Jones Creek Mitigation Project
Anson County, North Carolina

DENR-EEP Contract No. D04020-1

FINAL Year 5 Monitoring Report

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1.0 SUMMARY

This Annual Report details the monitoring activities during the 2010 growing season at the Jones Creek Mitigation Site. The Jones Creek Wetland and Stream Restoration Site is located near the Town of Wadesboro in Anson County, North Carolina. Construction of the Site was completed in December 2005. Baseline data on stream morphology and vegetation were collected immediately after construction and planting were completed. As-Built survey information is documented in **Appendix A**. All restoration is being monitored for five years to document success. The 2010 data represents results from the fifth year of hydrology, vegetation, and stream stability monitoring.

Mitigation at the Jones Creek Site involved stream restoration, stream preservation, wetland enhancement, and wetland restoration. The stream restoration channel was designed and constructed using natural channel design techniques. Wetland restoration involved raising the local water table by filling drainage ditches on-site and creation of microtopography across the Site. After construction, it was determined there was 3,068 feet of stream restoration, 5,150 feet of stream preservation, 25 acres of wetland restoration, and 2.7 acres of wetland enhancement. In the fall of 2008 additional work at the Site was completed. This involved minor repairs to ditch plugs, sub-surface ripping, and repairs to a damaged level spreader. These remedial actions addressed concentrated runoff from an adjacent upland area. The disturbed areas were stabilized and re-planted.

During the 2010 Growing Season a hydrologic and hydric soil assessment was conducted on the Jones Creek Site. This assessment identified 2.23 acres of additional restored wetlands within the conservation easement. These areas had hydric soils and indicators of wetland hydrology. The assessment also delineated 1.39 acres of unsuccessful wetland restoration in the vicinity of AW6 and AW17. The revised wetland restoration areas are included in the figures and the results are presented in this annual monitoring report.

This Annual Report presents the data from 19 hydrology monitoring stations, 13 vegetation monitoring plots, two crest gauges, a manual rain gauge, an auto-logging rain gauge, 6 stream cross sections, and photo reference locations, as required by the approved Restoration Plan for the Site. Five hydrology monitoring stations and an auto-logging rain gauge were added prior to the 2009 growing season. All 19 hydrology monitoring stations are equipped with automated groundwater gauges.

Weather station data from the Wadesboro Weather Station were used in conjunction with a manual rain gauge and an auto-logging rain gauge located on the Site to document precipitation amounts. During the 2010 growing season, the rainfall total through the end of August was below normal limits. On-site rainfall in May and June was within normal limits, however a rainfall deficit already occurred making it unlikely to recharge the water table.

In 2010, 10 of 19 hydrology monitoring gauges recorded hydroperiods of at least 7 percent of the growing season. Seven hydrology monitoring gauges recorded hydroperiods of 5 and 6 percent during the 2010 Year 5 growing season. Both AW6 and AW17 recorded hydroperiods of less than five percent of the growing season. The three monitoring gauges at the reference site recorded hydroperiods from 10 to 11 percent of the growing season. It is important to note that the hydrology of the targeted wetland system is highly responsive to rainfall and is expected to be variable across a given site, supporting the ecological and functional diversity that makes these systems so valuable. Overall, the Site was within the range of hydrologic conditions expected in undisturbed floodplain wetlands.

This Annual Report documents vegetation survivability based on 13 vegetation-monitoring plots, as specified in the approved Restoration Plan for the Site. They are randomly located to represent the different zones within the Site. The vegetation monitoring documented a density range of 440 stems per acre to 680 stems per acre with an average of 557 stems per acre. The Site had previously met the interim success criteria of 320 trees per acre by the end of year three, and has now met the final success criteria of 260 trees per acre by the end of Year 5.

Throughout the Year 5 monitoring season, the restored stream channel remained stable and continued to provide the intended habitat and hydrologic functions. Numerous beaver dams are present and causing minor aggradation. All monitored cross sections show very little adjustment in stream dimension, and the Site has achieved the stream stability success criteria specified in the Restoration Plan.

2.0 INTRODUCTION

2.1 PROJECT DESCRIPTION

The Jones Creek wetland and stream restoration Site is located near the Town of Wadesboro in Anson County, North Carolina (**Figure 1** and **Figure 2**). The Site has a history of agricultural use. Ditches on the site were used to increase subsurface drainage. Construction of the Site, including planting of trees, was completed in December 2005. Groundwater, surface water, and rain gauges were functional throughout 2010.

Mitigation at the Jones Creek Site involved stream restoration, stream preservation, wetland enhancement, and wetland restoration. Restoration of the Site involved the restoration of a stable meandering channel. The channel was designed and constructed using natural channel design techniques. Restoration also involved raising the local water table by filling drainage ditches on-site and creation of microtopography across the site. **Table 1** shows the as-built lengths and restoration type for each reach.

Table 1. Project Mitigation Structure and Objectives

Reach Name	As-Built Length (feet)	Mitigation Units	Restoration Approach
Stream			
Mill Branch	1,855	1,855	Stream Restoration
UT1	1,213	1,213	Stream Restoration
South Fork Jones Creek	5,150	1,030	Stream Preservation
Total	**8,218**	**4,098**	
Wetland	**As-Built Area (acres)**		
	25.0	25.0	Restoration
	2.7	1.4	Enhancement
2009 Hydrologic Assessment	1.7	1.7	Additional Restoration
Total	**29.4**	**28.1**	

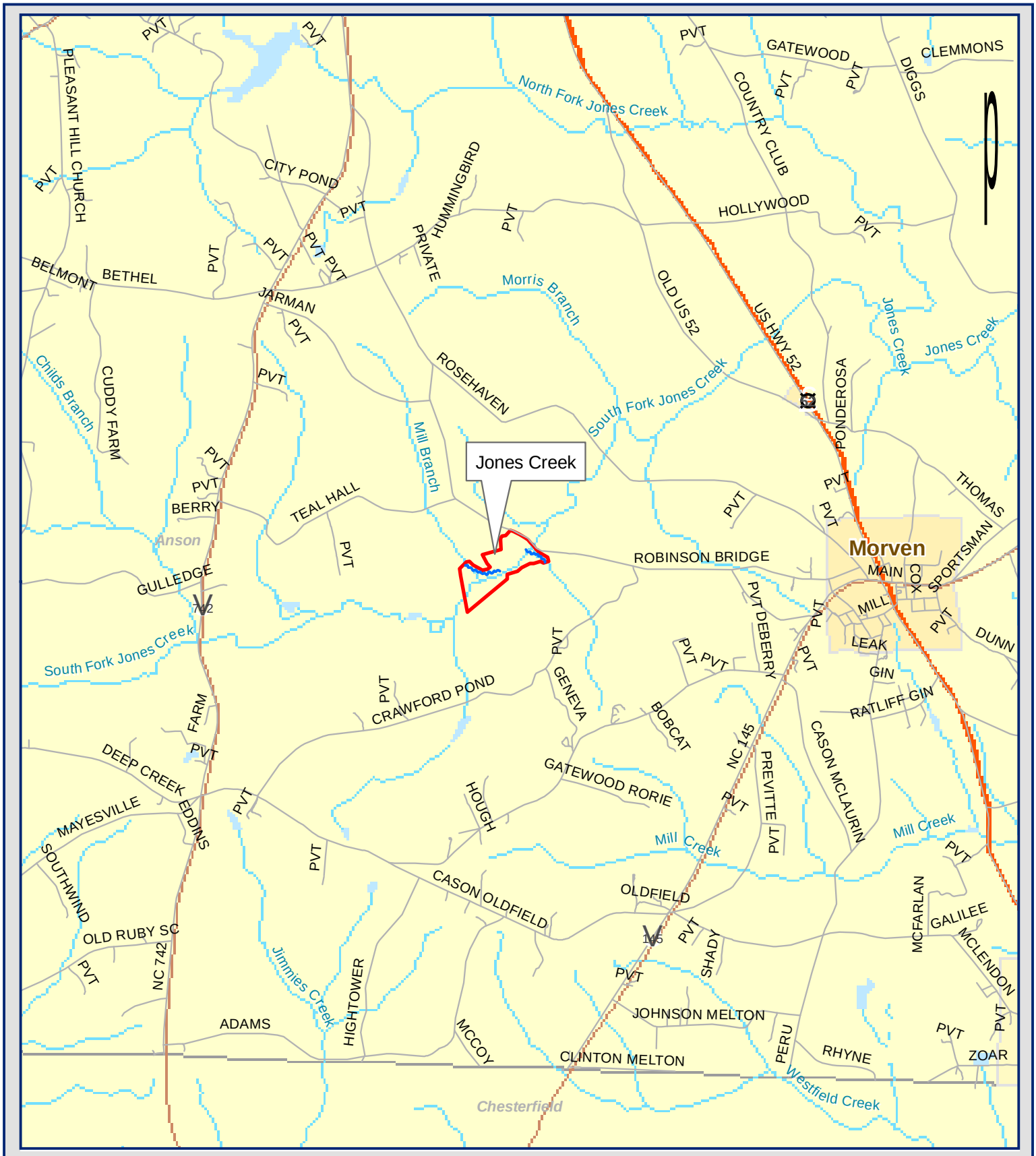


Figure 1
Jones Creek Site
Anson County
Vicinity Map

Legend

- Streams
- Roads
- Jones Creek Site

Anson County
NTS

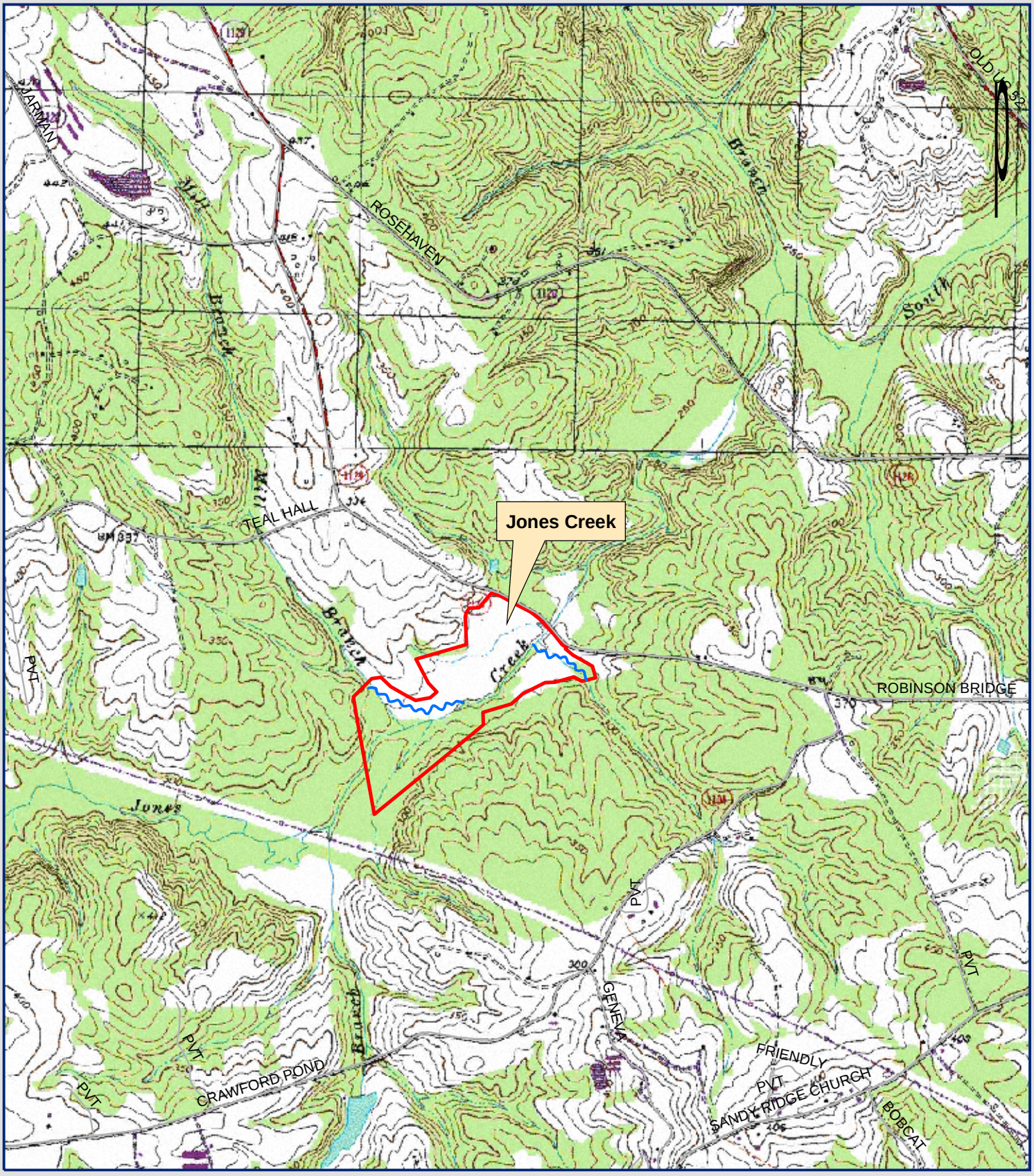


Figure 2
Jones Creek Site
Anson County
USGS Map

0 5001,000 2,000 3,000 4,000
Feet

Streams
Roads
Jones Creek Site

2.2 PROJECT PURPOSE

Monitoring of the Jones Creek Site is required to demonstrate successful restoration based on the criteria found in the Restoration Plan and through a comparison to reference site conditions. Hydrologic, vegetation, and stream monitoring are conducted on an annual basis. Success criteria must be met for five consecutive years. This Annual Report details the results of the monitoring efforts for 2010 (Year 5) at the Jones Creek Mitigation Site.

2.3 PROJECT HISTORY & SCHEDULE

Table 2. Project Activity and Reporting History

Month	Activity
December 2005	Construction Completed
March 2006	Post-restoration Monitoring Begins
November 2006	1st Annual Monitoring Report
November 2007	2nd Annual Monitoring Report
November 2008	3rd Annual Monitoring Report
November 2009	4th Annual Monitoring Report
November 2010	5th Annual Monitoring Report

Table 3. Project Contacts

Contact	Firm Information
Project Manager Norton Webster	EBX-Neuse 1, LLC (919) 608-9688
Designer Kevin Tweedy, PE	Buck Engineering PC (919) 463-5488
Monitoring Contractor Daniel Ingram	WK Dickson and Co., Inc (919) 782-0495

3.0 HYDROLOGY

3.1 HYDROLOGIC SUCCESS CRITERIA

As stated in the approved Restoration Plan, to meet the hydrologic success criteria the hydrology monitoring data must show that for each normal year of rainfall within the monitoring period the site has been inundated or saturated within 12 inches of the soil surface for a minimum of 7 percent of the growing season (16 days). The day counts are based on the growing season for Anson County, which is 225 days long (24 March – 5 November). Groundwater data are collected from 14 automated groundwater gauges. The Restoration Plan further specifies that precipitation must be within or below normal limits for the hydrologic data to be considered successful.

3.2 DESCRIPTION OF HYDROLOGY MONITORING EFFORTS

To monitor on-site hydrology 19 groundwater gauges are installed across the Site. **Figure 3** displays the gauge locations. Fourteen groundwater gauges (seven manual and seven automated) were installed following construction. During April 2007, all seven manual groundwater gauges were converted to automated gauges. To further document wetland restoration and define potential areas of concern five automated groundwater gauges were added during October 2008. The gauges are checked and the data downloaded monthly. During the monthly Site visits all automated gauges, calibration gauges, crest gauges, and the rain gauge are read.

INSERT

INSERT MATCHLINE

Wetland Hydroperiod
- > 7 %
- 5-7 %
- < 5 %

Unsuccessful Wetland Restoration (1.38 acres)

Additional Wetland Restoration (2.23 acres)

NAD 83

VEGETATION PLOT #1
XSEC4
VEGETATION PLOT #3
XSEC5
XSEC3
AUTOMATIC WELL #8
VEGETATION PLOT #8
AUTOMATIC WELL #12
AUTOMATIC WELL #11
VEGETATION PLOT #9
VEGETATION PLOT #7
AUTOMATIC WELL #7
AUTOMATIC WELL #13
AUTOMATIC WELL #14
AUTOMATIC WELL #18
AUTOMATIC WELL #19
VEGETATION PLOT #5
VEGETATION PLOT #4
AUTOMATIC WELL #1
AUTOMATIC WELL #3
VEGETATION PLOT #6
AUTOMATIC WELL #17
AUTOMATIC WELL #6
AUTOMATIC WELL #2
VEGETATION PLOT #10
XSEC1
CREST GAGE #1
MANNUAL RG
AUTOMATIC RG
VEGETATION PLOT #11
VEGETATION PLOT #2
CREST GAGE #2
AUTOMATIC WELL #5
AUTOMATIC WELL #15
AUTOMATIC WELL #10
AUTOMATIC WELL #9
AUTOMATIC WELL #16
VEGETATION PLOT #12
XSEC2
V-DITCH
AUTOMATIC WELL #4
V-DITCH
XSEC6
VEGETATION PLOT #13

Jones Creek Monitoring Overview

Figure 3

100 50 0 100 200
SCALE (FT)

Automated Gauges
Automatic groundwater gauges record water table elevations twice daily at 08:00 and 20:00. Infinities gauges employ pressure sensors that record water elevation above the bottom of the sensor (with atmospheric pressure compensation). Immediately adjacent to each automatic gauge is a manual calibration gauge. The calibration water table depth is recorded at monthly downloads. To determine wetland hydroperiods, the automatically recorded data are compared to the calibration data to determine a standard correction factor between the calibration gauge and the automatic gauge for each location. The standard correction factor is applied to correct daily readings. The corrected daily readings are then used to determine wetland hydroperiods.

Data Interpretation
Wetland hydroperiods are calculated from twice-daily water table depth elevations. A hydroperiod is calculated if the water table is equal to or less than -12 inches below ground surface for at least 24 hours. If a gauge falls below -12 inches for two consecutive readings (24 hours), then the hydroperiod ends at the last reading within -12 inches. If a gauge falls below -12 inches for only one reading then maintains a reading above -12 inches for a minimum of 24 hours, the hydroperiod is calculated continuously. This methodology accounts for minor technical malfunctions experienced by the automatic gauges.

3.3 RESULTS OF HYDROLOGY MONITORING

3.3.1 Site Data

The following hydroperiod statistics were calculated for each monitoring station during the growing season: 1) most consecutive days that the water table was within twelve inches of the soil surface; 2) cumulative number of days that the water table was within twelve inches of the soil surface; and 3) number of times that the water table rose to within twelve inches of the soil surface. The results of these calculations are presented in **Table 4**. The location of the groundwater and the stream gauges are shown in **Figures 3**. **Figures 4a-4e** provides charts of the water table depth for each of the monitoring gauges. **Appendix C** contains all the 2010 gauge data.

Table 4. Hydrologic Monitoring Results

Gauge	Consecutive		Cumulative		Occurrences
	Days	Percent of Growing Season	Days	Percent of Growing Season	
Jon AW1	18	8	18	8	1
Jon AW2	20	9	29	13	2
Jon AW3	14	6	14	6	1
Jon AW4	20	9	24	11	2
Jon AW5	13	6	18	8	3
Jon AW6	3	1	3	1	1
Jon AW7	29	13	35	16	3
Jon AW8	25	11	49	22	6
Jon AW9	12	5	12	5	1
Jon AW10	21	9	32	14	4
Jon AW11	30	13	50	22	6
Jon AW12	15	7	22	10	4
Jon AW13	20	9	22	10	2
Jon AW14	14	6	19	8	4
Jon AW15	18	8	25	11	3
Jon AW16	11	5	12	5	2
Jon AW17	2	1	2	1	1
Jon AW18	14	6	15	7	2
Jon AW19	12	5	12	5	1
Jon RAW1	22	10	24	11	2
Jon RAW2	23	10	27	12	2
Jon RAW3	24	11	39	17	2

Figure 4a. Groundwater Hydrographs 1-4

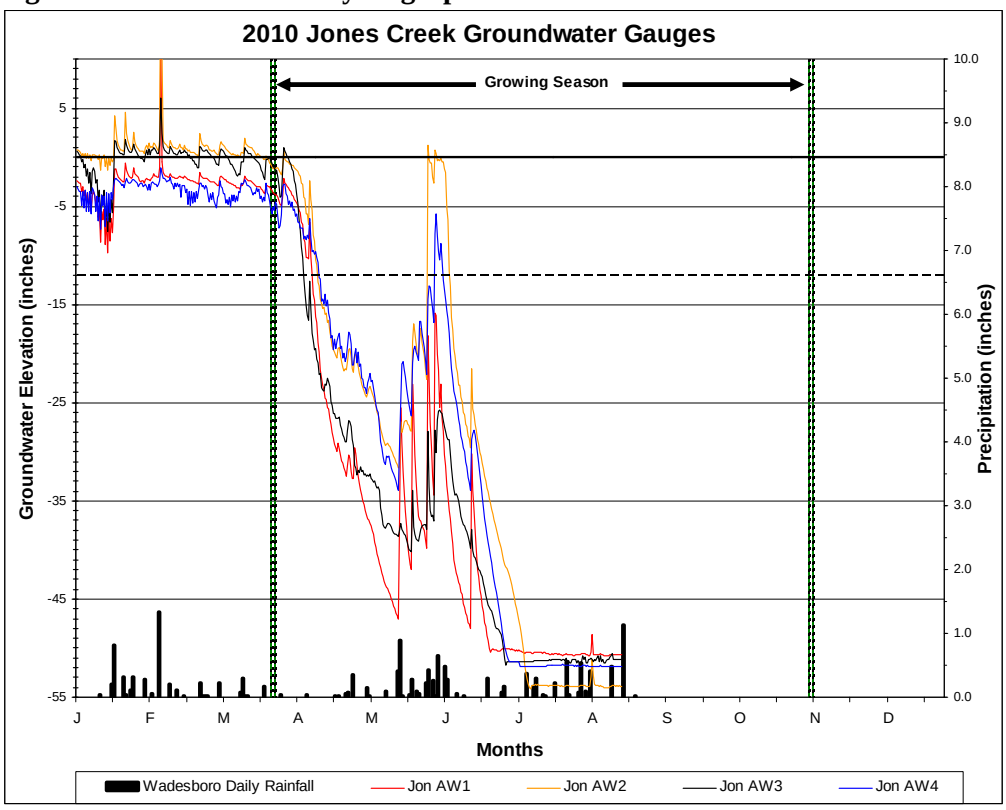


Figure 4b. Groundwater Hydrographs 5-8

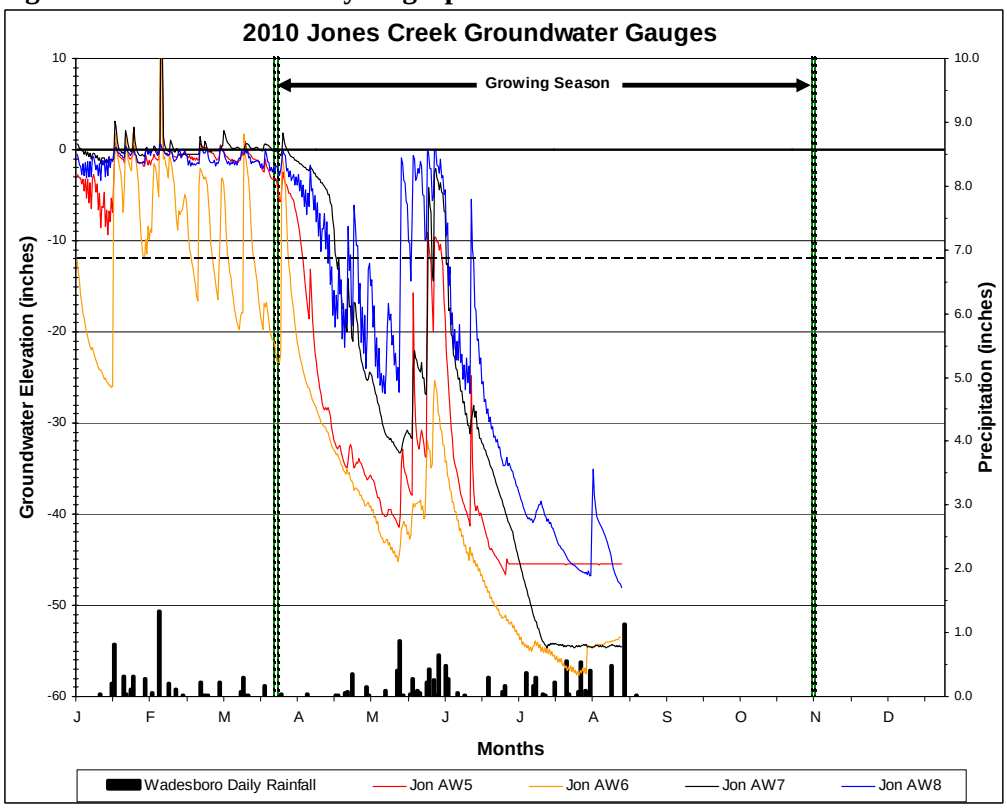


Figure 4c. Groundwater Hydrographs 9-12

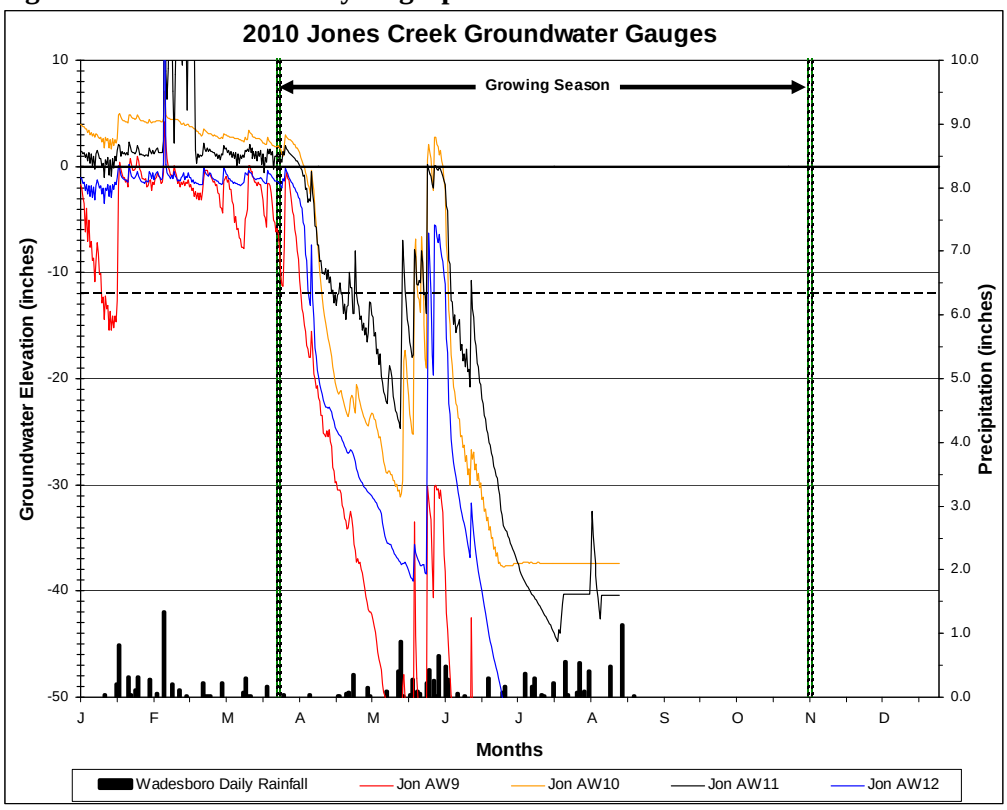


Figure 4d. Groundwater Hydrographs 13-14

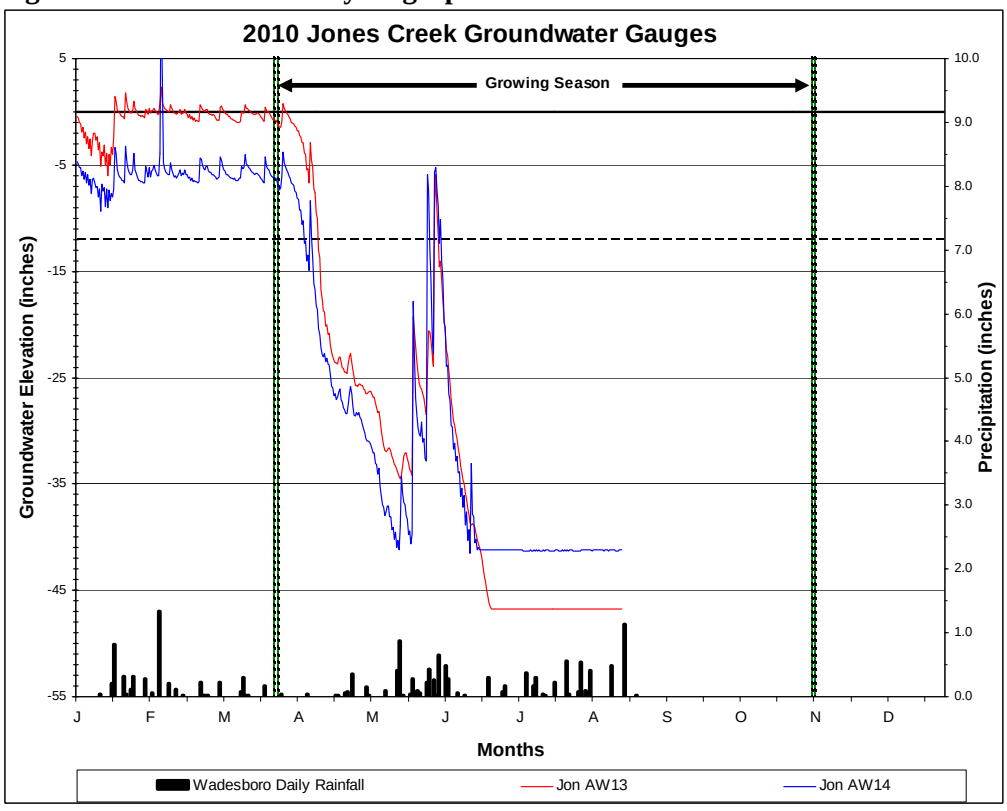
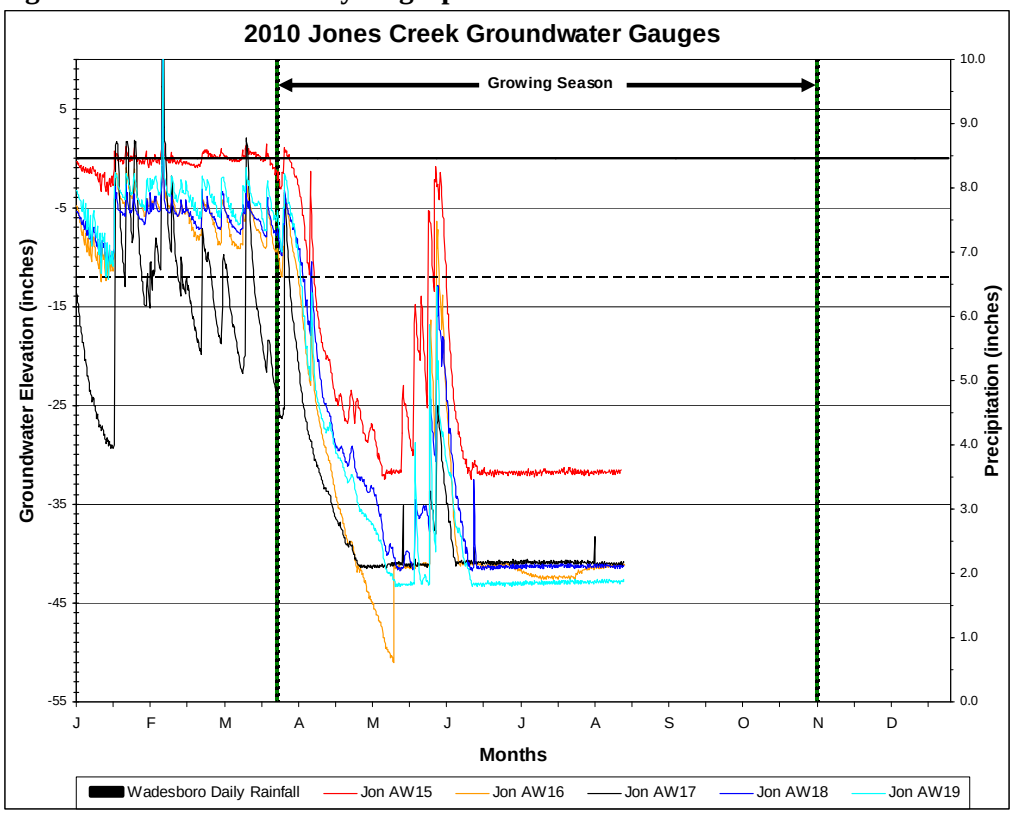


Figure 4e. Groundwater Hydrographs 15-19

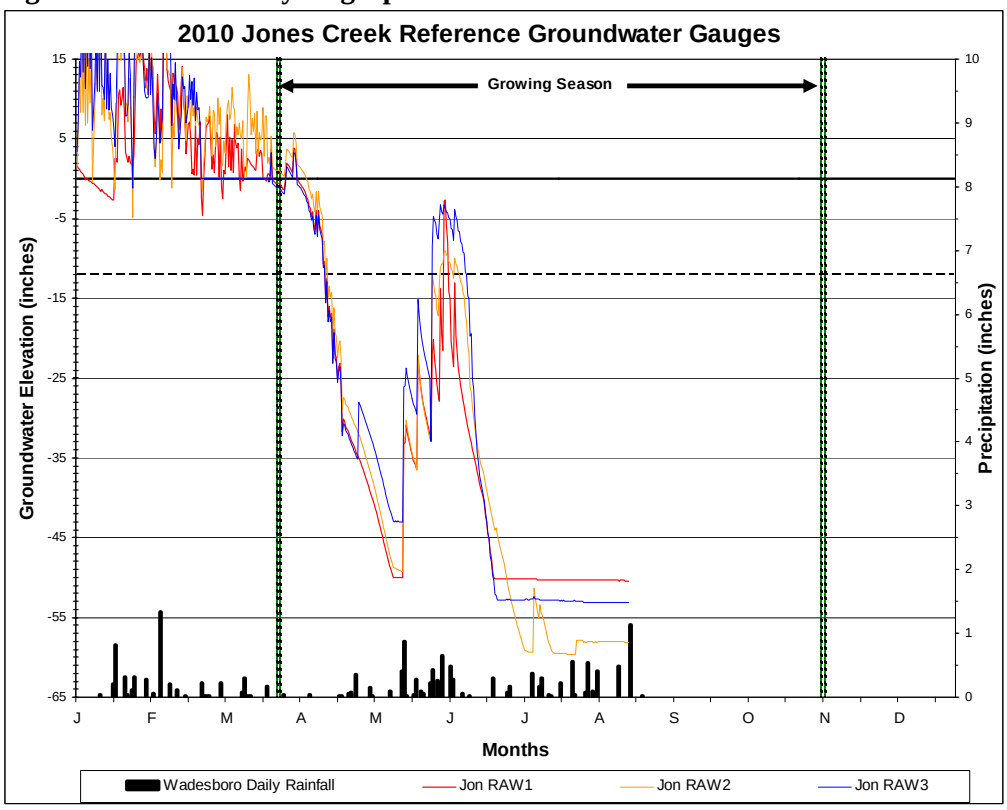


3.3.2 Reference Data

The Restoration Plan provides that if rainfall for any monitoring year is outside of normal limits reference wetland data can be used to determine if there is a positive correlation between performance on the restoration Site and the natural hydrology on the reference site.

Three reference gauges were installed in the Pee Dee National Wildlife Refuge in July 2006. The reference gauges are located in a wetland on the floodplain of Brown Creek. In late March thru the middle of April, Reference Gauges AW1, AW2, and AW3 experienced maximum wetland hydroperiods of 10, 10 and 11 percent of the growing season, respectively. All three reference gauges recorded a short wetland hydroperiod in late March thru early June as well. **Figure 5** and **Table 4** present the reference gauge data.

Figure 5. Reference Hydrographs



3.3.3 Climate Data

Figure 5 is a comparison of the 2010 monthly rainfall to historical precipitation for Anson County (NRCS WETS Tables). Observed precipitation data were collected from the Wadesboro automated weather station and an on-site manual rain gauge. Rainfall data collected from the on-site rain gauge showed amounts slightly higher than those taken from the Wadesboro weather station except forth month of August. Rainfall amounts from the Wadesboro weather station show rainfall amounts are below the historic average during every month of 2010 and show below normal rainfall throughout the year except for May and August, where rainfall reaches normal limits. The on-site rain gauge recorded normal rainfall during May and June.

Figure 6. 2010 Rainfall

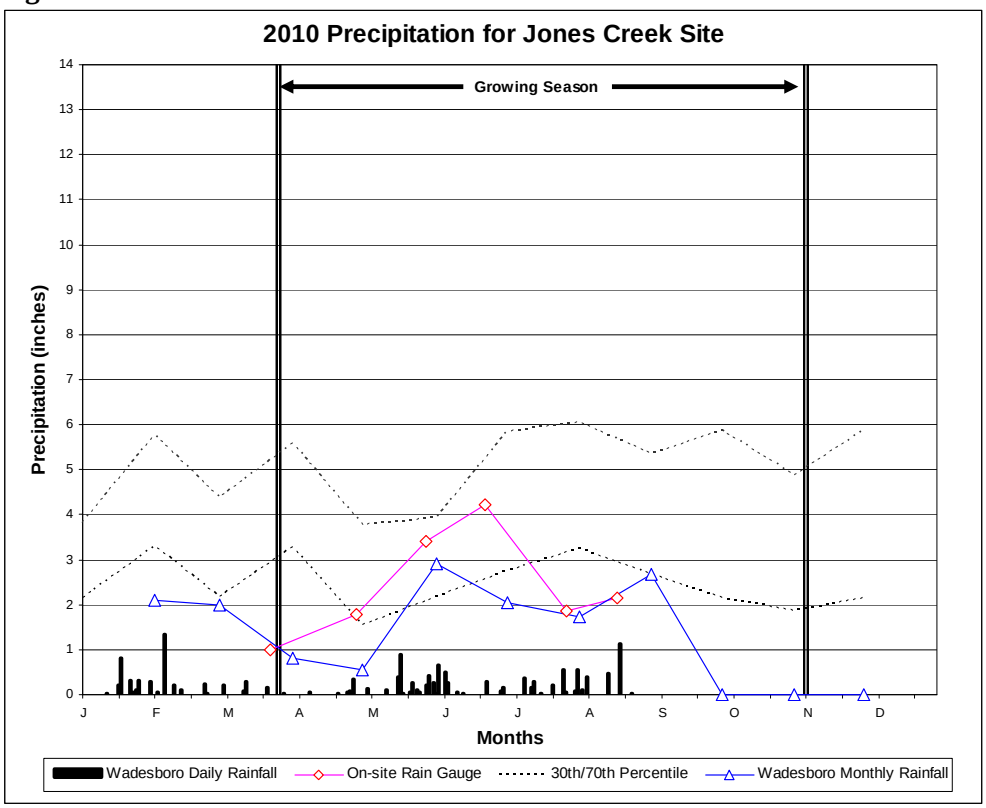


Table 5. Comparison of Normal Rainfall to Observed Rainfall

Month	Average	Normal Limits		Wadesboro Precipitation	On-Site Precipitation
		30 Percent	70 Percent		
January	4.66	3.31	5.78	2.09	---
February	3.56	2.18	4.37	1.99	---
March	4.61	3.28	5.58	0.81	1.00
April	2.94	1.54	3.78	0.54	1.78
May	3.44	2.18	3.93	2.91	3.40
June	4.56	2.74	5.84	2.04	4.23
July	5.26	3.26	6.06	1.74	1.85
August	4.41	2.67	5.36	2.67	2.15
September	4.25	2.15	5.87	3.35	6.40
October	3.66	1.85	4.87	---	---
November	3.10	2.14	3.86	---	---
December	3.28	2.16	3.83	---	---
Total	**47.73**	**29.46**	**59.13**	**18.14**	**20.81**

3.4 HYDROLOGIC CONCLUSIONS

Data collected from the groundwater gauges on the Jones Creek Mitigation Site indicate that 10 of 19 hydrology monitoring stations recorded a hydroperiod of at least 7 percent of the growing season. Monitoring gauges Jon AW3, Jon AW5, Jon AW14, and Jon AW18 recorded

hydroperiods of 6 percent. Three groundwater monitoring gauges (Jon AW9, Jon AW16, and Jon AW19) were within 12 inches of the surface for 5 percent of the growing season. Both Jon AW6 and Jon AW17 continued to show less hydrologic characteristics and only exhibited hydroperiods for 1 percent of the growing season. Below normal historic rainfall was recorded throughout the 2010 growing season, except the months of May and August. In years past when normal rainfall conditions occurred, most of Jones Creek hydrology monitoring gauges were well above the success criteria of 7 percent of the growing season. It is important to note that the hydrology of the targeted wetland system is highly responsive to rainfall and is expected to be variable across a given site, supporting the ecological and functional diversity that makes these systems so valuable. Overall, the site is within the range of hydrologic conditions expected in undisturbed floodplain wetlands. Based on the results of the five years of groundwater monitoring, most of the Site appears to be performing as designed, and the entire site is within the range of conditions expected in undisturbed floodplain wetlands.

