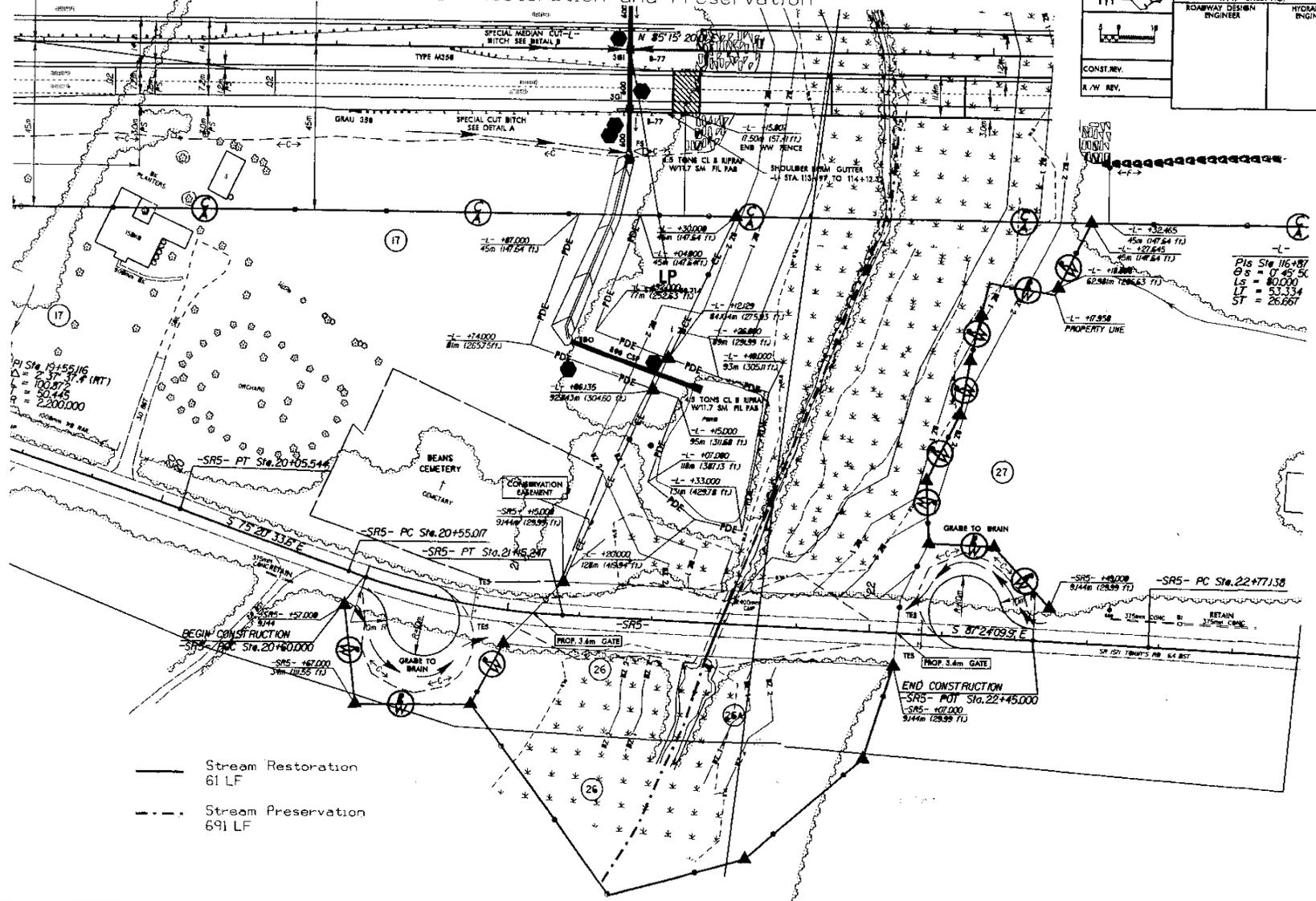
Photo Point #3 Looking at Vegetation Plot 2

July 2014

# Tommy's Road As-built Stream Restoration and Preservation



PROJECT REFERENCE NO. R-25548A	SHEET NO.
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULIC'S ENGINEER
CONST. REV.	
R/W REV.	

