Valley Fields Farm Stream Restoration Project

Monitoring Report: Year 05

Davidson County, North Carolina
Upper Yadkin River Basin
Cataloging Unit 030401030
DMS Project ID #407

Prepared for:

North Carolina Department of Environment Quality
Division of Mitigation Services
217 West Jones St, Suite 3000A
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Monitoring Firm:

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Project Manager: Adam Spiller
Email: adam.spiller@kci.com
Project No: 16133830

December 2015

Design Firm:

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P.O. Box 33068
Raleigh, NC 27636
(704) 333-5131

CONTENTS

Appendices

1.0 EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Valley Fields Farm (VFF) stream and wetland restoration project comprises 9,350 linear feet of stream restoration and 9,006 linear feet of stream preservation with approximately 3.1 acres of wetland restoration and 5.5 acres of wetland enhancement/preservation. Site construction was completed in June 2008 and plantings were completed in December 2008. This report represents the 5th year of monitoring data collection.

1.2 PROJECT LOCATION

The project is within USGS Hydrologic Cataloging Unit (HUC) 03040103030030 of the Yadkin River Basin. This 14-digit HUC has been identified as a Targeted Local Watershed (TLW) by DMS's *Upper Yadkin River Basin Restoration Priorities Plan 2009*. The project is in Davidson County approximately four miles northwest of High Point and located off of Shadow Valley Road.

1.3 PROJECT DESCRIPTION

The restoration of the Valley Fields Farm Site offers an opportunity to add functional stream and wetland uplift to the Yadkin River Basin. The project goal of the restoration project is to improve the water quality and biological habitat of the site's streams and wetlands through the following:

- Preserve stable on-site streams, wetlands, and riparian buffers in catchments draining into the primary enhancement/restoration reaches
- Enhance and restore (pattern, dimension, and profile) unstable streams using natural channel design techniques
- Re-establish riparian buffers
- Enhance and restore wetlands through modifications to hydrology, vegetation, and soils
- Improve water quality of non-point source storm water through Best Management Practices

2.0 MONITORING RESULTS

The survey data were collected with a survey-grade GPS unit between December 7 and 8, 2015. The stationing for the longitudinal profile is based on the thalweg stationing and has been adjusted to match grade control structures from previous longitudinal profiles.

The CVS-EEP protocol, Level 2 (http://cvs.bio.unc.edu/methods.htm) was used to collect vegetation data from the site. The vegetation monitoring was completed on September 22, 2015.

2.1 HYDROLOGY

Four automatic recording groundwater gauges were installed to monitor soil saturation within the upper 12 inches and any surface ponding within the wetland area of the site. Daily data were collected from the automatic gauges over the growing season to ensure that the water table was within 12 inches of

the surface for a minimum of 7.5% (18 days) of the growing season (March 26th – November 6th). During the 2015 growing season, 3 of the 4 gauges met this success criteria. The gauge that did not meet the success criteria (CE4) is located outside of the wetland restoration area. This gauge recorded a water table above the jurisdictional depth for 2.7% of the growing season (6 days). The other three gauges averaged 22.8% (51 days) of the growing season with the water table above jurisdictional depth.

In MY04, KCI conducted a site assessment to confirm the wetland delineations performed at the beginning of the project. This assessment followed the routine wetland determination procedure outlined in the 1987 COE Wetlands Delineation Manual. Several wetland boundaries were adjusted during this assessment and as a result, the total wetland preservation area was found to decrease by 1.03 acres and the total wetland enhancement area was found to decrease by 1.13 acres. See the Monitoring Year 04 Report for a more detailed description of this assessment.

2.2 VEGETATION

The vegetation monitoring success criterion for the planted stream riparian zone is a density of 260 stems per acre. The fifth-year vegetation monitoring was based on the Level 2 CVS-EEP vegetation monitoring protocol. There are eighteen permanent vegetation monitoring plots within the site.