During the 2009 Growing Season a hydrologic and hydric soil assessment was conducted on the Jones Creek Site. This assessment identified 2.23 acres of additional restored wetlands within the conservation easement. These areas had hydric soils and indicators of wetland hydrology. The assessment also delineated 1.39 acres of unsuccessful wetland restoration in the vicinity of AW6 and AW17. The unsuccessful restoration areas failed to meet hydrology success criteria or jurisdictional criteria. The revised wetland restoration areas are shown on **Figure 3**. The 2010 Hydrology Assessment is included in **Appendix E**.

4.0 VEGETATION

4.1 VEGETATION SUCCESS CRITERIA

The interim measure of vegetative success for the Jones Creek Site is the survival of at least 320 three-year old planted trees per acre at the end of year three of the monitoring period. The final vegetative success criteria will be the survival of 260 five-year old planted trees per acre at the end of Year 5 of the monitoring period.

Up to 20 percent of the site species composition may be comprised of invaders. Remedial action may be required should these (i.e. loblolly pine, red maple, sweetgum, etc.) present a problem and exceed 20 percent composition.

4.2 DESCRIPTION OF SPECIES AND VEGETATION MONITORING

The following monitoring protocol was designed to demonstrate vegetation density. Thirteen plots were established on the Jones Creek Site to monitor approximately one percent of the site. Four plots are located adjacent to newly constructed streambeds to monitor the vegetation in the stream restoration buffer. The other nine plots are randomly located each zone and randomly oriented within the wetland restoration area.

Plot construction consists of metal fence posts at each of the four corners to establish clearly and permanently the area that was to be sampled. Then ropes were hung connecting all four corners to help in determining if trees close to the plot boundary were inside or outside of the plot. Trees right on the boundary and trees just outside of the boundary that appear to have greater than 50 percent of their canopy inside the boundary were counted inside the plot. A piece of white PVC pipe ten feet tall was placed over the metal post on one corner to facilitate visual location of site throughout the five-year monitoring period.

All of the planted stems inside the plot were flagged with orange flagging and marked with a three foot tall piece of half inch PVC to mark them as the planted stems (vs. any colonizers) and to help in locating them in the future. Each stem was then tagged with a permanent numbered aluminum tag. **Table 6** describes the planted tree species.

Table 6. Planted Tree Species

ID	Common Name	Scientific Name	FAC Status
1	Swamp Chestnut Oak	*Quercus michauxii*	FACW-
2	Willow Oak	*Quercus phellos*	FACW-
3	River Birch	*Betula nigra*	FACW
4	Sycamore	*Platanus occidentalis*	FACW-
5	Sugar Berry	*Celtis laevigata*	FACW
6	Yellow Poplar	*Liriodendron tulipifera*	FAC
7	Swamp Tupelo	*Nyssa bifloria*	OBL
8	Overcup Oak	*Quercus lyrata*	OBL
9	Green Ash	*Fraxinus pennsylvanica*	FACW

4.3 RESULTS OF VEGETATION MONITORING

The following tables present stem counts for each of the monitoring plots. Each planted tree species is identified across the top row, and each plot is identified down the left column. The numbers on the top row correlate to the ID column of the previous table. Trees are flagged in the field on an as needed basis before the flags degrade. Flags are utilized, because they will not interfere with the growth of the tree. Volunteers are also flagged during this process. Annual variation in stem count data can be attributed to mortality and regeneration from the rootstock of stems previously assessed to be dead.

Table 7. 2010 Vegetation Monitoring Plot Species Composition

Plot	1	2	3	4	5	6	7	8	9	Total	Stems per Acre
JO 1	0	0	1	3	7	1	0	0	4	16	640
JO 2	1	0	2	2	5	1	0	0	3	14	560
JO 3	0	1	0	6	0	0	0	3	1	11	440
JO 4	2	2	3	2	0	0	0	4	0	13	520
JO 5	0	1	0	8	2	1	0	3	0	15	600
JO 6	4	0	2	5	0	0	0	1	1	13	520
JO 7	4	2	0	3	0	0	2	0	2	13	520
JO 8	1	1	3	0	0	0	3	0	3	11	440
JO 9	5	3	2	0	0	0	2	0	4	16	640
JO 10	1	2	2	3	0	0	1	1	4	14	560
JO 11	2	0	0	4	0	2	1	0	6	15	600
JO 12	1	5	0	2	0	2	0	0	3	13	520
JO 13	1	2	0	3	0	0	6	1	4	17	680

Average Stems per Acre: 557
Range of Stems per Acre: 440-680

Volunteer species are also monitored throughout the five-year monitoring period. Below is a table of the most common woody volunteer species.

Table 8. Volunteer species within the Wetland Restoration Area

ID	Scientific Name	Common Name	FAC Status
A	*Liquidambar styraciflua*	Sweetgum	FAC+
B	*Diospyros virginiana*	Persimmon	FAC
C	*Pinus taeda*	Loblolly Pine	FAC

Very few volunteer woody species were observed in the vegetation plots, but many were found adjacent to the plugged irrigation ditches, especially close to vegetation plots four and five.

4.4 VEGETATION OBSERVATIONS & CONCLUSIONS

After construction of the mitigation Site, a permanent ground cover seed mixture of Virginia wild rye (*Elymus virginicus*), switch grass (*Panicum virgatum*), and fox sedge (*Carex vulpinoidea*) was broadcast on the site at a rate of 10 pounds per acre. These species are present on the site. Hydrophytic herbaceous vegetation, including rush (*Juncus effusus*), spike-rush (*Eleocharis obtusa*), boxseed (*Ludwigia* spp.), false nettle (*Boehmeria cylindrica*), and sedge (*Carex* spp.), are observed across the site, particularly in areas of periodic inundation. There is a population of swamp thistle (*Cirsium muticus*) that is commonly found in boggy woodland and meadows the piedmont present throughout the site. The presence of these herbaceous wetland plants helps to confirm the presence of wetland hydrology on the Site.

There are quite a few weedy species occurring on the Site, though none are posing any problems for the woody or herbaceous hydrophytic vegetation. Commonly seen weedy vegetation includes asters, goldenrod (*Solidago* spp.), broomsedge (*Andropogon* spp.), ragweed (*Ambrosia artemisiifolia*), dogfennel (*Eupatorium capillifolium*), and wild dill (*Foeniculum vulgare*). The weedy vegetation does not threaten the planted vegetation.

The Site was planted in bottomland hardwood forest species in January 2006. There were thirteen vegetation-monitoring plots established throughout the planting areas. The data for Year 5 (2010) documents that the Site has a density of surviving planted stems of 440 to 680 stems per acre with an average density of 557 stems per acre. The Site had previously met the interim success criteria of 320 trees per acre by the end of year three, and has now met the final success criteria of 260 trees per acre by the end of Year 5.

5.0 STREAM MONITORING

5.1 STREAM SUCCESS CRITERIA

As stated in the approved Restoration Plan, the stream restoration success criteria for the site includes the following:

- *Bankfull Events*: Two bankfull flow events must be documented within the five-year monitoring period.
- *Cross sections*: There should be little change in as-built cross sections. Cross sections shall be classified using the Rosgen stream classification method and all monitored cross sections should fall within the quantitative parameters defined for "E" or "C" type channels.

- *Longitudinal Profiles*: The longitudinal profiles should show that the bedform features are remaining stable, e.g. they are not aggrading or degrading. Bedforms observed should be consistent with those observed in "E" and "C" type channels.
- *Photo Reference Stations*: Photographs will be used to subjectively evaluate channel aggradation or degradation, bank erosion, success of riparian vegetation and effectiveness of erosion control measures.

5.2 STREAM MORPHOLOGY MONITORING PLAN

To document the stated success criteria, the following monitoring program was instituted following construction completion on the Jones Creek Site:

5.2.1 Cross Sections

Two permanent cross sections were installed per 1,000 linear feet of stream restoration work, with one of the locations being a riffle cross section and one location being a pool cross section. A total of 6 permanent cross sections were established across the mitigation site. Each cross section was marked on both banks with permanent pins to establish the exact transect used. Permanent cross section pins were surveyed and located relative to a common benchmark to facilitate easy comparison of year-to-year data. The annual cross section surveys include points measured at all breaks in slope, including top of bank, bankfull, inner berm, edge of water, and thalweg. Riffle cross sections are classified using the Rosgen stream classification system. Permanent cross sections for 2010 (Year 5) were surveyed in August 2010.

5.2.2 Longitudinal Profile

A longitudinal profile of approximately 3,000 feet was surveyed along the restoration reaches in Year 1. The longitudinal survey will take place in Years 3, 4, and 5 as well. Measurements include thalweg, water surface, bankfull, and top of low bank. Each of these measurements is taken at the head of each feature, e.g. riffle, run, pool, and glide, and the max pool depth. A common benchmark will be used each year to facilitate comparison of year-to-year data. A longitudinal profile survey was conducted in August of 2010.

5.2.3 Hydrology

Two crest gauges were installed on the site to document bankfull events (**Figure 3**). The gauges are checked monthly, and record the highest out-of-bank flow event that occurred during the past month.

5.2.4 Photo Reference Stations

Photographs are used to visually document restoration success. Reference stations are marked with wooden stakes and Global Positioning Satellite (GPS) coordinates have been determined for each location. Reference photos are taken at each permanent cross section from both streambanks. The survey tape is centered in the photographs of the bank, and the water line is located in the lower edge of the frame with as much of the bank as possible included in each photo. In-stream structures (e.g., rock vanes, cross vanes, and constructed riffles) are also photographed. Photo reference stations will be photographed at least once per year for at least 5 years following construction.

5.3 STREAM MORPHOLOGY MONITORING RESULTS

5.3.1 Cross Sections

The cross sections were surveyed during the monitoring set-up and Monitoring Years 1 through Year 5. The baseline data has been compared with all five years of monitoring data in **Appendix B**. Compared to the documented data from the As-Built and Years 1-4, the Year 5 channel cross sections showed that overall stream dimensions remained stable during the fifth growing season. During Monitoring Year 5, very little erosion was noticed; however, noticeable sediment accumulation was present in the pools on Mill Branch. Several beaver dams were restricting the stream flow on Mill Branch and were contributing to the sediment accumulation. The beaver dams on Mill Branch were removed in late fall 2010.

Cross Section 3 on Mill Branch has aggraded approximately 2 feet from its as-built condition. Cross Section 6 showed signs of less aggradation during Year 5 and appears to be moving back to its stable state. All other cross sections are stable and have reached equilibrium. Both aggrading cross sections continue to provide pool habitat and are not vegetated. That dynamic activity is expected and will continue as deposition occurs between larger storms that then scour the pool features. The aggradation in Mill Branch is minor and is not a threat to the integrity of the stream restoration.

5.3.2 Longitudinal Profile

A longitudinal profile survey was conducted along two separate reaches of the restoration project, totaling approximately 3,000 linear feet. Survey was conducted for the entire length of both Mill Branch (STA 10+06.44 to STA 28+61.24), and UT1 (STA 10+00 to STA 22+12.76). The longitudinal profile information documents the elevations and locations of known streambed features and in-stream grade control structures according to the As-Built survey plans, as shown in **Appendix A**. The profile and cross sections show that there has been very little adjustment to stream profile or dimension since construction. **Table 9** summarizes stream areas requiring observation. **Figure 7** show the locations of the stream areas that require observation.

Table 9. Stream Areas Requiring Observation

S0A	Station	Description/Recommendation
1	Mill Branch 17+25	Beaver Dam / Removal of the dam is recommended.
2	Mill Branch 18+20	Beaver Dam / Removal of the dam is recommended.
3	Mill Branch 19+50	Beaver Dam / Removal of the dam is recommended.
4	Mill Branch 23+50	Beaver Dam / Removal of the dam is recommended.
5	Mill Branch 27+00	Beaver Dam / Removal of the dam is recommended.

5.3.3 Hydrology

During the 2010 monitoring season, two crest gauges were monitored to determine if there were any out-of-bank flow events in the Mill Branch and UT1 stream channels. One bankfull event was recorded during the month of February on both Crest Gauges 1 and 2. **Table 10** shows the results for the Monitoring Year 5 Crest Gauge data. The hydrology success criteria have already been satisfied by bankfull events in previous monitoring years.

Table 10. Crest Gauge Data

Month Recorded	Crest Gauge 1	Crest Gauge 2
January	---	---
February	1.8	1.6
March	0.0	0.0
April	0.0	0.0
May	0.0	0.0
June	0.0	0.0
July	0.0	0.0
August	0.0	0.0
September	0.0	0.0
October		
November		
December		

Table 11. Summary of Morphologic Monitoring Parameters

Parameter	As-Built UT1	As-Built Mill Branch	Year 5 UT1	Year 5 Mill Branch
Bankfull Xsec Area, Abkf (sq ft)	20.3	19.1	19.8	17.8
Avg. Bankfull Width, Wbkf (ft)	17.7	16.1	18.1	18.5
Bankfull W/D Ratio	15.4	13.5	16.5	19.6
Bankfull Mean Depth, Dbkf (ft)	1.1	1.2	1.1	0.9
Bankfull Max Depth, Dmax (ft)	2.0	2.1	1.9	1.9

5.4 STREAM CONCLUSIONS

In-stream structures installed within the restored stream included constructed riffles, log vanes, log weirs, rock step pools, J-hooks, rock cross vane, and root wads. Visual observations of structures throughout the 2010 growing season indicated that most structures are functioning as designed. Five beaver dams were located throughout the Mill Branch reach restricting stream flow. These beaver dams have been removed; however, they were not affecting the streams stability or the success criteria of Mill Branch.

INSERT

INSERT MATCHLINE

VEGETATION PLOT #1
VEGETATION PLOT #3
SOA 1
SOA 2
SOA 3
SOA 4
SOA 5
VEGETATION PLOT #2
CREST GAGE #2
VEGETATION PLOT #5
VEGETATION PLOT #4
AUTOMATIC WELL #1
AUTOMATIC WELL #3
VEGETATION PLOT #6
AUTOMATIC WELL #6
VEGETATION PLOT #8
VEGETATION PLOT #7
AUTOMATIC WELL #7
VEGETATION PLOT #9
AUTOMATIC WELL #2
VEGETATION PLOT #10
CREST GAGE #1
VEGETATION PLOT #11
AUTOMATIC WELL #5
VEGETATION PLOT #12
V-DITCH
AUTOMATIC WELL #4
Y-DITCH
VEGETATION PLOT #13
NAD 83
CE
JONES CREEK

Jones Creek
Stream Observation Areas

Figure 7

100 50 0 100 200
SCALE (FT)

6.0 CONCLUSIONS AND RECOMMENDATIONS

- Fifth year hydrologic monitoring documented that despite below normal rainfall conditions; all but two of the 19 hydrology monitoring gauges recorded greater than five percent hydroperiods. The two remaining gauges recorded hydroperiods of 1 percent of the growing season. Based on the results of the past five years of monitoring, the Site appears to be performing as designed and within the range of conditions expected in the floodplain wetlands.

- During the 2009 Growing Season a hydrologic and hydric soil assessment was conducted on the Jones Creek Site. This assessment identified 2.23 acres of additional restored wetlands within the conservation easement. These areas had hydric soils and indicators of wetland hydrology. The assessment also delineated 1.39 acres of unsuccessful wetland restoration in the vicinity of AW6 and AW17. The unsuccessful restoration areas failed to meet hydrology success criteria or jurisdictional criteria. The revised wetland restoration areas are shown on **Figure 3**.

- Rainfall amounts recorded at the Wadesboro weather station show rainfall amounts are below the historic average January through August of 2010 and show below normal rainfall throughout the year except for May and August, where rainfall reaches normal limits. The on-site rain gauge recorded normal rainfall only during May and June.

- Stream morphology data collected during monitoring Year 5 and observations of conditions at the Site indicate that the project continues to be successful. The stream morphology is relatively stable. All in-stream structures appear stable. Numerous beaver dams are present and causing minor aggradation. It was recommended that beavers and the beaver dams be removed. Following recommendation, beavers and the beaver dams were removed in late fall 2010. It was concluded that the Site has achieved the stream success criteria specified in the Restoration Plan.

- Vegetation monitoring efforts have documented the average number of stems per acre on Site to be 557, which is a survival rate of greater than 80 percent based on the initial planting count of 689 stems per acre. The range of density of surviving planted stems is 440 to 680 stems per acre. Vegetation survivability has remained excellent on site. The Site met the interim success criteria of 320 trees per acre by the end of year three, and has met the final success criteria of 260 trees per acre by the end of Year 5.

- The hydrology, vegetation, and stream data for all five years at the Jones Creek Mitigation Site are summarized in **Tables 12 – 15**. Based on this data and comments provided above in Sections 3, 4 and 5, it can be concluded that the Site has achieved the hydrology, vegetation, and stream success criteria specified in the Restoration Plan.

Table 12. Summary of Hydrology Monitoring Data 2006-2010

	Max Consecutive Hydroperiod (Percent of Growing Season)				
Gauge	**2006**	**2007**	**2008**	**2009**	**2010**
Jon AW1	4	6	14	16	8
Jon AW2	8	7	14	16	9
Jon AW3	4	4	7	16	6
Jon AW4	4	7	25	21	9
Jon AW5	8	6	24	15	6
Jon AW6	1	1	3	2	1
Jon AW7	8	15	25	37	13
Jon AW8	18	16	25	19	11
Jon AW9 (MW 1)	5	1	6	12	5
Jon AW10 (MW4)	5	4	7	15	9
Jon AW11 (MW2)	13	17	21	19	13
Jon AW12 (MW5)	6	14	14	16	7
Jon AW13 (MW3)	4	5	14	17	9
Jon AW14 (MW6)	5	7	10	14	6
Jon AW15	---	---	---	14	8
Jon AW16	---	---	---	12	5
Jon AW17	---	---	---	1	1
Jon AW18	---	---	---	14	6
Jon AW19	---	---	---	15	5
Jon RAW1	0	8	18	15	10
Jon RAW2	---	---	22	23	10
Jon RAW3	9	---	22	27	11

Table 13. Summary of Vegetation Monitoring Data 2006-2010

	Stems Per Acre				
Plot	**2006**	**2007**	**2008**	**2009**	**2010**
JO 1	720	720	640	640	640
JO 2	640	600	480	520	560
JO 3	520	520	520	440	440
JO 4	600	520	480	520	520
JO 5	680	640	680	640	600
JO 6	520	520	520	520	520
JO 7	640	640	640	520	520
JO 8	640	440	480	440	440
JO 9	640	680	680	640	640
JO 10	560	560	560	560	560
JO 11	640	640	640	640	600
JO 12	640	600	520	520	520
JO 13	680	680	680	680	680
Average	**625**	**597**	**578**	**560**	**557**

Table 14. Summary of Stream Crest Gauge Data 2006-2010

Year	(UT1) Crest Gauge 1		(Mill Branch) Crest Gauge 2	
	Number of Bankfull Events	Maximum Height Above Bankfull (feet)	Number of Bankfull Events	Maximum Height Above Bankfull (feet)
2006	5	3.05	4	2.25
2007	4	2.6	2	0.3
2008	2	0.6	1	1.5
2009	0	0	0	0
2010	1	1.8	1	1.6

Table 15a. Summary of Morphological Parameters 2006-2010 for UT1

Parameter	As-Built UT1	2006 Year 1	2007 Year 2	2008 Year 3	2009 Year 4	2010 Year 5
Bankfull Xsec Area, Abkf (sq ft)	20.3	20.9	20.3	18.3	24.4	19.8
Avg. Bankfull Width, Wbkf (ft)	17.7	16.3	16.7	15.7	17.2	18.1
Bankfull W/D Ratio	15.4	12.6	13.7	13.4	12.2	16.5
Bankfull Mean Depth, Dbkf (ft)	1.1	1.3	1.2	1.2	1.4	1.1
Bankfull Max Depth, Dmax (ft)	2.0	2.1	2.0	2.0	2.1	1.9

Table 15b. Summary of Morphological Parameters 2006-2010 for Mill Branch

Parameter	As-Built Mill Branch	2006 Year 1	2007 Year 2	2008 Year 3	2009 Year 4	2010 Year 5
Bankfull Xsec Area, Abkf (sq ft)	19.1	28.3	20.1	18.2	20.2	17.8
Avg. Bankfull Width, Wbkf (ft)	16.1	21.0	18.4	16.3	20.1	18.5
Bankfull W/D Ratio	13.5	15.9	16.9	14.7	20.3	19.6
Bankfull Mean Depth, Dbkf (ft)	1.2	1.4	1.1	1.1	1.0	0.9
Bankfull Max Depth, Dmax (ft)	2.1	3.1	2.3	2.1	2.3	1.9

APPENDIX A

As-Built Survey

PROJECT: 0215R

JONES CREEK

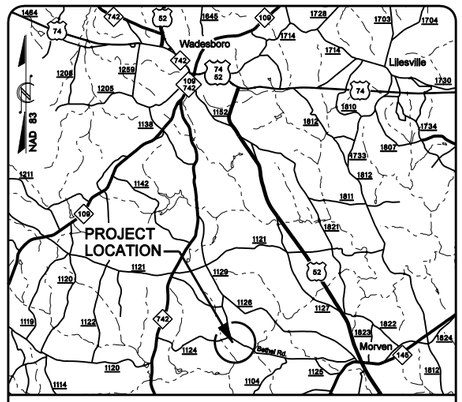
STREAM AND WETLAND RESTORATION PROJECT
EBX NEUSE - I, LLC
JONES CREEK AS-BUILT PLAN

ANSON COUNTY

LOCATION: 2 MILES WEST OF MORVEN OFF BETHEL RD.
(SR 1129; ROBINSON BRIDGE RD.)

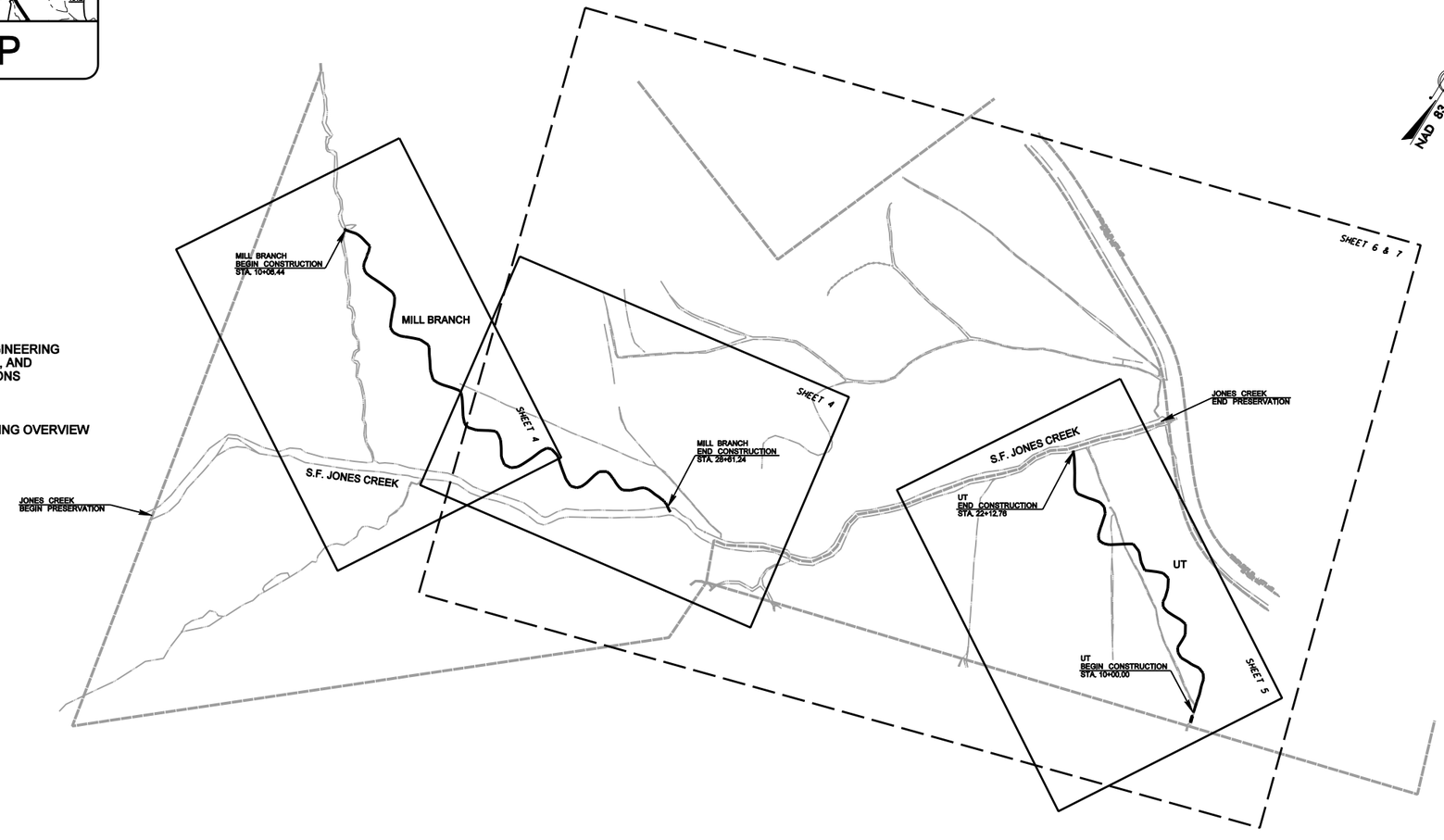
STATE	BUCK PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
NC	0215R	1	11

NO.	DATE	CHECKED BY	APPROVED BY
1	2/28/06	J. HUTTON	K. TWEEDY



VICINITY MAP

INDEX OF SHEETS



GRAPHIC SCALE

40 20 0 40 80
PLANS

PROJECT SUMMARY

EXISTING STREAM LENGTH	=	1825 FEET
RESTORED MILL BRANCH LENGTH	=	1855 FEET
RESTORED UT LENGTH	=	1213 FEET
RESTORED STREAM LENGTH	=	3068 FEET
PRESERVATION STREAM LENGTH	=	5150 FEET
RESTORED WETLAND AREA	=	25.0 ACRES
ENHANCED WETLAND AREA	=	2.7 ACRES

PREPARED FOR THE OFFICE OF:
EBX NEUSE – I, LLC

2530 MERIDIAN PARKWAY, SUITE 200
DURHAM, NORTH CAROLINA 27713

EBX CONTACT:
THOMAS L. RINKER
PROJECT MANAGER

PREPARED IN THE OFFICE OF:
BUCK ENGINEERING
8000 Regency Parkway, Suite 200
Cary, North Carolina 27511
Phone: 919-463-5488
Fax: 919-463-5490

DECEMBER 2005
COMPLETION DATE:

KEVIN TWEEDY, PE
PROJECT ENGINEER /MANAGER

PROJECT ENGINEER

THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY:

KEVIN L. TWEEDY
027337
APRIL 4, 2006

THIS MEDIA SHALL NOT BE CONSIDERED A CERTIFIED DOCUMENT

SIGNATURE: *P.E.*

2/26/03

STREAM CONVENTIONAL SYMBOLS

SUPERCEDES SHEET 1B

- LOG VANE
- LOG WEIR
- ROOT WAD
- LOG CROSS VANE
- J-HOOK
- ROCK VANE
- TEMPORARY SILT CHECK
- FOOT BRIDGE
- TEMPORARY STREAM CROSSING
- PERMANENT STREAM CROSSING
- ROCK CROSS VANE
- WING DEFLECTOR
- DOUBLE WING DEFLECTOR
- DOUBLE DROP CROSS VANE
- BOULDER CLUSTER
- SILT FENCE
- SAFETY FENCE
- CONSERVATION EASEMENT
- TRANSPLANTED VEGETATION
- ROCK STEP POOL
- TREE REMOVAL
- TREE PROTECTION
- PLAY GROUND EQUIPMENT
- CONSTRUCTED RIFFLE
- TRANSPLANTS
- FILL EXISTING CHANNEL
- CONTROL POINT

STANDARD SPECIFICATIONS

EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL
DECEMBER 1993

6.60 TEMPORARY SEDIMENT TRAP

6.06 CONSTRUCTION ACCESS

6.62 SILT FENCE

6.70 TEMPORARY (FORD) STREAM CROSSING

PROJECT REFERENCE NO.	SHEET NO.
0215R	1-A

PROJECT ENGINEER

THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY:

KEVIN L. TWEEDY
027337
APRIL 4, 2006

THIS MEDIA SHALL NOT BE CONSIDERED A CERTIFIED DOCUMENT

BUCK ENGINEERING
8000 Regency Parkway Suite 200
Cary, North Carolina 27511
Phone: 919-463-5488
Fax: 919-463-5490

GENERAL NOTES

1. The Contractor is required to install instream structures using a track hoe with a hydraulic thumb of sufficient size to move boulders 3ft X 3ft X 2ft (approximately 2 tons).

2. The Contractor will be required to provide, at a minimum, two operators at all times during construction of the new stream channel. In general, one operator will cut the new channel with a track hoe, while the other operator follows and installs instream structures, bank stabilization practices, and transplants. During construction of the new stream channel, the contractor will be required to have two track hoes and one loader on-site.

VEGETATION SELECTION

BARE ROOT VEGETATION

ZONE 1 (Wetland Restoration and Enhancement Areas)

COMMON NAME	*SCIENTIFIC NAME*	PERCENT PLANTED BY SPECIES
SWAMP CHESTNUT OAK	*Quercus michauxii*	14 %
BLACK WILLOW	*Salix nigra*	5 %
GREEN ASH	*Fraxinus pennsylvanica*	13 %
RIVER BIRCH	*Betula nigra*	14 %
BLACK GUM	*Nyssa sylvatica*	14 %
WILLOW OAK	*Quercus phellos*	20 %
SYCAMORE	*Platanus occidentalis*	20 %

ZONE 2 and 3 (Stream Restoration Buffer)

SYCAMORE	*Platanus occidentalis*	21 %
RIVER BIRCH	*Betula nigra*	21 %
HACKBERRY	*Celtis laevigata*	13 %
SWAMP CHESTNUT OAK	*Quercus michauxii*	13 %
GREEN ASH	*Fraxinus pennsylvanica*	21 %
TULIP POPLAR	*Liriodendron tulipifera*	11 %

LIVE STAKE VEGETATION

NOTE: Live stakes were installed randomly 2 to 3 feet apart along the streambanks from the toe of the bank to the top of the bank.

COMMON NAME	*SCIENTIFIC NAME*	NUMBER PLANTED
SILKY DOGWOOD	*Cornus Amomum*	900
BLACK WILLOW	*Salix nigra*	900
ELDERBERRY	*Sambucus canadensis*	900

PERMANENT SEED MIXTURE

ZONE 1, 2, and 3

COMMON NAME	*SCIENTIFIC NAME*	PERCENT OF MIXTURE	SEEDING DENSITY (lbs/acre)	WETNESS TOLERANCE
REDTOP	*Agrostis alba*	10 %	1.5	FACW
VIRGINIA WILDRYE	*Elymus virginicus*	15 %	2.25	FAC
SWITCHGRASS	*Panicum virgatum*	15 %	2.25	FAC+
EASTERN GAMMA GRASS	*Tripsicum dactyloides*	5 %	0.75	FAC+
PENNSYLVANIA SMARTWEED	*Polygonum pennsylvanicum*	5 %	0.75	FACW
LITTLE BLUE STEM	*Schizachyrium scoparium*	5 %	0.75	FACU
SOFT RUSH	*Juncus effusus*	5 %	0.75	FACW+
BEGGARS TICK	*Bidens frondosa (or aristosa)*	10 %	1.5	FACW
LANCE-LEAVED TICK SEED	*Coreopsis lanceolata*	10 %	1.5	FACU
TIOGA DEER TONGUE	*Panicum clandestinum*	10 %	1.5	FAC
BIG BLUE STEM	*Andropogon gerardii*	5 %	0.75	FAC
INDIAN GRASS	*Sorgastrum nutans*	5 %	0.75	FACU

TEMPORARY SEED MIXTURE

NOTE: Temporary seeding were applied to all disturbed areas of the site that were susceptible to erosion. These areas included constructed streambanks, access roads, side-slopes, spoil piles, etc. Rye grain was used and applied at a rate of 130 lbs/acre.

4/10/2006
I:\0215\Design\As_Built\0215_EBX_PSH_AB_1A.dgn

PROJECT REFERENCE NO.	SHEET NO.
0215R	I-B

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL SYMBOLS

*S.U.E = SUBSURFACE UTILITY ENGINEER

ROADS & RELATED ITEMS

- Edge of Pavement
- Curb
- Prop. Slope Stakes Cut (C)
- Prop. Slope Stakes Fill (F)
- Prop. Woven Wire Fence
- Prop. Chain Link Fence
- Prop. Barbed Wire Fence
- Prop. Wheelchair Ramp (WCR)
- Curb Cut for Future Wheelchair Ramp (CCFR)
- Exist. Guardrail
- Prop. Guardrail
- Equality Symbol
- Pavement Removal

RIGHT OF WAY

- Baseline Control Point
- Existing Right of Way Marker
- Exist. Right of Way Line w/Marker
- Prop. Right of Way Line with Proposed R/W Marker (Iron Pin & Cap)
- Prop. Right of Way Line with Proposed (Concrete or Granite) R/W Marker
- Exist. Control of Access Line (CA)
- Prop. Control of Access Line (CA)
- Exist. Easement Line (E)
- Prop. Temp. Construction Easement Line (E)
- Prop. Temp. Drainage Easement Line (TDE)
- Prop. Perm. Drainage Easement Line (PDE)

HYDROLOGY

- Stream or Body of Water
- River Basin Buffer (RBB)
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Shoreline
- Falls, Rapids
- Prop Lateral, Tail, Head Ditches (FLOW)

STRUCTURES

MAJOR

- Bridge, Tunnel, or Box Culvert (CONC)
- Bridge Wing Wall, Head Wall and End Wall (CONC WW)

MINOR

- Head & End Wall (CONC HW)
- Pipe Culvert
- Footbridge
- Drainage Boxes (CB)
- Paved Ditch Gutter

UTILITIES

- Exist. Pole
- Exist. Power Pole
- Prop. Power Pole
- Exist. Telephone Pole
- Prop. Telephone Pole
- Exist. Joint Use Pole
- Prop. Joint Use Pole
- Telephone Pedestal (T)
- U/G Telephone Cable Hand Hold (HH)
- Cable TV Pedestal (C)
- U/G TV Cable Hand Hold (HH)
- U/G Power Cable Hand Hold (HH)
- Hydrant
- Satellite Dish
- Exist. Water Valve
- Sewer Clean Out
- Power Manhole (P)
- Telephone Booth
- Cellular Telephone Tower
- Water Manhole (W)
- Light Pole
- H-Frame Pole
- Power Line Tower
- Pole with Base
- Gas Valve
- Gas Meter
- Telephone Manhole (T)
- Power Transformer
- Sanitary Sewer Manhole (S)
- Storm Sewer Manhole (S)
- Tank; Water, Gas, Oil
- Water Tank With Legs
- Traffic Signal Junction Box (S)
- Fiber Optic Splice Box (F)
- Television or Radio Tower
- Utility Power Line Connects to Traffic Signal Lines Cut Into the Pavement (TS)

- Recorded Water Line
- Designated Water Line (S.U.E.*)
- Sanitary Sewer (SS)
- Recorded Sanitary Sewer Force Main (FSS)
- Designated Sanitary Sewer Force Main(S.U.E.*) (FSS)
- Recorded Gas Line (G)
- Designated Gas Line (S.U.E.*) (G)
- Storm Sewer (S)
- Recorded Power Line (P)
- Designated Power Line (S.U.E.*) (P)
- Recorded Telephone Cable (T)
- Designated Telephone Cable (S.U.E.*) (T)
- Recorded U/G Telephone Conduit (TC)
- Designated U/G Telephone Conduit (S.U.E.*) (TC)
- Unknown Utility (S.U.E.*) (?UTL)
- Recorded Television Cable (TV)
- Designated Television Cable (S.U.E.*) (TV)
- Recorded Fiber Optics Cable (FO)
- Designated Fiber Optics Cable (S.U.E.*) (FO)
- Exist. Water Meter
- U/G Test Hole (S.U.E.*) (ATTUR)
- Abandoned According to U/G Record
- End of Information (E.O.I.)