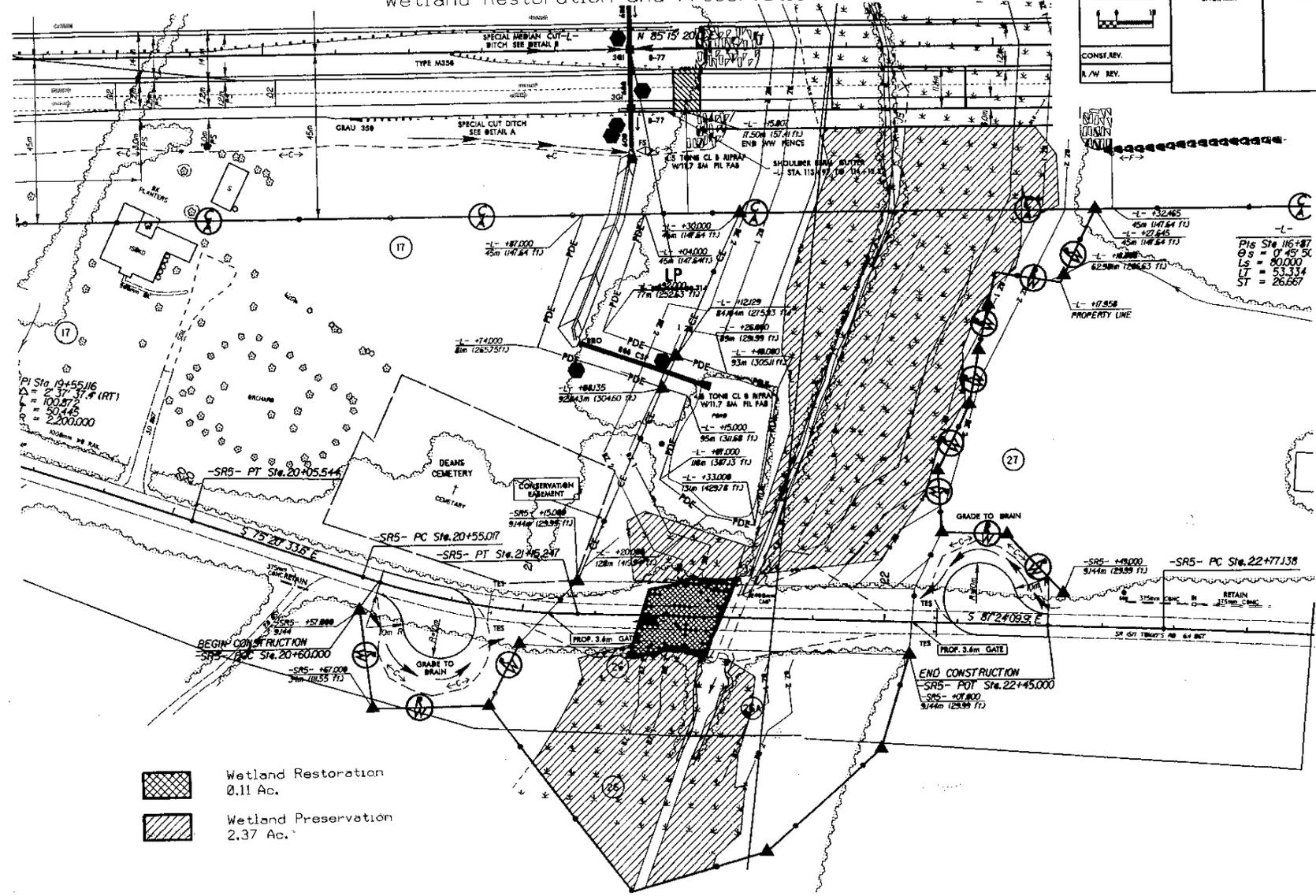


-L- 232.465  
 45m (147.64 FT)  
 -L- 172.645  
 45m (147.64 FT)  
 -L- 118.265  
 62.94m (206.63 FT)  
 -L- 17.950  
 PROPERTY LINE  
 -L-  
 PLS STA 116+87  
 9 S = 07.45 SC  
 LS = 80.000  
 LT = 53.334  
 ST = 26.667

— Stream Restoration  
 61 LF  
 - - - Stream Preservation  
 691 LF

# Tommy's Road As-built Wetland Restoration and Preservation

	PROJECT REFERENCE NO. # 25548A	SHEET NO.
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST. REV.		
R/W REV.		



