YEAR 3 (2014)
ANNUAL MONITORING REPORT
SLIVER MOON NON-RIPARIAN WETLAND MITIGATION SITE

CRAVEN COUNTY, NORTH CAROLINA
EEP PROJECT ID: 95017

PREPARED FOR:

NC Department of Environment & Natural Resources
Ecosystem Enhancement Program
Raleigh, North Carolina

PREPARED BY:

Restoration Systems, LLC
1101 Haynes Street, Suite 211
Raleigh, NC 27604

November 2014

EXECUTIVE SUMMARY

Restoration Systems, LLC has established the Sliver Moon Non-Riparian Wetland Mitigation Site (Site) that is designed specifically to assist in fulfilling North Carolina Ecosystem Enhancement Program wetland restoration goals. The Site is located approximately 4 miles east of Dover, North Carolina in the western portion of Craven County (Figure 1) and positioned within the Core Creek Targeted Local Watershed (TLW) 03020202080010 of the Neuse River Basin (8-digit HUC 03020202). Core Creek has been assigned a Best Usage Classification of **C; NSW, Sw** and is considered biologically impaired. This report serves as the Year 3 (2014) annual monitoring report.

The 17.1-acre project encompasses 14 acres of non-riparian wetland restoration, for a total for 14 non-riparian wetland mitigation units (WMUs). The restoration plan consisted of filling and plugging perimeter and interior ditches followed by planting the Site with native hardwood understory and canopy species.

The project goals aim to address stressors identified in the TLW and include the following:

- Remove non-point sources of pollution associated with vegetation maintenance including:
  a. the cessation of broadcasting fertilizer, pesticides, and other agricultural chemicals into and adjacent to Site drainage ditches and
  b. providing a vegetated wetland to aid in the treatment of runoff.
- Restore wetland hydroperiods that satisfy wetland jurisdictional requirements and approximate the Site's natural range and variation.
- Promote floodwater attenuation by filling ditches and enhancing groundwater storage capacity.
- Restore and reestablish natural community structure, habitat diversity, and functional continuity.
- Enhance and protect the Site's full potential of wetland functions and values in perpetuity.

In order to avert hydrologic trespassing issues with the property immediately to the west, a meandering shallow swale was constructed through the Site. The swale ultimately connects into the remaining southeastern ditch (Figure 2, Appendix B). Found during construction activities, the 6-inch corrugated pipe drained surface water originating from subsurface springs located within the adjacent western property. Elevations were taken of the pipe and throughout the Site to determine the path of least resistance. This approach was taken for two reasons 1) to minimize the possible draw down from the swale and 2) to maintain and enhance the Site's existing micro-topography, minimizing the amount of cut soil. Filling the western boundary ditch without allowing the surface hydrology to naturally flow through the Site would have undoubtedly inundated the neighbor's road and surrounding land. Ultimately, the additional surface hydrology is a bonus to the Site and will help further the success of the wetland restoration.

Fourteen vegetation plots (10-meters by 10-meters in size) were established and permanently monumented. These plots were surveyed in July 2014 for the Year 3 (2014) monitoring season following guidelines established in *CVS-EEP Protocol for Recording Vegetation, Version 4.2* (Lee et al. 2008). Vegetation sampling across the Site was above the required average density with 511

planted stems per acre surviving. In addition, each individual plot was above success criteria with the exception of Plot 5; however, when including natural recruits of red maple (*Acer rubrum*) the plot was well-above success criteria.

Agricultural encroachment in the southern margins of the Site occurred in the spring of 2012, after site planting had occurred. Carolina Silvics replanted the encroached area in the winter of 2012/2013 with approximately 40-3 gallon containerized sweetbay magnolia (*Magnolia virginiana*), 200 bare-root black gums (*Nyssa sylvatica var. sylvatica*), 700 bare-root swamp chestnut oaks (*Quercus michauxii*), 200 bare-root water oaks (*Quercus nigra*), and 200 bare-root willow oaks (*Quercus phellos*). Additionally, the southern boundary was marked more visibly to alleviate further encroachment into the Site.

An approximately 0.25-acre area along the southern margins of the Site was mowed in the spring of 2014. The southern boundary was remarked with new t-posts, 10-foot pvc pipes, and NCEEP signs every 100 feet. In addition, this area is scheduled to be replanted in the winter of 2014/2015.

Nine groundwater monitoring gauges were installed at the Site with an additional groundwater gauge installed in a reference wetland located immediately adjacent to the western boundary of the Site. All nine monitored gauges were inundated/saturated within 12 inches of the surface for greater than 7.5 percent of the year 3 (2014) growing season (21 days), which extends from March 18 to November 14 (242 days).

Site vegetation and wetland hydrology met success criteria for Year 3 (2014) monitoring. Additionally, the United States Army Corps of Engineers have approved a credit release for this project (Appendix E).

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1.0 PROJECT BACKGROUND

1.1 Location and Setting

Located approximately 4 miles east of Dover, North Carolina in western Craven County, the Site is situated within the Carolina Flatwoods section of the Middle Atlantic Coastal Plain physiographic province of North Carolina, United States Geological Survey (USGS) HUC 03020202 (NC Division of Water Quality [NCDWQ] Subbasin Number 03-04-08) of the Neuse River Basin. The Site is situated within an interstream flat north of Core Creek, NCDWQ Stream Index Number 27-90.

Directions to the Site (Figure 1, Appendix A) from the City of Kinston:

- Travel southeast on US 70 Bypass for 7.2 miles
- Turn left at SR 1005/Dover Road
- Continue on Old US Highway 70 for 0.3 mile
- Continue onto West Kornegay Street for 1.3 Miles
- Continue onto Old US Highway 70 for 3.7 miles
- Turn left at Daisy Lane
- Point in center of Site: Latitude: 35.205882 °N, Longitude: -77.361332 °W

1.2 Project Objectives

Project goals include the following:

- Improving Water Quality
  - Removing non-point sources of pollution associated with agricultural activities, including a) eliminating the application of fertilizer, pesticides, and other agricultural materials into ditches that flow to adjacent streams and wetlands and b) providing a vegetated wetland to aid in the treatment of pollutants such as sediment and/or agricultural pollutants from the adjacent landscape.
  - Reducing sedimentation onsite and in adjacent ditches by a) reducing ditch erosion associated with tillage and b) planting a diverse woody vegetative to reduce runoff.
- Enhancing Flood Attenuation
  - Promoting floodwater attenuation by a) removing ditches to reduce the amount of runoff that occurs during high precipitation; b) restoring wetland hydroperiods that satisfy wetland jurisdictional requirements and approximate the Site's natural range of variation; c) restoring non-riparian wetlands, resulting in increased storage capacity during precipitation events within the Site; d) revegetating the Site to reduce sheet flow off the Site.
- Restoring Non-riparian Habitat
  - Restore and reestablish natural community structure, habitat diversity, and functional continuity.
- Enhance and protect the Site's full potential of wetland functions and values in perpetuity.

Project objectives include the following:

- Providing 14 non-riparian WMUs, as calculated in accordance with the requirements stipulated in RFP #16-003571. This will be accomplished by restoring 14 acres of non-riparian wetland by eliminating row crop production, filling agricultural ditches, restoring historic water table elevations, redirecting ditches located near the Site to avoid possible draw-down, and planting the Site with native non-riparian forest vegetation.
- Protecting the Site in perpetuity with a conservation easement.

1.3 Monitoring Plan View

Monitoring features (vegetation plots and groundwater gauges) are depicted in Figure 2 (Appendix B). Tables 1 through 3 summarize project components and mitigation credits, project activities and reporting history, and project contacts, respectively (Appendix A).

2.0 ANNUAL MONITORING

Monitoring of restoration efforts will be performed for a minimum of 7 years or until success criteria are fulfilled. The detailed monitoring plan is depicted in Figure 2 (Appendix B).

2.1 Vegetation

Monitoring of planted vegetation will follow guidelines outlined in the *Carolina Vegetation Survey (CVS) EEP Protocol for Recording Vegetation, Version 4.2* (Lee et al. 2008) and will be conducted annually between June 1 and September 30 until vegetation success criteria are achieved. Fourteen, 10-meter by 10-meter vegetation plots have been placed within restored wetlands (Figure 2, Appendix B). Vegetation will receive a visual evaluation on a periodic basis to ascertain the degree of overtopping of planted elements by nuisance species.

Agricultural encroachment in the southern margins of the Site occurred in the spring of 2012, after site planting had occurred. Carolina Silvics replanted the encroached area in the winter of 2012/2013 with approximately 40-3 gallon containerized sweetbay magnolia (*Magnolia virginiana*), 200 bare-root black gums (*Nyssa sylvatica var. sylvatica*), 700 bare-root swamp chestnut oaks (*Quercus michauxii*), 200 bare-root water oaks (*Quercus nigra*), and 200 bare-root willow oaks (*Quercus phellos*). Additionally, the southern boundary was marked more visibly to alleviate further encroachment into the Site.

2.1.1 Vegetation Success Criteria

Success criteria are dependent upon the density and growth of living, planted stems throughout the planted areas of the Site, all of which is characterized as Non-riverine Wet Hardwood Flat (Schafale and Weakley 1990). The presence of desirable volunteer species will be considered by the United States Army Corps of Engineers (USACE) and Interagency Review Team (IRT) in making a determination whether the Site has successfully met the stated goals and objectives. An average density of 320 stems per acre of living, planted stems must be surviving in the first three monitoring years. Subsequently, 260 living, planted stems-per-acre must be surviving in Year 5 and 210 living, planted stems-per-acre in Year 7.

2.1.2 Vegetation Monitoring Results

Fourteen vegetation plots (10-meter by 10-meter in size) were established and permanently monumented. These plots were surveyed in July 2014 for the Year 3 (2014) monitoring period. Vegetation sampled across the Site exceeded the required average density with 511 planted stems-per-acre surviving. In addition, each individual plot exceeded success criteria based on planted stems alone with the exception of Plot 5; however, when including naturally recruited red maple (*Acer rubrum*) this plot was well-above success criteria.

Summary of Planted Vegetation Plot Results

Plot	Planted Stems/Acre Counting Towards Success Criteria				
	Year 1 (2012)	Year 2 (2013)	Year 3 (2014)	Year 5 (2016)	Year 7 (2018)
1	688	607	526		
2	648	648	647		
3	486	364	364		
4	567	526	364		
5	324	162	202		
6	567	486	324		
7	607	688	769		
8	405	364	404		
9	486	445	364		
10	607	607	607		
11	567	567	526		
12	648	728	728		
13	769	769	688		
14	648	688	647		
Average of All Plots (1-14)	**572**	**546**	**511**		

2.2 Hydrology

Measurements of wetland hydrology were performed in accordance with traditional methods as per the April 2003 *USACE Wilmington District Stream Mitigation Guidelines* (USACE et al. 2003). Nine continuously recording, groundwater monitoring gauges were installed within the 14 acres of restoration in accordance with specifications in *Installing Monitoring Wells/Piezometers in Wetlands* (NCWRP 1993); in addition, one reference gauge was installed adjacent to the Site and monitored. Year 3 (2014) groundwater data are presented by gauge in Appendix D.

2.2.1 Hydrology Success Criteria

Based on the Site's location and hydrology source, target hydrological characteristics include saturation or inundation for 7.5 percent of the growing season at a minimum of 12 inches below ground level during average rainfall conditions for a period of seven years. During growing seasons with atypical climatic conditions, groundwater gauges in reference wetlands may be used by the USACE/IRT to evaluate hydrology success.

The growing season will primarily be determined by the Unite States Department of Agriculture (USDA) *Soil Survey of Craven County, North Carolina* (USDA 1989) (March 18-November 14 [242 days]). In abnormally seasonable years the growing season may be based on USACE Regional Supplement (USACE 2010), which states the following:

> The growing season has begun on a site in a given year when two or more different non-evergreen vascular plant species growing in the wetland or surrounding areas exhibit one or more of the following indicators of biological activity:

a. Emergence of herbaceous plants from the ground
b. Appearance of new growth from vegetative crowns (e.g., in graminoids, bulbs, and corms)
c. Coleoptile/cotyledon emergence from seed
d. Bud burst on woody plants (i.e., some green foliage is visible between spreading bud scales)
1. Emergence or elongation of leaves of woody plants
f. Emergence or opening of flowers

The end of the growing season is indicated when woody deciduous species lose their leaves and/or the last herbaceous plants cease flowering and their leaves become dry or brown, generally in the fall due to cold temperatures or reduced moisture availability. Early plant senescence due to the initiation of the summer dry season in some areas does not necessarily indicate the end of the growing season and alternative procedures (e.g., soil temperature) should be used.