BOUNDARIES & PROPERTIES

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Property Line Symbol (PL, EIP)
- Exist. Iron Pin
- Property Corner (ECM)
- Property Monument
- Property Number (123)
- Parcel Number (6)
- Fence Line (WW & ISBW)
- Existing Wetland Boundaries (WLB)
- High Quality Wetland Boundary (HQ WLB)
- Medium Quality Wetland Boundaries (MQ WLB)
- Low Quality Wetland Boundaries (LQ WLB)
- Proposed Wetland Boundaries (WLB)
- Existing Endangered Animal Boundaries (EAB)
- Existing Endangered Plant Boundaries (EPB)

BUILDINGS & OTHER CULTURE

- Buildings
- Foundations
- Area Outline
- Gate
- Gas Pump Vent or U/G Tank Cap
- Church
- School
- Park
- Cemetery
- Dam
- Sign (S)
- Well (W)
- Small Mine
- Swimming Pool

TOPOGRAPHY

- Loose Surface
- Hard Surface
- Change in Road Surface
- Curb
- Right of Way Symbol (R/W)
- Guard Post (GP)
- Paved Walk
- Bridge
- Box Culvert or Tunnel
- Ferry
- Culvert
- Footbridge
- Trail, Footpath
- Light House

VEGETATION

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard (VINEYARD)

RAILROADS

- Standard Gauge (CSX TRANSPORTATION)
- RR Signal Milepost (MILEPOST 35)
- Switch (SWITCH)

revised 02/02/00

2/26/03

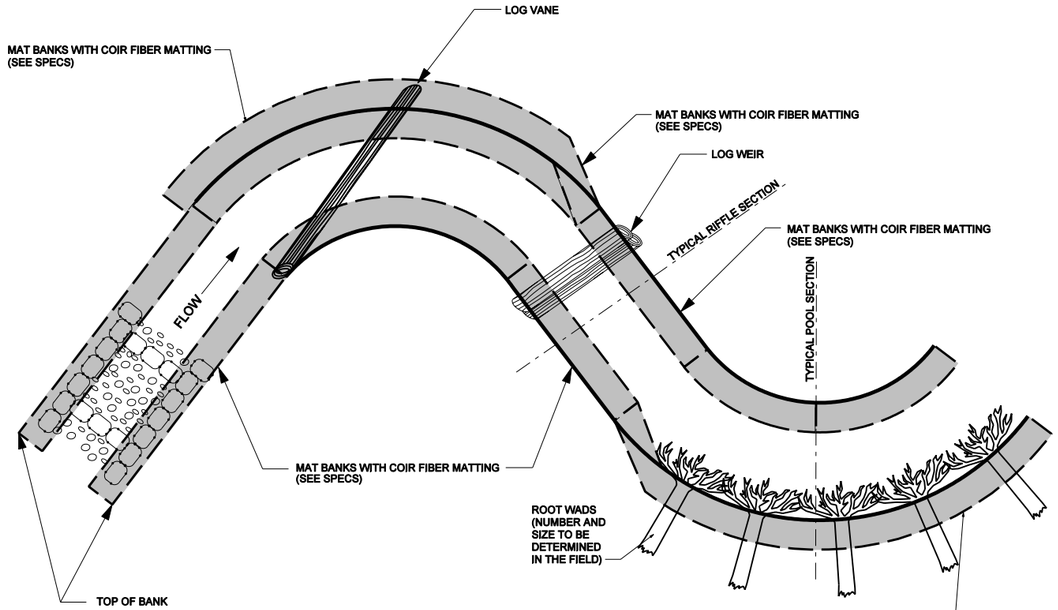
TYPICAL STRUCTURE PLACEMENT

STRUCTURE NOTES:

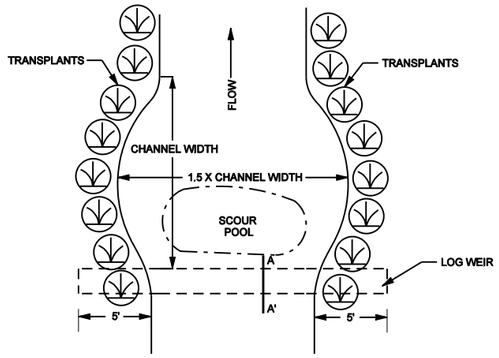
1. GENERALLY LOG WEIRS, ROOT WADS, LOG VANES AND COIR FIBER MATTING WILL BE INSTALLED IN THE LOCATION AND SEQUENCE AS SHOWN.
2. ADDITIONAL STRUCTURES OR CHANGES TO STRUCTURE LOCATIONS MAY BE MADE BY THE DESIGN ENGINEER DURING CONSTRUCTION.

NOTES:

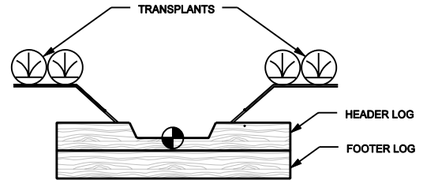
1. COIR FIBER MATTING TO BE INSTALLED ON ALL RESTORED STREAMBANKS.
2. IF ROOT WADS DO NOT COVER ENTIRE SLOPE ON OUTSIDE OF MEANDER BENDS, COIR FIBER MATTING IS NEEDED.



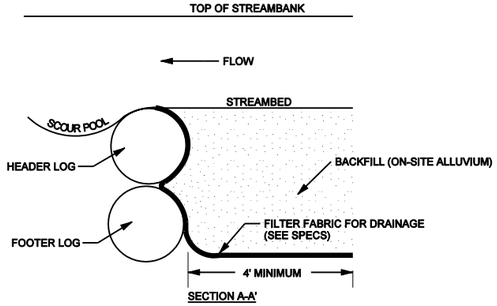
LOG WEIR



PLAN VIEW



CROSS SECTION VIEW



SECTION A-A'

NOTES:

1. LOGS SHOULD BE AT LEAST 12 INCHES IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, AND RECENTLY HARVESTED.
2. LOGS >24 INCHES IN DIAMETER MAY BE USED ALONE WITHOUT AN ADDITIONAL LOG. FILTER FABRIC SHOULD STILL BE USED TO SEAL AROUND LOG
3. PLACE FOOTER LOGS FIRST AND THEN HEADER (TOP) LOG. SET HEADER LOG APPROXIMATLEY 3 INCHES ABOVE THE INVERT ELEVATION.
4. CUT A NOTCH IN THE HEADER LOG APPROXIMATLEY 50 PERCENT OF THE CHANNEL BOTTOM WIDTH AND EXTENDING DOWN TO THE INVERT ELEVATION.
5. USE FILTER FABRIC FOR DRAINAGE TO SEAL GAPS BETWEEN LOGS.
6. PLACE TRANSPLANTS FROM TOE OF STREAMBANK TO TOP OF STREAMBANK.

PROJECT REFERENCE NO.	SHEET NO.
0215R	2

PROJECT ENGINEER

THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY:

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027337
APRIL 4, 2006

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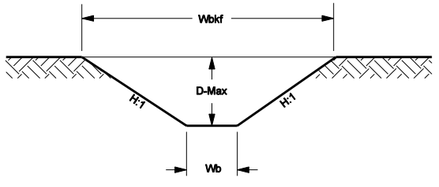
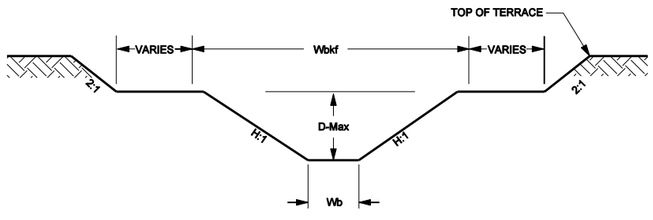
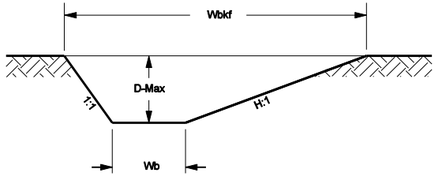
TYPICAL RIFFLE, POOL, AND BANKFULL BENCH CROSS SECTIONS



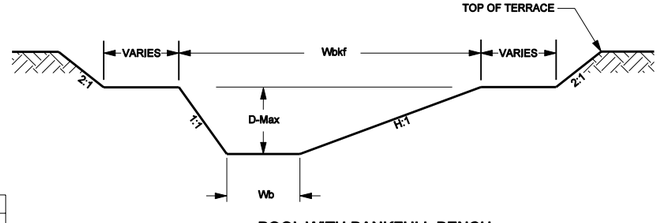
RIFFLE A-A



RIFFLE WITH BANKFULL BENCH



POOL B-B



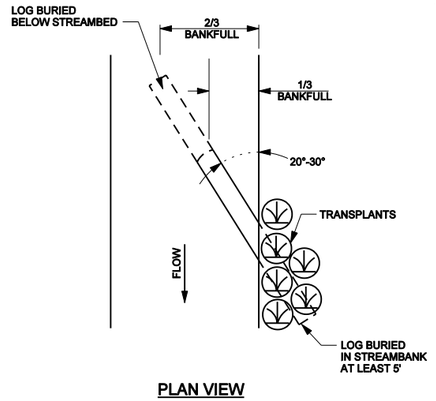
POOL WITH BANKFULL BENCH

Mill Branch		UT		
RIFFLE	POOL	RIFFLE	POOL	
18.3	25.0	16.2	22.0	WIDTH OF BANKFULL (Wbkf)
1.5	2.1	1.4	1.8	AVERAGE DEPTH (D)
2.1	3.6	1.9	3.1	MAXIMUM DEPTH (D-Max)
12.0	11.9	12.0	12.3	WIDTH TO DEPTH RATIO (Wbkf / D)
28.0	52.4	22.0	39.4	BANKFULL AREA (Abkf)
8.9	4.1	6.6	3.4	BOTTOM WIDTH (Wb)
2.3	4.8	2.5	5.0	H (HORIZONTAL)

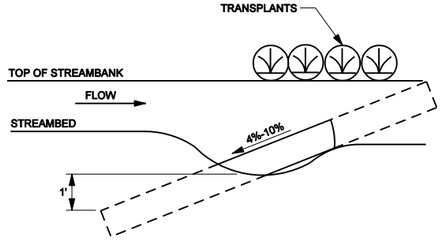
NOTES:

1. DURING CONSTRUCTION CORNERS OF DESIGN CHANNEL WILL BE ROUNDED AND A THALWEG WILL BE SHAPED PER DIRECTION OF ENGINEER.
2. POOLS SHOWN ABOVE ARE LEFT POOLS ONLY.

LOG VANE



PLAN VIEW



PROFILE VIEW

NOTES:

1. LOGS SHOULD BE AT LEAST 10" IN DIAMETER, RELATIVELY STRAIGHT, HARDWOOD, AND RECENTLY HARVESTED.
2. SOIL SHOULD BE COMPACTED WELL AROUND BURIED PORTIONS OF LOG.
3. TRANSPLANTS ARE PLACED ALONG THE TOP OF THE BANK OVER THE BURIED LOG VANE TO PROTECT AGAINST EROSION DURING HIGH FLOWS.

4/4/2006
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2/26/03

PROJECT REFERENCE NO.	SHEET NO.
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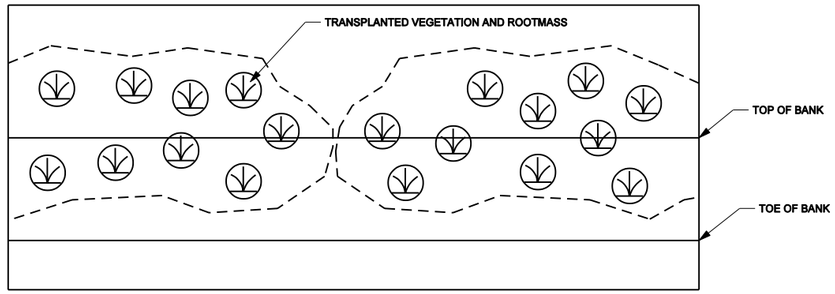
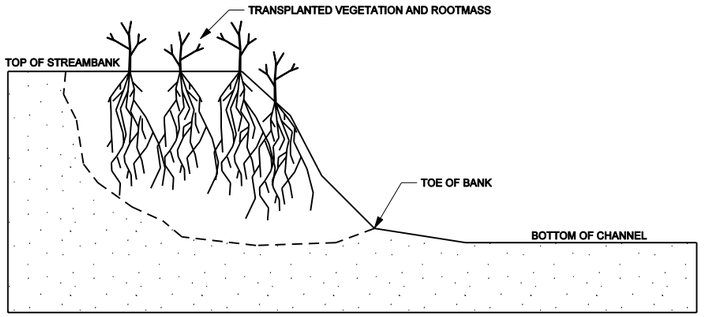
TRANSPLANTED VEGETATION



PLAN VIEW

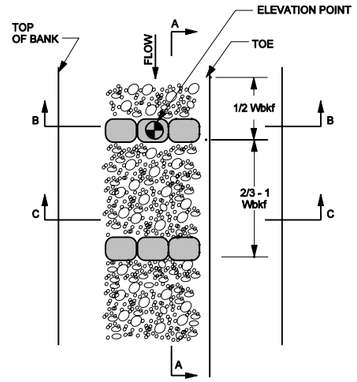


CROSS SECTION VIEW

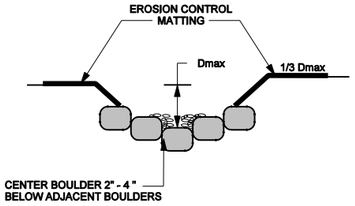
NOTES:

1. EXCAVATE A HOLE IN THE BANK TO BE STABILIZED THAT WILL ACCOMMODATE THE SIZE OF TRANSPLANT TO BE PLACED. BEGIN EXCAVATION AT THE TOE OF THE BANK.
2. EXCAVATE TRANSPLANT USING A FRONT END LOADER. EXCAVATE THE ENTIRE ROOT MASS AND AS MUCH ADDITIONAL SOIL MATERIAL AS POSSIBLE. IF ENTIRE ROOT MASS CANNOT BE EXCAVATED IN ONE BUCKET LOAD, THE TRANSPLANT IS TOO LARGE AND ANOTHER SHOULD BE SELECTED.
3. PLACE TRANSPLANT IN THE BANK TO BE STABILIZED SO THAT VEGETATION IS ORIENTATED VERTICALLY.
4. FILL IN ANY HOLES AROUND THE TRANSPLANT AND COMPACT.
5. ANY LOOSE SOIL LEFT IN THE STREAM SHOULD BE REMOVED.
6. PLACE MULTIPLE TRANSPLANTS CLOSE TOGETHER SUCH THAT THEY TOUCH.

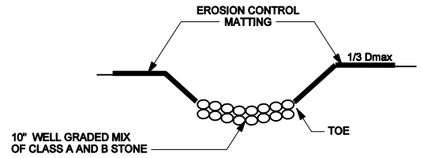
CONSTRUCTED RIFFLE



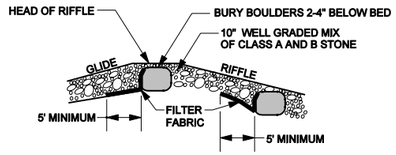
PLAN VIEW



SECTION B - B



SECTION C - C

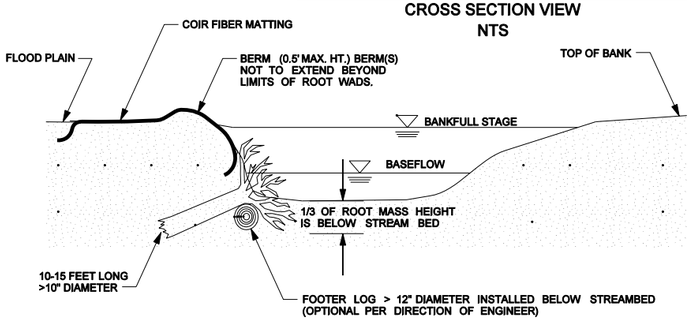


PROFILE A - A

REACH	Mill Branch	UT
Wbkf (ft)	18.3	16.2
Dmax (ft)	2.1	1.9

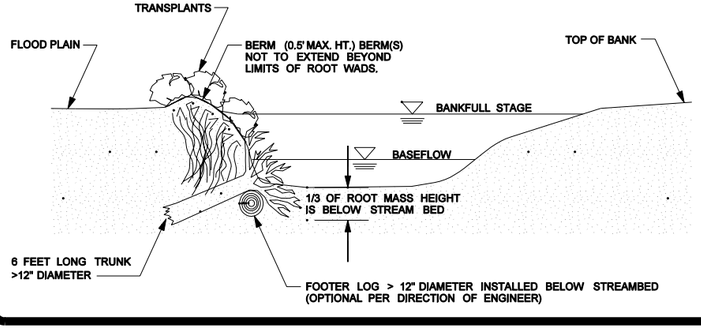
ROOT WADS WITHOUT TRANSPLANTS

CROSS SECTION VIEW
NTS



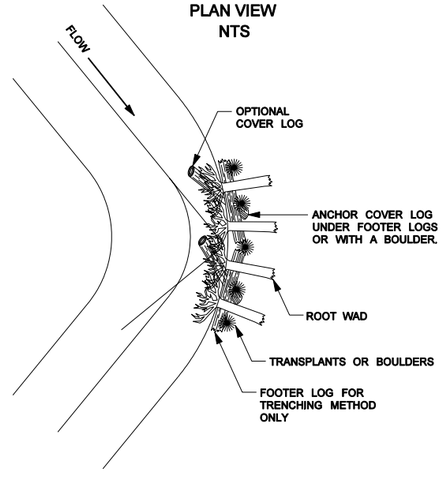
ROOT WADS WITH TRANSPLANTS

CROSS SECTION VIEW
NTS



ROOT WADS

PLAN VIEW
NTS



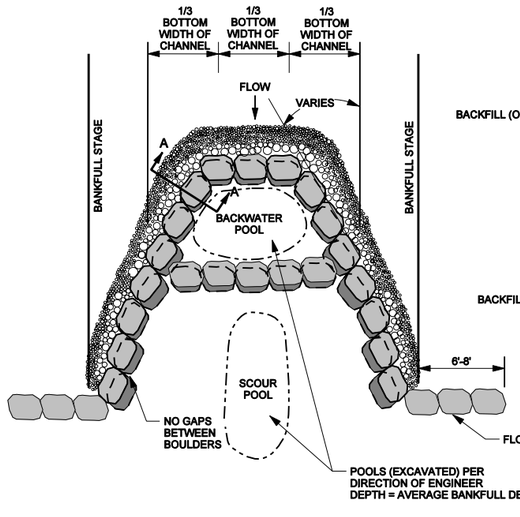
NOTES:

TRENCHING METHOD:
IF THE ROOT WAD CANNOT BE DRIVEN INTO THE BANK OR THE BANK NEEDS TO BE RECONSTRUCTED, THE TRENCHING METHOD SHOULD BE USED. THIS METHOD REQUIRES THAT A TRENCH BE EXCAVATED FOR THE LOG PORTION OF THE ROOT WAD. IN THIS CASE, A FOOTER LOG SHOULD BE INSTALLED UNDERNEATH THE ROOT WAD IN A TRENCH EXCAVATED PARALLEL TO THE BANK AND WELL BELOW THE STREAMBED. ONE-THIRD OF THE ROOT WAD SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS.

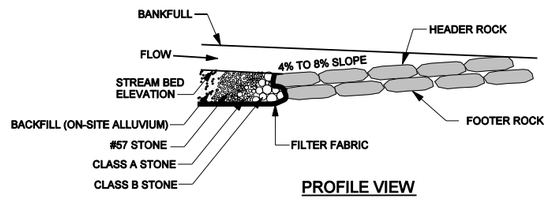
NOTES:

DRIVE POINT METHOD:
SHARPEN THE END OF THE LOG WITH A CHAINSAW BEFORE "DRIVING" IT INTO THE BANK. ORIENT ROOT WADS UPSTREAM SO THAT THE STREAM FLOW MEETS THE ROOT WAD AT A 90-DEGREE ANGLE, DEFLECTING THE WATER AWAY FROM THE BANK. A TRANSPLANT OR BOULDER SHOULD BE PLACED ON THE DOWNSTREAM SIDE OF THE ROOT WAD IF A BACK EDDY IS FORMED BY THE ROOT WAD. THE BOULDER SHALL BE APPROXIMATELY 4'X 3'X 2'.

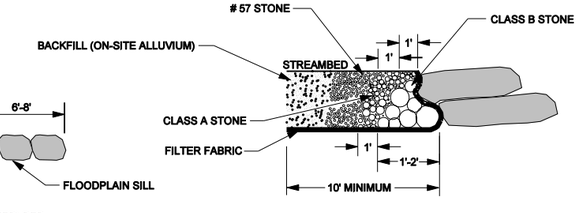
DOUBLE DROP ROCK CROSS VANE



PLAN VIEW



PROFILE VIEW



SECTION A - A

1. BOULDERS MUST BE AT LEAST 2' x 2' x 3'.
2. INSTALL FILTER FABRIC FOR DRAINAGE BEGINNING AT THE MIDDLE OF THE HEADER ROCKS AND EXTEND DOWNWARD TO THE DEPTH OF THE BOTTOM FOOTER ROCK, AND THEN UPSTREAM TO A MINIMUM OF TEN FEET.
3. DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAM BANK.
4. START AT BANKFULL AND PLACE FOOTER ROCKS FIRST AND THEN HEADER (TOP) ROCK.
5. CONTINUE WITH STRUCTURE, FOLLOWING ANGLE AND SLOPE SPECIFICATIONS.
6. AN EXTRA BOULDER CAN BE PLACED IN SCOUR POOL FOR HABITAT IMPROVEMENT.
7. USE CLASS B STONE TO FILL GAPS ON UPSTREAM SIDE OF BOULDERS, AND CLASS A STONE TO FILL GAPS ON UPSTREAM SIDE OF CLASS B STONE.
8. AFTER ALL STONE HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH ON-SITE ALLUVIUM TO THE ELEVATION OF THE TOP OF THE HEADER ROCK.

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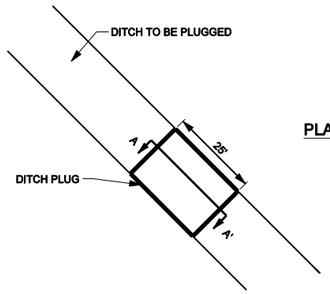
2/26/03

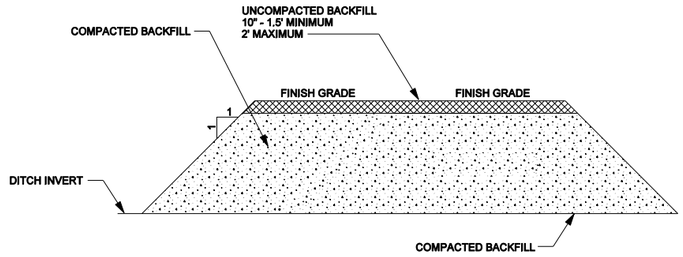
DITCH PLUG



PLAN VIEW

NOTE:

COMPACT BACKFILL USING ON-SITE HEAVY EQUIPMENT IN 10 INCH LIFTS.



SECTION A - A'

STANDARD "V" DITCH

STANDARD 'V' DITCH (TYPE B)

NOTES:

1. BANKS OF TYPE B DITCHES PROTECTED WITH STRAW, TEMPORARY AND PERMANENT SEEDING.
2. TYPE B DITCHES TO BE CONSTRUCTED WITH AS LITTLE SLOPE AS POSSIBLE.
3. SPOIL FROM DITCHES TO BE USED IN FILLING OLD CHANNEL OR SPREAD EVENLY OVER UPSLOPE AREAS.

PROJECT REFERENCE NO.	SHEET NO.
0215R	2-B

PROJECT ENGINEER

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027337
APRIL 4, 2006

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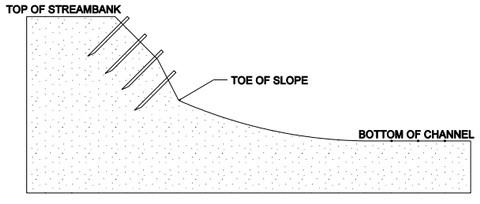
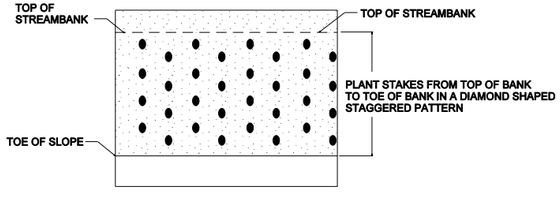
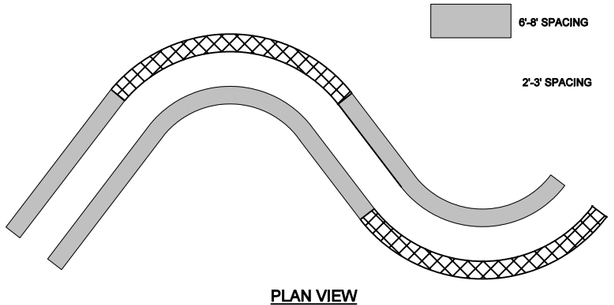
LIVE STAKING



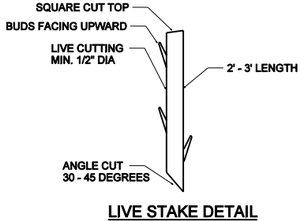
CROSS SECTION VIEW



PLAN VIEW



PLAN VIEW

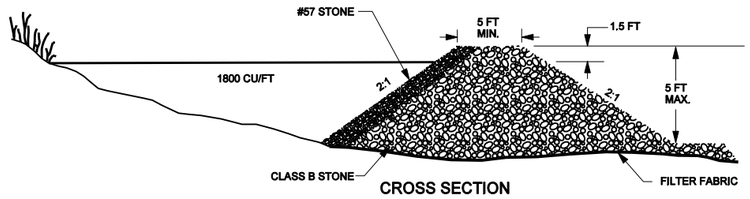


LIVE STAKE DETAIL

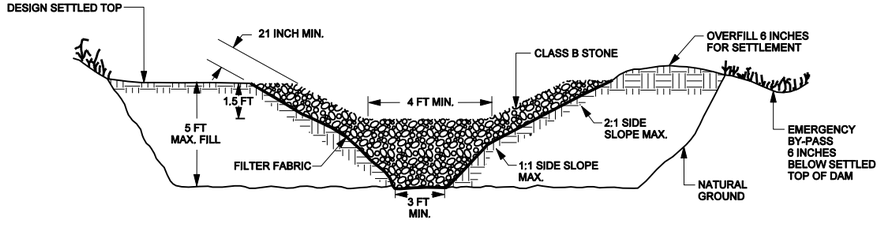
NOTES:

1. STAKES SHOULD BE CUT AND INSTALLED ON THE SAME DAY.
2. DO NOT INSTALL STAKES THAT HAVE BEEN SPLIT.
3. STAKES MUST BE INSTALLED WITH BUDS POINTING UPWARDS.
4. STAKES SHOULD BE INSTALLED PERPENDICULAR TO BANK.
5. STAKES SHOULD BE 1/2 TO 2 INCHES IN DIAMETER AND 2 TO 3 FT LONG.
6. STAKES SHOULD BE INSTALLED LEAVING 1/5 OF STAKE ABOVE GROUND.

SILT CHECK



CROSS SECTION



STONE SECTION

CONSTRUCTION SPECIFICATIONS:

1. CLEAR, GRUB, AND STRIP THE AREA UNDER THE EMBANKMENT OF ALL VEGETATION AND ROOT MATERIAL. REMOVE ALL SURFACE SOIL CONTAINING HIGH AMOUNTS OF ORGANIC MATTER AND STOCKPILE OR DISPOSE OF IT PROPERLY. HAUL ALL OBJECTIONABLE MATERIAL TO THE DESIGNATED DISPOSAL AREA.
2. ENSURE ALL FILL MATERIAL FOR THE EMBANKMENT IS FREE OF ROOTS, WOODY VEGETATION, ORGANIC MATTER, AND OTHER OBJECTIONABLE MATERIAL. PLACE THE FILL IN LIFTS NOT TO EXCEED 9 INCHES AND MACHINE COMPACT IT. OVER FILL THE EMBANKMENT 6 INCHES TO ALLOW FOR SETTLEMENT.
3. CONSTRUCT THE OUTLET SECTION IN THE EMBANKMENT. PROTECT THE CONNECTION BETWEEN THE RIPRAP AND THE SOIL FROM THE PIPING BY USING FILTER FABRIC OR A KETWAY CUTOFF TRENCH BETWEEN THE RIPRAP STRUCTURE AND THE SOIL.
   - PLACE THE FILTER FABRIC BETWEEN THE RIPRAP AND SOIL. EXTEND THE FABRIC ACROSS THE SPILLWAY FOUNDATION AND SIDES TO THE TOP OF THE DAM: OR
   - EXCAVATE A KETWAY TRENCH ALONG THE CENTERLINE OF THE SPILLWAY FOUNDATION EXTENDING UP THE SIDES TO THE HEIGHT OF THE DAM. THE TRENCH SHOULD BE AT LEAST 2 FEET DEEP AND 2 FEET WIDE WITH A 1:1 SLOPE.
4. CLEAR THE POND AREA BELOW THE ELEVATION OF THE CREST OF THE SPILLWAY TO FACILITATE SEDIMANT CLEANOUT.
5. ALL CUT AND FILL SLOPES SHOULD BE 2:1 OR FLATTER.
6. ENSURE THAT ALL STONE(DRAINAGE) SECTION OF THE EMBANKMENT HAS A MINIMUM BOTTOM WIDTH OF 3 FEET AND A MAXIMUM SIDE SLOPE OF 1:1 THAT EXTEND THE BOTTOM OF THE SPILLWAY.
7. CONSTRUCT A MINIMUM FINISHED STONE SPILLWAY BOTTOM WIDTH AS SHOWN, ON THE PLANS, WITH 2:1 SIDE SLOPES EXTENDING TO THE TOP OF THE OVER FILLED EMBANKMENT. KEEP THICKNESS OF THE SIDES TO THE SPILLWAY OUTLET STRUCTURE AT A MINIMUM OF 21 INCHES. THE WEIR MUST BE LEVEL AND CONSTRUCTED TO GRADE TO ASSURE DESIGN CAPACITY.
8. MATERIAL USED IN THE STONE SECTION SHOULD BE A WELL GRADED MIXTURE OF STONE WITH A d50 SIZE OF 9 INCHES (CLASS B EROSION CONTROL STONE IS RECOMMENDED) AND A MAXIMUM STONE SIZE OF 14 INCHES. THE STONE MAY BE MACHINED PLACED AND THE SMALLER STONESWORKED INTO THE VOIDS OF THE LARGER STONES. THE STONE SHOULD BE HARD, ANGULAR, AND HIGHLY WEATHER-RESISTANT.

2/26/03

PROJECT REFERENCE NO.	SHEET NO.
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APRIL 4, 2006

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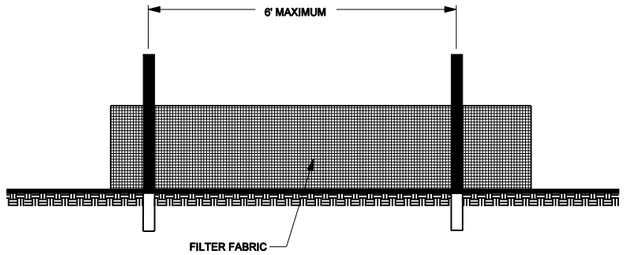
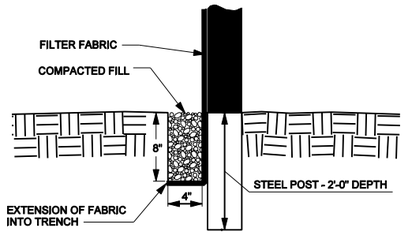
TEMPORARY SILT FENCE

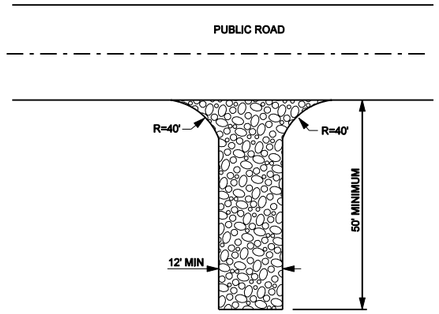


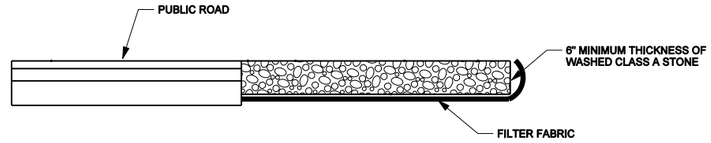


NOTES:

1. USE FILTER FABRIC A MINIMUM OF 36" IN WIDTH AND FASTEN ADEQUATELY TO THE WIRE AS DIRECTED BY THE ENGINEER.
2. PROVIDE 5' STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

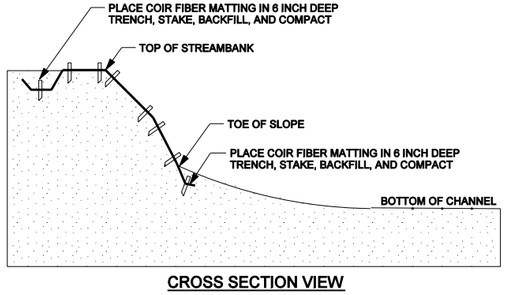




NOTES:

SPECIFICATION NO. 6.06 - CONSTRUCTION ACCESS "N.C. EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL DECEMBER 1993"

EORSION CONTROL MATTING



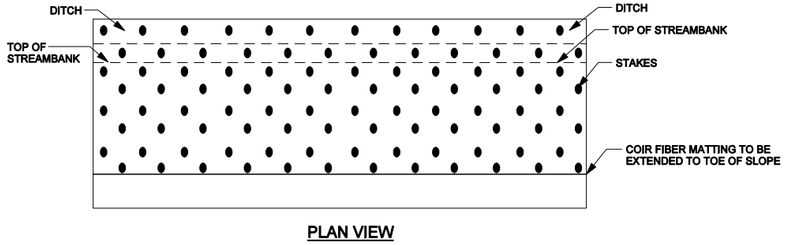
CROSS SECTION VIEW

NOTES:

1. BANKS SHOULD BE SEEDED PRIOR TO PLACEMENT OF MATTING.
2. PLACE COIR FIBER MATTING ACCORDING TO MANUFACTURER RECOMMENDATIONS.
3. MATTING STAKES SHOULD BE PLACED IN A DIAMOND SHAPED PATTERN.

THE WOOD STAKE SHALL BE THE NORTH AMERICAN GREEN ECO-STAKE OR APPROVED EQUAL WITH THE FOLLOWING DIMENSIONS:

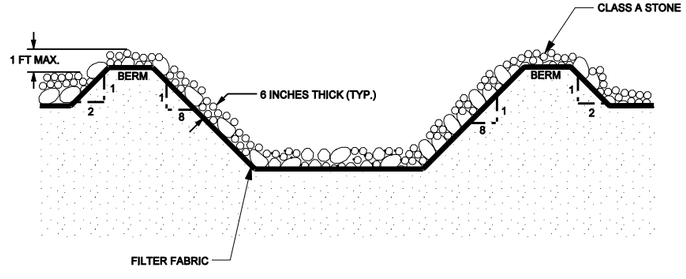
LEG LENGTH	11.00 IN (27.94 CM)
HEAD WIDTH	1.25 IN (3.18 CM)
HEAD THICKNESS	0.40 IN (1.02 CM)
LEG WIDTH	0.60 IN (1.52 CM) (TAPERED TO POINT)
LEG THICKNESS	0.40 IN (1.02 CM)
TOTAL LENGTH	12.00 IN (30.48 CM)



PLAN VIEW

TYPICAL MATTING STAKE

FORD STREAM CROSSING



NOTES:

1. CONSTRUCT STREAM CROSSING WHEN FLOW IS LOW.
2. HAVE ALL NECESSARY MATERIALS AND EQUIPMENT ON-SITE BEFORE WORK BEGINS.
3. MINIMIZE CLEARING AND EXCAVATION OF STREAMBANKS. DO NOT EXCAVATE CHANNEL BOTTOM. COMPLETE ONE SIDE BEFORE STARTING ON THE OTHER SIDE.
4. INSTALL STREAM CROSSING AT RIGHT ANGLE TO THE FLOW.
5. GRADE SLOPES TO A 8:1 SLOPE. TRANSPLANT SOD FROM ORIGINAL STREAMBANK ONTO SIDE SLOPES.
6. MAINTAIN CROSSING SO THAT RUNOFF IN THE CONSTRUCTION ROAD DOES NOT ENTER EXISTING CHANNEL.
7. A STABILIZED PAD OF CLASS A STONE, 6 INCHES THICK, LINED WITH FILTER FABRIC FOR DRAINAGE SHALL BE USED OVER THE BERM AND ACCESS SLOPES.
8. WIDTH OF THE CROSSING SHALL BE SUFFICIENT TO ACCOMMODATE THE LARGEST VEHICLE CROSSING THE CHANNEL.
9. CONTRACTOR SHALL DETERMINE AN APPROPRIATE RAMP ANGLE ACCORDING TO EQUIPMENT UTILIZED.

4/4/2006
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BUCK PROJECT REFERENCE NO.	SHEET NO.
0215R	3

PROJECT ENGINEER

THIS DOCUMENT
ORIGINALLY ISSUED AND
SEALED BY:

KEVIN L. TWEEDY
027337
APRIL 4, 2006

THIS MEDIA SHALL NOT BE CONSIDERED
A CERTIFIED DOCUMENT

BUCK ENGINEERING
8000 Regency Parkway Suite 200
Cary, North Carolina 27511
Phone: 919-463-5488
Fax: 919-463-5490

NAD 83

MILL BRANCH
BEGIN CONSTRUCTION
STA. 10+06.44

PHOTO POINT 1
407,578.3889 N
1,682,867.7110 E

PHOTO POINT 2
407,578.6740 N
1,682,754.5700 E

PHOTO POINT 3
407,473.0498 N
1,682,786.1770 E

PHOTO POINT 4
407,477.3834 N
1,682,918.0090 E

PHOTO POINT 5
407,345.7928 N
1,682,968.6740 E

407,389.6042 N
1,682,988.6630 E

407,342.8147 N
1,682,977.3990 E

PHOTO POINT 6
407,395.7057 N
1,683,099.6620 E

407,327.9566 N
1,683,122.4850 E

PHOTO POINT 7
407,284.9149 N
1,683,159.0200 E

407,346.7953 N
1,683,150.5010 E

PHOTO POINT 8
407,317.9124 N
1,683,276.9124 E

407,260.1449 N
1,683,291.1770 E

PHOTO POINT 9
407,206.6747 N
1,683,354.0570 E

407,278.8577 N
1,683,324.3060 E

REBAR & CAP
407,174.9060 N
1,683,458.1360 E
270.9350 Elev.

REBAR & CAP
407,420.5000 N
1,682,786.3900 E
275.3000 Elev.

REBAR & CAP
407,396.7700 N
1,682,979.6700 E
275.4300 Elev.

TRANSPLANTS
(TYPICAL)

MATCHLINE
STA 20+00.00

PETRINA ANN SLOAN
DB 405, PG 251

PLANTED PINES

MILL BRANCH

WOODS

MATCHLINE
STA 20+00.00

PHOTO POINT 10
407,270.2134 N
1,683,455.1360 E

407,204.2309 N
1,683,545.7120 E

PHOTO POINT 11
407,171.7051 N
1,683,564.4280 E

407,162.1561 N
1,683,557.9620 E

PHOTO POINT 12
407,312.1767 N
1,683,638.4720 E

PHOTO POINT 13
407,229.5169 N
1,683,786.0360 E

PHOTO POINT 14
407,338.8352 N
1,683,815.4630 E

PHOTO POINT 15
407,297.1263 N
1,683,910.5950 E

PHOTO POINT 16
407,363.1887 N
1,683,968.2370 E

REBAR & CAP
407,376.8201 N
1,684,035.6550 E
269.6984 Elev.