The site's average density for this monitoring period is 339 planted stems per acre. There are many volunteer woody stems throughout the site. Including volunteers, the monitoring plots averaged 1,295 total stems per acre. Five of the eighteen plots had a planted stem density of less than 260 stems per acre, but of those five, only two had a total stem density (including volunteers) of less than 260 stems per acre. Invasives do not represent a problem within the site, although isolated patches of multiflora rose (*Rosa multiflora*), Callery pear (*Pyrus calleryana*), broadleaf cattail (*Typha latifolia*), sweet autumn clematis (*Clematis terniflora*), and Japanese stiltgrass (*Microstegium vimineum*) occur. On the CCPV in Appendix B, *T. latifolia* is represented by a polygons within wetland A-5. On the left bank around Station 82+00, *C. terniflora* is represented by a polygon bordering the easement. **All other polygons represent *R. multiflora*.** Many large stems of *P. calleryana* are also scattered throughout the easement, mostly in the area in and around Wetland A-5. Additionally, during the MY03 and 04 end of year site walks, it was noted that herbaceous vegetation was being cut within the easement on both banks from the beginning of Reach B to approximately Station 1520+00. DMS was notified of this cutting and is aware that this vegetation maintenance is occurring due to a 2013 agreement between NCDOT and the landowner. This vegetation maintenance was not noted as of December 8, 2015 during the MY05 end of year site walk.

2.3 STREAM

The fifth year of monitoring found the Valley Fields Farm streams to be stable, with only minor changes from the previous monitoring conditions. No new beaver dams have been noted on the site since beaver dam removal was completed during MY04, although there is evidence that beavers are still present on the site. Reaches A and B both still show the effects of these beaver dams along their lengths, but are significantly improved from the previous monitoring year. Structures buried under impounded sediment continue to be uncovered, most of the large point bars formed within the channel have washed out and areas of severe aggradation are continuing to trend back towards their baseline condition. Some areas of bank scour and erosion noted in previous monitoring years are still present but show similar levels of improvement and are all trending towards stability. See Appendix B Stream Problem Area Photos. The channel dimensions continue to show yearly fluctuations and areas of large deposition are evident due

to the sandy nature of the system. Also, as typical in systems such as these, the channel has evolved from a C5 system to an E5 system, with deposition on the banks and the floodplain leading to lower width-to-depth ratios. Given the active sand transport throughout the system and the expected variation that is typical in these streams, the site as a whole appears to be stable and trending towards success. As a part of the stream success criteria, the stream must experience at least two bankfull events each in separate monitoring years. The site has experienced multiple bankfull events since construction. See Appendix E for verification of bankfull events. Summary information/data related to the occurrence of items such as beaver or encroachment and statistics related to performance of various project and monitoring elements can be found in the tables and figures in the report appendices. Stream centerlines for tributaries D through N provided by DMS. Narrative background and supporting information formerly found in these reports can be found in the Baseline Monitoring Report and in the Mitigation Plan documents available on the DMS's website. All raw data supporting the tables and figures in the appendices are available from DMS upon request.

3.0 REFERENCES

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. Technical Report Y-87-1. (http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf)

Lee, M.T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2006. CVS-EEP Protocol for Recording Vegetation, Version 4.0 (http://cvs.bio.unc.edu/methods.htm)

NCEEP. 2009. Upper Yadkin River Basin Restoration Priorities. (http://portal.ncdenr.org/c/document_library/get_file?uuid=7f49dbf7-ac1f-4d56-83d6-8ab892d5c672&groupId=60329)

USACE. 2003. Stream Mitigation Guidelines. USACE, NCDENR-DWQ, USEPA, NCWRC.