Summary of Hydrology Success Criteria by Year

Year	Soil Temperatures/Date Bud Burst Documented	Monitoring Period Used for Determining Success	7.5 Percent of Monitoring Period
2012 (Year 1)	--	March 18-November 14 (242 days)	18 days
2013 (Year 2)	Bud burst on red maple (*Acer rubrum*) and elderberry (*Sambucus canadensis*) and soil temperature of 48°F documented on February 7, 2013	February 7-November 14 (281 days)	21 days
2014 (Year 3)	--	March 18-November 14 (242 days)	18 days
2015 (Year 4)			
2016 (Year 5)			

2.2.2 Hydrology Monitoring Results

All nine monitored gauges within restoration areas were inundated/saturated within 12 inches of the surface for greater than 7.5 percent of the monitoring period used for 2014 (Year 3) (18 days), which extends from March 18 to November 14 (242 days). Due to malfunction in early August, the reference gauge was replaced. During the final download, this replacement gauge was filled with water due to a faulty gasket, resulting in a loss of data. The gauge was replaced again and is functioning properly.

No hydrology problem areas were identified within the Site during Year 3 (2014) monitoring.

Sliver Moon Wetland Restoration Site

Gauge	Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)				
	Year 1 (2012)* March 18 Growing Season Start	Year 2 (2013)** February 7 Growing Season Start	Year 3 (2014) March 18 Growing Season Start	Year 4 (2015)	Year 5 (2016)
1	Yes/25 days (10.3 percent)	Yes/43 days (15.3 percent)	Yes/51 Days (21 percent)		
2	Yes/117 days (48.3 percent)	Yes/96 days (34.2 percent)	Yes/127 Days (52 percent)		
3	Yes/117 days (48.3 percent)	Yes/95 days (33.8 percent)	Yes/ 56 Days (23 percent)		
4	No/13 days (5.4 percent)	Yes/29 days (10.3 percent)	Yes/20 Days (8.3 percent)		
5	Yes/76 days (31.4 percent)	Yes/92 days (32.7 percent)	Yes/54 Days (22 percent)		
6	Yes/24 days (9.9 percent)	Yes/43 days (15.3 percent)	Yes/28 Days (11.6 percent)		
7	Yes/40 Days (16.5 percent)	Yes/93 days (33.1 percent)	Yes/53 Days (22 percent)		
8	Yes/97 days (40.1 percent)	Yes/93 days (33.1 percent)	Yes/55 Days (23 percent)		
9	Yes/42 days (17.4 percent)	Yes/67 days (23.8 percent)	Yes/57 Days (24 percent)		
Ref	Yes/102 days (42.1 percent)	Yes/91 days (32.4 percent)	Yes/ 57 Days (24 percent)		

* Groundwater gauges were installed at the Site on March 24, six days after the published NRCS growing season start date (March 18). Therefore, Year 1 (2012) hydrology success criteria is proposed to use the USDA published growing season dates in place of the proposed biological and physical indicators of growing season as described for the Site.

**Based on biological and physical indicators for the site, February 7 was determined the start of the growing season for year 2 (2013) monitoring.

3.0 CONCLUSIONS

Vegetation sampling across the Site was above the required average density with 511 planted stems-per-acre surviving. In addition, each individual plot was above success criteria with the exception of Plot 5; however, when including natural recruits of red maple (*Acer rubrum*) the plot was well-above success criteria. Areas disturbed by 2012 agricultural encroachment were planted with 40, 3-gallon containerized trees and 1300 bare-roots trees. These trees are doing well and are successfully vegetating disturbed areas with the exception of a 0.25 acre area of additional agricultural encroachment along the south portion of the Site that occurred during summer 2014. The southern boundary was remarked with new t-posts, 10-foot pvc pipes, and NCEEP signs every 100 feet. In addition, this area is scheduled to be replanted in the winter of 2014/2015.

All nine monitored groundwater gauges within restoration areas were inundated/saturated within 12 inches of the surface for greater than 7.5 percent of the monitoring period used for 2014 (Year 3) (21 days), which extends from March 18 to November 14 (242 days)

Site vegetation and wetland hydrology met success criteria for Year 3 (2014) monitoring.

4.0 REFERENCES

Lee, M.T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2008. CVS-EEP Protocol for Recording Vegetation, Version 4.2. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, North Carolina.

NC Wetlands Restoration Program (NCWRP). 1993. Installing Monitoring Wells/Piezometers in Wetlands (WRP Technical Note HY-IA-3.1). Department of Environment, Health, and Natural Resources, Raleigh, North Carolina

Schafale, M.P. and A.S. Weakley. 1990. Classification of the Natural Communities of North Carolina: Third Approximation. North Carolina Natural Heritage Program, Division of Parks and Recreation, North Carolina Department of Environment, Health, and Natural Resources. Raleigh, North Carolina.

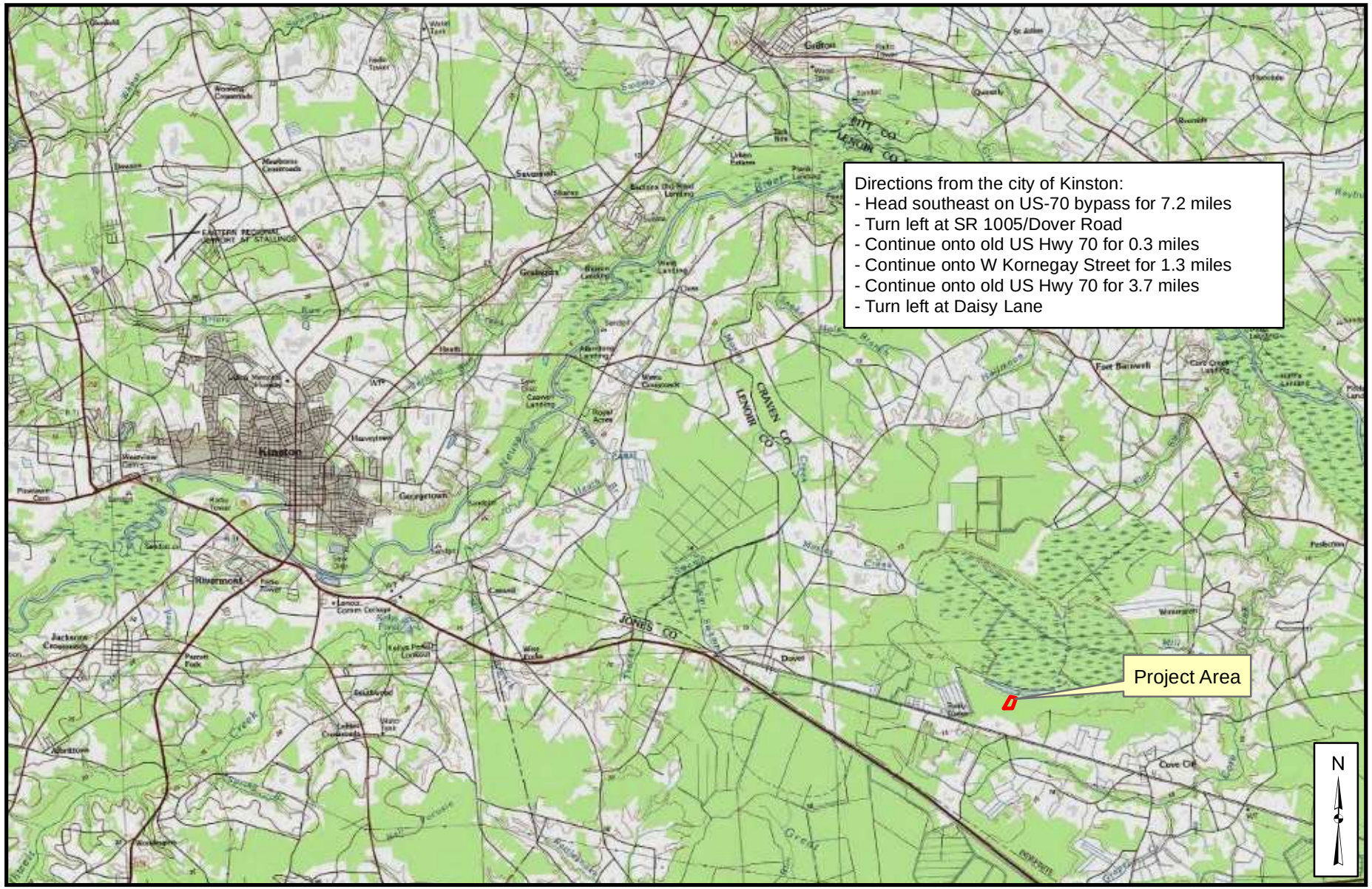
US Army Corps of Engineers (USACE). 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0). U.S. Army Engineer Research and Development Center, Environmental Laboratory, Vicksburg, MS. ERDC/EL TR-10-20. 154 pp.

US Army Corps of Engineers, US Environmental Protection Agency, NC Wildlife Resources Commission, NC Division of Water Quality (USACE et al.). 2003. Stream Mitigation Guidelines.

US Department of Agriculture (USDA). 1989. Soil Survey of Craven County, North Carolina. Natural Resources Conservation Service.

Appendix A.
General Tables and Figures

Figure 1. Site Location Map
Table 1. Project Components and Mitigation Credits
Table 2. Project Activity and Reporting History
Table 3. Project Contacts Table
Table 4. Project Baseline Information & Attributes Table



Axiom Environmental **218 Snow Ave** **Raleigh, NC 27603** Axiom Environmental, Inc.	Scale: 1 inch = 10,000 feet Date: Sept 2012 Project: Sliver Moon	**FIGURE 1:** **SITE LOCATION MAP** This figure indicates where the Site is physically located along with directions to the Site.	**Sliver Moon Non-Riparian Wetland Mitigation Site** RFP # 16-003571 EEP Project ID # 95017 Craven County, North Carolina Imagery USGS Topographical Map Coordinate System: NAD 1983 NC FEET

Table 1. Project Components and Mitigation Credits

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Mitigation Credits									
	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals					14				
Project Components									
Project Component -or- Reach ID	Stationing/Location		Existing Footage/Acreage		Approach (PI,PII etc.)		Restoration – or- Restoration Equivalent	Restoration Footage or Acreage	Mitigation Ratio
Non-riparian restoration	NA		17.01		NA		Restoration	14	1:1
Component Summation									
Restoration Level	Stream (linear feet)		Riparian Wetland (acres)		Non-riparian Wetland (acres)		Buffer (square feet)	Upland (acres)	
			Riverine	Non-Riverine					
Restoration	0		0	0	14		0	0	
Enhancement			0	0	0		0	0	
Enhancement 1	0								
Enhancement II	0								
Creation			0	0	0				
Preservation	0		0	0	0			0	
High Quality Preservation	0		0	0	0			0	

Table 2. Project Activity and Reporting History

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Activity or Report	Data Collection Complete	Completion or Delivery
CE Document	NA	October - 2011
Conservation Easement	NA	February - 2012
Mitigation Plan	NA	February - 2012
Construction	NA	March - 2012
Bare Root Planting	NA	March - 2012
Baseline Monitoring Document	April-2012	August 2012
Year 1 Monitoring	October 2012	November 2012
Supplemental Planting/Easement Marking		Winter 2012/2013
Year 2 Monitoring	November 2013	November 2013
Year 3 Monitoring	November 2014	November 2014
Year 4 Monitoring		
Year 5 Monitoring		
Year 6 Monitoring		
Year 7 Monitoring		

Table 3. Project Contacts Table

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

	Firm	POC & Address
Designer:	Restoration Systems, LLC with preliminary consulting by Axiom Environmental, Inc.	Grant Lewis; 919.215.1693 218 Snow Ave. Raleigh, NC 27603
Construction Contractor:	Land Mechanics, Inc.	Lloyd Glover; 919.422.3392 780 Landmark Road Willow Spring, NC 27592-7756
Planting Contractor:	Carolina Silvics	Dwight McKinney 252.482.8491 908 Indian Trail Road Edenton, NC 27932
Seeding Contractor:	Land Mechanics, Inc.	Lloyd Glover; 919.422.3392 780 Landmark Road Willow Spring, NC 27592-7756
Nursery Stock Suppliers:	ArborGen	1.888.888.7158
Baseline Data Collection	Restoration Systems, LLC	Ray Holz; 919.604.9314 1101 Haynes St. Raleigh, NC 27604
Vegetation Monitoring:	Axiom Environmental, Inc.	Grant Lewis; 919.215.1693 218 Snow Avenue Raleigh, NC 27603
Wetland Monitoring:	Axiom Environmental, Inc.	Grant Lewis; 919.215.1693 218 Snow Avenue Raleigh, NC 27603