MILL BRANCH
END CONSTRUCTION
STA. 28+61.24

JONES CREEK

PETRINA ANN SLOAN
DB 405, PG 251

PLANTED PINES

WOODS

AS-BUILT
JONES CREEK

40 20 0 40 80
SCALE (FT)

2/26/03

4/12/2006
C:\Projects\0215R\Design\As_Built\0215R_EBX_PSH_AB_03.dgn

2/26/03

BUCK PROJECT REFERENCE NO.	SHEET NO.
0215R	4

PROJECT ENGINEER

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ORIGINALLY ISSUED AND
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027337
APRIL 4, 2006

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8000 Regency Parkway Suite 200
Cary, North Carolina 27511
Phone: 919-463-5488
Fax: 919-463-5490

NAD 83

V-DITCH

V-DITCH

INSTALLED
60-INCH CSP
INV = 268.96

BEGIN CONSTRUCTION
UT STA. 10+00.00

FENCING
REMOVED

INSTALLED
GRAVEL CROSSING

INSTALLED
WOVEN-WIRE FENCE

TRANSPLANTS
(TYPICAL)

STONE
OUTLET

V-DITCH

END CONSTRUCTION
UT STA. 22+12.76

PHOTO POINT 1
407,667.2919 N
1,685,947.9340 E

PHOTO POINT 2
407,809.8810 N
1,685,899.5260 E

PHOTO POINT 3
407,790.9550 N
1,685,785.7780 E

PHOTO POINT 4
407,902.9344 N
1,685,780.6050 E

PHOTO POINT 5
407,907.1044 N
1,685,668.0500 E

PHOTO POINT 6
408,021.6373 N
1,685,633.0930 E

PHOTO POINT 7
407,985.2806 N
1,685,558.3840 E

PHOTO POINT 8
408,060.7091 N
1,685,488.0010 E

PHOTO POINT 9
407,982.0688 N
1,685,362.3760 E

PHOTO POINT 10
408,112.4104 N
1,685,330.2960 E

PHOTO POINT 11
408,077.5658 N
1,685,226.3210 E

REBAR & CAP
407,966.9100 N
1,685,509.1400 E
266.7700 Elev.

REBAR & CAP
407,962.2779 N
1,685,613.6430 E
267.5495 Elev.

REBAR & CAP
408,056.2403 N
1,685,407.7500 E
266.4400 Elev.

REBAR & CAP
408,167.8612 N
1,685,238.5330 E
265.4092 Elev.

407,998.8701 N
1,685,443.2320 E

407,998.7773 N
1,685,354.5880 E

408,024.8518 N
1,685,373.3560 E

408,041.5548 N
1,685,413.1950 E

LULIE W. HARDISON TRUST
WOO/OE51
DB 112, PG 518

EDMUND P. HUNTLEY
EDMUND P. HUNTLEY, JR.
DB 495, PG 241

PETRINA ANN SLOAN
DB 405, PG 251

JONES CREEK

WOODS

BRUSH PILE

BECP(1) W/MW

BECP(2) W/MW

BECP(3) W/MW

BECP(3B)

W/MW

ROCK DRIVE

AS-BUILT
JONES CREEK

20 40 0 40 80
SCALE (FT)

4/12/2006
I:\0215R\Design\As_Built\0215R_EBX_PSH_AB_04.dgn

2/26/03

BUCK PROJECT REFERENCE NO.	SHEET NO.
0215R	5

PROJECT ENGINEER

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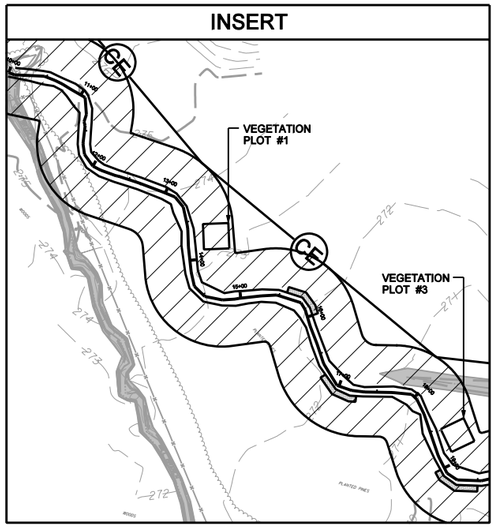
8000 Regency Parkway Suite 200
Cary, North Carolina 27511
Phone: 919-463-5488
Fax: 919-463-5490

NAD 83

INSERT



INSERT MATCHLINE

AUTOMATIC WELL #8
VEGETATION PLOT #8
MANUAL WELL #5
MANUAL WELL #2
VEGETATION PLOT #9
VEGETATION PLOT #7
AUTOMATIC WELL #7
MANUAL WELL #3
MANUAL WELL #6
VEGETATION PLOT #5
VEGETATION PLOT #4
AUTOMATIC WELL #1
AUTOMATIC WELL #3
VEGETATION PLOT #6
VEGETATION PLOT #2
CREST GAGE #2
AUTOMATIC WELL #2
VEGETATION PLOT #10
CREST GAGE #1
VEGETATION PLOT #11
AUTOMATIC WELL #5
MANUAL WELL #1
MANUAL WELL #4
VEGETATION PLOT #12
V-DITCH
AUTOMATIC WELL #4
V-DITCH
VEGETATION PLOT #13
JONES CREEK

STREAM RESTORATION BUFFER

FILLED CHANNEL AREA

STREAM PRESERVATION BUFFER

WETLAND ENHANCEMENT

WETLAND RESTORATION
(PLANTED HYDRIC SOIL AREAS)

TOTAL ACREAGES	
STREAM RESTORATION BUFFER	• 6.67 ACRES
STREAM PRESERVATION BUFFER	• 11.62 ACRES
WETLAND ENHANCEMENT	• 2.71
WETLAND RESTORATION (PLANTED HYDRIC SOIL AREAS)	• .25 ACRES

WETLAND /MONITORING OVERVIEW

100 50 0 100 200
SCALE (FT)

4/12/2006
I:\0215R\Design\As_Built\0215_EBX_PSH_AB_wet_05.dgn

2/26/03

BUCK PROJECT REFERENCE NO.	SHEET NO.
0215R	6

PROJECT ENGINEER

THIS DOCUMENT
ORIGINALLY ISSUED AND
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KEVIN L. TWEEDY
027337
APRIL 4, 2006

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BUCK ENGINEERING
8000 Regency Parkway Suite 200
Cary, North Carolina 27511
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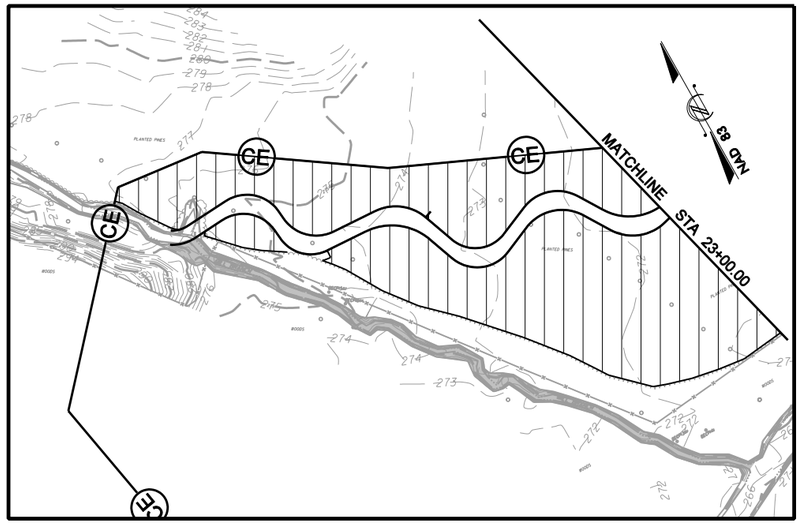


CE CONSERVATION EASEMENT

FILLED CHANNEL AREA

ZONE 1

ZONE 2

ZONE 3

EXISTING WETLAND BOUNDARY

NOTE:
PLACE LIVE STAKES ALONG THE BANKS OF MILL BRANCH AND UT TO SOUTH FORK JONES CREEK. PLANT ACCORDING TO DETAIL ON SHEET 2-A.

TOTAL PLANTED ACREAGE

ZONE 1	=	47.3 Ac
ZONE 2	=	2.5 Ac.
ZONE 3	=	6.2 Ac.

VEGETATION PLANTING PLAN

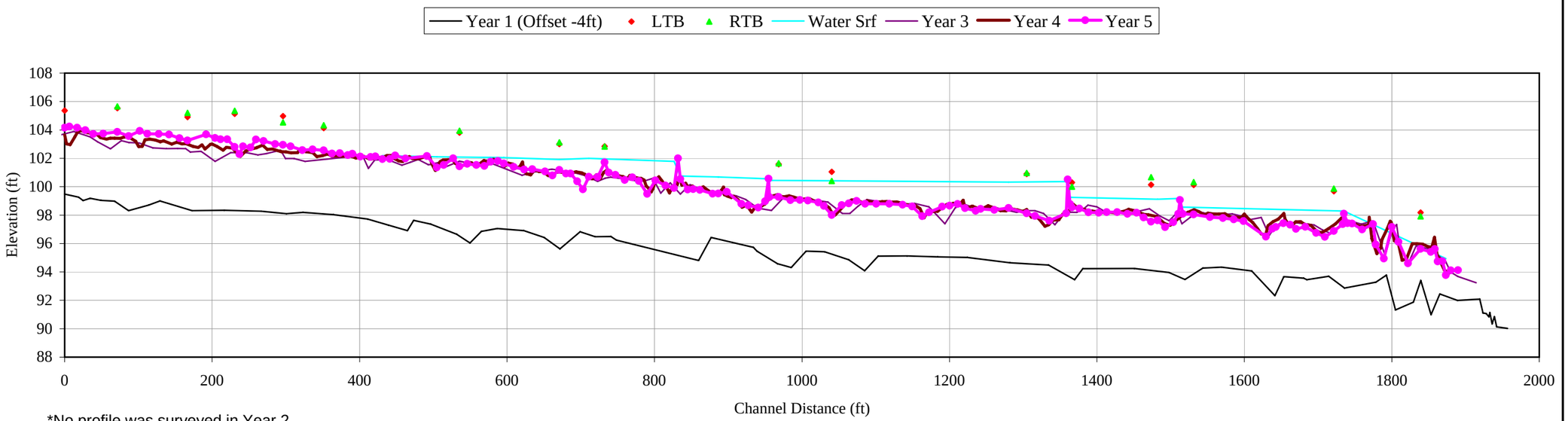
100 50 0 100 200
SCALE (FT)

4/4/2006
c:\0215\Design\As_Built\0215_EBX_PSH_AB_veg_06.dgn

APPENDIX B

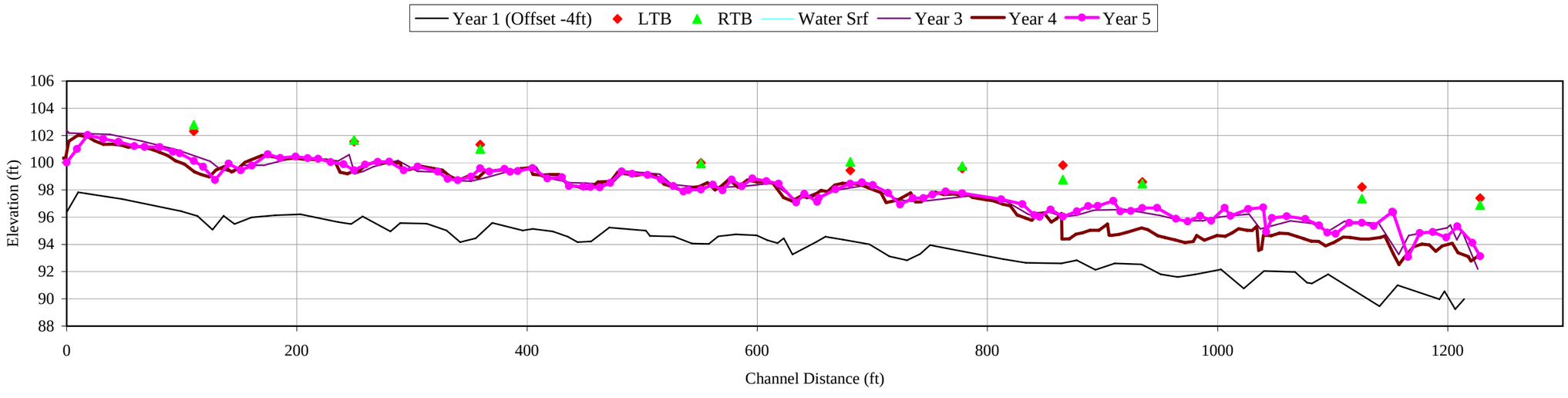
Profile and Cross Section Data

Jones Creek Mill Branch 2010 Profile



*No profile was surveyed in Year 2.

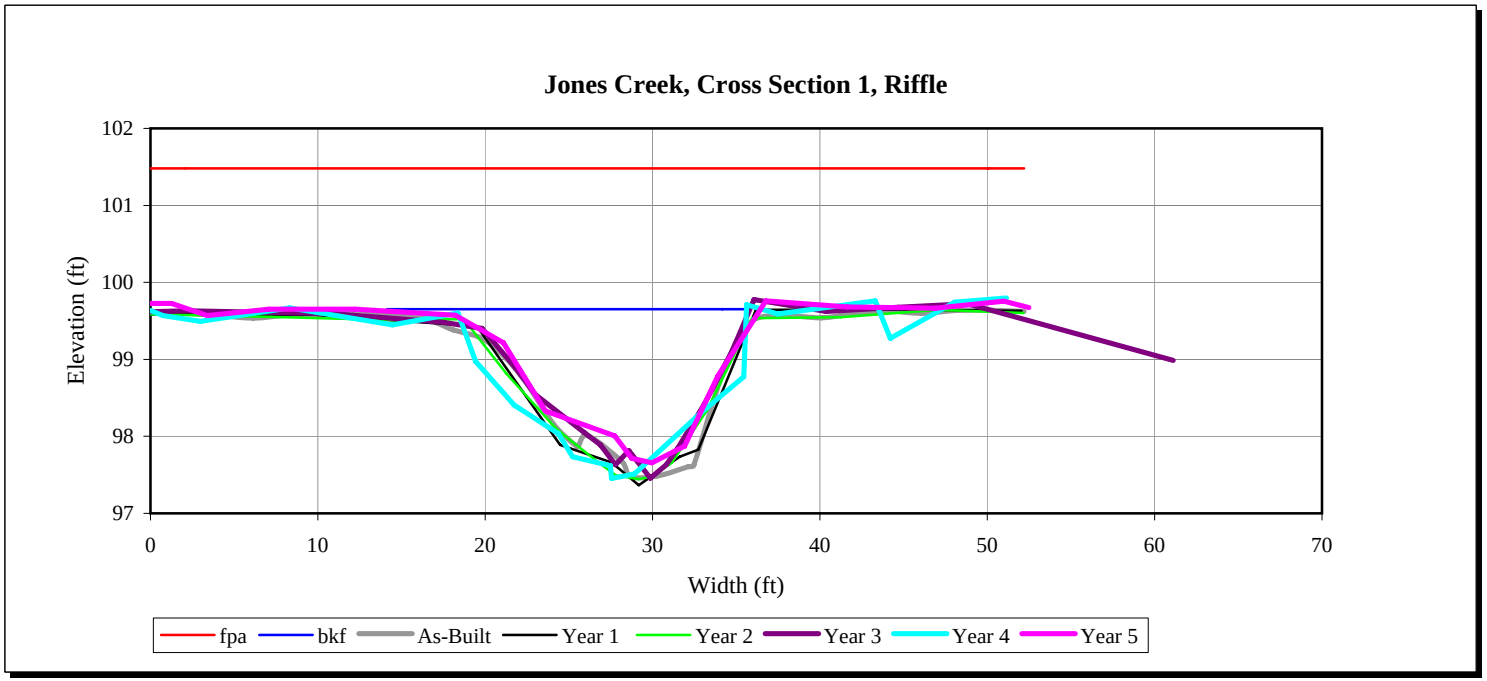
Jones Creek UT 2010 Profile



*No profile was surveyed in Year 2.

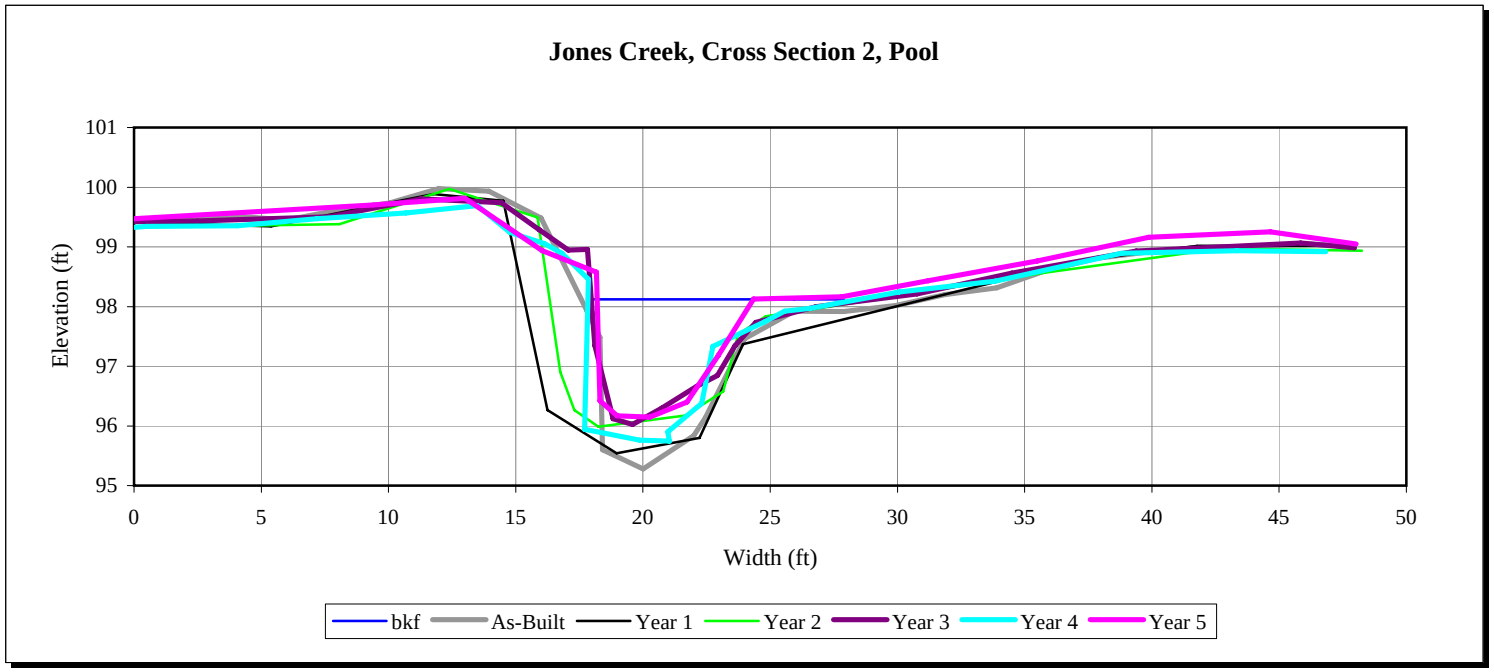
Looking at left bank.

Looking at right bank.



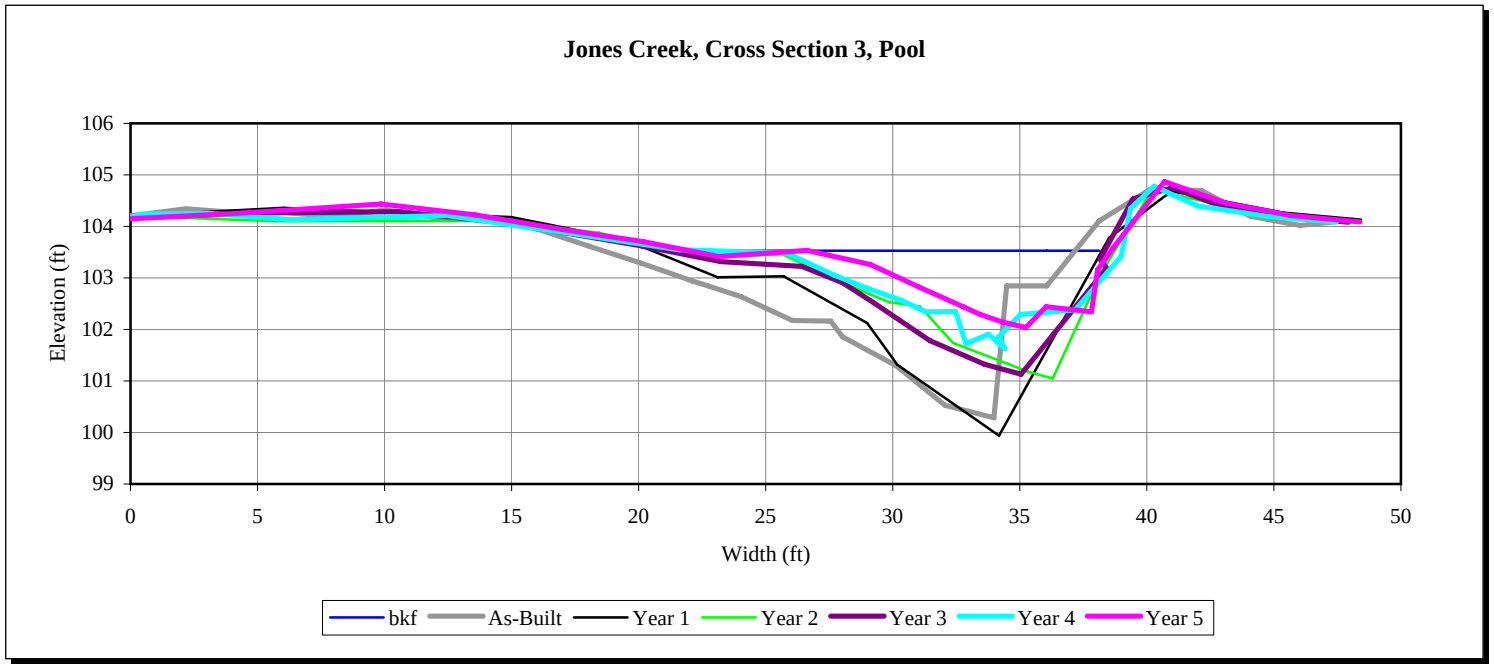
Looking at left bank.

Looking at right bank.



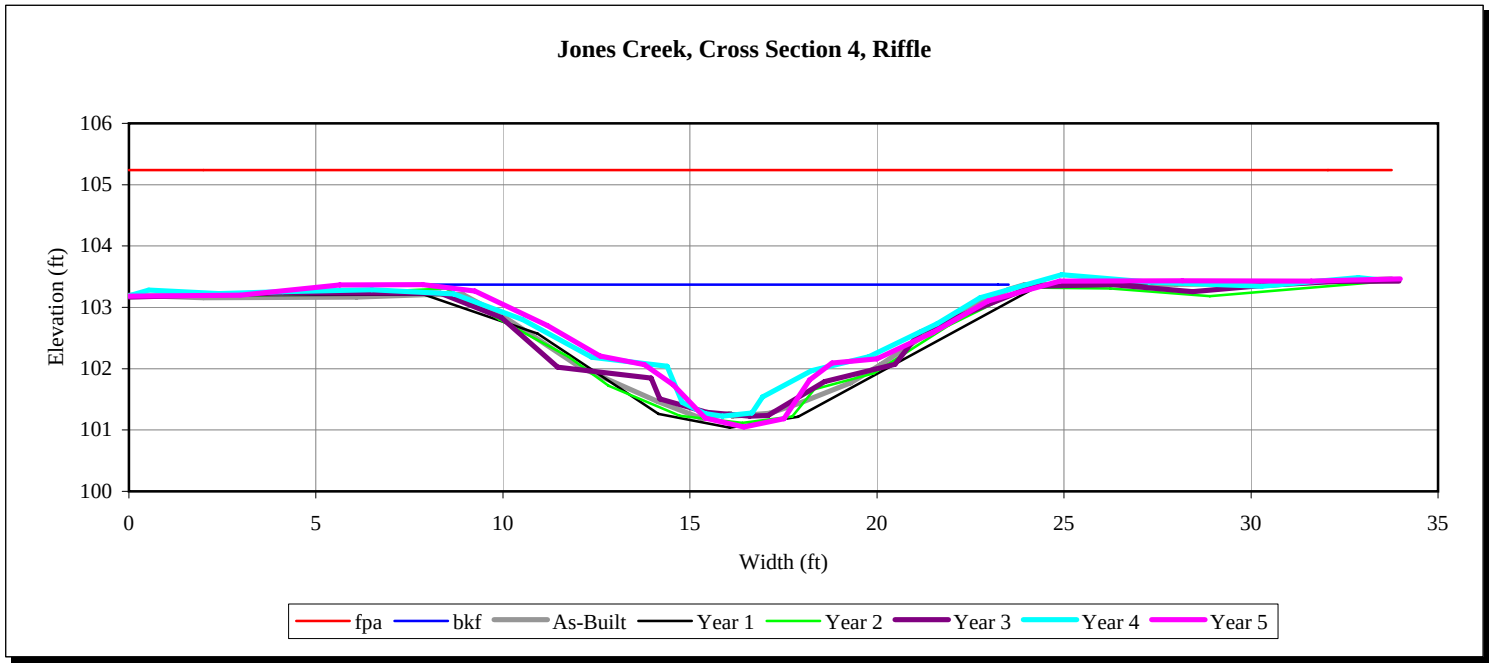
Looking at left bank.

Looking at right bank.



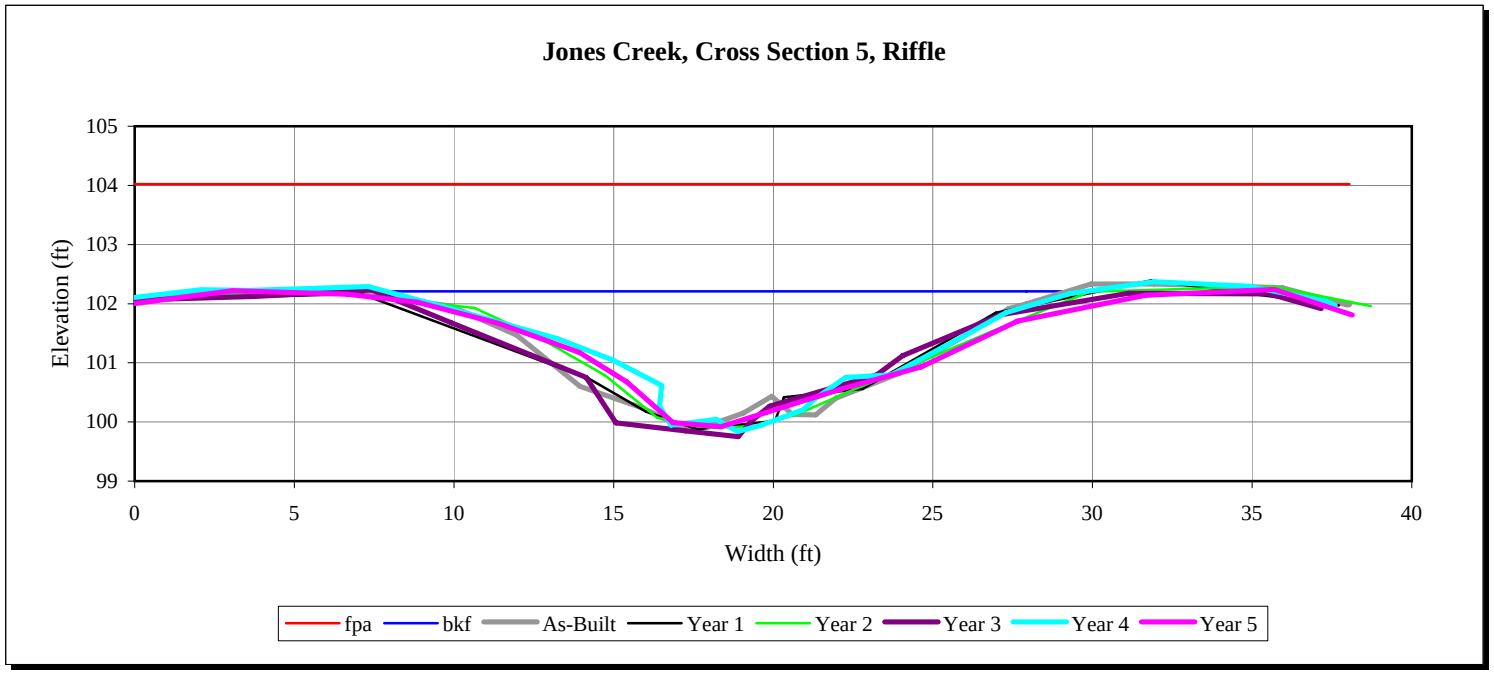
Looking at left bank.

Looking at right bank.



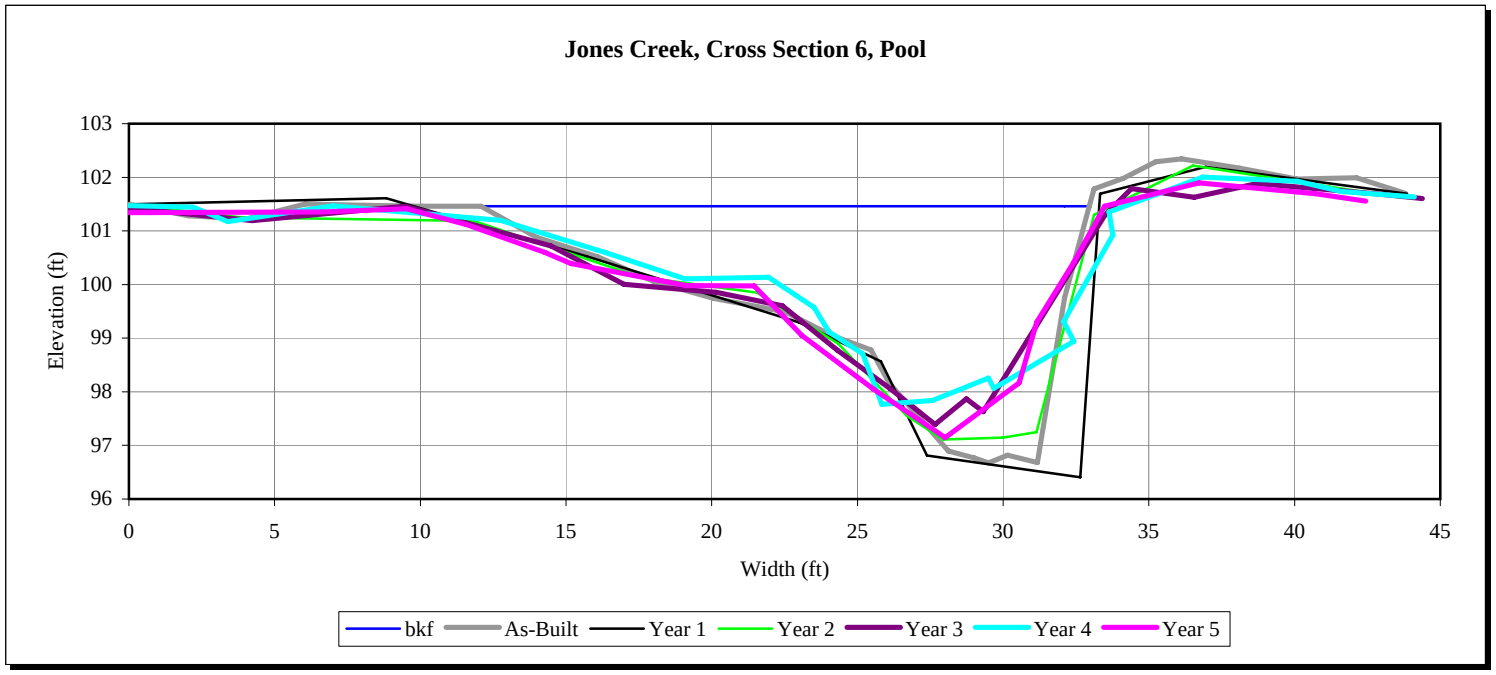
Looking at left bank.

Looking at right bank.



Looking at left bank.

Looking at right bank.



APPENDIX C

2010 Site Photos

SOA 1, Mill Branch Station 17+25 – Beaver Dam

SOA 2, Mill Branch Station 18+20 – Beaver Dam

SOA 3, Mill Branch Station 19+50 – Beaver Dam

SOA 4, Mill Branch Station 23+50 – Beaver Dam

SOA 5, Mill Branch Station 27+00 – Beaver Dam

Rock cross vane facing downstream (typ.)

Constructed riffle facing upstream on UT1 (typ.)

Rock cross vane facing downstream on UT1 (typ.)

Root wad facing right bank on UT1 (typ.)

Log vane facing left bank (typ.)

Log weir facing downstream (typ)

Rock J -Vane on Mill Branch (typ.)