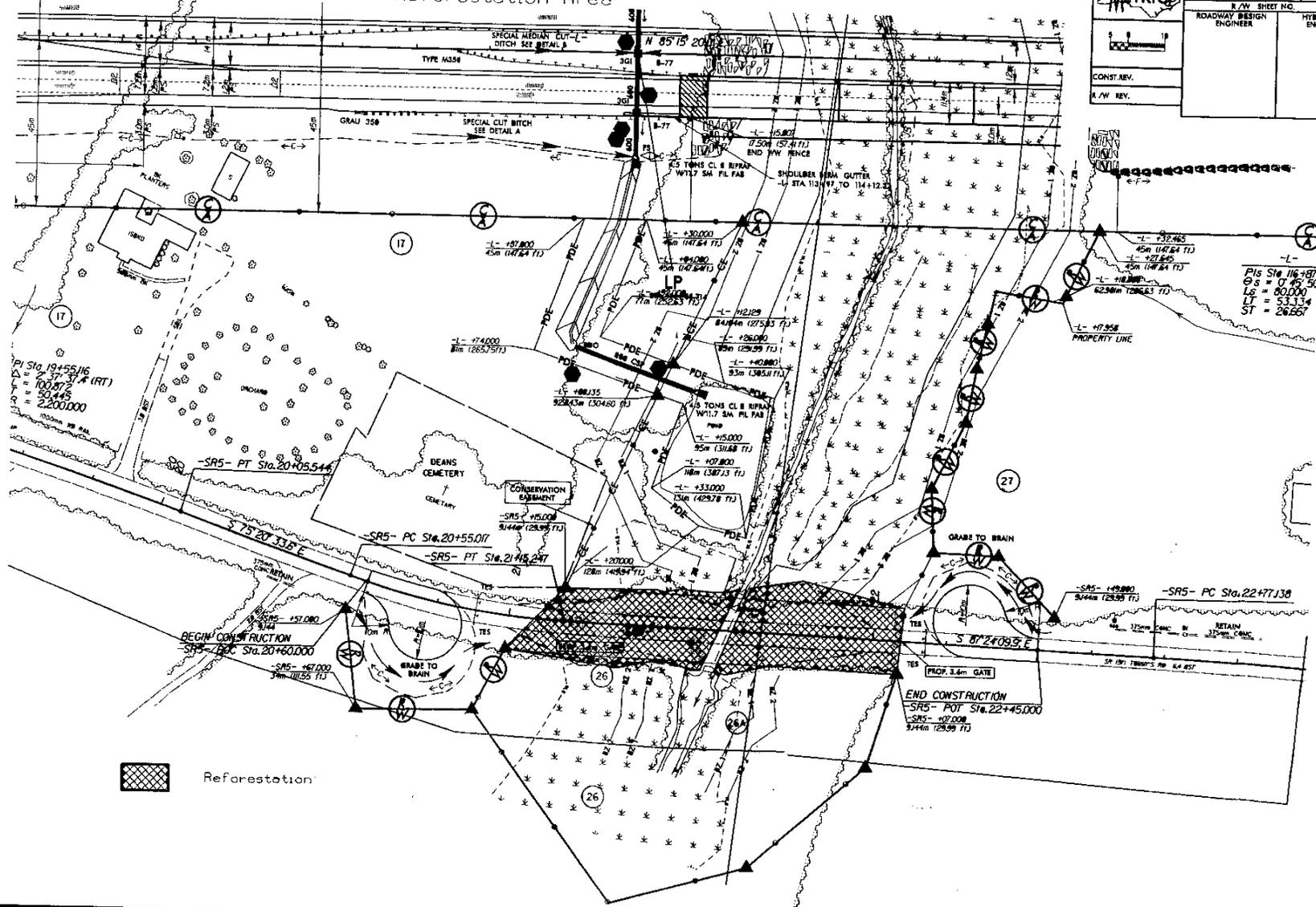
Wetland Restoration  
0.11 Ac.  
 Wetland Preservation  
2.37 Ac.