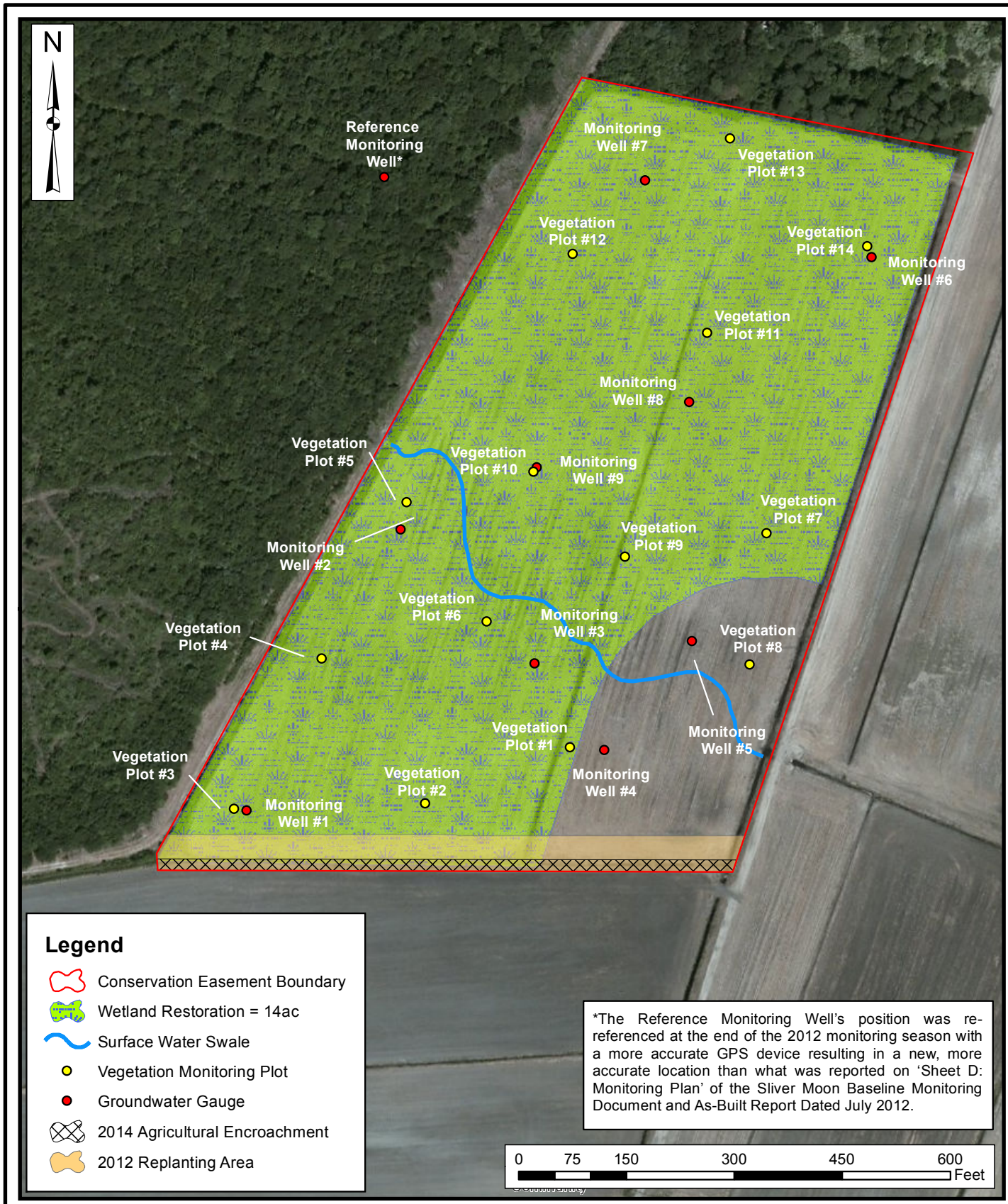
Table 4: Project Baseline Information & Attributes Table

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Project Information			
Project Name	Sliver Moon		
County	Craven		
Project Area (acres)	17.01		
Project Coordinates (latitude and longitude)	35.204817, -77.360605 (NAD 83/WGS 84)		
Project Watershed Summary Information			
Physiographic Province		Carolina Flatwoods section of the Middle Atlantic Coastal Plain	
River Basin		Neuse	
USGS Hydrologic Unit 8-digit	03020202	USGS Hydrologic Unit 14-digit	03020202080010
DWQ Sub-basin		03-04-08	
Project Drainage Area, Total Outfall (acres)		+/- 130	
Groundwater Treated by Site (acres)		+/- 20	
Project Drainage Area Percentage of Impervious Area		< 1%	
CGIA Land Use Classification		Cropland and Pasture	
Wetland Summary Information			
Parameters		**Wetland 1**	
Size of Wetland (acres)		14.00	
Wetland Type (non-riparian, riparian riverine or riparian non riverine)		Non-riparian	
Mapped Soil Series		Torhunta & Pantego	
Drainage class		Poorly Drained	
Soil Hydric Status		Class A	
Source of Hydrology		Rain Events	
Hydrologic Impairment		Ditches	
Native vegetation community		Non-Riverine Wet Harwood Forest	
Percent composition of exotic invasive vegetation		0%	
Regulatory Considerations			
Regulation		**Applicable?**	**Resolved?**
Waters of the United States – Section 404		Yes	Yes
Waters of the United States – Section 401		Yes	Yes
Endangered Species Act		No	
Historic Preservation Act		No	
Coastal Zone Management Act [CZMA/Coastal Area Management Act (CAMA)]		No	
FEMA Floodplain Compliance		No	
Essential Fisheries Habitat		No	
Sediment & Erosion Control Plan (S&EC)		Yes	Yes

APPENDIX B
VISUAL ASSESSMENT DATA

Figure 2. Current Condition Plan View
Table 5. Vegetation Condition Assessment



Axiom Environmental, Inc.
Axiom Environmental
218 Snow Ave
Raleigh, NC 27603

CURRENT CONDITION PLAN VIEW
SLIVER MOON WETLAND RESTORATION SITE
Craven County, North Carolina

Dwn. by.	KRJ
Date:	Nov. 2014
Project:	10-001

FIGURE
2

Table 5: Vegetation Condition Assessment

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Planted Acreage – 17.01 acres (Entire Easement)					
Vegetation Category		**Mapped Acreage**	**CCPV Symbol**	**Number of Polygons**	**% of planted Acreage**
Areas of Concern	One area of agricultural encroachment was observed during year 3 (2014) monitoring.	0.25	Black Crosshatch	1	1.5%
Exotic Invasive Species	No invasive species observed at the Site during year 3 (2014) monitoring.	NA	NA	NA	0%

APPENDIX C
VEGETATION DATA

Table 6. 2014 (Year 3) Planted and Total Stems/Acre
Table 7. Vegetation Plot Criteria Attainment
Table 8. CVS Vegetation Plot Metadata
Vegetation Plot Photographs

Table 6. 2014 (Year 3) Planted and Total Stems/Acre

CVS Project Code Sliver M. Project Name: Sliver Moon Non-riparian Wetland Mitigation Site

			Current Plot Data (MY3 2014)																									
			Sliver M-RS-0001			Sliver M-RS-0002			Sliver M-RS-0003			Sliver M-RS-0004			Sliver M-RS-0005			Sliver M-RS-0006			Sliver M-RS-0007			Sliver M-RS-0008			Sliver M-RS-0009		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer rubrum	red maple	Tree			4						46			77			42			22			9			4			2
Baccharis halimifolia	eastern baccharis	Shrub			1			5									4			3			1						2
Betula	birch	Tree																											
Betula nigra	river birch	Tree													1	1	1												
Carya	hickory	Tree				1	1	1																					
Liquidambar styraciflua	sweetgum	Tree																											
Liriodendron tulipifera	tuliptree	Tree	1	1	1	3	3	3				1	1	1				2	2	2	1	1	1						
Magnolia virginiana	sweetbay	Tree				2	2	2				1	1	1							4	4	4	1	1	1	2	2	2
Morella	bayberry	shrub										1	1	1	1	1	1										1	1	1
Morella cerifera	wax myrtle	shrub	1	1	1							1	1	1										1	1	1	1	1	1
Nyssa	tupelo	Tree	3	3	3	2	2	2	1	1	1				1	1	1												
Nyssa sylvatica	blackgum	Tree							2	2	2	2	2	2	1	1	1												
Persea	bay	Tree																											
Persea palustris	swamp bay	tree				2	2	2	3	3	3			4															
Pinus taeda	loblolly pine	Tree																											
Quercus	oak	Tree	1	1	1																2	2	2						
Quercus laurifolia	laurel oak	Tree	1	1	1	1	1	1	1	1	1							3	3	3	7	7	7	3	3	3	1	1	1
Quercus michauxii	swamp chestnut oak	Tree										1	1	1							4	4	4	1	1	1	3	3	3
Quercus nigra	water oak	Tree	5	5	5				1	1	2							1	1	1							1	1	1
Quercus pagoda	cherrybark oak	Tree	1	1	1	2	2	2	1	1	1	1	1	1							1	1	1	3	3	3			
Quercus phellos	willow oak	Tree				3	3	3				1	1	1	1	1	1	2	2	2				1	1	1			
Rhus copallinum	flameleaf sumac	shrub									1																		
Ulmus americana	American elm	Tree																											
		Stem count	13	13	18	16	16	21	9	9	57	9	9	90	5	5	51	8	8	33	19	19	29	10	10	14	9	9	13
		size (ares)	1			1			1			1			1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02		
		Species count	7	7	9	8	8	9	6	6	8	8	8	10	5	5	7	4	4	6	6	6	8	6	6	7	6	6	8
		Stems per ACRE	526.1	526.1	728.4	647.5	647.5	849.8	364.2	364.2	2307	364.2	364.2	3642	202.3	202.3	2064	323.7	323.7	1335	768.9	768.9	1174	404.7	404.7	566.6	364.2	364.2	526.1

Color for Density

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

PnoLS = Planted excluding livestakes

P-all = Planting including livestakes

T = All planted and natural recruits including livestakes

T includes natural recruits

Table 6. 2014 (Year 3) Planted and Total Stems/Acre (continued)

CVS Project Code Sliver M. Project Name: Sliver Moon Non-riparian Wetland Mitigation Site

			Current Plot Data (MY3 2014)															Annual Means											
			Sliver M-RS-0010			Sliver M-RS-0011			Sliver M-RS-0012			Sliver M-RS-0013			Sliver M-RS-0014			MY3 (2014)			MY2 (2013)			MY1 (2012)			MY0 (2012)		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer rubrum	red maple	Tree						12			16			11			14			259			177			6			
Baccharis halimifolia	eastern baccharis	Shrub			3			23			6			2			3			53			28			4			
Betula	birch	Tree																			1	1	1	1	1	1			
Betula nigra	river birch	Tree							3	3	3	6	6	6				10	10	10	9	9	9	1	1	1			
Carya	hickory	Tree																1	1	1	1	1	2						
Liquidambar styraciflua	sweetgum	Tree									3									3			9						
Liriodendron tulipifera	tuliptree	Tree	6	6	6				2	2	2	3	3	3	6	6	6	25	25	25	26	26	26	28	28	30	27	27	27
Magnolia virginiana	sweetbay	Tree	2	2	2	1	1	1	3	3	3				2	2	2	18	18	18	16	16	21	17	17	17	18	18	18
Morella	bayberry	shrub										2	2	2	1	1	1	6	6	6	9	9	9	9	9	9			
Morella cerifera	wax myrtle	shrub				3	3	3							1	1	1	8	8	8	7	7	7	1	1	1			
Nyssa	tupelo	Tree	6	6	6	4	4	4				1	1	1				18	18	18	18	18	18	15	15	15			
Nyssa sylvatica	blackgum	Tree	1	1	1													6	6	6	7	7	7	11	11	11	20	20	20
Persea	bay	Tree																						1	1	1			
Persea palustris	swamp bay	tree																5	5	9	5	5	5	10	10	10	9	9	9
Pinus taeda	loblolly pine	Tree																					2			2			
Quercus	oak	Tree																3	3	3	5	5	5	7	7	7			
Quercus laurifolia	laurel oak	Tree													4	4	4	21	21	21	24	24	24	18	18	18	32	32	32
Quercus michauxii	swamp chestnut oak	Tree																9	9	9	11	11	11	17	17	17	29	29	29
Quercus nigra	water oak	Tree				3	3	3	2	2	2	3	3	3	2	2	2	18	18	19	16	16	16	20	20	20	28	28	28
Quercus pagoda	cherrybark oak	Tree				1	1	1	1	1	1							11	11	11	11	11	11	16	16	16	32	32	32
Quercus phellos	willow oak	Tree				1	1	1	7	7	7	2	2	2				18	18	18	23	23	23	26	26	26	28	28	28
Rhus copallinum	flameleaf sumac	shrub																		1			1						
Ulmus americana	American elm	Tree																					1						
		Stem count	15	15	18	13	13	48	18	18	43	17	17	30	16	16	33	177	177	498	189	189	413	198	198	212	223	223	223
		size (ares)	1			1			1			1			1			14			14			14			14		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.35			0.35			0.35			0.35		
		Species count	4	4	5	6	6	8	6	6	9	6	6	8	6	6	8	15	15	19	16	16	22	16	16	19	9	9	9
		Stems per ACRE	607	607	728.4	526.1	526.1	1942	728.4	728.4	1740	688	688	1214	647.5	647.5	1335	511.6	511.6	1440	546.3	546.3	1194	572.3	572.3	612.8	644.6	644.6	644.6

Color for Density

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

PnoLS = Planted excluding livestakes

P-all = Planting including livestakes

T = All planted and natural recruits including livestakes

T includes natural recruits

Table 7. Vegetation Plot Criteria Attainment based on Planted Stems

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Vegetation Plot ID	Vegetation Survival Threshold Met?	Tract Mean
1	Yes	93%
2	Yes	
3	Yes	
4	Yes	
5	No*	
6	Yes	
7	Yes	
8	Yes	
9	Yes	
10	Yes	
11	Yes	
12	Yes	
13	Yes	
14	Yes	

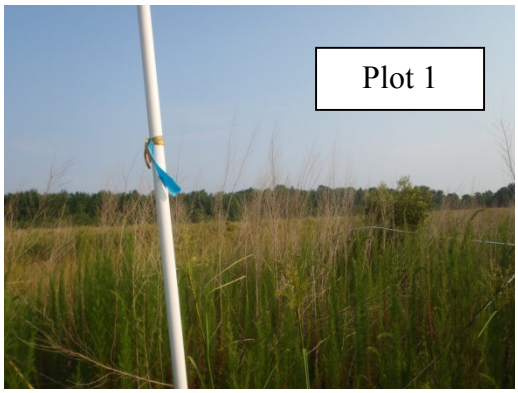
*This plot didn't meet success criteria based on planted stems alone; however, when including naturally recruited stems of red maple (*Acer rubrum*) this plot was well-above success criteria.