Downstream end of Mill Brach

Vegetation Plot 1

Vegetation Plot 2

Vegetation Plot 3

Vegetation Plot 4

Vegetation Plot 5

Vegetation Plot 6

Vegetation Plot 7

Vegetation Plot 8

Vegetation Plot 9

Vegetation Plot 10

Vegetation Plot 11

Vegetation Plot 12

Vegetation Plot 13

APPENDIX D

2010 Gauge Data

Date	Time	Water Level (inches)																		On-site Manual Raingauge	On-site Auto Raingauge	Wadesboro Daily Rainfall	Wadesboro Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	Jon AW1	Jon AW2	Jon AW3	Jon AW4	Jon AW5	Jon AW6	Jon AW7	Jon AW8	Jon AW9	Jon AW10	Jon AW11	Jon AW12	Jon AW13	Jon AW14	Jon RAW1	Jon RAW2	Jon RAW3	CG1	CG2				
1-Jan-2010	08:00:00	-2.38	0.76	0.61	-3.03	-2.68	-12.14	0.66	-0.48	-1.67	4.02	1.40	-1.05	-0.41	-4.72	1.59	1.49	3.44				0.01		
1-Jan-2010	20:00:00	-2.47	0.70	0.49	-3.19	-2.88	-13.31	0.46	-0.89	-2.01	3.91	1.43	-1.14	-0.61	-4.89	1.41	5.77	6.95						
2-Jan-2010	08:00:00	-2.61	0.60	0.21	-3.51	-3.17	-14.46	0.18	-1.67	-2.99	3.79	1.23	-1.54	-1.04	-5.22	1.17	13.42	14.68						
2-Jan-2010	20:00:00	-2.70	0.51	0.16	-3.45	-3.18	-15.91	0.14	-1.81	-3.53	3.73	1.26	-1.47	-1.10	-5.29	0.91	8.30	12.78						
3-Jan-2010	08:00:00	-3.45	0.18	-0.48	-4.88	-3.83	-16.69	-0.17	-2.79	-6.18	3.50	0.81	-2.25	-1.86	-5.97	0.69	17.85	23.74						
3-Jan-2010	20:00:00	-3.06	0.32	-0.27	-3.48	-3.21	-17.99	-0.10	-1.58	-3.99	3.58	1.19	-1.67	-1.48	-5.54	0.57	8.37	13.31						
4-Jan-2010	08:00:00	-3.97	0.04	-1.12	-5.18	-4.53	-18.39	-0.51	-2.91	-7.03	3.24	0.55	-2.63	-2.49	-6.40	0.33	16.21	22.72						
4-Jan-2010	20:00:00	-3.34	0.37	-0.69	-3.41	-3.29	-19.33	-0.19	-1.45	-5.07	3.40	1.34	-1.80	-1.90	-5.69	-0.13	6.63	11.32						
5-Jan-2010	08:00:00	-4.45	-0.10	-1.88	-5.53	-5.34	-19.97	-0.67	-3.07	-7.60	2.98	0.28	-2.80	-3.06	-6.72	0.05	16.18	22.20						
5-Jan-2010	20:00:00	-3.62	0.36	-1.15	-3.58	-3.29	-20.55	-0.28	-1.30	-7.03	3.17	1.22	-1.87	-2.32	-5.91	-0.02	7.01	14.13						
6-Jan-2010	08:00:00	-4.85	-0.14	-2.65	-5.58	-5.85	-21.13	-0.80	-3.00	-8.85	2.84	0.06	-2.91	-3.49	-6.96	-0.22	14.97	21.11						
6-Jan-2010	20:00:00	-3.92	0.28	-1.56	-3.52	-3.60	-21.62	-0.44	-1.28	-8.59	3.08	0.95	-1.92	-2.59	-6.36	-0.29	9.56	13.76						
7-Jan-2010	08:00:00	-5.54	-0.32	-3.69	-5.80	-6.51	-21.93	-0.99	-3.02	-10.88	2.75	-0.30	-3.14	-4.07	-7.72	-0.49	16.80	19.83						
7-Jan-2010	20:00:00	-3.91	0.22	-1.44	-3.13	-3.29	-21.63	-0.47	-0.73	-8.91	3.13	1.25	-1.77	-2.65	-6.32	-0.52	-0.41	6.10						
8-Jan-2010	08:00:00	-3.52	0.25	-1.05	-3.35	-2.69	-22.18	-0.33	-0.72	-7.21	2.97	1.49	-1.26	-2.02	-6.28	-0.59	3.96	8.46						
8-Jan-2010	20:00:00	-3.89	0.22	-1.48	-3.89	-3.39	-22.72	-0.50	-1.45	-8.17	2.75	1.23	-1.55	-2.01	-6.72	-0.76	9.04	11.92						
9-Jan-2010	08:00:00	-4.74	0.13	-2.58	-5.55	-4.62	-23.06	-0.85	-2.17	-10.15	2.69	0.73	-2.06	-2.67	-7.15	-0.94	14.47	18.32						
9-Jan-2010	20:00:00	-4.57	0.11	-2.27	-3.92	-3.81	-23.54	-0.71	-1.73	-10.10	2.75	0.80	-1.78	-2.33	-7.04	-1.01	11.35	11.00						
10-Jan-2010	08:00:00	-6.18	-0.28	-4.59	-6.54	-6.69	-23.96	-1.16	-2.87	-12.83	2.36	-0.05	-2.59	-3.53	-8.01	-1.23	20.65	21.80						
10-Jan-2010	20:00:00	-5.30	0.25	-3.37	-4.13	-4.75	-24.21	-0.91	-1.62	-12.29	2.67	0.28	-2.09	-2.95	-7.22	-1.30	13.65	10.98						
11-Jan-2010	08:00:00	-8.63	-1.33	-6.50	-7.33	-8.56	-24.13	-1.54	-3.39	-14.38	1.72	-1.00	-3.46	-5.09	-9.38	-1.56	23.48	22.50					0.03	
11-Jan-2010	20:00:00	-5.58	0.02	-3.81	-3.81	-6.28	-24.46	-0.85	-1.11	-12.25	2.80	0.68	-2.09	-3.78	-6.86	-1.31	8.06	11.79						
12-Jan-2010	08:00:00	-6.35	-0.12	-4.66	-4.92	-6.40	-24.82	-0.88	-1.72	-13.43	2.46	0.17	-2.28	-4.08	-7.44	-1.64	10.12	11.49						
12-Jan-2010	20:00:00	-5.35	0.25	-3.39	-3.91	-4.68	-25.24	-0.85	-1.14	-13.07	2.65	0.85	-1.70	-3.08	-7.11	-1.72	7.30	9.95						
13-Jan-2010	08:00:00	-8.90	-0.98	-6.95	-7.08	-8.41	-25.09	-1.41	-3.04	-15.40	1.73	-0.77	-2.84	-5.07	-8.94	-1.95	17.90	19.24						
13-Jan-2010	20:00:00	-6.23	-0.13	-4.65	-3.63	-6.62	-25.42	-0.98	-1.12	-13.70	2.58	0.59	-1.80	-3.93	-7.22	-1.99	10.17	8.83						
14-Jan-2010	08:00:00	-9.79	-1.36	-7.55	-6.51	-9.41	-25.61	-1.37	-2.92	-15.41	1.60	-0.95	-2.90	-6.02	-9.02	-2.22	13.38	14.91						
14-Jan-2010	20:00:00	-6.24	-0.08	-4.95	-3.66	-6.74	-25.89	-0.96	-0.83	-14.08	2.59	0.80	-1.66	-4.05	-7.33	-2.24	7.47	8.61						
15-Jan-2010	08:00:00	-8.57	-0.79	-6.66	-5.67	-7.95	-25.88	-1.14	-1.94	-15.20	1.97	-0.19	-2.16	-5.01	-8.40	-2.43	8.26	13.16						
15-Jan-2010	20:00:00	-6.26	-0.12	-4.27	-3.59	-5.34	-26.07	-1.01	-0.98	-14.06	2.48	1.02	-1.50	-3.38	-7.72	-2.47	5.23	8.87						
16-Jan-2010	08:00:00	-7.70	-0.52	-5.67	-4.27	-6.84	-25.94	-1.13	-1.29	-14.70	2.24	0.48	-1.67	-4.06	-8.07	-2.67	3.94	7.98				0.24	0.2	
16-Jan-2010	20:00:00	-5.33	-0.21	-2.36	-2.99	-3.52	-4.12	-0.98	-0.44	-12.63	2.64	1.56	-1.06	-2.32	-7.19	-2.66	1.86	6.48						
17-Jan-2010	08:00:00	-1.22	4.22	1.71	-2.27	0.53	1.85	3.08	0.31	-1.86	4.82	2.06	0.13	1.47	-3.33	2.58	-1.34	4.04				1.66	0.81	
17-Jan-2010	20:00:00	-1.15	2.92	1.54	-2.20	0.83	1.05	2.41	0.32	0.35	5.01	1.94	-0.12	1.00	-3.91	2.53	7.54	9.44						
18-Jan-2010	08:00:00	-1.73	1.69	0.98	-2.32	-0.23	-0.49	1.04	-0.13	-0.28	4.68	0.91	-0.82	0.26	-5.36	2.09	10.27	16.07						
18-Jan-2010	20:00:00	-2.02	1.16	0.69	-2.34	-0.63	-1.36	0.30	-0.39	-0.66	4.47	1.42	-1.04	-0.04	-5.86	10.55	18.17	20.78						
19-Jan-2010	08:00:00	-2.20	0.95	0.51	-2.56	-0.83	-1.97	-0.07	-0.43	-1.06	4.37	1.17	-1.12	-0.17	-6.11	11.12	20.64	18.11						
19-Jan-2010	20:00:00	-2.32	0.72	0.40	-2.59	-0.85	-2.71	-0.14	-0.60	-1.02	4.27	1.32	-1.22	-0.29	-6.26	9.24	14.86	17.78						
20-Jan-2010	08:00:00	-2.42	0.68	0.34	-2.91	-1.02	-4.31	-0.33	-0.64	-1.48	4.20	1.05	-1.31	-0.43	-6.44	9.99	17.56	17.69						
20-Jan-2010	20:00:00	-2.49	0.60	0.27	-2.81	-1.04	-6.94	-0.27	-0.92	-1.30	4.18	1.26	-1.38	-0.49	-6.51	11.41	16.16	16.56						
21-Jan-2010	08:00:00	-2.52	0.62	0.20	-3.15	-1.39	-4.06	-0.52	-0.95	-1.89	4.10	1.07	-1.46	-0.64	-6.68	8.16	14.41	16.69				1.07	0.31	
21-Jan-2010	20:00:00	-0.62	4.64	1.83	-2.56	0.31	1.44	2.05	0.42	-0.16	4.88	2.36	0.22	1.72	-3.22	3.26	9.70	7.87						
22-Jan-2010	08:00:00	-1.36	2.41	1.21	-2.19	0.14	0.07	1.43	0.11	0.73	4.85	1.82	-0.44	0.89	-4.65	2.69	9.19	7.84				0.13	0.04	
22-Jan-2010	20:00:00	-1.72	1.65	0.84	-2.49	-0.52	-1.07	0.65	-0.20	0.17	4.68	1.47	-0.91	0.33	-5.40	2.12	7.10	9.39						
23-Jan-2010	08:00:00	-1.87	1.34	0.61	-2.62	-0.92	-1.61	0.08	-0.34	-0.40	4.58	1.27	-1.09	0.06	-5.71	2.85	12.60	16.18						
23-Jan-2010	20:00:00	-2.05	1.03	0.47	-2.62	-0.99	-2.14	-0.16	-0.63	-0.33	4.51	1.32	-1.17	-0.11	-5.90	2.14	9.65	12.97						
24-Jan-2010	08:00:00	-2.17	0.77	0.47	-2.53	-0.91	-2.28	-0.22	-0.45	-0.27	4.46	1.14	-1.07	-0.17	-5.91	1.74	5.78	5.14				0.11	0.11	
24-Jan-2010	20:00:00	-2.08	0.91	0.70	-2.32	-0.67	1.78	0.17	-0.20	0.12	4.51	1.38	-0.76	0.16	-5.47	1.62	-4.91	-1.21						
25-Jan-2010	08:00:00	-1.03	2.55	1.33	-2.32	0.38	1.31	2.50	0.01	0.99	4.85	1.99	-0.43	1.04	-3.94	2.80	11.89	10.21				0.61	0.31	
25-Jan-2010	20:00:00	-1.66	1.55	0.80	-2.43	-0.54	-0.55	0.86	-0.46	0.53	4.60	1.63	-0.97	0.35	-5.47	8.62	18.82	22.45						
26-Jan-2010	08:00:00	-1.81	1.23	0.57	-2.56	-0.93	-1.46	0.12	-0.59	-0.21	4.46	1.08	-1.10	0.07	-5.85	14.98	14.95	17.49						
26-Jan-2010	20:00:00	-1.97	0.95	0.33	-2.67	-1.21	-2.50	-0.27	-1.40	-0.53	4.36	1.24	-1.34	-0.14	-6.15	15.20	14.86	17.25						
27-Jan-2010	08:00:00	-2.07	0.81	0.14	-2.94	-1.44	-4.14	-0.58	-1.49	-1.14	4.28	1.04	-1.48	-0.31	-6.48	15.94	15.28	17.72						
27-Jan-2010	20:00:00	-2.38	0.66	0.05	-2.71	-1.55	-7.17	-0.67	-1.48	-1.11	4.29	1.06	-1.51	-0.35	-6.51	15.35	14.51	16.74						
28-Jan-2010	08:00:00	-2.47	0.64	-0.06	-2.67	-1.48	-9.26	-0.69	-1.41	-1.26	4.22	0.98	-1.54	-0.41	-6.57	15.86	15.08	17.37						
28-Jan-2010	20:00:00	-2.44	0.60	-0.09	-2.66	-1.44	-10.93	-0.57	-1.37	-1.17	4.23	1.11	-1.41	-0.36	-6.53	16.28	16.12	17.40						
29-Jan-2010	08:00:00	-2.43	0.59	-0.27	-3.05	-1.77	-11.82	-0.69	-1.31	-1.93	4.12	1.05	-1.42	-0.47	-6.72	13.82	12.37	11.01						
29-Jan-2010	20:00:00	-2.62	0.38	-0.42	-2.93	-1.85	-11.99	-0.76	-1.52	-1.82	4.12	1.02	-1.50	-0.59	-6.73	11.45	12.20	10.25						
30-Jan-2010	08:00:00	-2.31	0.92	0.22	-2.74	-0.65	-9.83	-0.14	0.08	-1.33	4.42	1.71	-0.53	0.19	-5.15	13.86	11.29	10.05					0.28	
30-Jan-2010	20:00:00	-2.20	1.23	0.68	-2.94	-1.19	-11.47	0.20	-0.10	-1.30	4.21	1.46	-0.75	0.15	-5.54	10.51	12.29	10.21						
31-Jan-2010	08:00:00	-2.33	0.83	0.31	-3.38	-1.75	-8.43	-0.41	-0.47	-2.23	4.06	1.17	-1.18	-0.20	-6.10	16.25	18.34	16.59				0.48		
31-Jan-2010	20:00:00	-2.26	1.41	0.86	-2.78	-1.18	-9.86	0.04	0.02	-1.51	4.26	1.54	-0.61	0.37	-5.23	13.60	10.52	10.56						2.09
1-Feb-2010	08:00:00	-2.38	0.98	0.31	-3.37	-1.75	-8.67	-0.41	-0.71	-1.75	4.16	1.16	-1.28	-0.16	-6.08	14.45	15.89	15.13				0.01		
1-Feb-2010	20:00:00	-2.13	1.15	0.70	-2.62	-1.14	-9.09	-0.16	-0.18	-1.19	4.25	1.41	-0.84	0.16	-5.62	14.08	13.59	10.55						
2-Feb-2010	08:00:00	-2.00	0.97	0.72	-2.53	-0.98	-4.64	-0.12	0.03	-1.02	4.29	1.68	-0.56	0.05	-5.47	8.08	3.62	4.08				0.23	0.05	
2-Feb-2010	20:00:00	-1.63	1.44	1.00	-2.62	-0.46	-1.61	0.35	0.09	-0.61	4.36	1.71	-0.44	0.32	-5.01	5.65	1.56	2.55						
3-Feb-2010	08:00:00	-1.90	1.30	0.80	-2.73	-0.91	-1.81	0.24	-0.13	-0.91	4.32	1.32	-0.76	0.16	-5.51	8.74	4.12	5.16						
3-Feb-2010	20:00:00	-1.90	1.05	0.59	-2.70	-1.05	-2.59	-0.06	-0.44	-1.02	4.28	1.33	-1.06	-0.05	-5.85	13.11	10.00	10.74						
4-Feb-2010	08:00:00	-2.01	0.82	0.43	-3.05	-1.15	-3.90	-0.41	-0.62	-1.64	4.21	1.27	-1.22	-0.21	-6.07	9.58	9.33	8.30				0.02		
4-Feb-2010	20:00:00	-2.10	0.64	0.41	-2.72	-1.10	-5.17	-0.47	-0.42	-1.44	4.19	1.28	-1.18	-0.24	-6.07	5.49	-0.16	4.52						
5-Feb-2010	08:00:00	-1.07	1.87	1.27	-2.41	0.51	5.18	0.26	0.62	-0.60	4.56	2.41	0.32	0.91	-3.86	8.81	2.31	6.24				2.4	1.34	
5-Feb-2010	20:00:00	11.23	21.63	5.99	-1.03	15.16	28.59	18.18	0.58	4.20	7.09	28.34	18.93	2.35	11.74	4.73	0.72	7.58						
6-Feb-2010	08:00:00	-0.41	10.23	2.37	-1.63	8.76	1.72	11.51	0.06	2.14	4.92	9.05	0.23	0.85	2.97	20.38	19.60	17.24						
6-Feb-2010	20:00:00	-1.59	1.70	1.08	-2.13	0.11	-1.09	1.42	-0.09	0.76	4.63	6.38	-0.56	0.52	-4.79	21.97	20.51	17.61						

Date	Time	Water Level (inches)																		On-site Manual Raingauge	On-site Auto Raingauge	Wadesboro Daily Rainfall	Wadesboro Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	Jon AW1	Jon AW2	Jon AW3	Jon AW4	Jon AW5	Jon AW6	Jon AW7	Jon AW8	Jon AW9	Jon AW10	Jon AW11	Jon AW12	Jon AW13	Jon AW14	Jon RAW1	Jon RAW2	Jon RAW3	CG1	CG2				
7-Feb-2010	08:00:00	-1.78	1.49	0.79	-2.21	-0.34	-0.75	0.50	-0.23	-0.09	4.59	9.21	-0.79	0.31	-5.40	20.40	18.95	17.59						
7-Feb-2010	20:00:00	-1.89	1.29	0.60	-2.23	-0.50	-1.69	0.13	-0.50	-0.35	4.54	14.77	-0.93	0.17	-5.69	13.67	13.96	16.69						
8-Feb-2010	08:00:00	-1.94	1.21	0.48	-2.46	-0.67	-2.12	-0.10	-0.38	-0.86	4.45	12.41	-1.10	0.11	-5.83	12.11	13.54	16.43						
8-Feb-2010	20:00:00	-2.03	1.01	0.41	-2.37	-0.71	-3.11	-0.17	-0.71	-0.85	4.45	14.10	-0.86	0.01	-5.90	11.61	13.12	16.24						
9-Feb-2010	08:00:00	-2.09	0.94	0.42	-2.41	-0.62	-0.65	-0.20	-0.52	-1.02	4.40	7.07	-1.12	-0.03	-5.89	11.12	12.77	16.24				0.37	0.21	
9-Feb-2010	20:00:00	-1.67	1.75	1.07	-2.08	-0.01	-1.03	1.10	-0.05	0.12	4.59	2.21	-0.43	0.61	-4.82	5.07	-1.25	6.68						
10-Feb-2010	08:00:00	-1.89	1.39	0.86	-2.63	-0.41	-1.83	0.61	-0.17	-0.52	4.47	8.65	-0.89	0.31	-5.44	13.24	6.95	11.93				0.01		
10-Feb-2010	20:00:00	-2.04	1.09	0.60	-2.74	-0.64	-2.91	0.22	-0.86	-0.81	4.43	13.87	-1.07	0.07	-5.79	12.76	5.26	9.99						
11-Feb-2010	08:00:00	-2.10	0.99	0.32	-3.19	-0.80	-3.78	-0.22	-1.31	-1.58	4.40	12.79	-1.35	-0.17	-6.15	9.77	13.54	14.49						
11-Feb-2010	20:00:00	-2.13	0.93	0.36	-2.63	-0.75	-5.72	-0.28	-1.19	-1.36	4.27	12.76	-1.23	-0.14	-6.05	11.52	8.52	10.29						
12-Feb-2010	08:00:00	-2.15	0.87	0.19	-2.97	-0.91	-7.65	0.17	-1.09	-1.95	4.15	12.15	-1.40	-0.22	-6.22	10.57	7.61	8.24					0.11	
12-Feb-2010	20:00:00	-2.15	0.87	0.27	-2.64	-0.67	-8.87	0.04	-0.71	-1.54	4.00	10.95	-1.01	-0.14	-6.01	6.10	4.90	3.74						
13-Feb-2010	08:00:00	-2.06	1.02	0.51	-2.95	-0.60	-6.77	-0.55	-0.18	-1.76	3.98	9.61	-0.95	-0.02	-5.75	8.33	5.77	6.09				0.24		
13-Feb-2010	20:00:00	-1.91	1.36	0.76	-2.81	-0.52	-7.17	-0.58	-0.07	-1.38	4.06	14.15	-0.54	0.23	-5.44	12.00	9.35	8.04						
14-Feb-2010	08:00:00	-2.10	0.96	0.34	-4.02	-0.92	-6.81	-0.58	-0.92	-1.88	3.89	16.86	-1.27	-0.27	-6.04	14.16	14.01	12.70						
14-Feb-2010	20:00:00	-2.08	0.98	0.51	-2.85	-0.68	-6.56	-0.58	-0.50	-1.52	3.91	13.21	-0.96	-0.10	-5.83	9.43	10.46	11.25						
15-Feb-2010	08:00:00	-2.15	0.75	0.48	-2.82	-0.55	-5.74	-0.58	-0.42	-1.58	3.95	5.30	-0.99	-0.17	-5.86	8.34	7.18	11.55				0.11	0.01	
15-Feb-2010	20:00:00	-1.96	1.18	0.76	-2.85	-0.21	-4.98	-0.58	-0.13	-1.28	3.96	13.66	-0.64	0.19	-5.44	3.18	4.71	7.01						
16-Feb-2010	08:00:00	-2.09	0.90	0.50	-3.59	-0.67	-5.30	-0.58	-0.48	-1.94	3.79	13.87	-1.01	-0.14	-5.90	4.92	10.34	7.96						
16-Feb-2010	20:00:00	-2.17	0.84	0.47	-3.29	-0.67	-6.72	-0.58	-0.76	-1.75	3.72	14.18	-1.06	-0.19	-5.90	6.85	8.85	9.17						
17-Feb-2010	08:00:00	-2.29	0.63	0.15	-4.78	-0.88	-9.18	-0.58	-1.74	-2.25	3.74	14.87	-1.46	-0.55	-6.29	7.07	10.59	12.99						
17-Feb-2010	20:00:00	-2.27	0.69	0.28	-3.44	-0.66	-10.86	-0.58	-1.17	-2.03	3.68	10.75	-1.25	-0.27	-6.10	5.27	6.36	10.01						
18-Feb-2010	08:00:00	-2.35	0.53	-0.11	-4.98	-1.07	-11.37	-0.58	-1.78	-2.79	3.55	12.66	-1.57	-0.70	-6.47	0.67	10.79	12.23						
18-Feb-2010	20:00:00	-2.37	0.55	0.01	-3.43	-0.76	-12.51	-0.58	-1.46	-2.34	3.56	1.52	-1.44	-0.40	-6.26	1.18	7.81	9.16						
19-Feb-2010	08:00:00	-2.45	0.46	-0.35	-4.67	-1.11	-13.01	-0.58	-1.68	-3.09	3.33	0.27	-1.65	-0.74	-6.53	0.39	8.88	12.58						
19-Feb-2010	20:00:00	-2.49	0.47	-0.36	-3.60	-0.90	-14.09	-0.58	-1.57	-2.47	3.28	1.15	-1.57	-0.54	-6.44	6.65	6.63	7.35						
20-Feb-2010	08:00:00	-2.56	0.32	-0.72	-4.59	-1.16	-14.86	-0.58	-1.65	-3.16	3.07	0.82	-1.72	-0.85	-6.62	0.45	8.96	10.82						
20-Feb-2010	20:00:00	-2.60	0.27	-0.74	-3.52	-0.96	-16.12	-0.58	-1.60	-2.53	3.07	1.06	-1.68	-0.76	-6.53	5.04	7.18	8.56						
21-Feb-2010	08:00:00	-2.67	0.23	-1.04	-4.16	-1.19	-16.63	-0.58	-1.44	-3.14	2.92	0.92	-1.68	-0.94	-6.69	4.29	6.71	8.91						
21-Feb-2010	20:00:00	-2.77	0.00	-1.12	-3.32	-0.99	-3.87	-0.58	-1.61	-2.40	2.99	1.08	-1.70	-0.91	-6.55	7.09	6.60	6.38						
22-Feb-2010	08:00:00	-1.52	2.48	1.12	-2.63	0.65	-2.05	1.38	0.18	-1.07	3.52	2.19	0.00	0.67	-4.29	-2.44	0.82	0.00	1.8	1.6		0.61	0.23	
22-Feb-2010	20:00:00	-1.88	1.73	0.92	-2.59	0.48	-2.30	0.58	-0.06	-0.35	3.43	1.68	-0.46	0.46	-4.47	-4.66	-1.62							
23-Feb-2010	08:00:00	-2.03	1.39	0.77	-2.94	0.31	-2.73	0.01	-0.18	-0.39	3.30	1.46	-0.70	0.23	-5.05	0.42	2.29						0.02	
23-Feb-2010	20:00:00	-2.18	1.17	0.63	-2.83	0.29	-3.28	-0.12	-0.42	-0.32	3.20	1.75	-0.85	0.08	-5.32	2.94	4.01							
24-Feb-2010	08:00:00	-2.20	1.12	0.56	-3.27	0.08	-3.00	0.95	-0.44	-0.79	3.07	1.43	-0.90	-0.02	-5.44	6.43	7.78					0.11	0.01	
24-Feb-2010	20:00:00	-2.19	1.21	0.73	-2.85	0.31	-3.26	0.64	-0.15	-0.68	3.13	1.61	-0.57	0.21	-5.11	6.78	7.13							
25-Feb-2010	08:00:00	-2.11	1.26	0.75	-3.10	0.17	-3.85	-0.06	-0.05	-0.94	3.06	1.45	-0.67	0.18	-5.18	7.00	7.58					0.03	0.01	
25-Feb-2010	20:00:00	-2.26	1.04	0.49	-3.97	-0.28	-5.56	-0.12	-0.90	-1.17	2.96	1.36	-1.02	-0.11	-5.54	7.83	9.06							
26-Feb-2010	08:00:00	-2.38	0.71	0.32	-4.52	-0.27	-7.69	-0.16	-1.25	-1.46	2.91	1.29	-1.14	-0.25	-5.73	1.13	2.85							
26-Feb-2010	20:00:00	-2.47	0.73	0.28	-3.74	-0.31	-10.41	-0.20	-1.47	-1.33	2.94	1.27	-1.24	-0.27	-5.73	2.93	8.59							
27-Feb-2010	08:00:00	-2.54	0.59	0.06	-4.34	-0.43	-11.43	-0.15	-1.40	-1.87	2.88	0.98	-1.24	-0.36	-5.94	0.81	8.35							
27-Feb-2010	20:00:00	-2.56	0.67	0.04	-3.65	-0.43	-12.59	-0.15	-1.48	-1.69	2.85	1.15	-1.38	-0.26	-5.89	4.48	3.98							
28-Feb-2010	08:00:00	-2.56	0.71	-0.11	-4.46	-0.65	-13.53	-0.13	-1.23	-2.48	2.74	0.77	-1.41	-0.36	-6.00	5.85	4.89							
28-Feb-2010	20:00:00	-2.68	0.51	-0.38	-4.82	-0.86	-14.73	-0.13	-1.84	-2.65	2.68	1.03	-1.60	-0.51	-6.18	5.08	10.13							1.99
1-Mar-2010	08:00:00	-2.78	0.38	-0.67	-5.22	-1.19	-15.54	-0.13	-1.45	-3.83	2.64	0.66	-1.54	-0.80	-6.35	0.17	6.80							
1-Mar-2010	20:00:00	-2.91	0.29	-0.77	-4.08	-1.03	-16.52	-0.12	-1.57	-3.91	2.71	1.15	-1.67	-0.82	-6.28	5.18	8.97							
2-Mar-2010	08:00:00	-2.94	0.28	-0.84	-3.83	-0.91	-12.64	-0.08	-1.19	-4.43	2.68	1.08	-1.59	-0.83	-6.15	-1.03	1.51					0.35	0.22	
2-Mar-2010	20:00:00	-2.10	1.17	0.55	-2.37	0.56	-8.97	-0.10	0.24	-1.34	3.07	1.92	-0.12	0.46	-4.22	-2.46	1.81							
3-Mar-2010	08:00:00	-1.87	1.63	0.88	-2.99	0.22	-3.09	0.41	0.15	-1.12	2.97	1.66	-0.32	0.52	-4.58	1.05	4.80							
3-Mar-2010	20:00:00	-2.10	1.37	0.70	-3.16	-0.07	-3.28	0.36	-0.07	-0.98	2.94	1.72	-0.69	0.27	-5.11	0.63	3.21							
4-Mar-2010	08:00:00	-2.15	1.18	0.59	-3.69	-0.31	-3.87	2.14	-0.21	-1.45	2.90	1.34	-0.86	0.05	-5.44	4.01	7.07							
4-Mar-2010	20:00:00	-2.28	1.05	0.40	-3.75	-0.46	-6.16	1.70	-0.94	-1.30	2.85	1.56	-1.13	-0.08	-5.61	8.05	9.26							
5-Mar-2010	08:00:00	-2.34	0.86	0.18	-4.74	-0.74	-9.07	1.12	-1.12	-2.21	2.79	1.11	-1.17	-0.24	-5.89	1.47	9.79							
5-Mar-2010	20:00:00	-2.48	0.78	0.09	-4.28	-0.77	-11.46	0.83	-1.55	-2.11	2.75	1.44	-1.38	-0.28	-5.90	5.21	7.39							
6-Mar-2010	08:00:00	-2.55	0.63	-0.17	-4.82	-1.06	-12.20	0.63	-1.29	-3.33	2.71	0.91	-1.33	-0.46	-6.08	1.06	8.13							
6-Mar-2010	20:00:00	-2.64	0.47	-0.30	-4.13	-1.05	-13.51	0.47	-1.67	-3.65	2.71	1.27	-1.55	-0.47	-6.10	4.90	11.37							
7-Mar-2010	08:00:00	-2.68	0.38	-0.66	-5.02	-1.35	-13.97	0.27	-1.41	-5.32	2.66	0.71	-1.48	-0.73	-6.29	0.68	9.11							
7-Mar-2010	20:00:00	-2.80	0.28	-0.72	-3.78	-1.09	-15.50	0.18	-1.61	-4.77	2.70	1.26	-1.62	-0.69	-6.19	6.84	8.57							
8-Mar-2010	08:00:00	-2.79	0.32	-1.01	-4.50	-1.24	-16.35	0.13	-1.20	-5.99	2.63	0.13	-1.57	-0.79	-6.32	4.41	4.96							
8-Mar-2010	20:00:00	-2.89	0.23	-1.24	-3.84	-1.14	-17.59	0.14	-1.63	-5.80	2.61	1.14	-1.71	-0.83	-6.29	3.82	6.51							
9-Mar-2010	08:00:00	-2.92	0.22	-1.45	-4.58	-1.28	-18.12	0.18	-1.24	-6.73	2.56	0.31	-1.73	-0.93	-6.41	4.42	5.43							
9-Mar-2010	20:00:00	-3.10	0.09	-1.76	-3.95	-1.33	-18.96	0.24	-1.63	-6.79	2.49	1.08	-1.77	-1.02	-6.41	0.12	6.99							
10-Mar-2010	08:00:00	-3.09	0.20	-1.90	-4.39	-1.38	-19.33	0.28	-1.23	-7.60	2.43	0.78	-1.72	-1.01	-6.44	-1.55	5.31					0.24		
10-Mar-2010	20:00:00	-3.08	0.13	-1.62	-3.43	-1.18	-19.71	0.17	-0.94	-7.58	2.45	1.09	-1.59	-0.97	-6.26	3.75	5.07							
11-Mar-2010	08:00:00	-3.19	0.05	-1.76	-3.65	-1.18	-18.39	0.03	-1.02	-7.76	2.36	0.81	-1.46	-0.86	-6.21	-0.23	7.24					0.17	0.08	
11-Mar-2010	20:00:00	-2.82	0.55	-0.53	-2.64	-0.40	-17.87	-0.04	-0.10	-4.95	2.71	1.55	-0.61	0.04	-5.19	0.70	0.76							
12-Mar-2010	08:00:00	-2.84	0.45	-0.53	-2.76	-0.69	-17.87	-0.12	-0.33	-4.66	2.50	1.44	-0.74	-0.13	-5.36	1.52	0.05					1.03	0.3	
12-Mar-2010	20:00:00	-2.69	0.42	-0.52	-2.58	-0.59	1.66	-0.17	-0.48	-4.06	2.52	1.61	-0.78	-0.09	-5.25	0.86	0.16							
13-Mar-2010	08:00:00	-1.87	1.88	1.01	-2.33	0.91	-0.41	0.58	-0.02	0.12	3.37	1.36	-0.35	0.67	-3.98	2.50	8.04					0.1	0.01	
13-Mar-2010	20:00:00	-2.21	1.34	0.70	-2.46	0.19	-1.47	0.59	-0.37	0.11	3.20	2.11	-0.62	0.33	-4.86	2.36	13.07							
14-Mar-2010	08:00:00	-2.24	1.26	0.66	-2.87	-0.10	-2.40	0.59	-0.14	-0.46	3.06	1.34	-0.58	0.29	-5.01	2.08	10.83					0.04	0.01	
14-Mar-2010	20:00:00	-2.37	1.08	0.43	-2.86	-0.37	-3.48	0.47	-0.88	-0.53	2.96	1.75	-0.81	0.12	-5.29	1.81	5.55							
15-Mar-2010	08:00:00	-2.42	1.01	0.37	-3.17	-0.49	-5.47	0.27	-0.77	-0.92	2.90	0.71	-0.85	0.05	-5.40	1.64	7.55							
15-Mar-2010	20:00:00	-2.55	0.92	0.16	-3.50	-0.69	-8.56	0.18	-1.53	-1.01	2.80	1.42	-1.07	-0.09	-5.62	1.43	6.02							

Date	Time	Water Level (inches)																		On-site Manual Raingauge	On-site Auto Raingauge	Wadesboro Daily Rainfall	Wadesboro Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	Jon AW1	Jon AW2	Jon AW3	Jon AW4	Jon AW5	Jon AW6	Jon AW7	Jon AW8	Jon AW9	Jon AW10	Jon AW11	Jon AW12	Jon AW13	Jon AW14	Jon RAW1	Jon RAW2	Jon RAW3	CG1	CG2				
16-Mar-2010	08:00:00	-2.64	0.78	0.02	-3.79	-0.92	-10.62	0.13	-1.33	-1.51	2.76	0.80	-1.15	-0.10	-5.73	1.23	8.21							
16-Mar-2010	20:00:00	-2.72	0.67	-0.15	-3.55	-0.99	-11.83	0.14	-1.42	-1.52	2.69	1.36	-1.21	-0.20	-5.82	1.03	3.10							
17-Mar-2010	08:00:00	-2.84	0.36	-0.27	-3.77	-1.10	-12.52	0.18	-1.25	-1.83	2.66	0.53	-1.20	-0.20	-5.89	3.35	8.52							
17-Mar-2010	20:00:00	-2.98	0.19	-0.40	-3.13	-1.11	-13.49	0.24	-1.36	-1.47	2.68	1.41	-1.17	-0.23	-5.85	3.79	2.98							
18-Mar-2010	08:00:00	-2.96	0.37	-0.46	-3.45	-1.19	-14.48	0.30	-1.12	-1.70	2.61	0.95	-1.11	-0.14	-5.83	2.90	5.77							
18-Mar-2010	20:00:00	-2.96	0.23	-0.56	-3.27	-1.18	-16.02	0.17	-1.28	-1.68	2.49	1.55	-1.09	-0.13	-5.86	3.60	4.94							
19-Mar-2010	08:00:00	-3.05	0.16	-0.79	-4.14	-1.53	-17.14	0.03	-1.24	-2.37	2.40	0.18	-1.17	-0.21	-6.01	3.09	5.10							
19-Mar-2010	20:00:00	-3.25	0.00	-1.27	-4.01	-1.83	-18.28	-0.04	-1.94	-3.14	2.18	1.17	-1.34	-0.42	-6.29	0.15	8.91							
20-Mar-2010	08:00:00	-3.35	-0.03	-1.52	-4.55	-2.10	-18.91	-0.17	-1.56	-4.56	2.22	-0.55	-1.44	-0.59	-6.40	-0.01	2.85							
20-Mar-2010	20:00:00	-3.59	-0.17	-2.09	-4.07	-2.33	-19.74	-0.17	-2.12	-4.81	2.05	0.89	-1.61	-0.81	-6.62	-0.16	7.84							
21-Mar-2010	08:00:00	-3.70	-0.25	-2.32	-4.47	-2.51	-16.86	0.58	-1.63	-5.76	2.09	0.42	-1.63	-0.92	-6.69	-0.28	7.89					0.28	0.16	
21-Mar-2010	20:00:00	-2.93	0.13	-0.20	-2.69	-1.10	-17.21	0.59	-0.02	-1.61	2.81	1.60	-0.38	0.44	-4.26	0.54	1.92							
22-Mar-2010	08:00:00	-2.92	-0.24	-0.19	-3.57	-1.84	-16.69	0.58	-0.54	-1.62	2.42	1.21	-0.69	0.07	-5.11	0.54	2.68	-0.50	0	0	1			
22-Mar-2010	20:00:00	-2.96	-0.27	-0.13	-3.80	-2.10	-17.81	0.56	-1.25	-1.86	2.36	1.68	-0.71	0.03	-5.33	0.36	1.86	-0.16						
23-Mar-2010	08:00:00	-3.05	-0.54	-0.01	-4.40	-2.36	-18.89	0.43	-1.38	-2.45	2.25	1.08	-0.82	-0.04	-5.47	3.79	5.31	3.27						
23-Mar-2010	20:00:00	-3.21	-0.76	-0.32	-5.11	-2.81	-20.03	0.24	-2.29	-3.69	2.03	1.42	-1.04	-0.24	-5.79	-0.08	1.46	-0.60						
24-Mar-2010	08:00:00	-3.31	-0.96	-0.57	-5.71	-3.11	-20.40	0.08	-1.89	-5.04	1.98	-0.29	-1.19	-0.41	-5.97	-0.28	1.28	-0.80						
24-Mar-2010	20:00:00	-3.59	-1.14	-0.93	-5.03	-3.22	-20.97	-0.08	-2.45	-5.24	1.84	0.98	-1.33	-0.63	-6.11	-0.40	1.19	-0.92						
25-Mar-2010	08:00:00	-3.69	-1.13	-1.13	-5.42	-3.24	-20.92	-0.09	-1.92	-6.18	1.91	1.02	-1.36	-0.76	-6.22	-0.53	1.08	-1.05						
25-Mar-2010	20:00:00	-3.90	-1.19	-1.32	-4.52	-3.11	-21.38	-0.02	-2.35	-5.82	1.87	1.10	-1.40	-0.83	-6.22	-0.55	1.08	-1.07						
26-Mar-2010	08:00:00	-3.84	-1.06	-1.34	-4.78	-3.23	-22.45	0.12	-1.81	-6.38	2.03	0.95	-1.50	-0.82	-6.26	-0.66	0.99	-1.18				0.02		
26-Mar-2010	20:00:00	-4.10	-1.11	-2.08	-6.17	-3.73	-23.20	-0.20	-1.84	-7.71	1.78	0.61	-1.63	-0.99	-6.57	-0.85	0.82	-1.37						
27-Mar-2010	08:00:00	-4.39	-1.26	-2.90	-7.15	-4.65	-23.34	-0.38	-2.16	-10.24	1.63	0.52	-1.84	-1.19	-6.98	-1.08	0.61	-1.60						
27-Mar-2010	20:00:00	-4.81	-1.60	-4.04	-6.93	-5.65	-23.39	-0.57	-2.90	-11.20	1.19	0.42	-2.03	-1.43	-7.33	-1.26	0.45	-1.78						
28-Mar-2010	08:00:00	-4.89	-1.76	-3.92	-5.92	-5.69	-22.37	-0.68	-2.15	-11.25	0.97	1.43	-1.10	-1.43	-7.08	-1.36	0.37	-1.88				0.09	0.03	
28-Mar-2010	20:00:00	-4.16	-1.25	-1.70	-3.01	-4.09	-0.54	-0.21	-1.14	-7.60	1.92	1.11	-1.42	-0.85	-6.08	-0.15	1.61	-0.67						
29-Mar-2010	08:00:00	-2.20	0.59	0.92	-2.77	-2.48	-1.30	1.86	-0.17	-1.31	2.95	1.94	-0.10	0.81	-3.82	1.94	3.72	1.42				0.93		
29-Mar-2010	20:00:00	-2.65	-0.22	0.56	-2.75	-3.20	-2.38	0.90	-0.57	-0.64	2.76	1.66	-0.44	0.35	-4.79	1.83	3.63	1.31						
30-Mar-2010	08:00:00	-2.81	-0.39	0.39	-3.71	-3.78	-3.99	0.40	-0.65	-1.17	2.66	1.49	-0.70	0.16	-5.10	1.61	3.43	1.09						
30-Mar-2010	20:00:00	-3.02	-0.42	0.06	-3.91	-3.92	-7.75	0.08	-2.31	-1.27	2.56	1.32	-1.08	-0.12	-5.51	1.29	3.13	0.77						
31-Mar-2010	08:00:00	-3.18	-0.50	-0.10	-4.80	-4.25	-11.07	-0.17	-2.07	-2.26	2.51	1.24	-1.27	-0.23	-5.69	1.04	2.90	0.52						
31-Mar-2010	20:00:00	-3.37	-0.69	-0.44	-4.46	-4.76	-12.70	-0.43	-3.01	-3.17	2.38	1.05	-1.50	-0.48	-6.08	0.73	2.61	0.21						0.81
1-Apr-2010	08:00:00	-3.47	-0.70	-0.68	-5.10	-4.87	-13.95	-0.60	-2.40	-4.28	2.31	0.99	-1.64	-0.69	-6.25	3.82	5.72	3.30						
1-Apr-2010	20:00:00	-3.79	-0.87	-1.17	-4.54	-5.22	-15.81	-0.78	-3.43	-4.64	2.05	0.84	-1.89	-0.97	-6.69	3.72	5.65	3.20						
2-Apr-2010	08:00:00	-3.92	-0.85	-1.44	-5.36	-5.61	-17.64	-0.91	-2.69	-5.96	2.10	0.73	-2.03	-1.08	-6.90	2.45	4.40	1.93						
2-Apr-2010	20:00:00	-4.29	-1.06	-2.34	-5.25	-6.32	-19.12	-1.11	-3.87	-6.67	1.73	0.50	-2.38	-1.39	-7.47	-0.14	1.83	-0.66						
3-Apr-2010	08:00:00	-4.46	-1.14	-2.76	-5.99	-6.95	-20.07	-1.16	-3.02	-7.91	1.76	0.53	-2.45	-1.49	-7.61	-0.34	1.65	-0.86						
3-Apr-2010	20:00:00	-4.74	-1.33	-3.90	-5.76	-7.54	-21.12	-1.28	-3.87	-8.79	1.52	0.24	-2.88	-1.75	-8.11	-0.55	1.46	-1.07						
4-Apr-2010	08:00:00	-4.90	-1.38	-4.68	-6.59	-8.33	-21.85	-1.28	-2.73	-10.75	1.34	0.07	-3.10	-1.83	-8.26	-0.73	1.30	-1.25						
4-Apr-2010	20:00:00	-5.43	-1.79	-6.52	-6.58	-9.09	-22.60	-1.51	-4.54	-11.85	0.86	-0.20	-3.72	-2.21	-9.20	-0.99	1.06	-1.51						
5-Apr-2010	08:00:00	-5.67	-1.97	-7.47	-7.25	-10.08	-23.16	-1.54	-3.36	-13.47	0.57	-0.33	-3.95	-2.31	-9.28	-1.19	0.88	-1.71						
5-Apr-2010	20:00:00	-6.57	-2.66	-9.08	-7.25	-11.25	-23.66	-1.73	-5.22	-13.82	0.15	-0.89	-5.31	-2.86	-10.58	-1.53	0.57	-2.05						
6-Apr-2010	08:00:00	-6.82	-2.78	-10.26	-7.21	-12.24	-24.29	-1.78	-3.90	-14.93	-0.03	-0.81	-5.60	-2.92	-10.29	-1.76	0.36	-2.28						
6-Apr-2010	20:00:00	-8.32	-4.05	-12.27	-8.26	-13.88	-24.79	-1.96	-6.24	-15.55	-0.60	-2.20	-8.26	-3.91	-12.37	-2.34	-0.20	-2.86						
7-Apr-2010	08:00:00	-8.62	-4.22	-13.77	-8.05	-15.22	-25.36	-2.01	-4.44	-16.88	-0.95	-2.02	-8.86	-3.99	-12.20	-2.64	-0.48	-3.16						
7-Apr-2010	20:00:00	-10.19	-5.73	-15.12	-8.45	-16.41	-25.67	-2.22	-7.09	-17.22	-1.67	-3.35	-11.66	-5.49	-14.06	-3.46	-1.28	-3.98						
8-Apr-2010	08:00:00	-10.25	-5.79	-16.07	-7.88	-17.63	-26.11	-2.27	-4.85	-18.02	-1.95	-3.08	-12.37	-5.39	-13.44	-3.76	-1.56	-4.28				0.18	0.04	
8-Apr-2010	20:00:00	-10.36	-6.82	-16.55	-8.32	-18.58	-26.15	-2.30	-6.24	-17.97	-2.63	-3.32	-13.08	-6.73	-14.98	-4.69	-2.47	-5.21						
9-Apr-2010	08:00:00	-6.59	-2.42	-12.64	-6.24	-13.13	-26.59	-1.81	-1.69	-15.49	-0.41	-0.54	-7.41	-2.88	-8.40	-4.21	-1.97	-4.73				0.03		
9-Apr-2010	20:00:00	-10.14	-4.28	-15.41	-8.14	-15.72	-27.19	-2.04	-4.51	-17.16	-1.38	-2.47	-12.43	-4.58	-11.73	-5.78	-3.51	-6.30						
10-Apr-2010	08:00:00	-11.94	-5.44	-17.94	-9.67	-18.75	-27.49	-2.19	-4.30	-19.59	-2.32	-3.55	-14.36	-5.16	-13.57	-6.45	-4.16	-6.97						
10-Apr-2010	20:00:00	-13.99	-7.93	-18.67	-9.49	-20.65	-27.75	-2.56	-6.56	-19.95	-4.15	-5.58	-17.09	-7.25	-16.11	-4.00	-1.69	-4.52						
11-Apr-2010	08:00:00	-14.59	-8.55	-19.67	-9.89	-22.26	-28.05	-2.63	-5.11	-20.90	-5.53	-5.71	-17.93	-7.53	-16.71	-6.68	-4.35	-7.20						
11-Apr-2010	20:00:00	-16.20	-10.44	-19.53	-9.59	-23.29	-28.32	-2.97	-7.86	-20.64	-7.11	-7.38	-19.24	-9.54	-18.22	-3.97	-1.62	-4.49						
12-Apr-2010	08:00:00	-16.87	-10.92	-20.57	-10.21	-24.38	-28.77	-2.96	-5.87	-21.76	-8.33	-7.35	-19.72	-10.04	-18.63	-5.88	-3.51	-6.40						
12-Apr-2010	20:00:00	-18.91	-12.72	-20.95	-10.75	-25.22	-29.07	-3.25	-9.44	-22.17	-9.92	-9.01	-20.53	-12.98	-20.44	-6.41	-4.02	-6.93						
13-Apr-2010	08:00:00	-19.90	-13.16	-22.11	-12.23	-26.29	-29.46	-3.27	-7.05	-23.48	-11.04	-8.81	-21.01	-13.70	-20.95	-7.00	-4.59	-7.52						
13-Apr-2010	20:00:00	-21.65	-14.45	-22.07	-12.41	-26.82	-29.89	-3.69	-11.18	-23.45	-12.26	-10.07	-21.43	-16.74	-22.21	-10.67	-8.24	-11.19						
14-Apr-2010	08:00:00	-22.49	-14.97	-23.45	-14.63	-27.82	-30.10	-3.69	-8.66	-25.16	-13.35	-9.94	-22.02	-17.54	-22.85	-10.33	-7.87	-10.85						
14-Apr-2010	20:00:00	-23.27	-15.35	-23.70	-14.38	-28.31	-30.23	-3.96	-8.66	-25.25	-14.06	-10.14	-22.34	-18.70	-23.11	-15.10	-12.62	-15.62						
15-Apr-2010	08:00:00	-23.70	-15.26	-23.80	-14.91	-28.62	-30.43	-4.03	-6.97	-25.51	-14.80	-9.66	-22.62	-18.84	-22.74	-12.43	-9.93	-12.95						
15-Apr-2010	20:00:00	-24.53	-16.01	-23.07	-13.91	-28.34	-30.55	-4.31	-10.94	-24.89	-15.48	-10.65	-22.65	-20.10	-23.47	-17.42	-14.90	-17.94						
16-Apr-2010	08:00:00	-24.70	-15.90	-23.22	-15.15	-28.59	-30.86	-4.42	-7.98	-25.47	-16.20	-9.75	-22.79	-20.03	-23.21	-15.99	-13.45	-16.51						
16-Apr-2010	20:00:00	-25.54	-16.81	-22.52	-14.52	-28.27	-31.00	-4.96	-12.49	-24.80	-16.66	-10.92	-22.69	-20.94	-23.77	-17.43	-14.87	-17.95						
17-Apr-2010	08:00:00	-25.60	-16.61	-22.88	-15.82	-28.67	-31.62	-4.99	-9.37	-25.89	-17.25	-10.39	-22.88	-20.84	-23.81	-16.87	-14.29	-17.39						
17-Apr-2010	20:00:00	-26.63	-17.81	-23.30	-16.43	-29.22	-32.00	-5.86	-14.86	-26.39	-17.93	-11.96	-23.13	-21.90	-24.69	-22.56	-19.96	-23.08						
18-Apr-2010	08:00:00	-27.15	-18.39	-24.87	-18.45	-30.54	-32.48	-6.08	-12.83	-28.40	-18.90	-11.65	-23.69	-22.55	-25.89	-18.83	-16.20	-19.35						
18-Apr-2010	20:00:00	-28.10	-19.20	-25.30	-18.18	-31.17	-32.67	-7.69	-18.18	-28.75	-19.55	-12.89	-24.06	-23.10	-25.98	-22.00	-19.35	-22.52						
19-Apr-2010	08:00:00	-28.64	-19.61	-26.17	-19.57	-32.01	-33.01	-8.69	-15.43	-29.83	-20.34	-12.07	-24.54	-23.42	-26.75	-22.47	-19.80	-22.99						
19-Apr-2010	20:00:00	-29.21	-19.90	-26.13	-18.56	-32.22	-33.18	-11.39	-19.51	-29.69	-20.76	-13.09	-24.78	-23.59	-26.54	-25.03	-22.34	-25.55						
20-Apr-2010	08:00:00	-29.60	-20.22	-26.57	-19.53	-32.63	-33.52	-12.00	-15.95	-30.47	-21.22	-12.13	-25.05	-23.58	-27.03	-23.62	-20.91	-24.14				0.04	0.02	
20-Apr-2010	20:00:00	-29.99	-20.49	-26.58	-18.81	-32.83	-33.43	-13.18	-18.54	-30.50	-21.50	-11.96	-25.21	-23.67	-26.87	-23.12	-20.39	-23.64						
21-Apr-2010	08:00:00	-29.08	-19.52	-26.55	-18.31	-32.54	-33.80	-11.78	-12.94	-30.46	-21.23	-11.00	-25.30	-23.11	-26.42	-25.30	-22.55	-25.82				0.02	0.01	
21-Apr-2010	20:00:00	-29.76	-19.34	-26.52	-17.94	-32.46	-34.00	-14.57	-15.88	-30.78	-21.11	-12.02	-25.46	-23.10	-26.09	-31.75	-28.98	-32.27						