PLS Sta 19+55.116  
 Gs = 17.45 SC  
 LS = 60.000  
 LT = 53.334  
 ST = 26.667

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# Tommy's Road As-built Reforestation Area

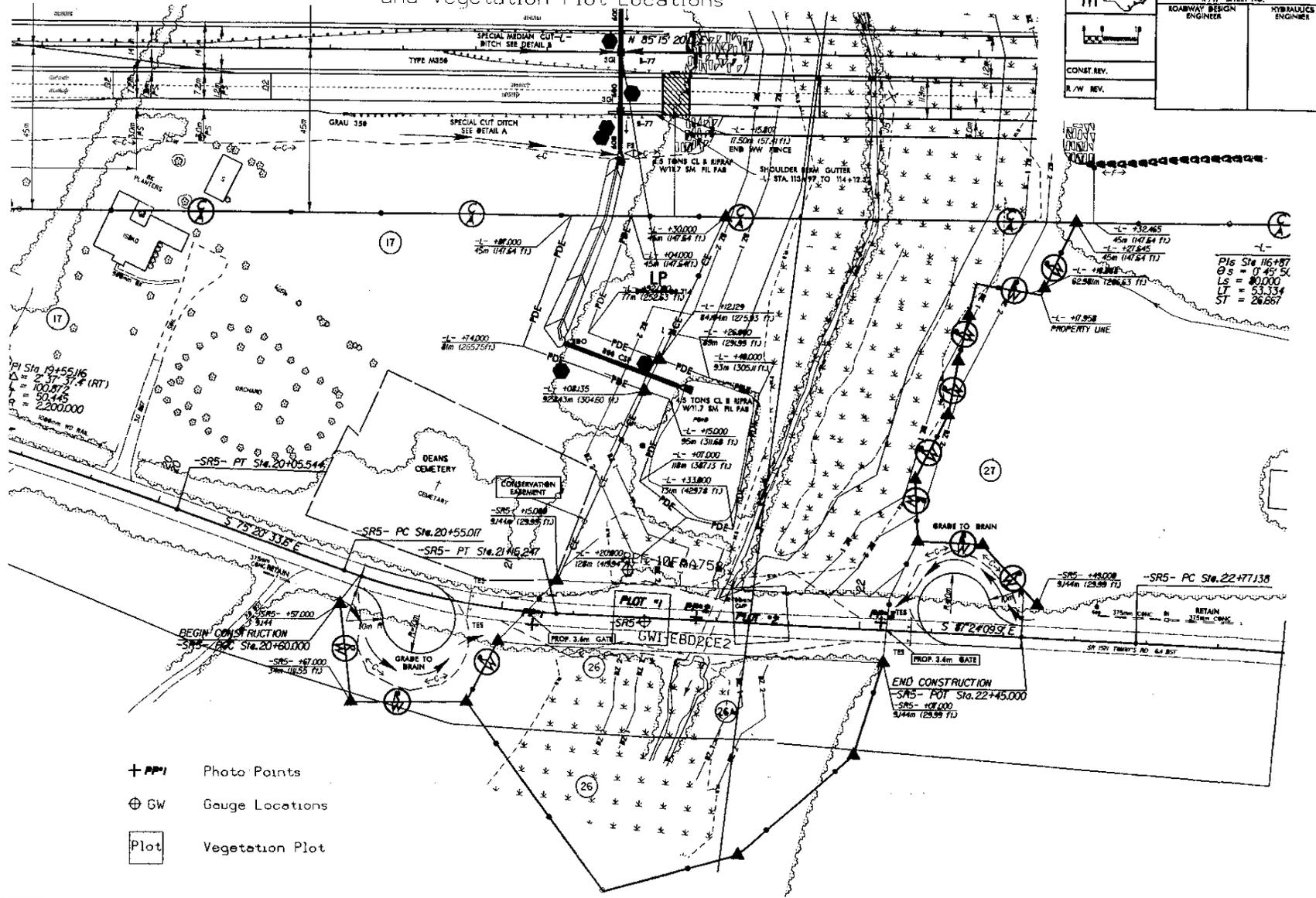
	PROJECT REFERENCE NO.	SHEET NO.
	R-25548A	
	R/W SHEET NO.	
ROADWAY DESIGN ENGINEER		HYDRAULIC ENGINEER
CONST. REV.		
R/W REV.		