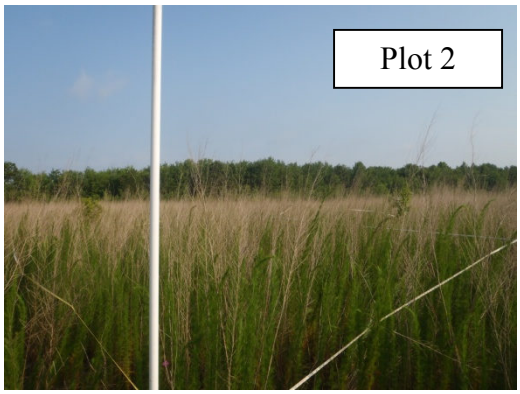
Table 8. CVS Vegetation Plot Metadata

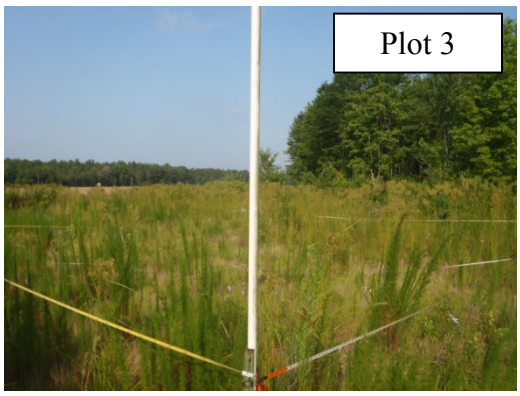
Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

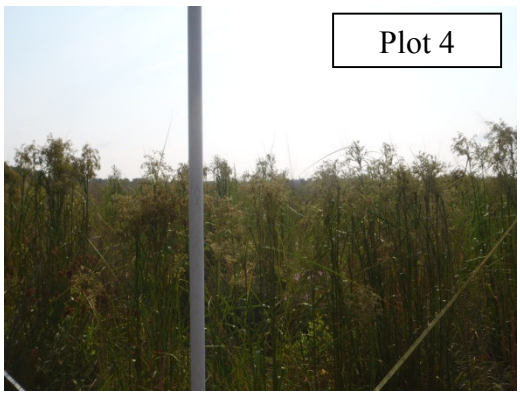
Report Prepared By	Corri Faquin
Date Prepared	7/15/2014 15:10
database name	RS-SliverMoon-Wall1-2014-A-v2.3.1.mdb
database location	\\AE-SBS\RedirectedFolders\KJernigan\Desktop
computer name	KEENAN-PC
file size	56918016
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Proj, planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Proj, total stems	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
ALL Stems by Plot and spp	A matrix of the count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded.
PROJECT SUMMARY----------	
Project Code	Sliver M
project Name	Sliver Moon Non-riparian Wetland Mitigation Site
Description	14 ac. Non-riparian wetland Mitigation Site in the Neuse 01 River Basin
River Basin	Neuse
length(ft)	730
stream-to-edge width (ft)	1100
area (sq m)	56000
Required Plots (calculated)	13
Sampled Plots	14

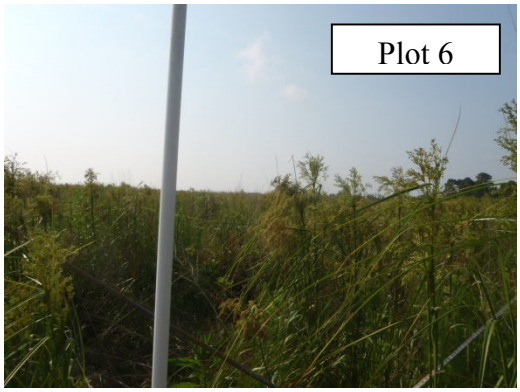
Sliver Moon
2014 (Year 3) Vegetation Monitoring Photographs
Taken July 2014



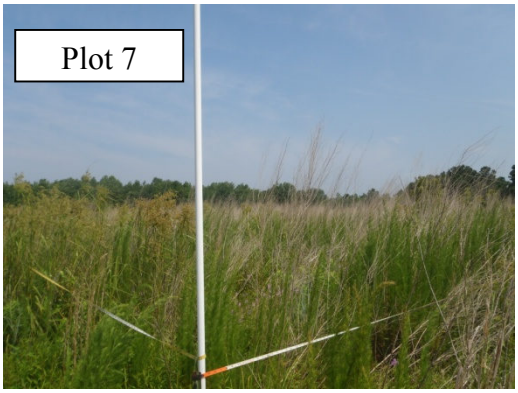


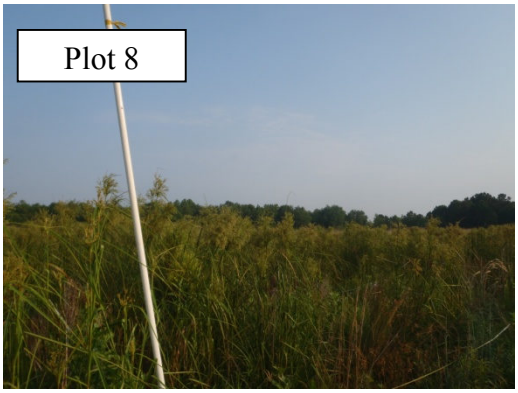


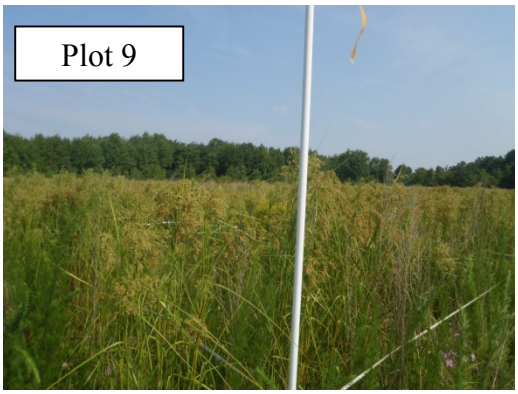


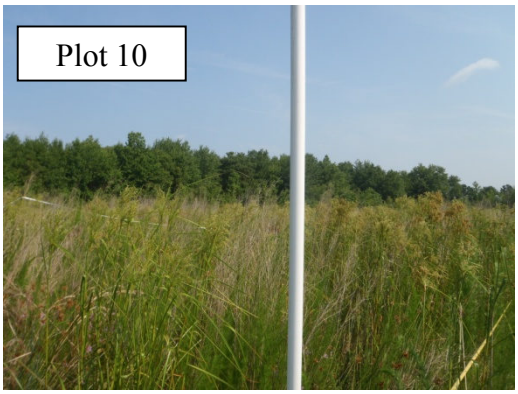


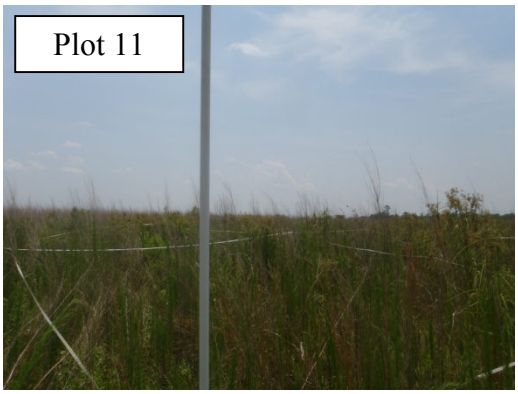
Sliver Moon
2014 (Year 3) Vegetation Monitoring Photographs
Taken July 2014
(continued)