Date	Time	Water Level (inches)																		On-site Manual Raingauge	On-site Auto Raingauge	Wadesboro Daily Rainfall	Wadesboro Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	Jon AW1	Jon AW2	Jon AW3	Jon AW4	Jon AW5	Jon AW6	Jon AW7	Jon AW8	Jon AW9	Jon AW10	Jon AW11	Jon AW12	Jon AW13	Jon AW14	Jon RAW1	Jon RAW2	Jon RAW3	CG1	CG2				
22-Apr-2010	08:00:00	-30.36	-20.11	-27.28	-19.48	-33.18	-34.52	-15.20	-14.24	-31.92	-21.69	-12.11	-25.79	-23.47	-27.06	-30.19	-27.39	-30.71						
22-Apr-2010	20:00:00	-30.98	-20.81	-27.71	-19.19	-33.60	-34.64	-17.34	-20.73	-32.22	-22.16	-13.92	-26.03	-24.03	-27.32	-30.40	-27.58	-30.92						
23-Apr-2010	08:00:00	-31.13	-21.37	-28.33	-20.41	-34.20	-35.22	-17.46	-16.86	-33.15	-22.61	-12.93	-26.34	-24.13	-27.87	-31.12	-28.28	-31.64						
23-Apr-2010	20:00:00	-31.65	-21.74	-28.50	-20.02	-34.50	-35.29	-19.49	-21.72	-33.34	-23.00	-14.39	-26.59	-24.52	-28.08	-31.54	-28.68	-32.06						
24-Apr-2010	08:00:00	-32.00	-21.54	-29.03	-20.80	-34.79	-35.53	-19.08	-17.51	-34.13	-23.33	-13.17	-26.88	-24.51	-28.44	-32.12	-29.24	-32.64				0.04	0.05	
24-Apr-2010	20:00:00	-32.46	-21.69	-28.98	-20.31	-34.89	-35.10	-20.06	-19.09	-34.00	-23.52	-13.14	-27.05	-24.64	-28.43	-32.43	-29.53	-32.95						
25-Apr-2010	08:00:00	-31.40	-20.79	-27.80	-19.19	-34.10	-35.62	-14.17	-8.40	-33.19	-22.98	-9.94	-26.90	-23.69	-27.57	-32.93	-30.01	-33.45				0.13	0.07	
25-Apr-2010	20:00:00	-30.33	-19.56	-26.79	-17.76	-32.73	-35.42	-17.32	-13.22	-32.52	-21.94	-11.45	-26.72	-23.06	-26.48	-33.18	-30.24	-33.70						
26-Apr-2010	08:00:00	-30.71	-19.48	-26.90	-18.01	-32.32	-36.22	-17.19	-11.62	-33.11	-21.52	-11.47	-26.75	-22.72	-25.82	-33.61	-30.64	-34.13						
26-Apr-2010	20:00:00	-32.06	-20.31	-27.46	-19.05	-32.82	-36.30	-20.69	-19.33	-34.09	-21.84	-13.92	-27.02	-23.60	-26.48	-33.94	-30.95	-34.46						
27-Apr-2010	08:00:00	-32.75	-21.49	-28.77	-21.12	-34.13	-36.67	-21.10	-16.62	-35.62	-22.69	-13.84	-27.40	-24.29	-27.77	-34.37	-31.36	-34.89				0.36	0.35	
27-Apr-2010	20:00:00	-32.77	-21.84	-29.40	-21.20	-35.00	-37.38	-16.71	-6.15	-36.16	-23.21	-7.99	-27.77	-24.90	-28.47	-34.71	-31.68	-35.23						
28-Apr-2010	08:00:00	-29.56	-20.20	-31.40	-20.06	-34.64	-37.10	-16.89	-8.37	-37.32	-20.59	-11.93	-28.52	-25.72	-28.62	-35.05	-32.00	-28.00	0	0	1.78			
28-Apr-2010	20:00:00	-30.19	-20.11	-31.64	-19.44	-34.32	-37.10	-18.42	-10.47	-37.00	-20.94	-12.91	-28.78	-25.68	-28.28	-35.32	-32.33	-28.27						
29-Apr-2010	08:00:00	-31.29	-20.79	-32.36	-20.95	-34.44	-37.38	-19.26	-10.51	-37.43	-21.81	-13.15	-29.25	-25.84	-28.54	-35.82	-32.89	-28.77						
29-Apr-2010	20:00:00	-32.50	-21.26	-31.85	-19.85	-33.95	-37.38	-21.51	-16.85	-37.26	-22.26	-14.43	-29.45	-25.66	-28.30	-36.24	-33.38	-29.19						
30-Apr-2010	08:00:00	-33.25	-22.04	-32.08	-21.35	-34.35	-37.88	-22.01	-14.61	-37.97	-22.75	-14.14	-29.75	-25.57	-28.73	-36.70	-33.90	-29.65						
30-Apr-2010	20:00:00	-33.95	-22.55	-31.54	-21.08	-34.36	-37.86	-23.12	-21.18	-38.29	-23.17	-15.40	-29.86	-25.67	-28.96	-37.14	-34.40	-30.09						0.54
1-May-2010	08:00:00	-34.39	-23.11	-32.02	-22.47	-34.80	-38.43	-23.53	-17.30	-39.05	-23.53	-14.71	-30.09	-25.75	-29.38	-37.60	-34.92	-30.55						
1-May-2010	20:00:00	-35.00	-23.45	-31.83	-22.66	-35.22	-38.41	-24.14	-22.38	-39.78	-23.85	-15.86	-30.23	-26.02	-29.86	-38.03	-35.41	-30.98						
2-May-2010	08:00:00	-35.41	-23.78	-32.35	-23.43	-35.69	-39.07	-24.43	-18.23	-40.56	-24.08	-15.17	-30.41	-26.17	-30.19	-38.48	-35.93	-31.43						
2-May-2010	20:00:00	-36.02	-24.14	-32.26	-23.42	-35.90	-39.05	-25.03	-23.98	-41.09	-24.33	-16.53	-30.55	-26.46	-30.78	-38.99	-36.50	-31.94						
3-May-2010	08:00:00	-36.44	-24.40	-32.46	-24.10	-36.24	-38.89	-25.33	-20.57	-41.74	-24.43	-15.68	-30.74	-26.55	-30.94	-39.43	-37.00	-32.38				0.25	0.14	
3-May-2010	20:00:00	-36.80	-24.11	-32.43	-22.94	-36.10	-38.68	-25.20	-13.08	-41.92	-23.80	-12.71	-30.84	-26.44	-30.93	-39.85	-37.48	-32.80						
4-May-2010	08:00:00	-36.99	-23.57	-32.46	-22.63	-35.85	-39.25	-24.48	-12.49	-41.98	-23.42	-12.92	-30.97	-26.26	-31.07	-40.34	-38.03	-33.29					0.01	
4-May-2010	20:00:00	-37.29	-23.38	-32.31	-22.01	-35.76	-39.13	-24.50	-14.91	-42.20	-23.28	-13.99	-31.06	-26.26	-31.33	-40.84	-38.60	-33.79						
5-May-2010	08:00:00	-37.52	-23.64	-32.74	-22.90	-36.05	-39.64	-24.78	-14.31	-42.81	-23.33	-14.17	-31.28	-26.53	-31.58	-41.39	-39.21	-34.34						
5-May-2010	20:00:00	-37.99	-24.06	-32.86	-22.68	-36.25	-39.46	-25.62	-19.53	-43.32	-23.79	-16.04	-31.42	-26.82	-32.10	-41.92	-39.80	-34.87						
6-May-2010	08:00:00	-38.35	-24.46	-33.04	-23.54	-36.52	-40.35	-25.99	-17.08	-43.90	-23.94	-15.63	-31.60	-26.88	-32.08	-42.50	-40.44	-35.45						
6-May-2010	20:00:00	-39.24	-24.91	-33.01	-24.36	-37.09	-40.27	-26.73	-23.75	-44.79	-24.58	-17.66	-31.75	-27.40	-33.06	-43.13	-41.13	-36.08						
7-May-2010	08:00:00	-39.71	-25.44	-33.48	-25.30	-37.70	-41.04	-27.02	-20.71	-45.71	-24.90	-17.22	-32.07	-27.79	-33.20	-43.67	-41.74	-36.62						
7-May-2010	20:00:00	-40.48	-25.99	-33.70	-25.79	-38.15	-40.77	-27.85	-25.03	-46.47	-25.53	-18.63	-32.24	-28.25	-34.10	-44.34	-42.47	-37.29						
8-May-2010	08:00:00	-40.86	-26.27	-33.60	-25.97	-38.20	-41.91	-28.06	-21.79	-46.84	-25.44	-17.64	-32.36	-28.13	-33.54	-44.81	-43.00	-37.76						
8-May-2010	20:00:00	-41.35	-26.82	-33.98	-27.49	-38.51	-42.13	-28.81	-25.89	-47.46	-26.20	-19.75	-32.71	-28.98	-35.30	-45.53	-43.78	-38.48						
9-May-2010	08:00:00	-41.76	-27.64	-35.72	-29.04	-39.54	-42.66	-29.40	-24.59	-48.80	-26.96	-20.37	-33.56	-30.05	-36.18	-46.12	-44.43	-39.07						
9-May-2010	20:00:00	-42.34	-28.20	-36.51	-29.62	-40.03	-42.65	-30.17	-26.58	-49.61	-27.76	-21.25	-34.20	-30.78	-36.93	-46.78	-45.16	-39.73						
10-May-2010	08:00:00	-42.76	-28.64	-37.39	-30.48	-39.96	-43.16	-30.57	-24.84	-49.85	-28.30	-21.60	-34.87	-31.36	-37.21	-47.34	-45.78	-40.29						
10-May-2010	20:00:00	-43.21	-29.03	-37.66	-31.00	-40.23	-43.07	-31.10	-26.69	-50.44	-28.79	-22.09	-35.15	-31.80	-37.94	-48.00	-46.50	-40.95						
11-May-2010	08:00:00	-43.52	-29.30	-37.74	-31.34	-40.30	-42.84	-31.36	-24.51	-50.82	-28.93	-22.31	-35.46	-31.98	-37.61	-48.50	-47.06	-41.45				0.33	0.1	
11-May-2010	20:00:00	-43.83	-29.20	-37.59	-30.41	-40.07	-42.69	-31.58	-19.65	-50.90	-28.73	-19.98	-35.47	-31.80	-37.13	-48.96	-47.58	-41.91						
12-May-2010	08:00:00	-43.89	-29.07	-37.36	-30.58	-39.49	-43.44	-31.54	-16.86	-50.64	-28.69	-18.81	-35.63	-31.60	-37.09	-49.40	-48.09	-42.35						
12-May-2010	20:00:00	-44.34	-29.40	-37.32	-30.48	-39.46	-43.17	-31.82	-18.72	-50.92	-29.03	-19.23	-35.65	-31.63	-38.07	-49.95	-48.70	-42.90						
13-May-2010	08:00:00	-44.51	-29.47	-37.44	-31.00	-39.48	-43.84	-31.75	-18.01	-51.25	-29.04	-19.93	-35.92	-31.94	-38.09	-50.01	-48.82	-42.96						
13-May-2010	20:00:00	-44.98	-29.79	-37.65	-31.59	-39.96	-43.66	-32.02	-21.49	-52.05	-29.63	-21.66	-36.14	-32.41	-39.32	-49.99	-48.86	-42.94						
14-May-2010	08:00:00	-45.22	-30.04	-38.02	-31.96	-40.19	-44.29	-32.10	-20.33	-52.59	-29.60	-22.18	-36.45	-32.78	-39.09	-50.04	-48.97	-42.99						
14-May-2010	20:00:00	-45.71	-30.42	-38.22	-32.20	-40.44	-44.02	-32.45	-23.62	-53.15	-30.15	-23.02	-36.64	-33.13	-40.25	-50.00	-49.00	-42.95						
15-May-2010	08:00:00	-45.97	-30.70	-38.37	-32.62	-40.56	-44.73	-32.57	-22.36	-53.59	-29.96	-23.23	-36.84	-33.34	-39.54	-50.05	-49.11	-43.00						
15-May-2010	20:00:00	-46.43	-31.06	-38.43	-32.95	-40.95	-44.51	-32.86	-25.32	-54.29	-30.57	-23.77	-36.95	-33.66	-40.97	-50.01	-49.13	-42.96						
16-May-2010	08:00:00	-46.69	-31.29	-38.54	-33.51	-41.14	-45.18	-32.95	-23.87	-54.79	-30.45	-24.12	-37.15	-33.94	-40.34	-50.07	-49.25	-43.02				0.08	0.4	
16-May-2010	20:00:00	-47.06	-31.62	-38.62	-33.97	-41.45	-44.52	-33.20	-26.63	-55.42	-31.14	-24.71	-37.29	-34.31	-41.18	-50.02	-49.26	-42.97						
17-May-2010	08:00:00	-37.56	-31.53	-38.06	-29.58	-40.15	-43.46	-33.31	-14.04	-54.43	-30.84	-17.35	-37.46	-34.57	-39.01	-33.19	-32.50	-26.14					0.88	
17-May-2010	20:00:00	-25.49	-26.89	-37.25	-24.89	-34.43	-41.64	-32.95	-0.93	-49.03	-29.62	-6.91	-37.40	-34.22	-34.30	-33.08	-32.45	-26.03				1.21		
18-May-2010	08:00:00	-29.17	-28.02	-37.86	-21.00	-32.92	-41.12	-32.22	-1.53	-47.83	-18.34	-9.11	-37.38	-33.28	-36.02	-30.82	-30.25	-23.77					0.02	
18-May-2010	20:00:00	-32.15	-27.52	-38.10	-20.78	-34.87	-40.79	-31.75	-3.40	-50.09	-17.38	-11.65	-37.31	-32.41	-36.80	-31.85	-31.34	-24.80				0.16		
19-May-2010	08:00:00	-34.22	-26.98	-38.41	-21.63	-35.45	-41.34	-31.24	-3.62	-50.99	-18.32	-12.85	-37.47	-32.09	-36.95	-32.63	-32.18	-25.58						
19-May-2010	20:00:00	-36.16	-26.84	-38.55	-22.38	-35.78	-41.17	-31.00	-5.69	-51.63	-20.24	-14.42	-37.68	-32.07	-37.95	-33.28	-32.90	-26.23						
20-May-2010	08:00:00	-37.73	-26.79	-39.01	-23.52	-36.31	-42.18	-30.82	-5.95	-52.47	-21.59	-15.12	-38.08	-32.57	-38.27	-33.95	-33.63	-26.90						
20-May-2010	20:00:00	-39.62	-27.16	-39.46	-24.43	-36.96	-41.91	-31.11	-10.10	-53.44	-23.34	-16.57	-38.36	-33.10	-39.77	-34.63	-34.37	-27.58						
21-May-2010	08:00:00	-40.52	-27.37	-39.92	-25.19	-37.38	-42.72	-31.22	-10.31	-54.17	-23.97	-17.08	-38.68	-33.62	-39.43	-35.28	-35.08	-28.23				0.1	0.04	
21-May-2010	20:00:00	-41.48	-27.82	-40.11	-25.82	-37.76	-42.34	-31.61	-14.43	-54.86	-25.09	-17.95	-38.86	-33.89	-40.61	-35.92	-35.78	-28.87						
22-May-2010	08:00:00	-41.98	-27.97	-40.24	-26.33	-37.91	-39.95	-31.65	-7.68	-55.33	-25.21	-17.73	-39.07	-34.14	-39.80	-36.53	-36.46	-29.48					0.27	
22-May-2010	20:00:00	-23.07	-18.78	-33.99	-20.94	-15.78	-38.85	-24.17	-0.68	-33.51	-8.79	-7.90	-35.66	-19.21	-17.81	-22.19	-22.18	-15.14						
23-May-2010	08:00:00	-26.26	-16.98	-37.67	-19.62	-26.20	-39.18	-22.08	-1.06	-44.24	-6.82	-8.47	-36.41	-20.80	-23.23	-24.09	-24.14	-17.04						
23-May-2010	20:00:00	-30.37	-17.81	-38.38	-19.28	-29.89	-38.80	-22.87	-3.34	-48.25	-10.89	-11.03	-36.70	-22.09	-26.94	-25.76	-25.87	-18.71						
24-May-2010	08:00:00	-32.95	-19.05	-38.83	-19.81	-31.54	-38.87	-23.11	-3.17	-50.21	-12.32	-11.17	-37.04	-23.41	-28.41	-26.93	-27.10	-19.88					0.1	
24-May-2010	20:00:00	-34.93	-19.95	-39.02	-20.26	-32.47	-38.69	-23.96	-2.08	-51.46	-12.48	-10.79	-37.33	-24.56	-29.74	-27.85	-28.09	-20.80						
25-May-2010	08:00:00	-36.61	-20.17	-39.07	-20.71	-32.91	-38.72	-24.17	-2.58	-52.21	-13.74	-10.99	-37.61	-25.48	-30.27	-28.64	-28.94	-21.59					0.05	
25-May-2010	20:00:00	-36.96	-18.63	-38.48	-16.71	-31.61	-38.44	-24.42	-1.26	-51.22	-6.58	-7.99	-37.61	-25.95	-30.48	-29.40	-29.76	-22.35						
26-May-2010	08:00:00	-37.06	-17.49	-37.92	-16.73	-30.78	-39.51	-23.40	-1.88	-50.71	-8.61	-9.07	-37.55	-26.07	-29.17	-29.98	-30.40	-22.93						
26-May-2010	20:00:00	-37.56	-18.90	-37.50	-17.87	-31.44	-39.14	-25.03	-4.90	-51.68	-13.62	-12.11	-37.54	-26.49	-31.11	-30.72	-31.20	-23.67						
27-May-2010	08:00:00	-37.98	-20.15	-37.46	-19.38	-32.29	-40.48	-25.10	-5.08	-52.84	-14.91	-12.03	-37.61	-26.90	-30.74	-31.35	-31.90	-24.30						
27-May-2010	20:00:00	-39.02	-21.60	-37.37	-20.70	-33.62	-40.28	-26.81	-10.06	-54.49	-18.09	-11.97	-38.29	-27.71	-32.68	-32.10	-32.71	-25.05						
28-May-2010	08:00:00	-39.80	-22.61	-37.93	-22.10	-33.82	-34.80	-26.93	-9.70	-55.00	-19.00	-13.86	-38.35	-28.48	-32.90	-32.81	-32.06	-32.99			3.4	1.51	0.22	
28-May-2010	20:00:00	-18.12	1.26	-27.88	-14.43	-9.07	-32.00	-18.09	-0.03	-30.16	0.59	0.20	-22.20	-24.20	-5.94	-21.93	-12.19	-8.48						

Date	Time	Water Level (inches)																			On-site Manual Raingauge	On-site Auto Raingauge	Wadesboro Daily Rainfall	Wadesboro Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	Jon AW1	Jon AW2	Jon AW3	Jon AW4	Jon AW5	Jon AW6	Jon AW7	Jon AW8	Jon AW9	Jon AW10	Jon AW11	Jon AW12	Jon AW13	Jon AW14	Jon RAW1	Jon RAW2	Jon RAW3	CG1	CG2				
29-May-2010	08:00:00	-22.58	-0.23	-33.61	-13.08	-10.22	-32.80	-4.10	-0.44	-31.22	2.04	-0.32	-6.32	-20.61	-7.51	-20.20	-12.88	-4.75				0.01	0.42	
29-May-2010	20:00:00	-27.09	-0.54	-35.94	-13.19	-11.54	-33.04	-6.15	-2.03	-32.45	1.30	-0.70	-9.30	-20.73	-13.06	-22.49	-14.06	-5.16						
30-May-2010	08:00:00	-29.43	-0.63	-36.56	-14.48	-12.48	-34.93	-6.90	-2.14	-33.30	0.70	-0.95	-11.94	-21.47	-15.90	-24.11	-14.65	-5.66						
30-May-2010	20:00:00	-32.46	-2.01	-36.47	-15.35	-16.91	-34.61	-13.50	-5.54	-37.64	-1.22	-1.68	-17.76	-22.81	-21.14	-25.81	-16.41	-7.03						
31-May-2010	08:00:00	-34.42	-2.60	-37.01	-16.88	-20.00	-27.99	-14.44	-5.22	-40.64	-2.31	-2.03	-19.64	-23.97	-22.74	-27.05	-17.19	-7.59				1.03	0.26	
31-May-2010	20:00:00	-15.93	0.76	-27.81	-7.85	-9.56	-25.31	-2.48	-0.06	-30.11	2.77	0.03	-5.50	-9.13	-5.72	-27.90	-13.25	-5.40						
1-Jun-2010	08:00:00	-16.15	0.32	-30.05	-5.78	-9.55	-25.96	-2.03	-0.03	-30.01	2.74	0.05	-5.62	-5.90	-5.26	-13.73	-11.17	-3.24				0.16	0.02	
1-Jun-2010	20:00:00	-20.06	-0.37	-26.67	-8.04	-10.09	-26.60	-3.16	-1.67	-30.46	2.14	-0.25	-6.64	-9.24	-7.29	-19.57	-10.68	-4.13						2.91
2-Jun-2010	08:00:00	-21.66	-0.21	-25.88	-9.60	-10.07	-28.85	-3.51	-1.84	-30.35	1.85	-0.34	-7.22	-11.62	-8.86	-21.53	-10.68	-4.48				0.16	0.65	
2-Jun-2010	20:00:00	-25.48	-0.29	-25.76	-10.41	-11.04	-29.21	-4.38	-2.62	-31.23	1.10	-0.07	-6.37	-14.60	-12.40	-2.84	-9.01	-3.23						
3-Jun-2010	08:00:00	-23.08	-0.15	-26.04	-8.75	-10.40	-30.64	-3.70	-0.98	-30.50	1.48	-0.23	-7.64	-14.04	-10.17	-2.68	-9.01	-3.63						
3-Jun-2010	20:00:00	-26.62	-0.42	-26.07	-10.41	-11.73	-30.94	-4.67	-3.05	-31.74	0.56	-0.61	-8.46	-15.87	-14.16	-5.73	-9.51	-4.14						
4-Jun-2010	08:00:00	-27.89	-0.45	-26.89	-12.50	-12.73	-32.34	-4.81	-2.90	-32.65	0.13	-0.89	-9.01	-17.76	-15.65	-7.93	-9.81	-4.33						
4-Jun-2010	20:00:00	-30.32	-1.23	-27.47	-13.41	-16.76	-32.44	-6.71	-4.94	-36.59	-1.42	-1.37	-10.29	-19.62	-19.80	-14.08	-10.37	-4.92						
5-Jun-2010	08:00:00	-31.47	-1.57	-27.97	-14.41	-18.45	-34.28	-6.87	-4.43	-38.19	-2.12	-1.75	-11.04	-20.69	-20.28	-15.03	-10.57	-5.10					0.49	
5-Jun-2010	20:00:00	-33.43	-5.13	-28.47	-15.68	-22.39	-34.16	-12.61	-9.46	-42.04	-7.39	-3.75	-16.22	-22.35	-23.97	-20.41	-11.30	-6.19						
6-Jun-2010	08:00:00	-34.52	-6.41	-28.70	-16.53	-24.13	-35.86	-12.44	-8.09	-43.69	-8.86	-4.17	-17.54	-22.98	-23.86	-21.75	-11.53	-6.42				0.02	0.27	
6-Jun-2010	20:00:00	-35.93	-11.65	-28.79	-17.95	-26.34	-36.09	-17.67	-14.95	-45.81	-13.58	-8.84	-22.37	-24.24	-26.46	-23.66	-12.45	-7.72						
7-Jun-2010	08:00:00	-36.77	-13.10	-30.21	-19.93	-28.55	-37.42	-17.37	-12.88	-47.93	-14.83	-9.15	-23.33	-25.55	-27.18	-13.08	-9.98	-3.86				0.01		
7-Jun-2010	20:00:00	-38.11	-16.37	-31.63	-21.50	-30.56	-37.49	-20.28	-19.21	-49.85	-17.72	-12.59	-25.64	-27.04	-29.54	-19.72	-10.74	-4.74						
8-Jun-2010	08:00:00	-39.39	-17.55	-32.93	-22.62	-31.50	-38.76	-20.50	-17.89	-50.70	-18.78	-12.77	-26.77	-27.91	-29.59	-21.63	-10.98	-5.24						
8-Jun-2010	20:00:00	-41.02	-19.48	-33.84	-23.81	-33.76	-38.68	-22.56	-21.91	-52.87	-20.84	-14.88	-27.86	-29.02	-31.73	-23.66	-11.76	-6.45						
9-Jun-2010	08:00:00	-41.61	-20.16	-34.38	-24.28	-34.40	-39.74	-22.76	-19.75	-53.42	-21.18	-14.00	-28.57	-29.56	-31.18	-24.82	-12.03	-6.74						
9-Jun-2010	20:00:00	-42.38	-21.38	-34.33	-24.96	-34.89	-39.79	-24.04	-23.08	-53.82	-22.38	-15.67	-29.26	-30.24	-32.88	-26.01	-12.89	-7.86						
10-Jun-2010	08:00:00	-42.67	-21.95	-34.53	-25.57	-35.43	-40.63	-24.16	-21.05	-54.28	-22.56	-15.07	-29.88	-30.74	-32.43	-26.86	-13.22	-8.09				0.16	0.06	
10-Jun-2010	20:00:00	-43.38	-23.16	-34.96	-26.66	-36.17	-40.63	-25.19	-23.08	-54.93	-23.67	-14.87	-30.66	-31.59	-33.97	-27.76	-14.24	-9.17						
11-Jun-2010	08:00:00	-43.60	-23.17	-35.71	-27.33	-36.92	-41.76	-25.11	-19.23	-55.59	-23.81	-14.41	-31.33	-32.27	-33.86	-28.51	-14.64	-9.39				0.01		
11-Jun-2010	20:00:00	-44.27	-24.42	-36.59	-28.40	-37.74	-41.60	-26.50	-23.37	-56.32	-25.43	-17.31	-32.11	-33.31	-36.23	-29.57	-17.02	-11.74						
12-Jun-2010	08:00:00	-44.55	-24.92	-37.11	-28.89	-38.24	-42.53	-26.45	-22.43	-56.73	-25.41	-16.82	-32.71	-33.91	-35.41	-30.26	-17.85	-11.96						
12-Jun-2010	20:00:00	-45.46	-25.96	-37.44	-29.57	-38.70	-42.38	-27.80	-25.17	-57.10	-26.51	-18.38	-33.23	-34.60	-37.23	-31.10	-20.96	-14.73						
13-Jun-2010	08:00:00	-45.81	-26.19	-37.59	-29.93	-38.91	-43.51	-27.67	-23.63	-57.22	-26.21	-17.67	-33.64	-34.93	-36.11	-31.71	-21.83	-14.96				0.21	0.02	
13-Jun-2010	20:00:00	-46.46	-27.22	-37.85	-31.01	-39.44	-43.35	-29.05	-26.37	-57.66	-27.79	-18.92	-34.14	-35.85	-38.90	-32.52	-26.05	-19.67						
14-Jun-2010	08:00:00	-46.71	-27.46	-38.17	-31.49	-39.79	-44.34	-28.96	-22.91	-57.92	-27.26	-17.27	-34.85	-36.42	-37.63	-33.10	-26.79	-19.42				0.09		
14-Jun-2010	20:00:00	-47.37	-28.41	-38.57	-32.55	-40.25	-44.21	-30.21	-25.54	-58.29	-29.00	-19.33	-35.59	-37.28	-40.31	-33.92	-28.67	-25.04						
15-Jun-2010	08:00:00	-47.49	-28.66	-39.16	-33.05	-40.69	-45.04	-30.21	-23.77	-58.64	-28.51	-19.08	-36.21	-37.81	-39.28	-34.51	-29.91	-26.48						
15-Jun-2010	20:00:00	-48.08	-29.56	-39.84	-33.93	-41.29	-43.67	-31.22	-26.72	-59.15	-30.00	-20.77	-36.88	-38.62	-41.58	-35.34	-31.16	-29.87						
16-Jun-2010	08:00:00	-30.19	-21.59	-37.88	-28.73	-24.78	-44.57	-29.60	-5.45	-42.55	-26.71	-10.76	-31.75	-38.82	-33.02	-35.95	-32.16	-31.86				0.74		
16-Jun-2010	20:00:00	-33.99	-25.65	-40.11	-28.20	-34.04	-44.28	-28.94	-10.85	-51.72	-27.58	-13.37	-33.28	-38.78	-37.83	-36.77	-33.20	-34.45						
17-Jun-2010	08:00:00	-35.94	-26.21	-40.63	-27.78	-37.39	-45.32	-28.01	-12.35	-54.98	-26.92	-14.17	-34.56	-38.81	-38.12	-37.38	-34.07	-35.43						
17-Jun-2010	20:00:00	-38.09	-27.20	-40.83	-28.32	-39.01	-45.09	-29.31	-17.26	-56.51	-28.60	-16.35	-35.60	-39.13	-40.48	-38.24	-34.98	-37.19						
18-Jun-2010	08:00:00	-39.99	-27.78	-41.16	-29.09	-39.63	-45.76	-28.76	-17.64	-57.04	-28.04	-16.86	-36.48	-39.68	-40.17	-38.90	-35.79	-38.01						
18-Jun-2010	20:00:00	-41.95	-28.76	-41.60	-30.19	-39.15	-45.45	-30.59	-20.96	-56.47	-29.60	-18.55	-37.35	-40.16	-41.16	-39.90	-36.64	-39.63						
19-Jun-2010	08:00:00	-42.71	-29.28	-41.97	-31.21	-39.58	-46.20	-30.48	-20.75	-56.81	-28.97	-18.85	-38.15	-40.66	-40.97	-40.86	-37.45	-40.33						
19-Jun-2010	20:00:00	-44.10	-30.11	-42.14	-32.36	-40.14	-45.95	-31.67	-23.45	-57.28	-30.29	-20.34	-38.83	-40.98	-41.18	-42.24	-38.23	-41.88						
20-Jun-2010	08:00:00	-44.67	-30.47	-42.44	-33.33	-39.86	-46.79	-31.75	-22.85	-56.91	-29.82	-20.60	-39.37	-41.45	-41.19	-43.07	-38.99	-42.87						
20-Jun-2010	20:00:00	-45.75	-31.21	-42.70	-34.58	-40.40	-46.62	-32.20	-25.67	-57.36	-31.33	-21.92	-39.99	-42.00	-41.19	-44.47	-39.79	-44.31						
21-Jun-2010	08:00:00	-46.38	-31.71	-43.46	-35.69	-40.89	-47.40	-32.34	-25.39	-57.76	-31.15	-22.32	-40.70	-42.82	-41.20	-45.29	-40.50	-45.09						
21-Jun-2010	20:00:00	-47.38	-32.47	-43.98	-36.80	-41.44	-47.26	-32.87	-27.60	-58.22	-32.50	-23.44	-41.43	-43.62	-41.21	-46.72	-41.28	-47.28						
22-Jun-2010	08:00:00	-47.81	-32.92	-44.60	-37.62	-41.90	-47.99	-33.03	-27.43	-58.50	-32.25	-23.81	-42.06	-44.25	-41.21	-47.50	-42.00	-48.01	0	0	4.23			
22-Jun-2010	20:00:00	-48.78	-33.70	-45.07	-38.51	-42.43	-47.88	-33.56	-28.90	-58.96	-33.43	-24.76	-42.71	-44.97	-41.21	-49.05	-42.75	-49.70						
23-Jun-2010	08:00:00	-49.24	-34.08	-45.57	-39.23	-42.76	-48.60	-33.81	-28.49	-59.22	-33.10	-25.17	-43.43	-45.54	-41.21	-50.06	-43.42	-50.38				0.05	0.3	
23-Jun-2010	20:00:00	-50.01	-34.74	-45.83	-39.90	-43.64	-48.48	-34.22	-29.89	-60.03	-34.32	-26.05	-44.25	-46.16	-41.21	-50.09	-44.14	-52.02						
24-Jun-2010	08:00:00	-50.45	-35.31	-46.10	-40.65	-43.91	-49.17	-34.66	-29.39	-60.23	-33.93	-26.23	-44.74	-46.59	-41.22	-50.11	-43.82	-52.18						
24-Jun-2010	20:00:00	-50.22	-35.85	-46.22	-41.31	-43.74	-49.07	-34.96	-30.63	-59.99	-35.08	-27.01	-45.21	-46.72	-41.20	-50.11	-44.61	-52.83						
25-Jun-2010	08:00:00	-50.07	-36.28	-46.74	-42.32	-43.98	-49.74	-35.17	-30.42	-60.16	-34.96	-27.38	-45.74	-46.77	-41.20	-50.10	-45.28	-52.86						
25-Jun-2010	20:00:00	-50.17	-36.93	-47.20	-43.02	-44.27	-49.59	-35.71	-31.51	-60.38	-36.03	-28.30	-46.28	-46.77	-41.21	-50.11	-45.94	-52.82						
26-Jun-2010	08:00:00	-50.15	-37.42	-47.74	-43.83	-44.49	-50.12	-36.09	-31.40	-60.53	-35.80	-28.58	-46.76	-46.77	-41.21	-50.12	-46.55	-52.81				0.08		
26-Jun-2010	20:00:00	-50.24	-37.94	-47.96	-44.28	-44.74	-49.95	-36.60	-32.09	-60.71	-36.72	-29.13	-47.22	-46.78	-41.20	-50.11	-47.20	-52.79						
27-Jun-2010	08:00:00	-50.28	-38.38	-48.04	-45.04	-44.91	-50.47	-37.02	-31.85	-60.81	-36.44	-29.39	-47.68	-46.77	-41.21	-50.11	-47.78	-52.79						
27-Jun-2010	20:00:00	-50.30	-38.93	-48.15	-45.82	-45.11	-50.35	-37.41	-32.76	-60.94	-37.36	-30.40	-48.17	-46.76	-41.21	-50.12	-48.43	-52.78						
28-Jun-2010	08:00:00	-50.29	-39.30	-48.37	-46.54	-45.32	-51.03	-37.77	-32.57	-61.08	-37.32	-30.89	-48.65	-46.78	-41.22	-50.12	-49.29	-52.76						
28-Jun-2010	20:00:00	-50.17	-39.87	-48.64	-47.36	-45.55	-51.00	-38.14	-33.61	-61.24	-37.65	-32.39	-49.24	-46.76	-41.22	-50.12	-50.22	-52.75						
29-Jun-2010	08:00:00	-50.09	-40.44	-49.27	-48.41	-45.82	-51.42	-38.49	-34.05	-61.44	-37.68	-32.78	-49.86	-46.76	-41.23	-50.12	-51.00	-52.77				0.08	0.07	
29-Jun-2010	20:00:00	-50.08	-41.07	-50.03	-49.11	-46.09	-51.25	-39.05	-34.71	-61.64	-37.69	-33.84	-50.48	-46.77	-41.23	-50.13	-51.74	-52.75						
30-Jun-2010	08:00:00	-50.05	-41.48	-51.10	-49.90	-46.36	-51.30	-39.40	-34.67	-61.84	-37.69	-34.03	-51.05	-46.76	-41.22	-50.14	-52.43	-52.76				0.12	0.16	
30-Jun-2010	20:00:00	-50.09	-41.81	-51.70	-50.32	-46.58	-51.02	-39.90	-34.52	-61.99	-37.68	-34.25	-51.64	-46.78	-41.21	-50.13	-53.09	-52.76						
1-Jul-2010	08:00:00	-50.06	-41.93	-51.38	-50.81	-44.90	-51.67	-40.26	-33.72	-62.13	-37.66	-34.39	-52.18	-46.76	-41.21	-50.15	-53.71	-52.78				0.01		
1-Jul-2010	20:00:00	-50.12	-42.25	-51.39	-51.16	-45.30	-51.50	-40.76	-34.67	-62.04	-37.63	-34.85	-52.58	-46.77	-41.22	-50.14	-54.34	-52.76						2.04
2-Jul-2010	08:00:00	-50.04	-42.57	-51.40	-51.34	-45.52	-52.03	-41.09	-34.39	-61.98	-37.67	-35.10	-52.80	-46.77	-41.20	-50.17	-54.90	-52.76						
2-Jul-2010	20:00:00	-50.17	-43.05	-51.41	-51.41	-45.52	-51.87	-41.66	-35.23	-61.91	-37.66	-35.50	-52.80	-46.76	-41.23	-50.17	-55.48	-52.76						
3-Jul-2010	08:00:00	-50.12	-43.51	-51.41	-51.43	-45.52	-52.44	-41.96	-35.38	-61.83	-37.68	-35.73	-52.80	-46.78	-41.22	-50.18	-56.05	-52.76						
3-Jul-2010	20:00:00	-50.24	-44.19	-51.41	-51.44	-45.52	-52.24	-42.78	-36.02	-61.78	-37.66	-36.10	-52.80	-46.76	-41.23	-50.17	-56.56	-52.77						
4-Jul-2010	08:00:00	-50.18	-44.74	-51.41	-51.41	-45.52	-52.85	-43.19	-36.21	-61.69	-37.37	-36.33	-52.80	-46.78	-41.24	-50.17	-57.06	-52.76						
4-Jul-2010	20:00:00	-50.27	-45.50	-51.41	-51.42	-45.52	-52.69	-43.90	-36.85	-61.64	-37.36	-36.66	-52.80	-46.78	-41.24	-50.18	-57.58	-52.77						