Reforestation

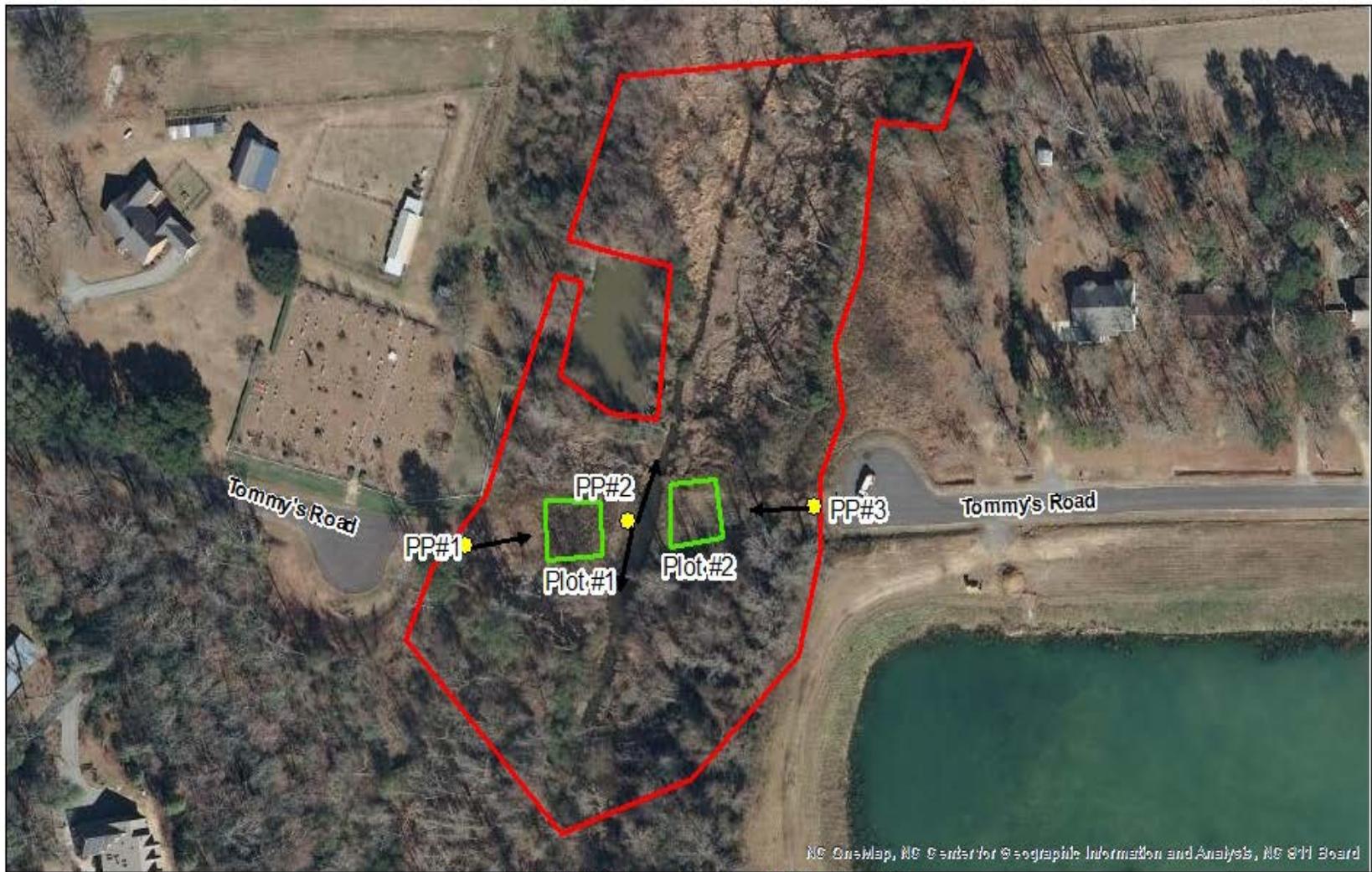
# Tommy's Road As-built - Gauge, Photo Point and Vegetation Plot Locations

 CONST. REV. R/W REV.	PROJECT REFERENCE NO. <b>R-25548A</b>	SHEET NO. <b>1</b>
	R/W SHEET NO. <b>1</b>	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER



- + PPI Photo Points
- ⊕ GW Gauge Locations
- Plot Vegetation Plot

DATE PLOTTED: 01/27/2017 10:55:00 AM PROJECT: R-25548A SHEET: 1 OF 1  
 DRAWN BY: J. B. [unreadable] CHECKED BY: [unreadable]



**R-2554BA Tommy's Road Mitigation Site  
Photo Point and Vegetation Plot Locations  
Wayne County, North Carolina**