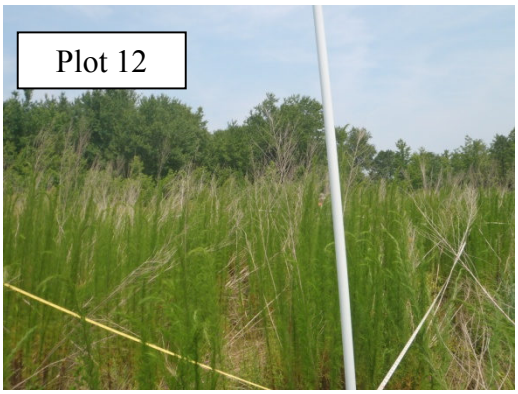


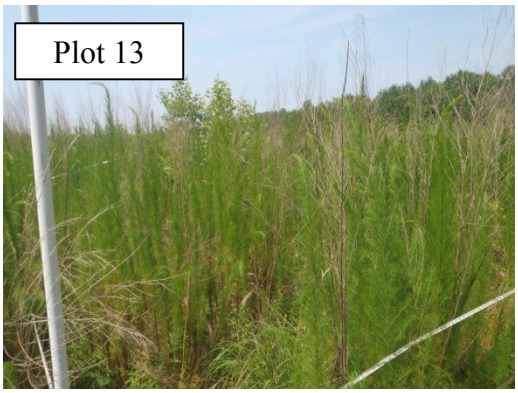


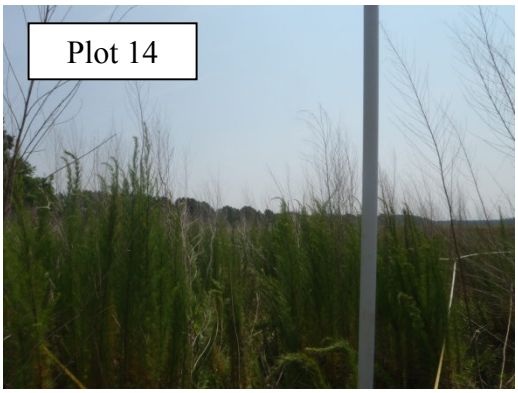












APPENDIX D
HYDROLOGY DATA

Table 9. Wetland Gauge Attainment Data
2014 Groundwater Gauge Graphs

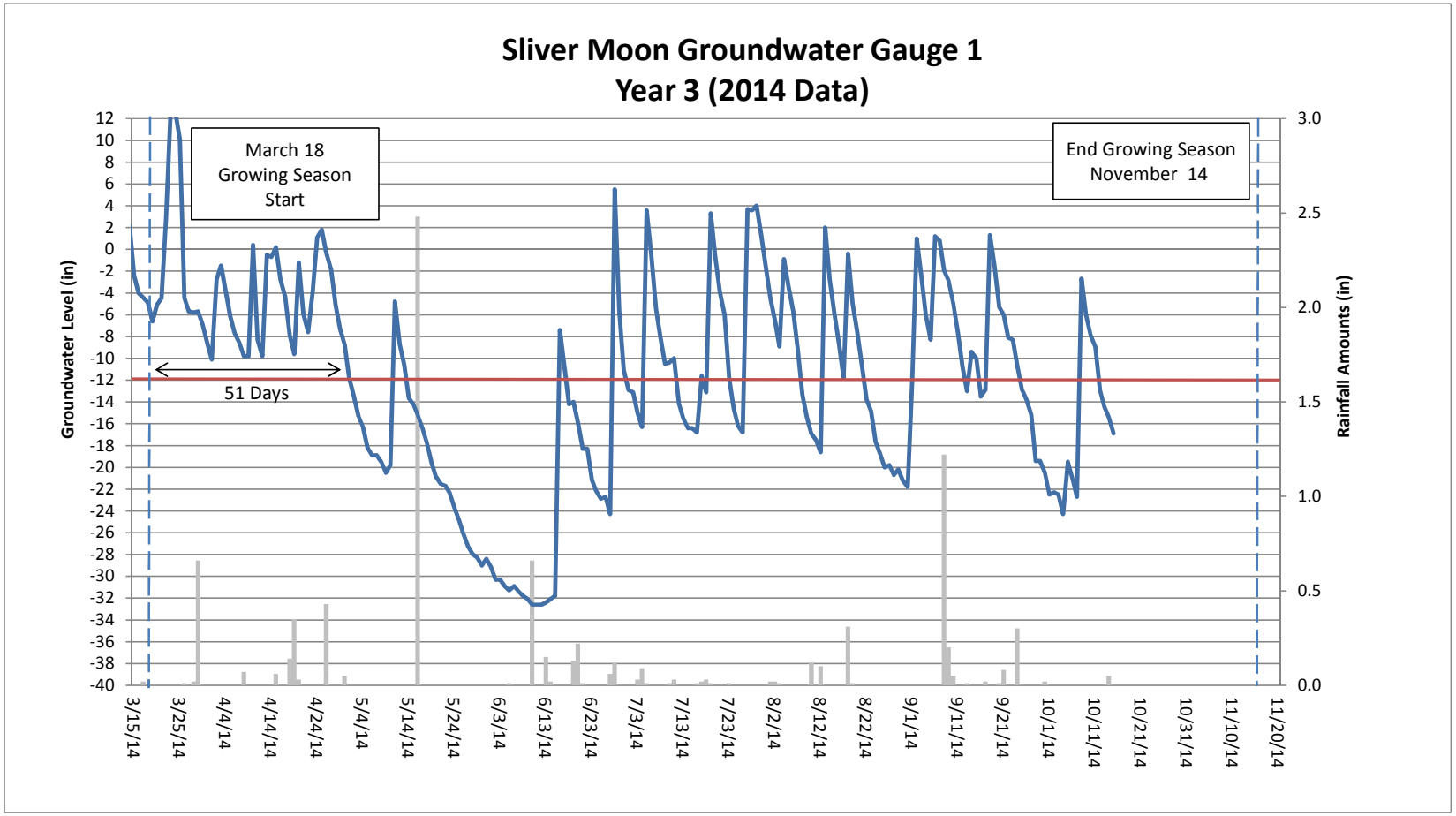
Table 9. Wetland Gauge Attainment Data

Sliver Moon Non-Riparian Wetland Mitigation Site, Craven County, EEP Project ID: 95017

Gauge	Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)				
	Year 1 (2012)* March 18 Growing Season Start	Year 2 (2013)** February 7 Growing Season Start	Year 3 (2014) March 18 Growing Season Start	Year 4 (2015)	Year 5 (2016)
1	Yes/25 days (10.3 percent)	Yes/43 days (15.3 percent)	Yes/51 Days (21 percent)		
2	Yes/117 days (48.3 percent)	Yes/96 days (34.2 percent)	Yes/127 Days (52 percent)		
3	Yes/117 days (48.3 percent)	Yes/95 days (33.8 percent)	Yes/ 56 Days (23 percent)		
4	No/13 days (5.4 percent)	Yes/29 days (10.3 percent)	Yes/20 Days (8.3 percent)		
5	Yes/76 days (31.4 percent)	Yes/92 days (32.7 percent)	Yes/54 Days (22 percent)		
6	Yes/24 days (9.9 percent)	Yes/43 days (15.3 percent)	Yes/28 Days (11.6 percent)		
7	Yes/40 Days (16.5 percent)	Yes/93 days (33.1 percent)	Yes/53 Days (22 percent)		
8	Yes/97 days (40.1 percent)	Yes/93 days (33.1 percent)	Yes/55 Days (23 percent)		
9	Yes/42 days (17.4 percent)	Yes/67 days (23.8 percent)	Yes/57 Days (24 percent)		
Ref	Yes/102 days (42.1 percent)	Yes/91 days (32.4 percent)	Yes/ 57 Days (24 percent)		

* Groundwater gauges were installed at the Site on March 24, six days after the published NRCS growing season start date (March 18). Therefore, Year 1 (2012) hydrology success criteria is proposed to use the USDA published growing season dates in place of the proposed biological and physical indicators of growing season as described for the Site.

**Based on biological and physical indicators for the site, February 7 was determined the start of the growing season for year 2 (2013) monitoring.


Sliver Moon Groundwater Gauge 1
Year 3 (2014 Data)
March 18
Growing Season
Start
End Growing Season
November 14
51 Days
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
3.0
2.5
2.0
1.5
1.0
0.5
0.0
3/15/14
3/25/14
4/4/14
4/14/14
4/24/14
5/4/14
5/14/14
5/24/14
6/3/14
6/13/14
6/23/14
7/3/14
7/13/14
7/23/14
8/2/14
8/12/14
8/22/14
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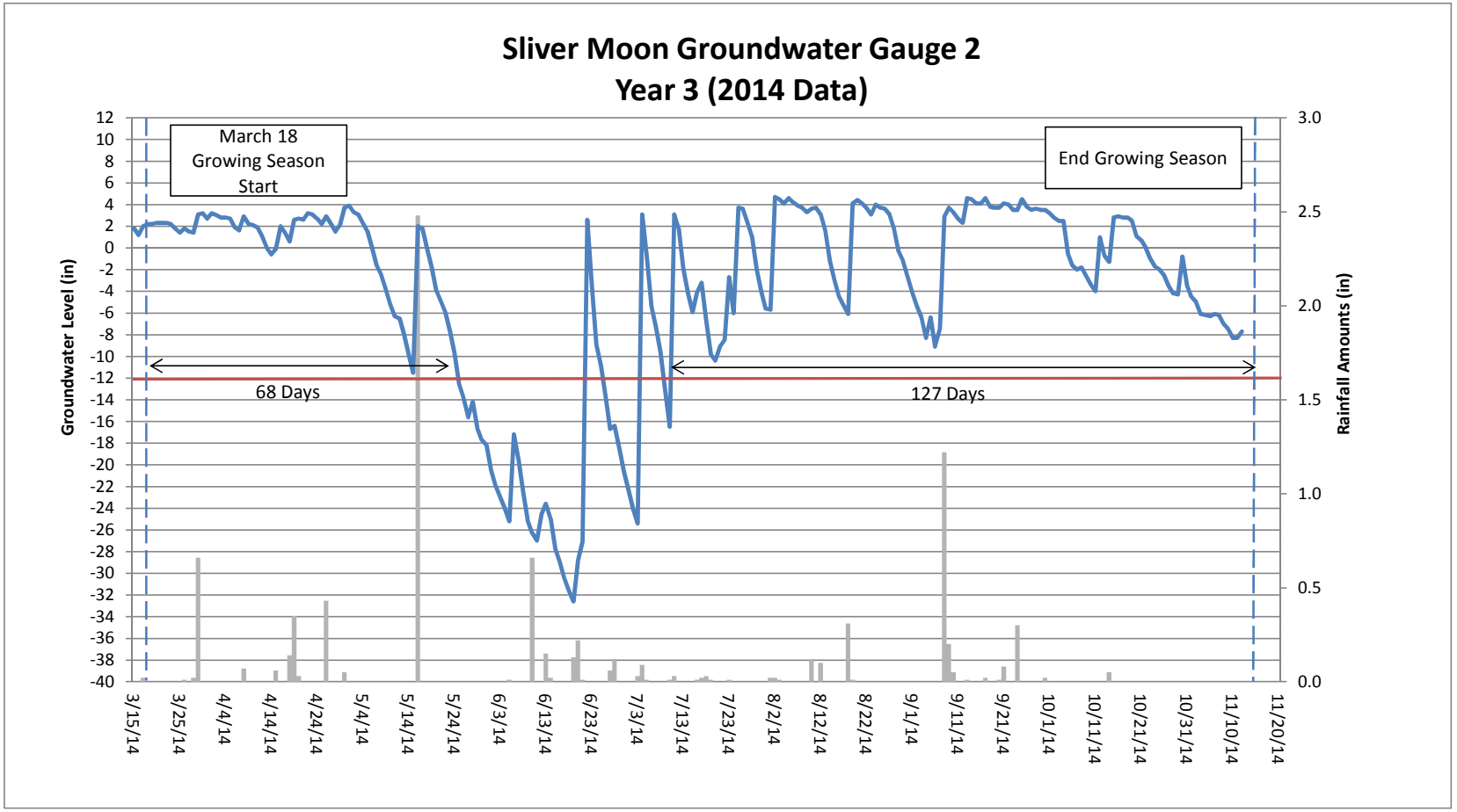
11/10/14
11/20/14


Sliver Moon Groundwater Gauge 2
Year 3 (2014 Data)
March 18
Growing Season
Start
End Growing Season
68 Days
127 Days
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
3.0
2.5
2.0
1.5
1.0
0.5
0.0
3/15/14
3/25/14
4/4/14
4/14/14
4/24/14
5/4/14
5/14/14
5/24/14
6/3/14
6/13/14
6/23/14
7/3/14
7/13/14
7/23/14
8/2/14
8/12/14
8/22/14
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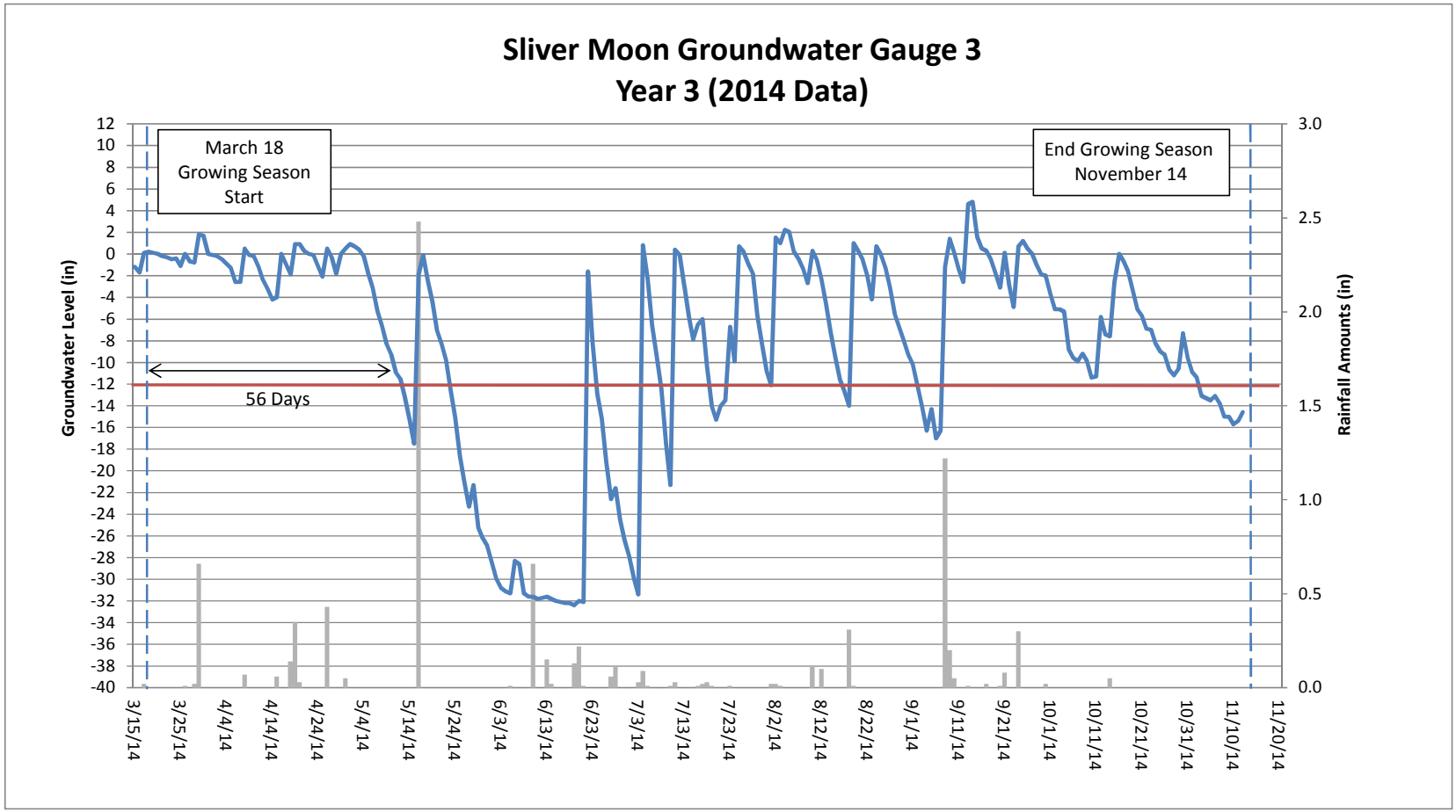
11/10/14
11/20/14