Date	Time	Water Level (inches)																		On-site Manual Raingauge	On-site Auto Raingauge	Wadesboro Daily Rainfall	Wadesboro Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	Jon AW1	Jon AW2	Jon AW3	Jon AW4	Jon AW5	Jon AW6	Jon AW7	Jon AW8	Jon AW9	Jon AW10	Jon AW11	Jon AW12	Jon AW13	Jon AW14	Jon RAW1	Jon RAW2	Jon RAW3	CG1	CG2				
5-Jul-2010	08:00:00	-50.21	-45.98	-51.42	-51.38	-45.52	-53.25	-44.31	-37.07	-61.57	-37.36	-36.92	-52.80	-46.77	-41.24	-50.19	-58.12	-52.77						
5-Jul-2010	20:00:00	-50.26	-46.63	-51.42	-51.39	-45.52	-53.08	-44.95	-37.58	-61.49	-37.37	-37.28	-52.80	-46.78	-41.24	-50.20	-58.62	-52.77						
6-Jul-2010	08:00:00	-50.20	-47.17	-51.43	-51.34	-45.52	-53.71	-45.34	-37.88	-61.43	-37.37	-37.56	-52.80	-46.78	-41.24	-50.20	-59.01	-52.78						
6-Jul-2010	20:00:00	-50.31	-47.81	-51.44	-51.89	-45.52	-53.53	-46.02	-38.46	-61.36	-37.36	-38.02	-52.80	-46.77	-41.25	-50.20	-59.22	-52.74						
7-Jul-2010	08:00:00	-50.29	-48.48	-51.43	-51.90	-45.52	-54.23	-46.38	-38.75	-61.28	-37.36	-38.36	-52.80	-46.78	-41.25	-50.21	-59.28	-52.73						
7-Jul-2010	20:00:00	-50.46	-49.34	-51.42	-51.87	-45.52	-54.05	-46.98	-39.28	-61.22	-37.36	-38.59	-52.80	-46.78	-41.27	-50.19	-59.32	-52.78						
8-Jul-2010	08:00:00	-50.46	-50.28	-51.42	-51.89	-45.52	-54.59	-47.40	-39.55	-61.15	-37.34	-38.80	-52.80	-46.78	-41.27	-50.22	-59.35	-52.77						
8-Jul-2010	20:00:00	-50.51	-51.73	-51.42	-51.87	-45.52	-54.32	-47.96	-40.03	-61.08	-37.34	-39.08	-52.80	-46.77	-41.26	-50.21	-59.35	-52.73						
9-Jul-2010	08:00:00	-50.42	-52.60	-51.41	-51.89	-45.52	-54.74	-48.33	-40.30	-61.00	-37.34	-39.27	-52.80	-46.77	-41.27	-50.22	-59.36	-52.75				0.43	0.37	
9-Jul-2010	20:00:00	-50.49	-53.18	-51.38	-51.84	-45.52	-54.39	-48.93	-40.52	-60.93	-37.34	-39.49	-52.80	-46.78	-41.27	-50.23	-59.38	-52.74						
10-Jul-2010	08:00:00	-50.45	-53.66	-51.36	-51.87	-45.52	-54.93	-49.28	-40.35	-60.87	-37.34	-39.63	-52.80	-46.77	-41.26	-50.21	-51.39	-52.35				0.01		
10-Jul-2010	20:00:00	-50.45	-54.03	-51.35	-51.86	-45.52	-54.58	-49.88	-40.66	-60.79	-37.35	-39.85	-52.80	-46.76	-41.25	-50.22	-52.56	-52.74						
11-Jul-2010	08:00:00	-50.40	-54.18	-51.35	-51.89	-45.52	-55.01	-50.26	-40.55	-60.71	-37.34	-40.03	-52.80	-46.77	-41.26	-50.23	-53.44	-52.75				0.18		
11-Jul-2010	20:00:00	-50.59	-53.77	-51.34	-51.87	-45.52	-54.58	-50.91	-40.95	-60.65	-37.34	-40.26	-52.80	-46.78	-41.27	-50.25	-54.27	-52.73						
12-Jul-2010	08:00:00	-50.58	-53.77	-51.33	-51.91	-45.52	-54.40	-51.24	-40.59	-60.59	-37.35	-40.41	-52.80	-46.77	-41.25	-50.24	-55.04	-52.75				0.2	0.16	
12-Jul-2010	20:00:00	-50.48	-53.77	-51.32	-51.89	-45.52	-53.94	-51.70	-40.44	-60.51	-37.35	-40.58	-52.80	-46.77	-41.27	-50.25	-53.48	-52.76						
13-Jul-2010	08:00:00	-50.44	-53.73	-51.31	-51.92	-45.52	-54.41	-51.85	-39.67	-60.44	-37.35	-40.73	-52.80	-46.77	-41.25	-50.26	-54.43	-52.81				0.13	0.29	
13-Jul-2010	20:00:00	-50.46	-53.78	-51.31	-51.90	-45.52	-53.97	-52.44	-39.44	-60.37	-37.35	-40.89	-52.80	-46.77	-41.26	-50.27	-54.79	-52.81						
14-Jul-2010	08:00:00	-50.41	-53.73	-51.31	-51.89	-45.52	-54.72	-52.64	-39.01	-60.30	-37.34	-41.08	-52.80	-46.77	-41.25	-50.28	-55.19	-52.79				0.07		
14-Jul-2010	20:00:00	-50.40	-53.75	-51.30	-51.87	-45.52	-54.27	-53.11	-38.94	-60.23	-37.34	-41.26	-52.80	-46.77	-41.26	-50.27	-55.94	-52.81						
15-Jul-2010	08:00:00	-50.42	-53.76	-51.30	-51.86	-45.52	-55.11	-53.47	-38.52	-60.16	-37.35	-41.44	-52.80	-46.77	-41.26	-50.26	-56.60	-52.82						
15-Jul-2010	20:00:00	-50.48	-53.83	-51.29	-51.88	-45.52	-54.61	-53.87	-39.24	-60.09	-37.35	-41.67	-52.80	-46.77	-41.26	-50.26	-57.22	-52.81						
16-Jul-2010	08:00:00	-50.52	-53.81	-51.27	-51.84	-45.52	-55.16	-54.01	-39.44	-60.02	-37.35	-41.86	-52.80	-46.77	-41.25	-50.27	-57.96	-52.82				0.12	0.03	
16-Jul-2010	20:00:00	-50.48	-53.82	-51.27	-51.86	-45.52	-54.62	-54.31	-40.15	-59.95	-37.36	-42.06	-52.80	-46.76	-41.26	-50.27	-58.71	-52.79						
17-Jul-2010	08:00:00	-50.45	-53.77	-51.27	-51.83	-45.52	-55.23	-54.40	-40.26	-59.87	-37.35	-42.27	-52.80	-46.76	-41.24	-50.28	-59.18	-52.88					0.01	
17-Jul-2010	20:00:00	-50.58	-53.84	-51.25	-51.82	-45.52	-54.73	-54.72	-40.72	-59.80	-37.35	-42.42	-52.80	-46.77	-41.25	-50.28	-59.42	-52.88						
18-Jul-2010	08:00:00	-50.55	-53.82	-51.26	-51.70	-45.52	-55.29	-54.34	-40.56	-59.74	-37.36	-42.61	-52.80	-46.77	-41.25	-50.28	-59.50	-52.87				0.01		
18-Jul-2010	20:00:00	-50.55	-53.86	-51.23	-51.78	-45.52	-54.82	-54.41	-41.04	-59.67	-37.35	-42.84	-52.80	-46.78	-41.27	-50.29	-59.50	-52.86						
19-Jul-2010	08:00:00	-50.67	-53.85	-51.20	-51.78	-45.52	-55.41	-54.19	-40.92	-59.61	-37.35	-43.05	-52.80	-46.79	-41.27	-50.25	-59.52	-52.90						
19-Jul-2010	20:00:00	-50.63	-53.84	-51.21	-51.79	-45.52	-55.01	-54.32	-41.47	-59.55	-37.37	-43.25	-52.80	-46.77	-41.27	-50.26	-59.51	-52.88						
20-Jul-2010	08:00:00	-50.52	-53.79	-51.19	-51.77	-45.52	-55.63	-54.17	-41.52	-59.46	-37.35	-43.50	-52.80	-46.78	-41.26	-50.25	-59.53	-52.89						
20-Jul-2010	20:00:00	-50.64	-53.85	-51.19	-51.79	-45.52	-55.44	-54.23	-41.94	-59.40	-37.37	-43.77	-52.80	-46.77	-41.26	-50.28	-59.56	-52.91						
21-Jul-2010	08:00:00	-50.57	-53.83	-51.19	-51.79	-45.52	-55.96	-54.16	-42.28	-59.32	-37.35	-44.00	-52.80	-46.77	-41.25	-50.29	-59.55	-52.90				0.13	0.22	
21-Jul-2010	20:00:00	-50.61	-53.81	-51.18	-51.79	-45.52	-55.58	-54.30	-42.78	-59.25	-37.36	-44.29	-52.80	-46.77	-41.24	-50.28	-59.55	-52.92						
22-Jul-2010	08:00:00	-50.61	-53.81	-51.19	-51.78	-45.52	-56.19	-54.24	-43.05	-59.18	-37.36	-44.50	-52.80	-46.78	-41.25	-50.30	-59.55	-52.90						
22-Jul-2010	20:00:00	-50.66	-53.84	-51.20	-51.79	-45.52	-55.83	-54.38	-43.31	-59.12	-37.36	-44.78	-52.80	-46.77	-41.27	-50.30	-59.57	-52.91						
23-Jul-2010	08:00:00	-50.61	-53.82	-51.19	-51.78	-45.52	-56.27	-54.27	-43.50	-59.04	-37.38	-43.63	-52.80	-46.78	-41.26	-50.31	-59.57	-52.92				0.06		
23-Jul-2010	20:00:00	-50.65	-53.87	-51.20	-51.78	-45.52	-55.87	-54.41	-43.77	-58.98	-37.36	-43.96	-52.80	-46.78	-41.27	-50.30	-59.60	-52.93						
24-Jul-2010	08:00:00	-50.63	-53.81	-51.31	-51.78	-45.52	-56.60	-54.30	-43.88	-58.91	-37.35	-42.64	-52.80	-46.79	-41.24	-50.33	-59.61	-52.93						
24-Jul-2010	20:00:00	-50.84	-53.94	-51.18	-51.67	-45.52	-56.34	-54.57	-44.07	-58.85	-37.38	-41.17	-52.80	-46.77	-41.32	-50.29	-59.60	-52.91						
25-Jul-2010	08:00:00	-50.71	-53.88	-51.17	-51.69	-45.52	-56.87	-54.47	-44.30	-58.76	-37.37	-40.26	-52.80	-46.78	-41.25	-50.32	-59.61	-52.92						
25-Jul-2010	20:00:00	-50.65	-53.86	-51.30	-51.73	-45.53	-56.62	-54.53	-44.54	-58.70	-37.38	-40.26	-52.81	-46.77	-41.29	-50.31	-59.61	-52.93						
26-Jul-2010	08:00:00	-50.59	-53.82	-51.00	-51.71	-45.52	-57.10	-54.40	-44.76	-58.62	-37.36	-40.25	-52.80	-46.77	-41.24	-50.32	-59.63	-52.94					0.55	
26-Jul-2010	20:00:00	-50.64	-53.85	-51.37	-51.72	-45.52	-56.78	-54.47	-45.02	-58.55	-37.37	-40.26	-52.80	-46.79	-41.26	-50.32	-59.62	-52.88						
27-Jul-2010	08:00:00	-50.63	-53.84	-51.22	-51.71	-45.52	-57.14	-54.40	-45.18	-58.50	-37.36	-40.27	-52.80	-46.77	-41.25	-50.32	-59.63	-52.92			1.85	0.08	0.04	
27-Jul-2010	20:00:00	-50.65	-53.87	-51.48	-51.72	-45.52	-56.64	-54.49	-45.31	-58.54	-37.37	-40.27	-52.80	-46.77	-41.25	-50.34	-57.90	-52.93						
28-Jul-2010	08:00:00	-50.64	-53.89	-51.48	-51.72	-45.52	-57.24	-54.48	-45.40	-58.59	-37.35	-40.26	-52.80	-46.77	-41.25	-50.30	-57.91	-52.94				0.01		
28-Jul-2010	20:00:00	-50.70	-53.92	-51.18	-51.74	-45.52	-56.79	-54.59	-45.55	-58.65	-37.37	-40.26	-52.80	-46.77	-41.26	-50.31	-57.92	-52.95						
29-Jul-2010	08:00:00	-50.77	-53.96	-51.19	-51.78	-45.52	-57.45	-54.63	-45.53	-58.71	-37.37	-40.34	-52.80	-46.78	-41.27	-50.32	-57.91	-52.94						
29-Jul-2010	20:00:00	-50.76	-53.95	-51.14	-51.83	-45.52	-57.11	-54.58	-45.72	-58.78	-37.39	-40.34	-52.80	-46.78	-41.28	-50.30	-57.92	-52.95						
30-Jul-2010	08:00:00	-50.64	-53.86	-51.12	-51.80	-45.52	-57.69	-54.46	-45.80	-58.83	-37.38	-40.34	-52.80	-46.78	-41.27	-50.32	-57.89	-52.92						
30-Jul-2010	20:00:00	-50.71	-53.91	-51.46	-51.82	-45.52	-57.33	-54.57	-45.95	-58.89	-37.39	-40.34	-52.80	-46.78	-41.27	-50.33	-58.10	-53.13						
31-Jul-2010	08:00:00	-50.69	-53.88	-51.23	-51.80	-45.52	-57.68	-54.48	-46.07	-58.95	-37.37	-40.33	-52.80	-46.78	-41.26	-50.33	-58.09	-53.12				0.16	0.07	
31-Jul-2010	20:00:00	-50.73	-53.93	-51.50	-51.84	-45.52	-57.17	-54.54	-46.21	-59.01	-37.38	-40.34	-52.80	-46.78	-41.27	-50.32	-58.10	-53.13						
1-Aug-2010	08:00:00	-50.67	-53.84	-51.46	-51.81	-45.52	-57.34	-54.45	-46.27	-59.06	-37.38	-40.34	-52.80	-46.78	-41.24	-50.34	-58.06	-53.09				0.13	0.54	
1-Aug-2010	20:00:00	-50.59	-53.84	-51.44	-51.81	-45.52	-56.85	-54.44	-46.38	-59.12	-37.37	-40.34	-52.80	-46.77	-41.25	-50.34	-58.08	-53.11						1.74
2-Aug-2010	08:00:00	-50.54	-53.75	-50.80	-51.73	-45.52	-57.46	-54.32	-46.38	-59.17	-37.35	-40.34	-52.80	-46.78	-41.24	-50.32	-58.05	-53.08						
2-Aug-2010	20:00:00	-50.55	-53.82	-51.11	-51.77	-45.52	-56.91	-54.41	-46.52	-59.23	-37.35	-40.32	-52.80	-46.77	-41.24	-50.32	-58.09	-53.12						
3-Aug-2010	08:00:00	-50.53	-53.75	-50.85	-51.73	-45.52	-57.54	-54.33	-46.37	-59.28	-37.37	-40.33	-52.80	-46.78	-41.25	-50.34	-58.06	-53.09				0.11	0.1	
3-Aug-2010	20:00:00	-50.69	-53.93	-51.51	-51.81	-45.52	-54.50	-54.55	-46.64	-59.35	-37.37	-40.33	-52.80	-46.77	-41.23	-50.34	-58.10	-53.13						
4-Aug-2010	08:00:00	-50.71	-53.89	-51.46	-51.79	-45.52	-54.46	-54.50	-46.28	-59.40	-37.37	-40.33	-52.80	-46.78	-41.24	-50.36	-58.10	-53.13						
4-Aug-2010	20:00:00	-50.74	-53.91	-51.16	-51.85	-45.52	-54.53	-54.52	-46.69	-59.46	-37.38	-40.33	-52.80	-46.78	-41.24	-50.32	-58.09	-53.12						
5-Aug-2010	08:00:00	-50.79	-53.95	-51.19	-51.86	-45.52	-54.54	-54.60	-46.79	-59.52	-37.38	-40.33	-52.80	-46.78	-41.24	-50.32	-58.10	-53.13				1.44	0.4	
5-Aug-2010	20:00:00	-50.43	-52.98	-51.07	-51.83	-45.52	-54.52	-54.62	-39.42	-59.58	-37.38	-37.82	-52.80	-46.76	-41.26	-50.32	-58.05	-53.08						
6-Aug-2010	08:00:00	-48.67	-51.16	-51.13	-51.83	-45.52	-54.51	-54.54	-35.00	-59.62	-37.39	-32.51	-52.80	-46.77	-41.25	-50.34	-58.07	-53.10				0.05		
6-Aug-2010	20:00:00	-50.68	-52.83	-51.40	-51.84	-45.52	-54.49	-54.49	-37.95	-59.68	-37.37	-34.77	-52.80	-46.77	-41.25	-50.34	-58.06	-53.09						
7-Aug-2010	08:00:00	-50.65	-53.62	-51.20	-51.83	-45.52	-54.35	-54.46	-39.26	-59.74	-37.38	-36.06	-52.80	-46.78	-41.25	-50.35	-58.04	-53.07						
7-Aug-2010	20:00:00	-50.65	-53.85	-51.27	-51.83	-45.52	-54.30	-54.48	-40.26	-59.81	-37.38	-37.40	-52.80	-46.78	-41.25	-50.36	-58.07	-53.10						
8-Aug-2010	08:00:00	-50.62	-53.78	-50.73	-51.81	-45.52	-54.35	-54.37	-40.67	-59.86	-37.38	-38.52	-52.80	-46.77	-41.25	-50.36	-58.03	-53.06						
8-Aug-2010	20:00:00	-50.67	-53.95	-51.39	-51.85	-45.53	-54.29	-54.54	-40.96	-59.91	-37.39	-39.70	-52.81	-46.78	-41.25	-50.37	-58.09	-53.12						
9-Aug-2010	08:00:00	-50.59	-53.81	-50.76	-51.80	-45.52	-54.35	-54.38	-41.12	-59.98	-37.36	-40.64	-52.80	-46.78	-41.25	-50.38	-58.05	-53.08						
9-Aug-2010	20:00:00	-50.70	-53.97	-51.39	-51.86	-45.52	-54.31	-54.54	-41.43	-60.04	-37.38	-41.80	-52.80	-46.78	-41.25	-50.35	-58.08	-53.11						
10-Aug-2010	08:00:00	-50.68	-53.94	-51.17	-51.84	-45.52	-54.32	-54.48	-41.71	-60.09	-37.36	-42.65	-52.80	-46.78	-41.25	-50.35	-58.08	-53.11						
10-Aug-2010	20:00:00	-50.77	-53.99	-51.51	-51.89	-45.52	-54.25	-54.58	-42.09	-60.15	-37.37	-40.43	-52.80	-46.78	-41.26	-50.35	-58.08	-53.11						

Date	Time	Water Level (inches)																		On-site Manual Raingauge	On-site Auto Raingauge	Wadesboro Daily Rainfall	Wadesboro Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	Jon AW1	Jon AW2	Jon AW3	Jon AW4	Jon AW5	Jon AW6	Jon AW7	Jon AW8	Jon AW9	Jon AW10	Jon AW11	Jon AW12	Jon AW13	Jon AW14	Jon RAW1	Jon RAW2	Jon RAW3	CG1	CG2				
11-Aug-2010	08:00:00	-50.79	-54.00	-51.48	-51.86	-45.52	-54.11	-54.55	-42.31	-60.21	-37.36	-40.42	-52.80	-46.79	-41.25	-50.37	-58.09	-53.12						
11-Aug-2010	20:00:00	-50.82	-54.02	-51.23	-51.89	-45.52	-54.09	-54.62	-42.75	-60.28	-37.39	-40.43	-52.80	-46.77	-41.24	-50.37	-58.08	-53.11						
12-Aug-2010	08:00:00	-50.85	-54.04	-51.18	-51.88	-45.52	-54.07	-54.58	-43.13	-60.31	-37.39	-40.43	-52.80	-46.77	-41.25	-50.36	-58.03	-53.06						
12-Aug-2010	20:00:00	-50.78	-54.00	-51.20	-51.86	-45.52	-54.03	-54.56	-43.60	-60.37	-37.40	-40.44	-52.80	-46.77	-41.27	-50.36	-58.09	-53.12						
13-Aug-2010	08:00:00	-50.69	-53.93	-50.93	-51.82	-45.52	-54.01	-54.46	-43.98	-60.43	-37.39	-40.44	-52.80	-46.77	-41.25	-50.38	-58.05	-53.08						
13-Aug-2010	20:00:00	-50.67	-53.86	-50.76	-51.81	-45.52	-53.98	-54.44	-44.60	-60.48	-37.38	-40.46	-52.80	-46.78	-41.25	-50.38	-58.06	-53.09						
14-Aug-2010	08:00:00	-50.64	-53.76	-50.60	-51.81	-45.52	-53.85	-54.35	-45.31	-60.55	-37.37	-40.44	-52.80	-46.78	-41.25	-50.40	-58.04	-53.07					0.48	
14-Aug-2010	20:00:00	-50.65	-53.84	-51.14	-51.82	-45.52	-53.84	-54.42	-45.92	-60.61	-37.37	-40.45	-52.80	-46.78	-41.24	-50.37	-58.06	-53.09						
15-Aug-2010	08:00:00	-50.69	-53.83	-51.15	-51.84	-45.52	-53.86	-54.40	-46.31	-60.67	-37.37	-40.46	-52.80	-46.79	-41.25	-50.38	-58.08	-53.11						
15-Aug-2010	20:00:00	-50.71	-53.91	-51.18	-51.83	-45.52	-53.82	-54.50	-46.75	-60.73	-37.38	-40.44	-52.80	-46.78	-41.26	-50.37	-58.09	-53.12						
16-Aug-2010	08:00:00	-50.67	-53.83	-51.14	-51.83	-45.52	-53.81	-54.42	-47.07	-60.78	-37.36	-40.45	-52.80	-46.77	-41.26	-50.38	-58.08	-53.11						
16-Aug-2010	20:00:00	-50.73	-53.93	-51.20	-51.87	-45.52	-53.73	-54.54	-47.38	-60.83	-37.37	-40.45	-52.80	-46.78	-41.26	-50.40	-58.11	-53.14						
17-Aug-2010	08:00:00	-50.69	-53.84	-51.14	-51.82	-45.52	-53.47	-54.42	-47.51	-60.90	-37.37	-40.45	-52.80	-46.78	-41.24	-50.41	-58.10	-53.13						
17-Aug-2010	20:00:00	-50.69	-53.89	-51.16	-51.85	-45.52	-53.49	-54.49	-47.72	-60.95	-37.37	-40.45	-52.80	-46.77	-41.24	-50.40	-58.11	-53.14						
18-Aug-2010	08:00:00	-50.72	-53.94	-51.20	-51.84	-45.52	-53.49	-54.52	-48.00	-61.00	-37.36	-40.45	-52.80	-46.79	-41.24	-50.39	-58.12	-53.15			2.15	0.02		
18-Aug-2010	20:00:00	-50.88	-54.00	-51.22	-51.86	-36.21	-53.29	-54.60	-47.89	-60.45	-37.37	-40.45	-52.80	-46.77	-41.26	-50.35	-59.76	-53.20						
19-Aug-2010	08:00:00	-50.85	-53.99	-51.22	-51.88	-36.33	-53.20	-54.62	-48.22	-60.80	-37.39	-40.44	-52.80	-46.77	-41.26	-50.36	-59.79	-53.21				4.18	1.13	
19-Aug-2010	20:00:00	-9.75	-53.96	-51.24	-51.85	-36.44	-1.28	-54.53	-48.34	-61.02	-37.40	3.61	-14.65	-46.78	-41.25	-50.33	-59.74	-53.19						
20-Aug-2010	08:00:00	-5.21	-3.92	-0.86	-51.80	-36.51	-5.23	0.51	-21.52	-61.24	0.97	-0.91	-19.66	-3.07	-5.33	-47.62	-35.15	-40.73				0.01		
20-Aug-2010	20:00:00	-19.83	-23.68	-51.12	-51.82	-36.55	-15.26	-1.34	-28.76	-61.28	-2.06	-5.99	-28.70	-7.87	-11.35	-50.33	-37.76	-45.24						
21-Aug-2010	08:00:00	-22.01	-31.56	-51.12	-51.81	-36.67	-23.24	-2.29	-31.14	-61.40	-5.64	-10.11	-34.67	-23.52	-26.78	-50.33	-39.42	-47.65						
21-Aug-2010	20:00:00	-27.62	-35.83	-51.19	-51.87	-36.75	-26.03	-3.92	-32.77	-61.59	-10.69	-14.93	-39.95	-33.40	-39.53	-50.32	-40.92	-51.14						
22-Aug-2010	08:00:00	-31.17	-39.57	-51.16	-51.83	-36.91	-29.86	-4.94	-32.83	-61.39	-13.77	-16.93	-43.32	-38.83	-41.26	-50.35	-42.19	-52.40				0.01		
22-Aug-2010	20:00:00	-34.43	-42.33	-51.19	-51.86	-36.96	-31.49	-6.83	-33.15	-61.62	-18.84	-18.80	-46.33	-42.97	-41.26	-50.33	-43.43	-52.90						
23-Aug-2010	08:00:00	-36.95	-45.74	-51.18	-51.83	-37.09	-34.34	-8.26	-32.68	-61.65	-22.03	-20.02	-49.28	-46.09	-41.25	-50.35	-44.49	-52.90						
23-Aug-2010	20:00:00	-39.58	-48.17	-51.19	-51.86	-37.15	-35.07	-13.38	-33.51	-34.74	-26.15	-21.60	-51.44	-46.90	-41.26	-50.35	-45.64	-52.92						
24-Aug-2010	08:00:00	-42.26	-50.21	-51.19	-51.82	-37.28	-36.95	-15.12	-33.18	-41.89	-29.29	-22.51	-52.80	-46.77	-41.26	-50.35	-46.62	-52.89					0.02	
24-Aug-2010	20:00:00	-43.84	-52.58	-51.17	-51.82	-37.33	-36.97	-18.64	-33.63	-44.18	-32.08	-23.77	-52.80	-46.78	-41.25	-50.36	-47.66	-52.89						
25-Aug-2010	08:00:00	-45.03	-53.65	-51.14	-51.81	-37.43	-38.57	-19.61	-33.29	-45.72	-33.70	-24.52	-52.80	-46.78	-41.24	-50.37	-48.62	-52.87						
25-Aug-2010	20:00:00	-46.29	-53.86	-51.15	-51.82	-37.51	-38.34	-21.87	-33.77	-45.68	-37.00	-25.47	-52.80	-46.78	-41.24	-50.38	-49.90	-52.93						
26-Aug-2010	08:00:00	-47.36	-53.80	-51.12	-51.79	-37.62	-40.06	-22.88	-33.44	-45.91	-37.42	-26.07	-52.80	-46.79	-41.24	-50.40	-51.06	-52.89						
26-Aug-2010	20:00:00	-48.38	-53.88	-51.15	-51.82	-37.68	-39.82	-24.97	-34.12	-45.35	-37.38	-26.98	-52.80	-46.78	-41.24	-50.39	-52.20	-52.93						
27-Aug-2010	08:00:00	-49.26	-53.84	-51.13	-51.77	-37.81	-41.08	-25.79	-33.85	-46.09	-37.40	-27.45	-52.80	-46.78	-41.23	-50.41	-53.54	-52.91						
27-Aug-2010	20:00:00	-50.38	-53.91	-51.14	-51.77	-37.85	-40.75	-27.20	-34.55	-45.67	-37.39	-28.06	-52.80	-46.78	-41.24	-50.41	-54.55	-52.94						
28-Aug-2010	08:00:00	-50.84	-53.84	-51.12	-51.71	-37.95	-42.26	-28.01	-34.40	-46.03	-37.39	-28.51	-52.80	-46.79	-41.23	-50.43	-55.57	-52.91						
28-Aug-2010	20:00:00	-50.70	-53.86	-51.12	-51.74	-37.98	-41.82	-29.14	-35.20	-45.59	-37.38	-29.13	-52.80	-46.77	-41.23	-50.42	-56.52	-52.96						
29-Aug-2010	08:00:00	-50.62	-53.74	-51.09	-51.71	-38.10	-43.11	-29.91	-35.09	-45.98	-37.36	-29.72	-52.80	-46.77	-41.22	-50.42	-57.54	-52.89						
29-Aug-2010	20:00:00	-50.70	-53.82	-51.13	-51.73	-38.17	-42.55	-30.83	-35.81	-45.56	-37.38	-30.71	-52.80	-46.78	-41.22	-50.42	-58.56	-52.96						
30-Aug-2010	08:00:00	-50.69	-53.74	-51.11	-51.70	-38.28	-44.02	-31.43	-35.58	-46.15	-37.36	-31.29	-52.80	-46.79	-41.22	-50.43	-59.54	-52.95						
30-Aug-2010	20:00:00	-50.75	-53.86	-51.15	-51.72	-38.35	-43.79	-32.25	-36.40	-45.79	-37.37	-31.91	-52.80	-46.78	-41.22	-50.44	-59.75	-52.97						
31-Aug-2010	08:00:00	-50.77	-53.86	-51.15	-51.72	-38.46	-44.61	-32.74	-35.97	-46.40	-37.38	-32.29	-52.80	-46.79	-41.22	-50.46	-59.86	-52.94						
31-Aug-2010	20:00:00	-50.84	-53.97	-51.20	-51.76	-38.56	-44.30	-33.42	-36.95	-46.15	-37.38	-32.84	-52.80	-46.77	-41.23	-50.46	-59.61	-52.97						
1-Sep-2010	08:00:00	-50.87	-53.98	-51.22	-51.75	-38.69	-45.13	-33.78	-36.51	-46.86	-37.37	-33.23	-52.80	-46.78	-41.24	-50.44	-59.66	-52.93						
1-Sep-2010	20:00:00	-50.87	-53.98	-51.21	-51.84	-38.78	-44.90	-34.25	-37.48	-46.66	-37.39	-33.82	-52.80	-46.78	-41.25	-50.44	-59.68	-52.95						2.67
2-Sep-2010	08:00:00	-50.99	-54.03	-51.24	-51.82	-38.96	-45.68	-34.63	-37.17	-47.29	-37.38	-34.18	-52.80	-46.78	-41.24	-50.45	-59.72	-52.93						
2-Sep-2010	20:00:00	-51.02	-54.04	-51.27	-51.95	-39.04	-45.63	-35.12	-38.06	-46.97	-37.39	-34.72	-52.80	-46.78	-41.26	-50.45	-59.70	-52.95						
3-Sep-2010	08:00:00	-51.14	-54.08	-51.30	-51.95	-39.26	-46.38	-35.47	-37.93	-47.70	-37.41	-35.08	-52.80	-46.79	-41.27	-50.46	-59.69	-52.95						
3-Sep-2010	20:00:00	-50.96	-54.01	-51.26	-51.93	-39.36	-46.11	-35.80	-38.87	-47.17	-37.39	-35.68	-52.80	-46.79	-41.26	-50.45	-59.70	-52.95						
4-Sep-2010	08:00:00	-50.86	-53.92	-51.20	-51.86	-39.43	-47.27	-35.98	-39.04	-48.06	-37.38	-36.12	-52.80	-46.79	-41.25	-50.46	-59.75	-52.87						
4-Sep-2010	20:00:00	-50.87	-53.95	-51.23	-51.89	-39.46	-46.73	-36.40	-40.08	-47.53	-37.39	-36.75	-52.80	-46.79	-41.27	-50.47	-59.74	-52.90						
5-Sep-2010	08:00:00	-50.81	-53.86	-51.18	-51.77	-39.58	-47.80	-36.59	-40.31	-48.41	-37.37	-37.25	-52.80	-46.79	-41.26	-50.45	-59.77	-52.84						
5-Sep-2010	20:00:00	-50.94	-53.90	-51.21	-51.80	-39.56	-47.27	-37.03	-41.17	-48.01	-37.37	-37.92	-52.80	-46.80	-41.24	-50.47	-59.76	-52.89						
6-Sep-2010	08:00:00	-50.86	-53.79	-51.16	-51.73	-39.68	-48.12	-37.27	-41.36	-48.80	-37.35	-38.50	-52.80	-46.79	-41.22	-50.49	-59.78	-52.85						
6-Sep-2010	20:00:00	-50.85	-53.80	-51.18	-51.73	-39.71	-47.72	-37.65	-42.63	-48.58	-37.34	-39.16	-52.80	-46.78	-41.21	-50.47	-59.80	-52.89						
7-Sep-2010	08:00:00	-50.80	-53.73	-51.15	-51.70	-39.80	-48.91	-37.97	-42.69	-49.43	-37.30	-39.64	-52.80	-46.79	-41.22	-50.49	-59.80	-52.86						
7-Sep-2010	20:00:00	-50.95	-53.93	-51.23	-51.75	-39.87	-48.49	-38.50	-43.40	-49.51	-37.35	-40.23	-52.80	-46.79	-41.23	-50.47	-59.78	-53.02						
8-Sep-2010	08:00:00	-51.04	-53.97	-51.27	-51.77	-40.01	-48.82	-38.87	-43.01	-50.46	-37.36	-40.66	-52.80	-46.78	-41.23	-50.47	-60.10	-53.02						
8-Sep-2010	20:00:00	-51.07	-54.03	-51.28	-51.93	-40.12	-48.57	-39.34	-43.69	-50.60	-37.39	-41.23	-52.80	-46.79	-41.26	-50.47	-59.78	-53.03						
9-Sep-2010	08:00:00	-51.02	-54.00	-51.28	-51.82	-40.38	-49.37	-39.57	-43.57	-51.36	-37.37	-41.65	-52.80	-46.79	-41.25	-50.46	-59.79	-53.00						
9-Sep-2010	20:00:00	-51.07	-54.02	-51.25	-51.95	-40.36	-48.94	-40.03	-44.12	-51.46	-37.39	-40.34	-52.80	-46.79	-41.27	-50.46	-59.79	-53.02						
10-Sep-2010	08:00:00	-50.98	-53.98	-51.26	-51.81	-40.59	-50.12	-40.23	-44.28	-52.64	-37.38	-40.34	-52.80	-46.79	-41.23	-50.47	-59.84	-52.93						
10-Sep-2010	20:00:00	-51.03	-54.00	-51.25	-51.90	-40.54	-49.62	-40.68	-44.95	-52.61	-37.37	-40.34	-52.80	-46.77	-41.25	-50.48	-59.80	-53.01						
11-Sep-2010	08:00:00	-51.01	-53.93	-51.26	-51.76	-40.73	-50.12	-40.92	-45.47	-53.23	-37.37	-40.35	-52.80	-46.79	-41.24	-50.49	-59.83	-52.94				0.1	0.02	
11-Sep-2010	20:00:00	-51.06	-54.01	-51.28	-51.82	-40.68	-49.96	-41.37	-45.92	-52.75	-37.38	-40.35	-52.80	-46.78	-41.25	-50.49	-59.82	-52.99						
12-Sep-2010	08:00:00	-51.00	-54.00	-51.27	-51.81	-40.84	-50.38	-41.65	-45.09	-53.33	-37.37	-40.35	-52.80	-46.79	-41.24	-50.50	-59.84	-52.97				0.04		
12-Sep-2010	20:00:00	-50.96	-53.94	-51.25	-51.79	-40.92	-50.17	-41.94	-45.94	-53.12	-37.36	-40.35	-52.80	-46.79	-41.24	-50.50	-59.85	-52.96						
13-Sep-2010	08:00:00	-50.89	-53.87	-51.24	-51.72	-41.00	-51.29	-42.39	-45.65	-53.58	-37.33	-40.34	-52.80	-46.78	-41.23	-50.50	-59.86	-52.92						
13-Sep-2010	20:00:00	-50.98	-53.97	-51.24	-51.76	-41.02	-50.82	-43.01	-46.56	-53.65	-37.37	-40.35	-52.80	-46.78	-41.23	-50.50	-59.84	-53.01						
14-Sep-2010	08:00:00	-50.90	-53.91	-51.24	-51.74	-41.16	-51.64	-43.36	-46.59	-54.23	-37.35	-40.35	-52.80	-46.78	-41.23	-50.51	-59.87	-52.95						
14-Sep-2010	20:00:00	-50.95	-53.96	-51.27	-51.75	-41.23	-51.28	-43.88	-47.36	-54.66	-37.36	-40.35	-52.80	-46.79	-41.23	-50.51	-59.85	-53.01						
15-Sep-2010	08:00:00	-50.87	-53.87	-51.25	-51.71	-41.34	-52.36	-44.22	-47.66	-55.01	-37.32	-40.34	-52.80	-46.78	-41.22	-50.51	-59.77	-52.95						
15-Sep-2010	20:00:00	-51.05	-53.94	-51.27	-51.73	-41.39	-51.88	-44.75	-47.75	-54.09	-37.34	-40.34	-52.80	-46.79	-41.22	-50.51	-60.20	-53.02						
16-Sep-2010	08:00:00	-51.09	-53.93	-51.29	-51.71	-41.51	-53.05	-45.12	-48.27	-54.85	-37.31	-40.34	-52.80	-46.80	-41.22	-50.51	-60.05	-52.98						
16-Sep-2010	20:00:00	-51.15	-54.01	-51.28	-51.77	-41.58	-53.02	-45.79	-48.74	-54.47	-37.37	-40.34	-52.80	-46.79	-41.23	-50.50	-60.19	-53.04						