Sliver Moon Groundwater Gauge 3
Year 3 (2014 Data)
March 18
Growing Season
Start
End Growing Season
November 14
56 Days
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
3.0
2.5
2.0
1.5
1.0
0.5
0.0
3/15/14
3/25/14
4/4/14
4/14/14
4/24/14
5/4/14
5/14/14
5/24/14
6/3/14
6/13/14
6/23/14
7/3/14
7/13/14
7/23/14
8/2/14
8/12/14
8/22/14
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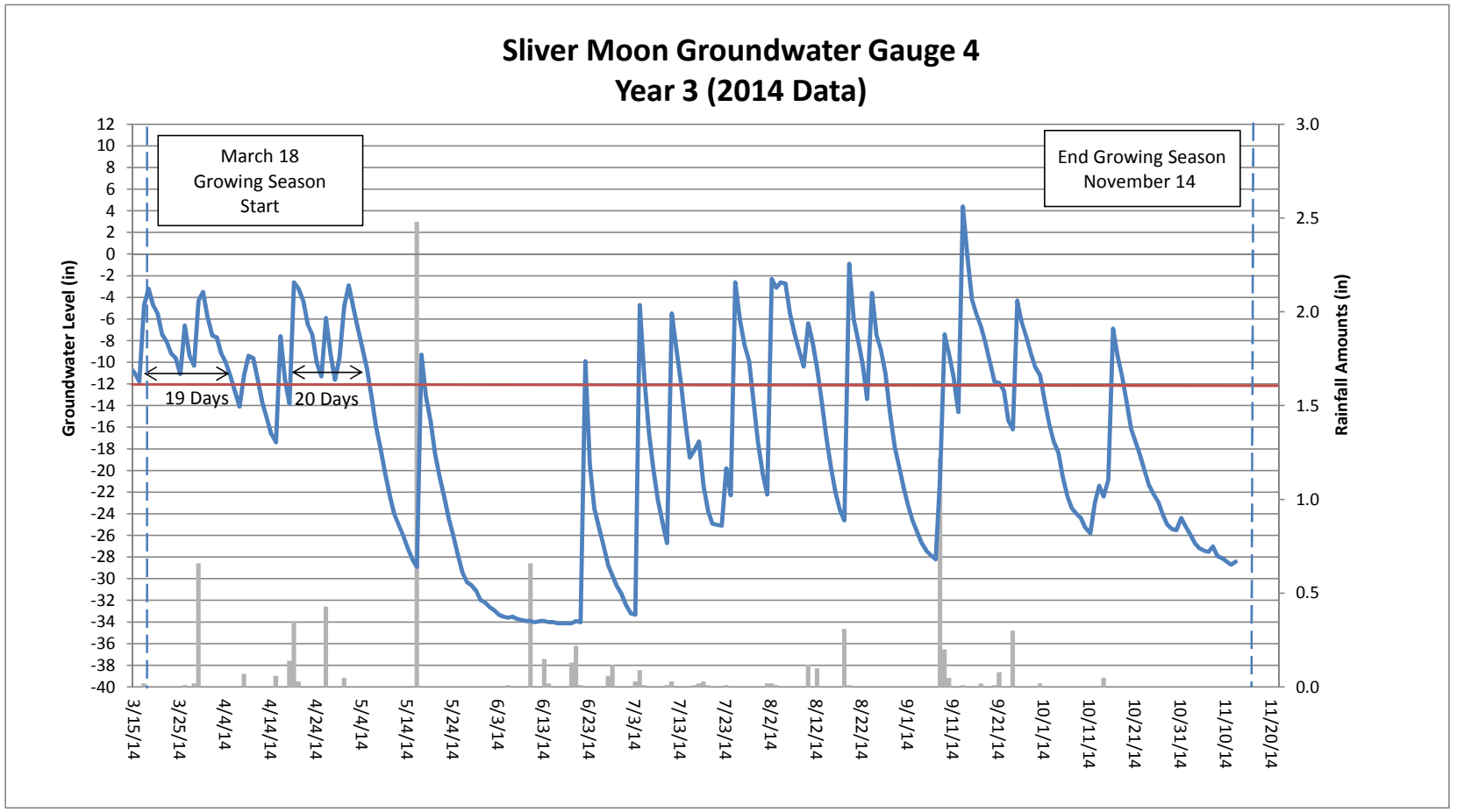
11/10/14
11/20/14


Sliver Moon Groundwater Gauge 4
Year 3 (2014 Data)
March 18
Growing Season
Start
End Growing Season
November 14
19 Days
20 Days
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
3.0
2.5
2.0
1.5
1.0
0.5
0.0
3/15/14
3/25/14
4/4/14
4/14/14
4/24/14
5/4/14
5/14/14
5/24/14
6/3/14
6/13/14
6/23/14
7/3/14
7/13/14
7/23/14
8/2/14
8/12/14
8/22/14
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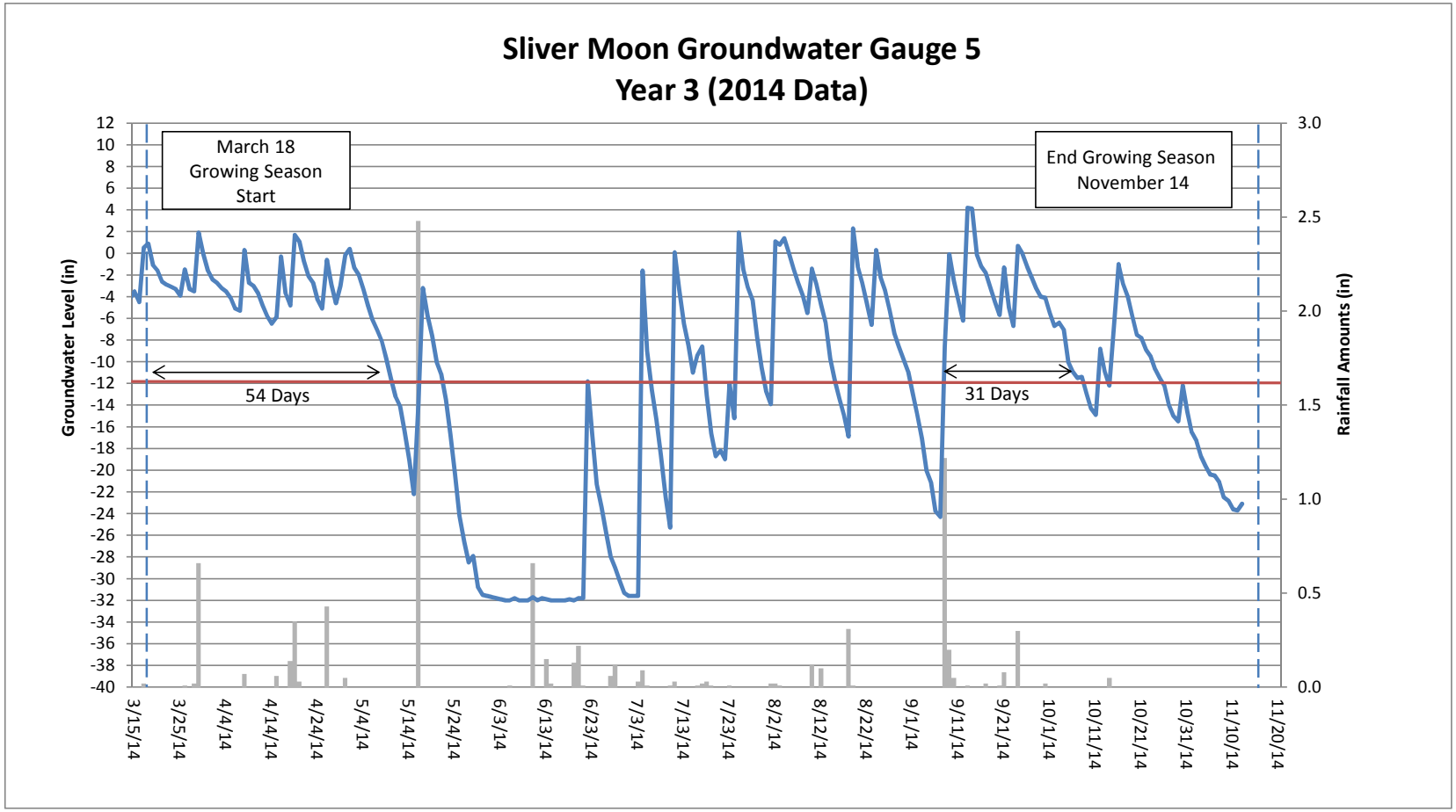
11/10/14
11/20/14


Sliver Moon Groundwater Gauge 5
Year 3 (2014 Data)
March 18
Growing Season
Start
End Growing Season
November 14
54 Days
31 Days
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
3.0
2.5
2.0
1.5
1.0
0.5
0.0
3/15/14
3/25/14
4/4/14
4/14/14
4/24/14
5/4/14
5/14/14
5/24/14
6/3/14
6/13/14
6/23/14
7/3/14
7/13/14
7/23/14
8/2/14
8/12/14
8/22/14
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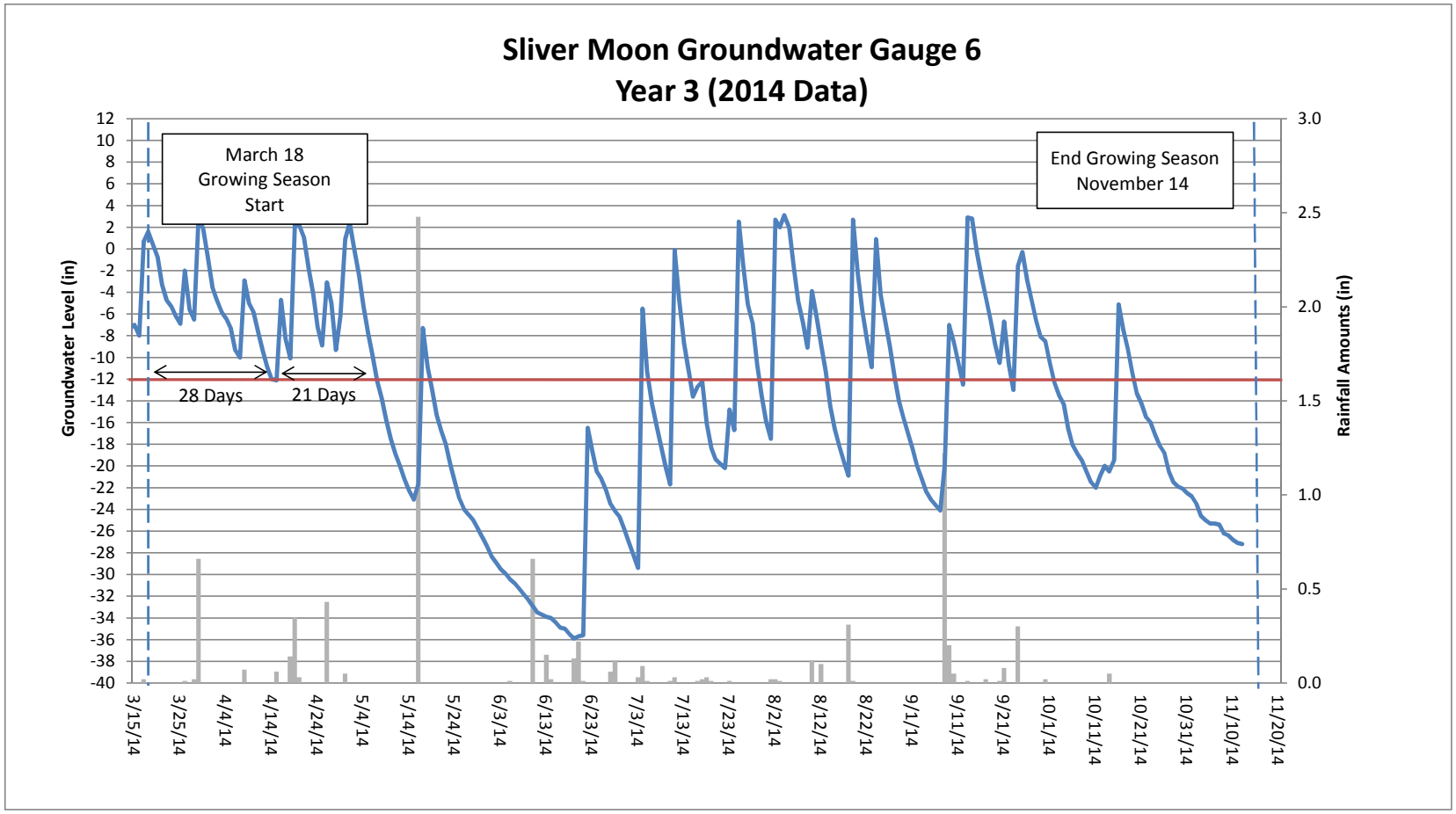
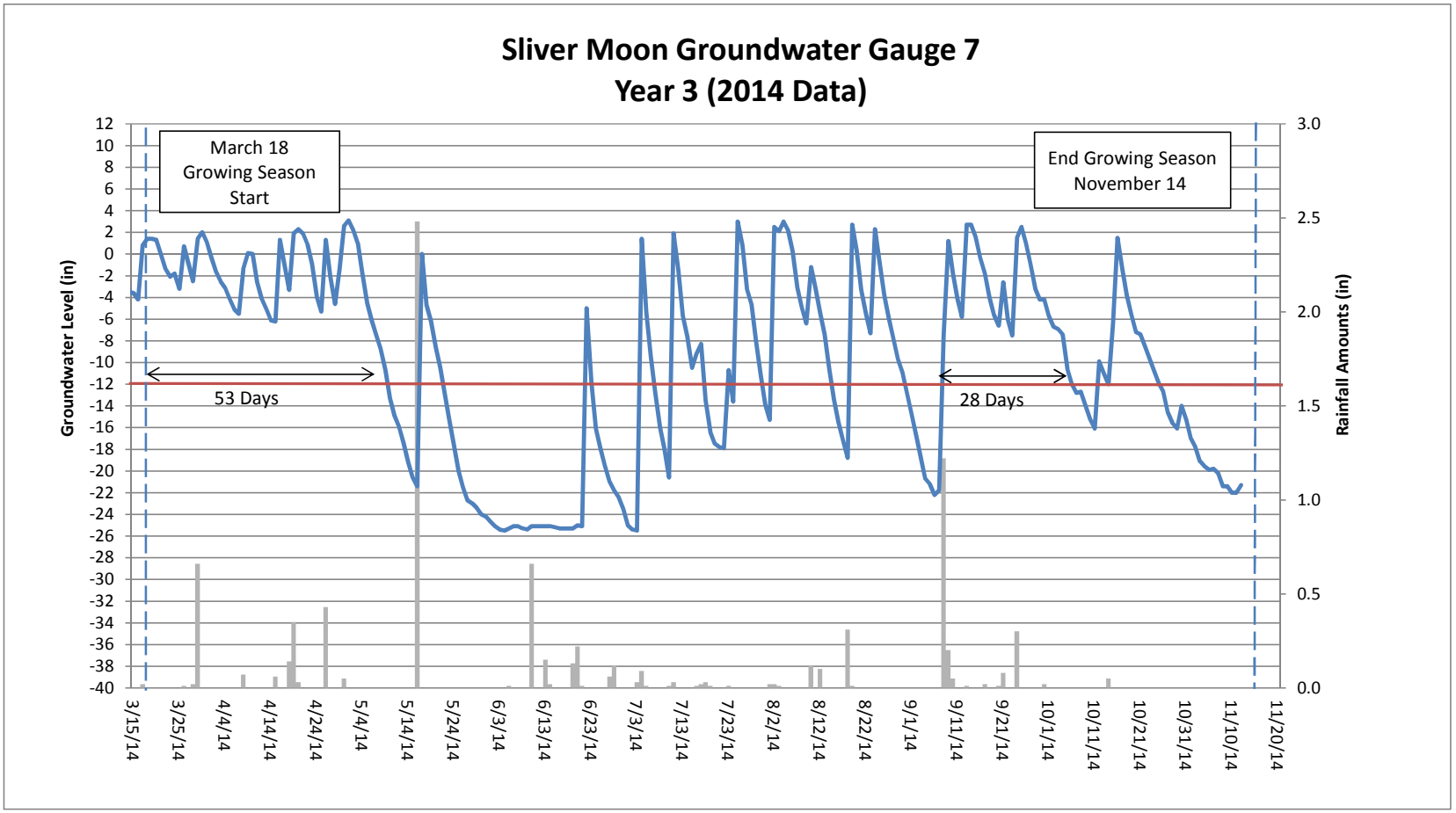
11/10/14
11/20/14