Date	Time	Water Level (inches)																		On-site Manual Raingauge	On-site Auto Raingauge	Wadesboro Daily Rainfall	Wadesboro Monthly Rainfall
dd-mmm-yyyy	hh:mm:ss	Jon AW1	Jon AW2	Jon AW3	Jon AW4	Jon AW5	Jon AW6	Jon AW7	Jon AW8	Jon AW9	Jon AW10	Jon AW11	Jon AW12	Jon AW13	Jon AW14	Jon RAW1	Jon RAW2	Jon RAW3	CG1	CG2				
17-Sep-2010	08:00:00	-51.10	-54.00	-51.27	-51.75	-41.74	-53.51	-46.07	-49.16	-55.29	-37.35	-40.34	-52.80	-46.79	-41.23	-50.51	-60.18	-53.04						
17-Sep-2010	20:00:00	-51.08	-53.99	-51.27	-51.76	-41.81	-52.97	-46.47	-49.48	-55.23	-37.36	-40.33	-52.80	-46.78	-41.22	-50.52	-60.16	-53.03						
18-Sep-2010	08:00:00	-50.88	-53.86	-51.24	-51.70	-41.91	-53.74	-46.69	-49.58	-55.90	-37.29	-40.31	-52.80	-46.79	-41.21	-50.53	-59.74	-52.97						
18-Sep-2010	20:00:00	-50.97	-53.92	-51.25	-51.73	-41.95	-52.70	-47.15	-49.97	-56.11	-37.33	-40.32	-52.80	-46.79	-41.22	-50.53	-59.77	-53.00						
19-Sep-2010	08:00:00	-50.95	-53.95	-51.28	-51.71	-42.07	-53.69	-47.62	-50.05	-56.11	-37.31	-40.32	-52.80	-46.78	-41.22	-50.53	-59.74	-52.99						
19-Sep-2010	20:00:00	-51.18	-54.02	-51.29	-51.77	-42.15	-52.48	-48.22	-50.40	-56.54	-37.36	-40.23	-52.80	-46.79	-41.22	-50.52	-60.21	-53.05						
20-Sep-2010	08:00:00	-51.11	-54.01	-51.28	-51.75	-42.30	-53.45	-48.71	-50.36	-56.92	-37.36	-40.23	-52.80	-46.79	-41.24	-50.51	-59.90	-52.88						
20-Sep-2010	20:00:00	-51.08	-53.99	-51.28	-51.78	-42.38	-52.29	-49.19	-50.73	-57.25	-37.35	-40.22	-52.80	-46.78	-41.22	-50.52	-59.75	-52.90						
21-Sep-2010	08:00:00	-50.86	-53.87	-51.26	-51.70	-42.50	-53.36	-49.69	-50.87	-57.47	-37.28	-40.22	-52.79	-46.77	-41.20	-50.52	-59.77	-52.90						
21-Sep-2010	20:00:00	-50.95	-53.94	-51.27	-51.72	-42.52	-52.37	-50.28	-51.17	-57.48	-37.32	-40.21	-52.66	-46.78	-41.21	-50.53	-59.80	-52.94						
22-Sep-2010	08:00:00	-50.81	-53.84	-51.24	-51.68	-42.63	-53.74	-50.80	-51.32	-57.78	-37.28	-40.21	-52.56	-46.78	-41.21	-50.53	-59.78	-52.93						
22-Sep-2010	20:00:00	-50.94	-53.93	-51.26	-51.72	-42.69	-52.69	-51.36	-51.59	-57.77	-37.33	-40.21	-52.54	-46.78	-41.21	-50.53	-59.89	-52.94						
23-Sep-2010	08:00:00	-50.78	-53.82	-51.26	-51.68	-42.82	-54.08	-51.93	-51.65	-58.03	-37.29	-40.20	-52.54	-46.79	-41.20	-50.53	-59.79	-52.94						
23-Sep-2010	20:00:00	-50.93	-53.94	-51.27	-51.71	-42.88	-53.08	-52.52	-51.94	-57.90	-37.33	-40.20	-52.54	-46.79	-41.21	-50.52	-60.00	-52.96						
24-Sep-2010	08:00:00	-50.89	-53.88	-51.27	-51.69	-43.00	-53.61	-53.09	-52.03	-58.17	-37.28	-40.20	-52.58	-46.79	-41.21	-50.53	-59.78	-52.96						
24-Sep-2010	20:00:00	-51.09	-54.03	-51.30	-51.79	-43.08	-53.61	-53.81	-52.29	-58.22	-37.37	-40.21	-52.59	-46.79	-41.23	-50.51	-60.26	-52.98						
25-Sep-2010	08:00:00	-51.34	-54.12	-51.31	-51.85	-43.27	-53.17	-54.26	-52.23	-58.43	-37.38	-40.22	-52.61	-46.79	-41.22	-50.53	-60.23	-52.98						
25-Sep-2010	20:00:00	-51.26	-54.06	-51.30	-51.89	-43.43	-53.05	-54.55	-52.49	-58.49	-37.41	-40.21	-52.65	-46.78	-41.23	-50.52	-60.23	-52.99						
26-Sep-2010	08:00:00	-51.16	-54.07	-51.30	-51.87	-43.56	-53.48	-54.70	-52.47	-58.67	-37.40	-40.22	-52.71	-46.79	-41.23	-50.53	-60.23	-52.97				0.85	0.59	
26-Sep-2010	20:00:00	-51.36	-54.16	-51.32	-51.90	-43.64	-53.47	-54.64	-51.99	-58.64	-37.41	-40.23	-52.74	-46.78	-41.24	-50.53	-60.24	-52.98						
27-Sep-2010	08:00:00	-51.20	-54.06	-51.32	-51.91	-43.76	-53.55	-54.58	-51.03	-58.83	-37.41	-40.23	-52.78	-46.78	-41.23	-50.53	-60.23	-52.96				1.09	0.58	
27-Sep-2010	20:00:00	-51.37	-54.18	-51.31	-51.95	-43.87	-52.89	-54.76	-50.16	-58.83	-37.42	-40.25	-52.78	-46.79	-41.26	-50.53	-60.24	-52.98						
28-Sep-2010	08:00:00	-51.13	-54.02	-51.31	-51.93	-44.00	0.00	-54.59	-48.72	-59.00	-37.40	-40.21	-52.74	-46.79	-41.25	-50.53	-58.88	-53.16	0	0	6.4	0.02		
28-Sep-2010	20:00:00																							
29-Sep-2010	08:00:00																						1.38	
29-Sep-2010	20:00:00																							
30-Sep-2010	08:00:00																						0.78	
30-Sep-2010	20:00:00																							
1-Oct-2010	08:00:00																							
1-Oct-2010	20:00:00																							3.35
2-Oct-2010	08:00:00																							
2-Oct-2010	20:00:00																							
3-Oct-2010	08:00:00																							
3-Oct-2010	20:00:00																							
4-Oct-2010	08:00:00																							
4-Oct-2010	20:00:00																							
5-Oct-2010	08:00:00																							
5-Oct-2010	20:00:00																							
6-Oct-2010	08:00:00																							
6-Oct-2010	20:00:00																							
7-Oct-2010	08:00:00																							
7-Oct-2010	20:00:00																							

APPENDIX E

2010 Hydrology Assessment

Jones Creek Mitigation Project

Anson County, North Carolina

Hydrologic Restoration Assessment

Prepared for
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Prepared by
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October 2010

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Project Description

This Jones Creek hydrology analysis is intended to make an interim determination of the extent of wetland restoration on the Jones Creek Mitigation Site. WK Dickson determined those areas meeting the hydrologic design goals, areas that require additional monitoring, areas that have failed to meet design goals, and areas of additional restoration beyond the original restoration boundary. This was accomplished through hydrology data analysis and a site evaluation utilizing soil borings and visible surface and vegetation characteristics. The wetland restoration boundaries presented in this Technical Memorandum conservatively define successful wetland restoration areas from areas where success has not yet been determined. The boundaries presented in this Technical Memorandum are not intended to represent the final limits of wetland restoration.

Repair and maintenance activities occurred at the site during fall of 2008 and included repair to ditch plugs, repair of a level spreader in the wetland restoration area, and subsurface ripping of the soil to increase infiltration in the wetland restoration area (approximately 3 acres). The disturbed areas were re-seeded and planted to provide stabilization. This work was designed to increase wetland hydroperiods through surface water retention, increased infiltration, and to slow run-off.

Past monitoring years' data and the 2010 through September hydrology data indicate that two wetland hydrology monitoring gauges are performing below the hydrologic design goals for the project. Specifically a linear portion of the wetland north of Jones Creek appears to suffer from subsurface drainage to Jones Creek.

The Jones Creek Restoration site defines wetland hydrologic success as meeting a minimum 7 percent wetland hydroperiod. A wetland hydroperiod is the number of consecutive days that the water table elevation is within 12 inches of the soil surface during the growing season. The growing season was determined from National Weather Service Wetlands Determination Tables (WETS) and is 225 days long, beginning on March 24 and ending November 5. Hydrologic data is considered only for normal precipitation conditions throughout the growing season (within the 30-70 percentiles on the WETS table). Groundwater monitoring gauges were installed across the wetland site to monitor the elevation of groundwater.

Prior to the start of the 2007 growing season, all manual gauges at the restoration site were converted to automated gauges. In October 2008 the site was examined to estimate the extent of wetland restoration outside the areas specified in the Restoration Plan. Six additional wetland areas were found that exhibited wetland hydrology, hydrophytic vegetation and hydric soils. These areas were not formally delineated, but were estimated to be 1.32 acres.

Methodology

Gauge Data

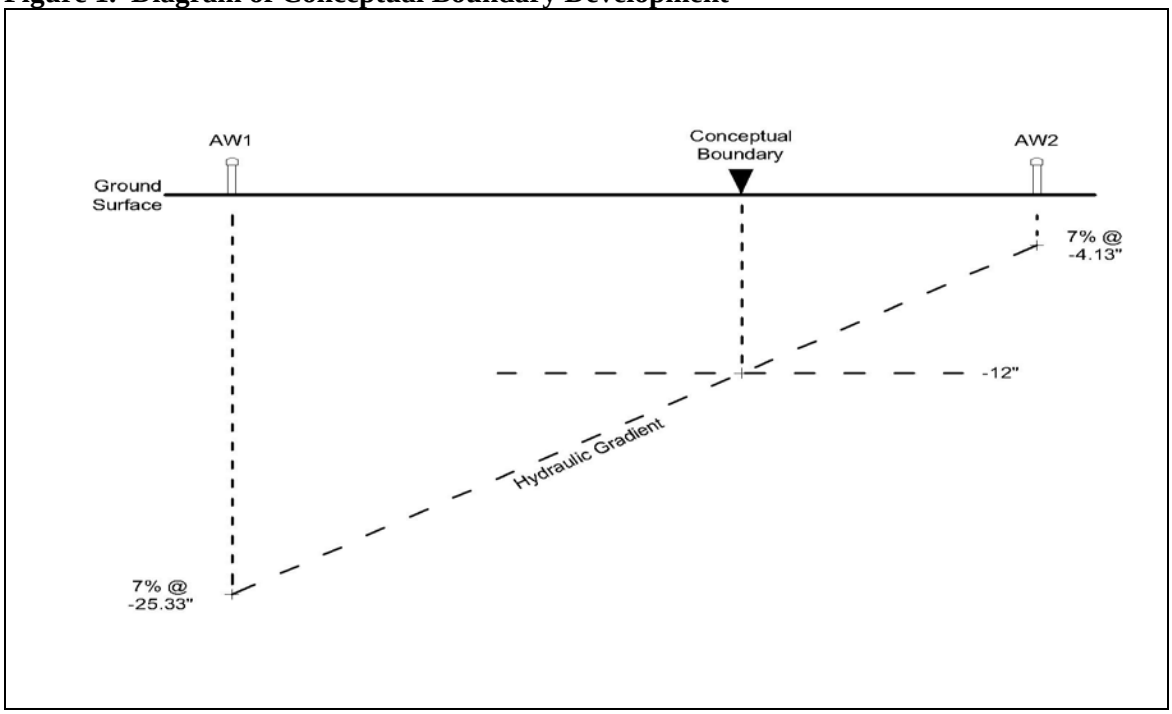
Monitoring has been conducted at Jones Creek beginning in 2006 and continuing through 2009 (in progress). Hydrology data from 2007 was not used in this analysis due to a severe statewide drought with below normal rainfall. To determine areas clearly exhibiting wetland hydrology restoration, two techniques were utilized: 1) review and analyze groundwater monitoring gauge data that have been collected across the site to develop potential boundaries that define areas meeting design goals, and 2) perform a field assessment of each area that has not met design

goals to establish a boundary on the ground that reflects the observed site characteristics combined with the analyzed gauge data. The boundary determined through this process conservatively defines wetland restoration areas from areas where success has not yet been determined. The boundary is not intended to represent the final limits of wetland restoration.

The groundwater gauge data was analyzed for all years with normal rainfall by calculating the minimum depth to 7 percent hydroperiod for gauges not meeting success criteria and the nearest adjacent gauge meeting success, where applicable. The minimum depth to 7 percent hydroperiod is the minimum depth to the water table over any consecutive 16-day period during the growing season. The 2008 through 2010 data were used because 2006 started below normal and the site was becoming wetter after construction. The 2007 monitoring year was abnormally dry. The 2010 data is incomplete, but covers the early period of the growing season where success is typically observed.

For the gauges that failed to meet the 7 percent wetland hydroperiod within 12 inches of the surface a linear hydraulic gradient was developed with an adjacent successful gauge. For example, gauge AW1 had a hydroperiod of 2.6 percent (6 days). The minimum depth at which 7 percent was achieved was -25.33 inches from the surface. Gauge AW2 had a hydroperiod of 27.1 percent (61 days). The minimum depth at which 7 percent was achieved was -4.13 inches below the ground surface. A conceptual boundary was established at the point where the hydraulic gradient between these two gauges crossed below 12 inches from the surface (**Figure 1**).

Figure 1. Diagram of Conceptual Boundary Development



During the field assessment, the conceptual boundary was located with a sub-meter GPS receiver and refined through soil borings and observation of surface characteristics. Field indicators included primary hydrology indicators (saturation and inundation), hydrophytic vegetation, and

low/depressional topography. A boundary line was developed that more accurately defined the extent of apparent successful wetland restoration. In areas where no clear boundary is present, the original conceptual boundary is used. The boundary in the field was GPS located for mapping and documentation. This was not a wetland delineation and did not include survey or marking the boundary with flagging tape.

Wetland Boundary Expansion

A field evaluation of the wetland boundaries was conducted by following along the restoration boundary and systematically evaluating soil and vegetation along and outside of the boundary. Location of the boundary was continually verified with GPS location. Prior to restoration the hydric soil was delineated and used as a basis for the restoration boundary. Post restoration some of these areas have developed hydric soil characteristics. Soils along the edges of drained wetlands would be the first to begin loosing hydric characteristics, especially where tillage or land disturbance have occurred and it is these areas have re-gained hydric characteristics and should be considered wetland restoration.

The above methodology was combined with analysis of the 2009 and 2010 growing season hydrology data. A map was developed combining the hydrology analysis, field assessment, and GPS points to more accurately define the extent of apparent successful wetland restoration.

Results and Discussion

The additional remediation work on the site was performed in late 2008 to repair ditch plugs, halt minor erosion, and maintain diffuse surface flow. This additional work resulted in reducing the erosion and insured the project functions as designed. This work was not intended to affect AW6 and no change in performance was observed. The result of the analysis and field assessment for Gauge AW6 is briefly described below. The additional Gauge AW17 was installed in 2009. An additional task was undertaken to evaluate hydric conditions outside of the restoration boundary and is described below.

Gauge Data

Fourteen gauges were initially installed in 2006 and five additional monitoring gauges were installed prior to the 2009 growing season to provide additional information on groundwater at the site. Of the original 14 gauges 7 were manual wells that were read monthly. The manual gauges have since been replaced with automated gauges that record water depth twice daily. The wetland restoration area is divided by Jones Creek, with twelve gauges (AW1, AW3, AW6, AW7, AW8, AW11, AW12, AW13, AW14, AW17, AW18, and AW19) to the north and seven gauges (AW2, AW4, AW5, AW9, AW10, AW15, AW16) to the south. To the south of Jones Creek is the larger restoration area from which a long narrow strip extends southward along Jones Creek (**Figure 1**). Within this narrow strip are located two gauges that are underperforming (AW6 and AW17).

Four of the initial 14 gauges (AW2, AW7, AW8, and AW11) have achieved a minimum 7 percent hydroperiod in all monitoring years, satisfying success criteria (**Table 1**).
Three gauges (AW5, AW12, and AW14) have recorded hydroperiods of at least 5 to 7 percent of the growing season in all years with normal rainfall, satisfying jurisdictional criteria. Two gauges, (AW9 and AW10) have recorded hydroperiods of at least 5 to 7 percent of the growing season during normal years, but did not achieve at least 5 percent during the dry year, 2007.

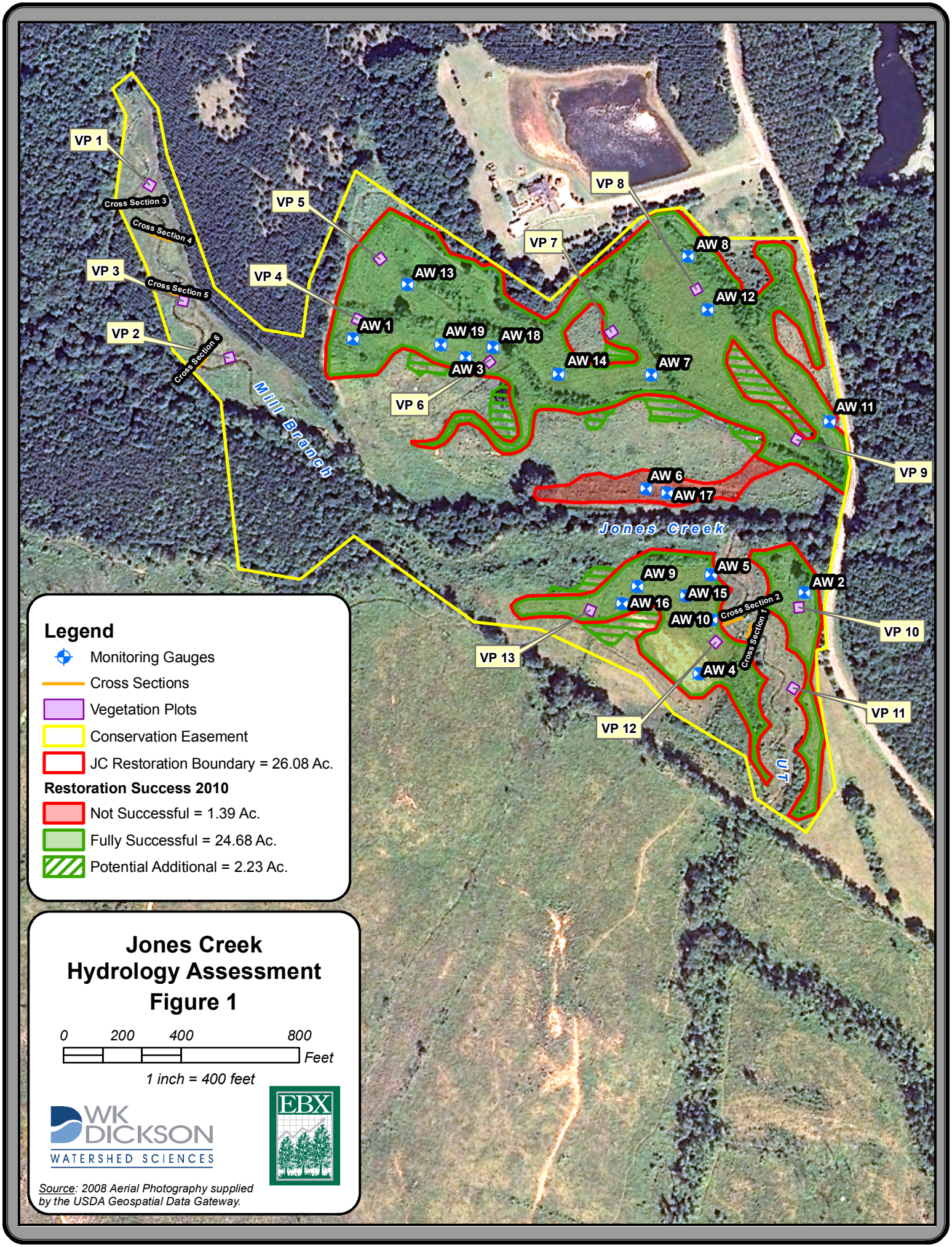
Three gauges (AW1, AW4, and AW13) have recorded hydroperiods less than 5 to 7 percent during the first monitoring year after construction. The gauges have recorded increasing hydroperiod length during the following years, achieving 5 to 7 percent during 2007 and greater than 7 percent the last three years recorded. One gauge (AW 3) recorded less than 5 percent the first two monitoring years, but has recorded greater than 7 percent during 2009 and 2009, and greater than 6 percent in2010. . One gauge, AW6, has not achieved a consistent 5 percent hydroperiod during any of the four monitoring years. Gauge AW17 is close to this gauge and has not achieved a consistent 5 percent during either of the two monitoring years. These gauges are located on a narrow band extending south from the main restoration and parallel the east side of Jones Creek (**Figure 2**). In 2009 AW15, AW16, AW18, AW 19 recorded hydroperiods greater than 12 percent. In 2010 AW15 recorded hydroperiods greater of 8 percent and AW16, AW18, AW 19 recorded hydroperiods of 5 percent or greater.

Table 1. Growing Seasons Meeting Hydrologic Goals

Gauge	Percent of Growing Season Meeting Criteria					
	Monitoring Year					
	2006	2007	2008	2009[1]	2010	Successful Years /Years Monitored
Max Consecutive Wetland Hydroperiod (Percent of Growing Season)						
AW1	4	6	14	16	8	3 of 5
AW2	8	7	14	16	9	5 of 5
AW3	4	4	7	16	6	2 of 5
AW4	4	7	25	21	9	4 of 5
AW5	8	6	24	15	6	3 of 5
AW6	1	1	3	2	1	0 of 5
AW7	8	15	38	37	13	5 of 5
AW8	18	16	27	19	11	5 of 5
AW9 (MW1)	5	1	6	12	5	1 of 5
AW10 (MW4)	5	4	12	15	9	3 of 5
AW11 (MW2)	13	17	27	19	13	5 of 5
AW12 (MW5)	6	14	14	16	7	4 of 5
AW13 (MW3)	4	5	14	17	9	3 of 5
AW14 (MW6)	5	7	10	14	6	3 of 5
AW15	N/A[2]	N/A[2]	N/A[2]	14	8	2 of 2
AW16	N/A[2]	N/A[2]	N/A[2]	12	5	1 of 2
AW17	N/A[2]	N/A[2]	N/A[2]	1	1	0 of 2
AW18	N/A[2]	N/A[2]	N/A[2]	14	6	1 of 2
AW19	N/A[2]	N/A[2]	N/A[2]	15	5	1 of 2
Reference Gauges						
RAW1	0	8	15	15	10	4 of 5
RAW2	N/A[3]	N/A[3]	22	23	10	3 of 5
RAW3	4	N/A[3]	22	27	11	3 of 5

Less than 5% | 5% to 7% | 7% and Greater

[1] Data for 2009 through April
[2] Gauge not installed
[3] Gauge technical failure


VP 1
Cross Section 3
Cross Section 4
VP 3
Cross Section 5
VP 2
Cross Section 6
VP 5
VP 4
VP 8
VP 7
AW 8
AW 13
AW 12
AW 1
AW 19
AW 18
AW 14
AW 7
AW 3
VP 6
AW 11
VP 9
Mill Branch
AW 6
AW 17
Jones Creek
AW 9
AW 5
AW 2
AW 15
AW 16
Cross Section 2
AW 10
Cross Section 1
VP 10
VP 13
AW 4
VP 11
VP 12
UT
Legend
Monitoring Gauges
Cross Sections
Vegetation Plots
Conservation Easement
JC Restoration Boundary = 26.08 Ac.
Restoration Success 2010
Not Successful = 1.39 Ac.
Fully Successful = 24.68 Ac.
Potential Additional = 2.23 Ac.
Jones Creek
Hydrology Assessment
Figure 1
0
200
400
800
Feet
1 inch = 400 feet
WK DICKSON
WATERSHED SCIENCES
EBX
Source: 2008 Aerial Photography supplied by the USDA Geospatial Data Gateway.

For the gauges AW6 and AW17 that failed to meet the 7 percent wetland hydroperiod within 12 inches of the surface, a linear hydraulic gradient was developed with an adjacent successful gauge (AW11). For the successful AW11, the minimum depth at which 7 percent hydroperiod was achieved ranged from -0.77 to 3.35 inches from the surface (**Table 2**). For gauges AW6 and AW17, the minimum depth at which 7 percent hydroperiod was achieved ranged from -21.56 to 26.11 inches and from -20.86 to 25.16 inches from the surface.

Table 2. Depth to hydrologic success

Gauge	2008	2009	2010*
AW6	24.73	-21.56	-26.11
AW11	-0.77	-1.25	-3.35
AW17**	NA	-20.86	-25.16

*data through September
**gauge installed in 2009

In 2008 12 of 14 gauges recorded successful hydroperiods. In the 2009 growing season, 17 of 19 gauges recorded successful hydroperiods. Through September 2010, 10 of 19 gauges recorded successful hydroperiods. In 2010, only two gauges recorded less than 5 percent hydroperiod. The rainfall for 2010 appears to be below average, as discussed below.

Rainfall Data

Annual rainfall during the growing season from 2006 through 2009 has been within the annual normal rainfall amounts except for 2007, which was abnormally dry and most of the state was in a severe drought (**Figure 3** and **Table 3**). The hydroperiod was derived from data recorded during the early part of the growing season and not during the large rain events recorded in August. Rainfall data throughout the monitoring period has exhibited normal to dryer than normal years. Fifty percent of the gauges did not meet the success criteria during 2007. Therefore, the 2007 results are not included in this analysis. During the first year after construction, 2006, many gauges underperformed as the site became saturated and the rainfall for February through April in 2006 was below normal. Despite the drought conditions in 2007, many gauges appeared to maintain similar hydrologic success or in some cases, increased hydroperiods as the site become saturated. The rainfall for 2010 through September indicates a below average rainfall year and possibly below normal.

Figure 3. Five-Year Monthly Precipitation for Jones Creek Restoration Site

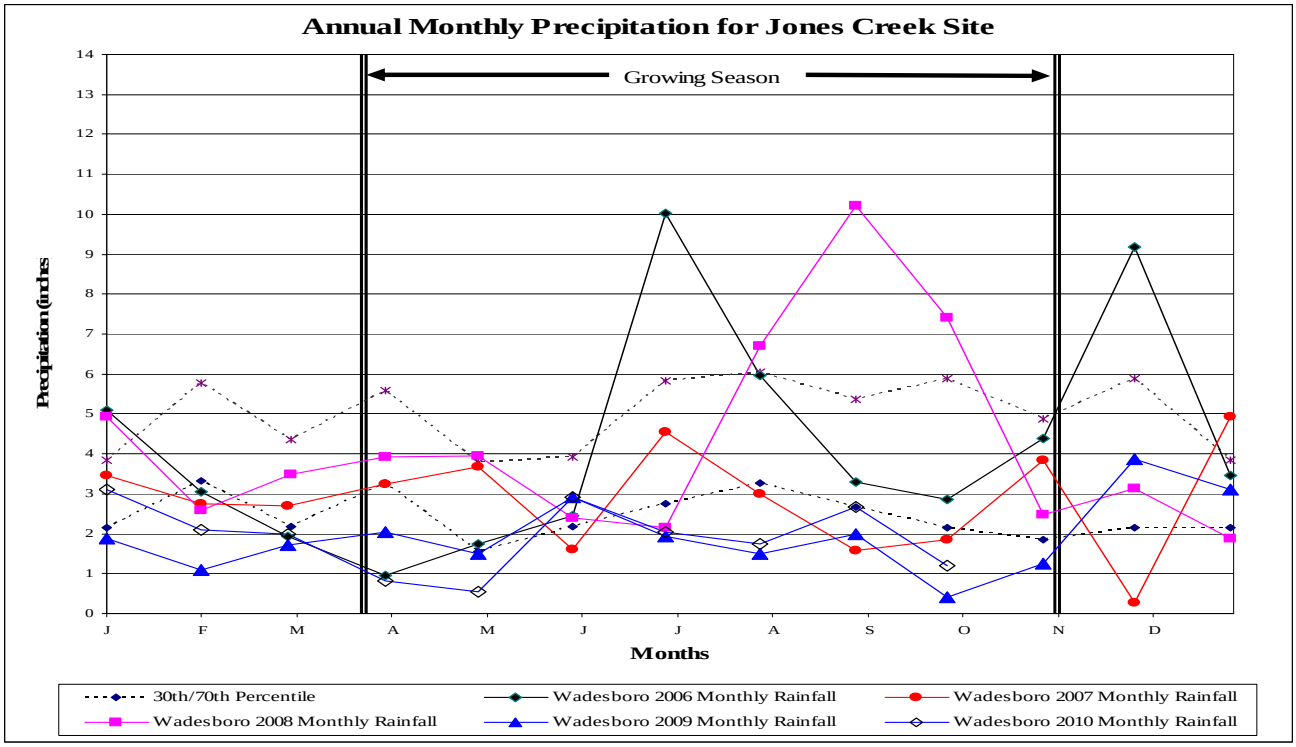


Table 3. Five-Year Monthly Precipitation for Jones Creek Restoration Site

Month	Average	Normal Limits		Wadesboro Precipitation 2006	Wadesboro Precipitation 2007	Wadesboro Precipitation 2008	Wadesboro Precipitation 2009	Wadesboro Precipitation 2010*
		30 Percent	70 Percent					
January	4.66	3.31	5.78	3.04	2.75	2.60	1.93	4.23
February	3.56	2.18	4.37	1.94	4.58	3.50	4.88	4.21
March	4.61	3.28	5.58	0.94	3.25	3.92	5.82	3.51
April	2.94	1.54	3.78	1.73	3.67	3.96	2.52	0.76
May	3.44	2.18	3.93	2.44	2.52	1.60	5.48	3.65
June	4.56	2.74	5.84	10.01	4.54	2.14	2.33	1.66
July	5.26	3.26	6.06	5.97	2.99	6.70	3.26	4.04
August	4.41	2.67	5.36	3.29	1.59	10.22	3.65	3.66
September	4.25	2.15	5.87	2.87	1.84	7.42	0.67	5.88
October	3.66	1.85	4.87	4.39	3.85	2.49	2.68	
November	3.10	2.14	3.86	9.18	0.26	3.14	8.60	
December	3.28	2.16	3.83	3.46	4.93	3.72	6.94	
Annual		43.21	50.80					
Total	47.73			49.26	36.77	51.41	48.76	31.60

* Data through September

Rainfall Within Normal Limits	Rainfall Below Normal Limits	Rainfall Above Normal Limits

Field Assessment

The gauge AW6 and AW17has not achieved success in any of the past monitoring years. Gauge AW6 and AW17 are located in a narrow band of restoration that extends from the larger area of restoration southwest to and along Jones Creek. The topography in this area is a long narrow shallow depression extending southwest away from the main restoration area. Soils adjacent to these gauges are typical alluvial soils having multiple depositional layers of different textures. The surface layers are silt loam or sandy loam over sandy clay loams or sandy clay with a deeper layer of loamy sand. Because of the highly permeable sandy textured soil and the proximity to the channel of Jones Creek, this area likely drains more rapidly, preventing long-term saturated soils.

The closest successful gauge is AW11 that met the success criteria. At the conceptual boundary, a topographic and vegetative break was observed. Despite the depressional topography and vegetative change, the soils in this area do not exhibit strong hydric characteristics. A restoration boundary was found where this narrow band joins the larger wetland boundary. This area is nearly level with shallow swales and hummocks. There is evidence of surface ponding and water stained leaves throughout the surrounding area. Soils (Boring JX 8) within this refined boundary are hydric. The typical profile has a surface that is brown (10YR 4/4) clay loam having mottles (7.5YR 3/4) and is underlain by grey (10YR 4/2) sandy clay loam. Hydrophytic vegetation includes common rush (*Juncus effusus*), slimpod rush (*Juncus diffusissimus*), Canadian rush (*Juncus Canadensis*), herbwilliam (*Ptilimnium capillaceum*), broadleaf cattail (*Typha latifolia*), and spikerush (*Eleocharis* sp.). A field boundary was determined primarily utilizing hydric soil indicators, topography, and vegetation and mapped with sub-meter GPS.

Additional Wetland Restoration

Non-wetland restoration or enhancement inclusions in the conservation easement were also evaluated. To the north of Jones Creek, seven additional areas along the restoration boundary were identified as well as one area located within the restored wetland (**Figure 3**). Most of these areas are clearly within shallow depressional features similar to the adjacent restored wetland.

To the south of Jones Creek, two small areas were identified. To the north of Jones Creek, six areas were identified, including one area within the restoration boundary. Most areas exhibit evidence of ponding and water stained leaves are present. The vegetation is predominantly hydrophytic and includes most species identified previously. Many of the soils have hydric indicators within five to eight inches. The typical sandy textured surface is dark grayish brown (10YR 4/2) with many strong brown redoxomorphic concentration mottles. Black mottles of manganese concretions and nodules were also commonly observed. A field boundary for each area was determined primarily utilizing hydric soil indicators, topography, and vegetation. Each area was delineated using flagging and mapped with sub-meter GPS.

These areas of additional restoration were not included in the pre-construction hydric soil delineation likely due to the loss of hydric indicators from artificial drainage such as redoxomorphic mottles. Small areas along the outside of drained wetlands would be the first to begin loosing hydric indicators. Following restoration the soils have regained hydric indicators and should be considered restoration. Most of these additional restoration areas are in low topographic positions or depressions.

Restoration Summary

The results of the Jones Creek Hydrology analysis divide the restoration into two categories (**Table 4**). The first category is 24.7 acres (95 percent of the total) that have demonstrated full restoration to wetland conditions. The second category is 1.4 acres (5 percent of the total) that have not demonstrated full restoration to wetland conditions is not successful. **Figure 5** and **Figure 5** illustrate these findings.

Table 5. Jones Creek Wetland Restoration Summary

Total Potential Wetland Restoration Acres	Fully Successful Wetland Restoration Acres	Unsuccessful Wetland Restoration Acres	Additional Wetland Restoration Acres (within conservation easement)
26.1	24.7	1.4	2.1

Potential additional wetland restoration or enhancement inclusions in the conservation easement were also evaluated. There are 2.1 acres of potential additional restoration located within the conservation easement and are outside of the original wetland restoration boundary.