Sliver Moon Groundwater Gauge 6
Year 3 (2014 Data)
March 18
Growing Season
Start
End Growing Season
November 14
28 Days
21 Days
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
3.0
2.5
2.0
1.5
1.0
0.5
0.0
3/15/14
3/25/14
4/4/14
4/14/14
4/24/14
5/4/14
5/14/14
5/24/14
6/3/14
6/13/14
6/23/14
7/3/14
7/13/14
7/23/14
8/2/14
8/12/14
8/22/14
9/1/14
9/11/14
9/21/14
10/1/14
10/11/14
10/21/14
10/31/14
11/10/14
11/20/14


Sliver Moon Groundwater Gauge 7
Year 3 (2014 Data)
March 18
Growing Season
Start
End Growing Season
November 14
53 Days
28 Days
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
3.0
2.5
2.0
1.5
1.0
0.5
0.0
3/15/14
3/25/14
4/4/14
4/14/14
4/24/14
5/4/14
5/14/14
5/24/14
6/3/14
6/13/14
6/23/14
7/3/14
7/13/14
7/23/14
8/2/14
8/12/14
8/22/14
9/1/14
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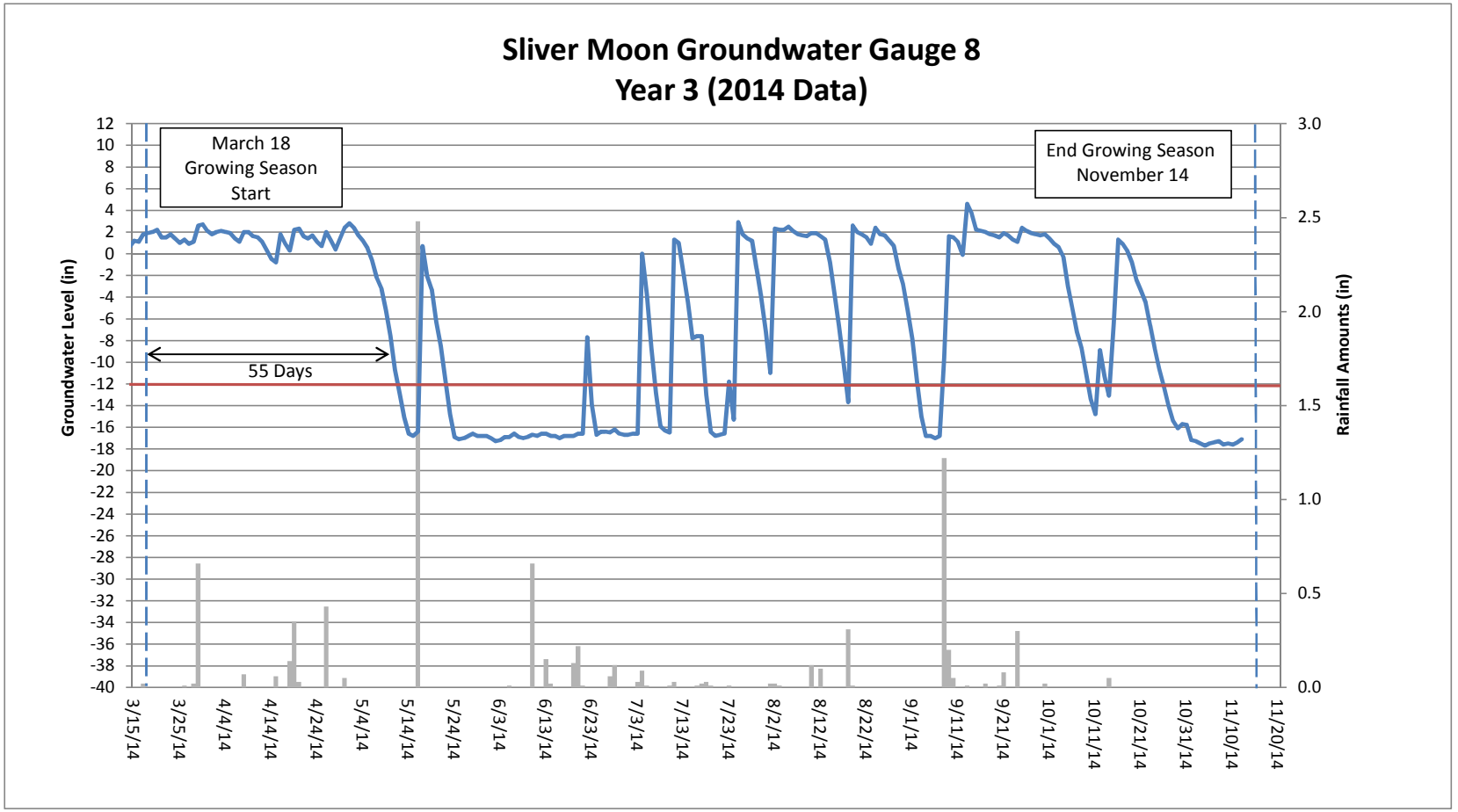
10/11/14
10/21/14
10/31/14
11/10/14
11/20/14


Sliver Moon Groundwater Gauge 8
Year 3 (2014 Data)
March 18
Growing Season
Start
End Growing Season
November 14
55 Days
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
3.0
2.5
2.0
1.5
1.0
0.5
0.0
3/15/14
3/25/14
4/4/14
4/14/14
4/24/14
5/4/14
5/14/14
5/24/14
6/3/14
6/13/14
6/23/14
7/3/14
7/13/14
7/23/14
8/2/14
8/12/14
8/22/14
9/1/14
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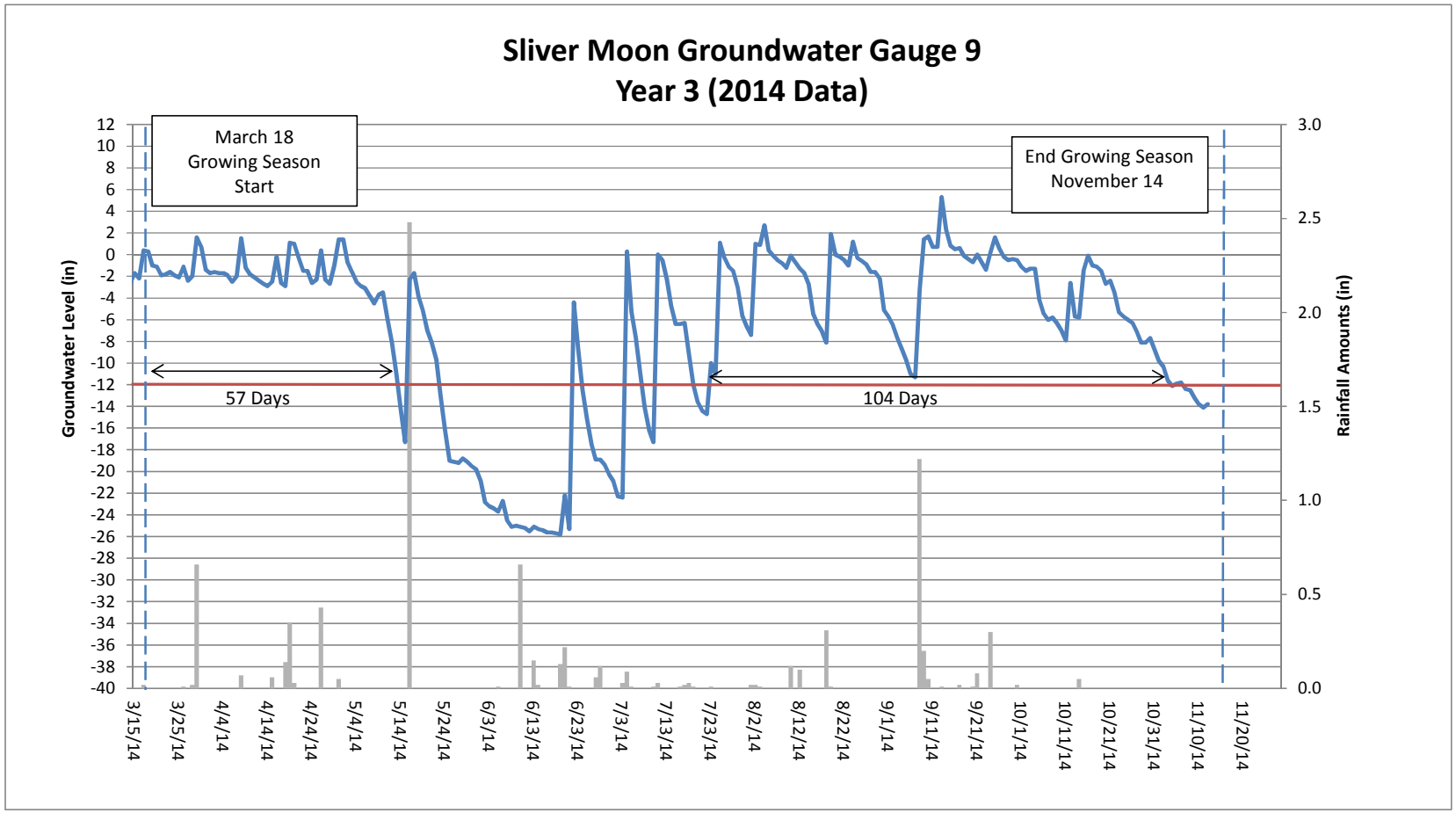
11/10/14
11/20/14


Sliver Moon Groundwater Gauge 9
Year 3 (2014 Data)
March 18
Growing Season
Start
End Growing Season
November 14
57 Days
104 Days
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
3.0
2.5
2.0
1.5
1.0
0.5
0.0
3/15/14
3/25/14
4/4/14
4/14/14
4/24/14
5/4/14
5/14/14
5/24/14
6/3/14
6/13/14
6/23/14
7/3/14
7/13/14
7/23/14
8/2/14
8/12/14
8/22/14
9/1/14
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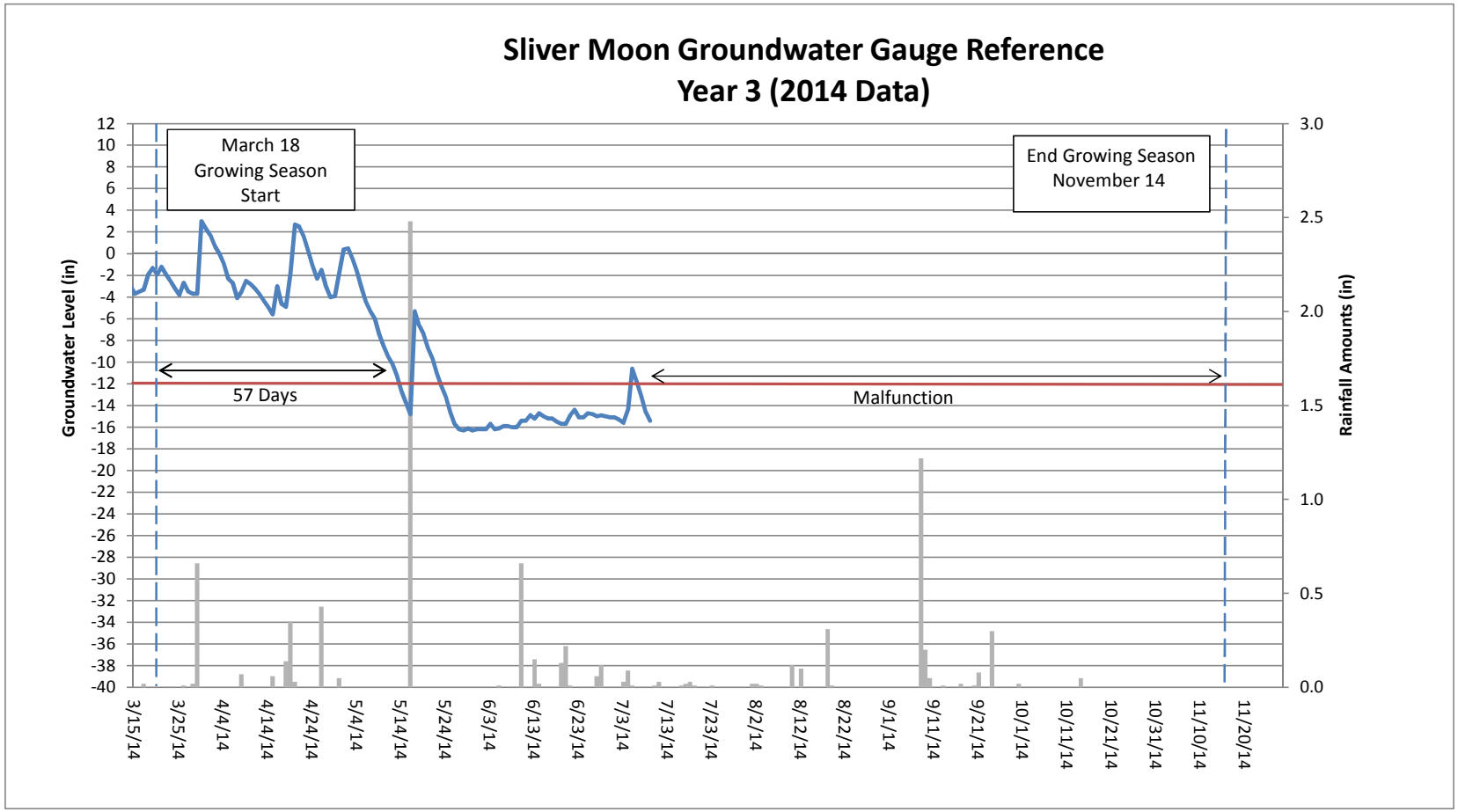
10/31/14
11/10/14
11/20/14


Sliver Moon Groundwater Gauge Reference
Year 3 (2014 Data)
March 18
Growing Season
Start
End Growing Season
November 14
57 Days
Malfunction
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
3.0
2.5
2.0
1.5
1.0
0.5
0.0
3/15/14
3/25/14
4/4/14
4/14/14
4/24/14
5/4/14
5/14/14
5/24/14
6/3/14
6/13/14
6/23/14
7/3/14
7/13/14
7/23/14
8/2/14
8/12/14
8/22/14
9/1/14
9/11/14
9/21/14
10/1/14
10/11/14
10/21/14
10/31/14
11/10/14
11/20/14

APPENDIX E
CREDIT RELEASE DOCUMENTATION

U.S. Army Corps of Engineers Credit Release Approval Letter

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

REPLY TO
ATTENTION OF:

July 11, 2014

Regulatory Division

Re: NCEEP Mitigation Site Credit Releases for the 2014 Monitoring Year

Mr. Tim Baumgartner
North Carolina Ecosystem Enhancement Program
1652 Mail Service Center
Raleigh, NC 27699-1652

Dear Mr. Baumgartner:

Please reference the meeting of May 28, 2014, attended by representatives from the North Carolina Ecosystem Enhancement Program (NCEEP), the U.S. Army Corps of Engineers Wilmington District (District), and members of the North Carolina Interagency Review Team (NCIRT). The meeting was held to provide the District and NCIRT members with the opportunity to review monitoring reports from the 2013 monitoring year for all sites that were developed pursuant to the NCEEP in-lieu fee instrument dated July 28, 2010. The purpose of this letter is to provide USACE approval of credit release for all the projects referenced herein.

Attached to this letter are credit release schedules for all sites reviewed during this meeting. These ledgers indentify the credits released with this approval and the schedule for future credit releases. Please note that this process only applies to sites that were instituted after the date of the approved NCEEP instrument. Credit release for these projects is provided in accordance with the provisions of the instrument, the Federal Mitigation Rule (33 CFR Part 332), and the memo entitled *NCIRT Monitoring Report Review, Credit Release and Project Closeout Process for NCEEP Mitigation Projects*, which details the USACE Wilmington District monitoring, closeout and credit release process for NCEEP Mitigation Projects. For reference, below is a list of all mitigation sites that were reviewed during this year's annual monitoring report review, along with the associated USACE Action ID and the credit release action taken for that project (i.e., full credit release with no contingencies, full credit release with contingencies, partial credit release with contingencies, no credit release with contingencies, etc.). Please see the attached individual credit release schedules for specific credit release numbers, future scheduled releases, and any required contingencies.

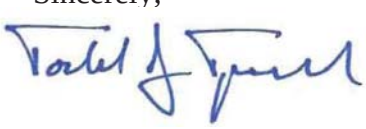
NCEEP Project Credit Releases for the 2012 Monitoring Year

Project Site Name	USACE Action ID	Credit Release Action Taken
Sliver Moon	SAW-2012-00096	Full Credit Release with No Contingencies

Please note that in accordance with Section 332.8(n)(3) of the Mitigation Rule, once credits have been released for particular sites, those credits must first be used to fulfill any advance credits that have already been provided within the project service area before any remaining released credits can be sold or transferred to permittees. Once this is done, those advance credits that are no longer being used to meet mitigation obligations may be added to the pot of available advance credits within the appropriate cataloging unit, as specified by the NCEEP instrument. Additionally, as released credits are associated with a particular USACE or NCDWQ permit action, those credits must remain obligated to that particular permit action. Any deviation from this requirement must be brought to the immediate attention of the USACE and NCIRT for approval on a case-by-case basis. All transactions of released credits should be reported in the ledgers submitted with the NCEEP Annual Report.

Thank you for your continued efforts in improving our procedures. If you have any questions regarding this letter, or the requirements of the Mitigation Rule, please call me at 919-846-2564.

Sincerely,



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Todd Tugwell
Special Projects Manager

Enclosures

Electronic Copies Furnished:
NCIRT Distribution List

Mitigation Project Name	**Sliver Moon Non-Riparian Wetland Mitigation Site**	**County**	**Craven**	**USACE Action ID**	2012-00096
EEP IMS ID	**95017**	**Date Project Instituted**	**7/27/2011**	**NCDWR Permit No**	
River Basin	**Neuse**	**Date Prepared**	**5/28/2014**		
Cataloging Unit	**03020202**				

Credit Release Milestone	**Stream Credits**						**Wetland Credits**							
	Scheduled Releases (Stream)	**Warm**	**Cool**	**Cold**	**Anticipated Release Year (Stream)**	**Actual Release Date (Stream)**	**Scheduled Releases (Forested)**	Riparian Riverine	Riparian Non riverine	Non-riparian	**Scheduled Releases (Coastal)**	Coastal	**Anticipated Release Year (Wetland)**	**Actual Release Date (Wetland)**
Potential Credits (Mitigation Plan)										**14.00**				
Potential Credits (As-Built Survey)										**14.00**				
1 (Site Establishment)	**N/A**				N/A	N/A	**N/A**				**N/A**		N/A	N/A
2 (Year 0 / As-Built)	**30%**				N/A	N/A	**30%**			4.20	**30%**		2012	July 2012
3 (Year 1 Monitoring)	**10%**				N/A	N/A	**10%**			1.40	**10%**		2013	9/3/2013
4 (Year 2 Monitoring)	**10%**				N/A	N/A	**10%**			1.40	**15%**		2014	5/28/2014
5 (Year 3 Monitoring)	**10%**				N/A	N/A	**15%**				**20%**		2015	
6 (Year 4 Monitoring)	**5%**				N/A	N/A	**5%**				**10%**		2016	
7 (Year 5 Monitoring)	**10%**				N/A	N/A	**15%**				**15%**		2017	
8 (Year 6 Monitoring)	**5%**				N/A	N/A	**5%**				**N/A**		2018	
9 (Year 7 Monitoring)	**10%**				N/A	N/A	**10%**				**N/A**		2019	
Stream Bankfull Standard	**10%**				N/A	N/A	**N/A**				**N/A**			
Total Credits Released to Date										**7.00**				

DEBITS (released credits only)

Ratios			1	1.5	2.5	5	1	3	2	5	1	3	2	5	1	3	2	5
			Stream Restoration	**Stream Enhancment I**	**Stream Enhancement II**	**Stream Preservation**	**Riparian Restoration**	**Riparian Creation**	**Riparian Enhancement**	**Riparian Preservation**	**Nonriparian Restoration**	**Nonriparian Creation**	**Nonriparian Enhancement**	**Nonriparian Preservation**	**Coastal Marsh Restoration**	**Coastal Marsh Creation**	**Coastal Marsh Enhancement**	**Coastal Marsh Preservation**
As-Built Amounts (feet and acres)											**14.00**							
As-Built Amounts (mitigation credits)											**14.00**							
Percentage Released											**50%**							
Released Amounts (feet / acres)											**7.00**							
Released Amounts (credits)											**7.00**							
NCDWR Permit	USACE Action ID	Project Name																
2008-0987	2008-01885	Seymour Johnson Repair Drainage on East End Runway									5.60							
2008-0987	2008-01885	Seymour Johnson Repair Drainage on East End Runway									1.40							
Remaining Amounts (feet / acres)											**0.00**							
Remaining Amounts (credits)											**0.00**							

Contingencies (if any): None

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Signature of Wilmington District Official Approving Credit Release

July 11, 2014

Date

1 - For NCEEP, no credits are released during the first milestone
2 - For NCEEP projects, the second credit release milestone occurs automatically when the as-built report (baseline monitoring report) has been made available to the NCIRT by posting it to the NCEEP Portal, provided the following criteria have been met:
1) Approval of the final Mitigation Plan
2) Recordation of the preservation mechanism, as well as a title opinion acceptable to the USACE covering the property
3) Completion of all physical and biological improvements to the mitigation site pursuant to the mitigation plan
4) Reciept of necessary DA permit authorization or written DA approval for porjects where DA permit issuance is not required

3 - A 10% reserve of credits is to be held back until the bankfull event performance standard has been met

Information from EEP Debit Ledger dated 6/23/2014