APPENDIX A – PROJECT VICINITY MAP AND BACKGROUND TABLES

FIGURE 1. SITE VICINITY MAP

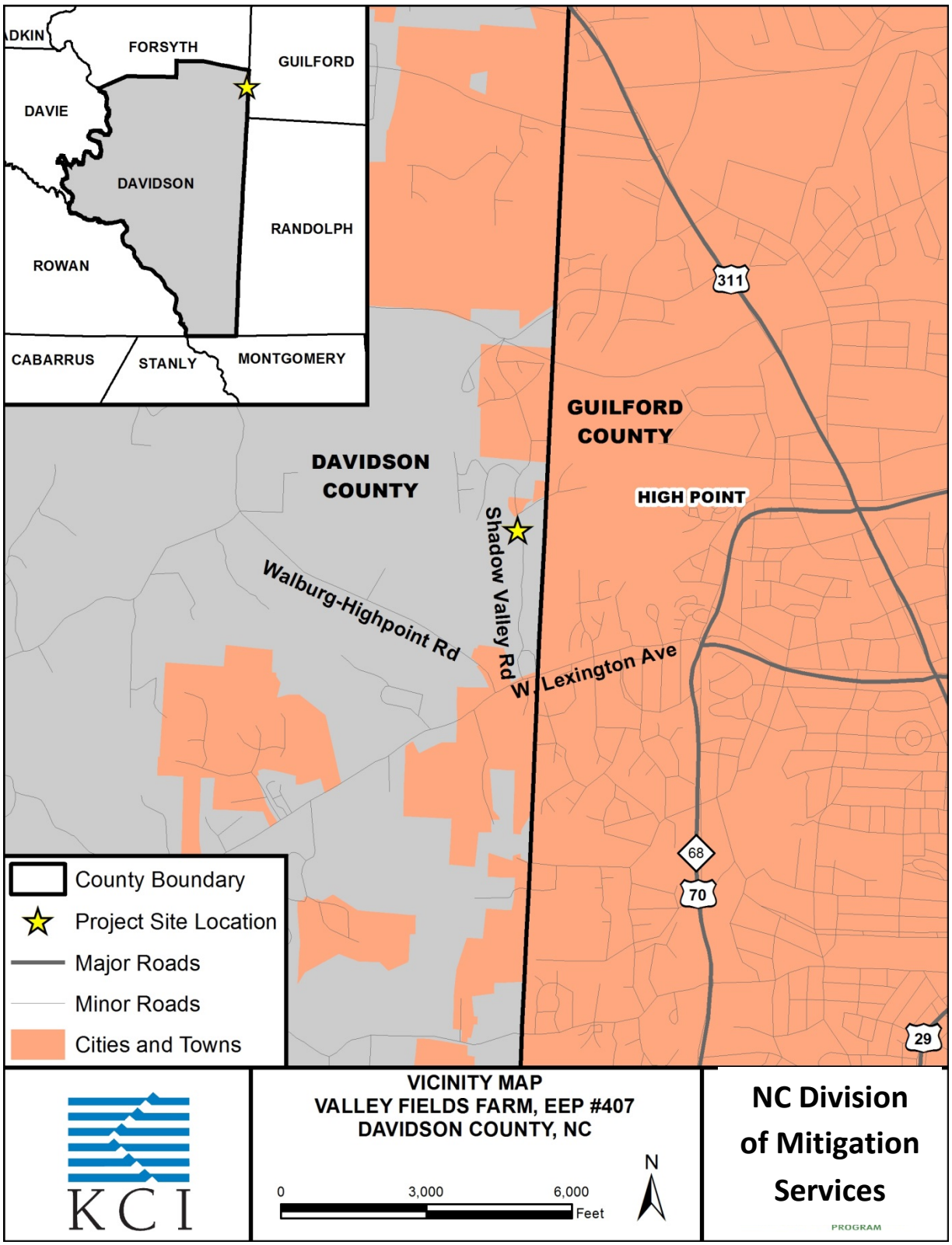


FIGURE 2. MITIGATION PLANVIEW

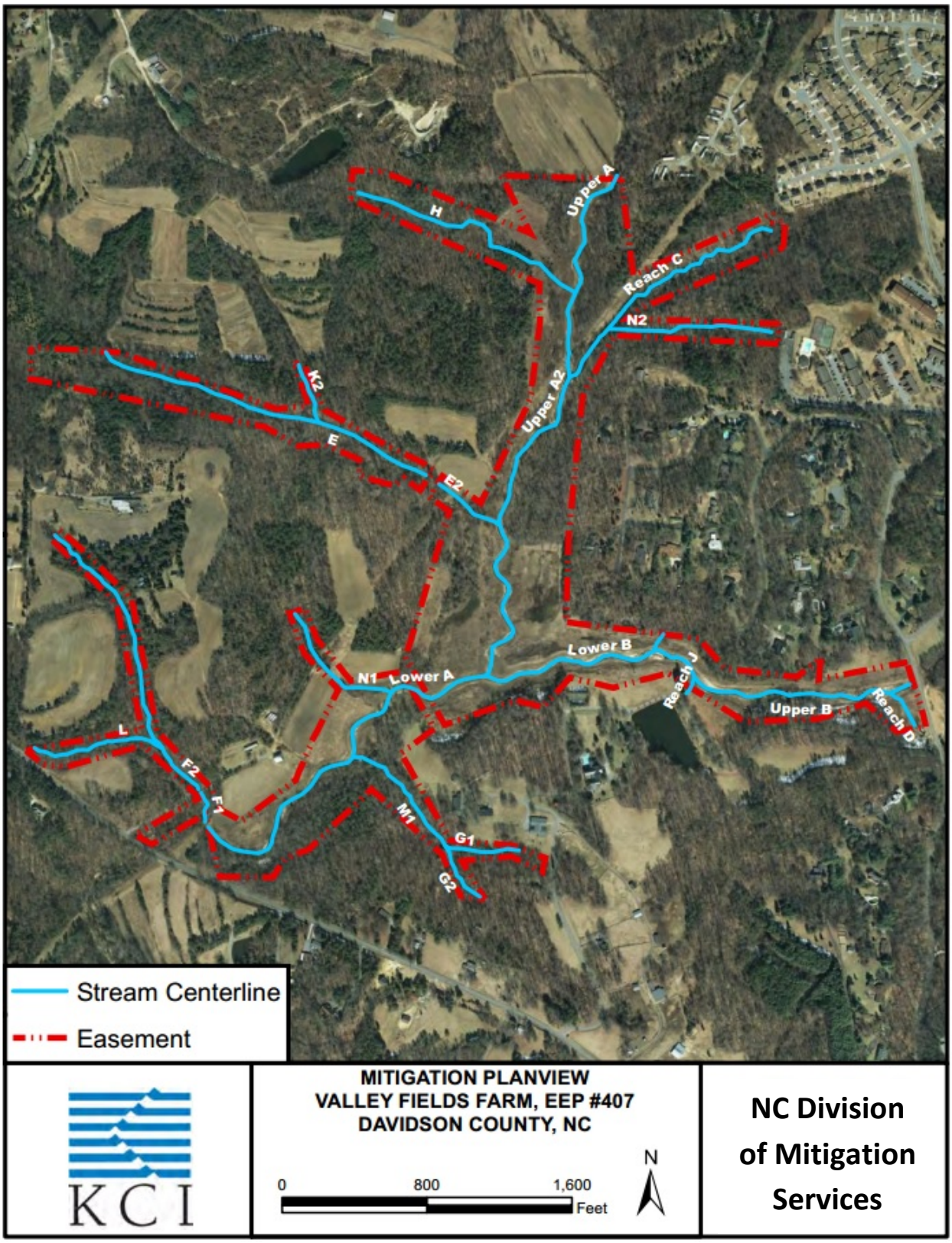


TABLE 1. PROJECT COMPONENTS

Mitigation Credits									
	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
LF/Acres	9,350	9,006	3.1	5.5	-	-	-	-	-
Credits	9,350	1,801	3.1	2.2	-	-	-	-	-
TOTAL CREDITS	11,151		5.3		-		-	-	-

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**
Upper A	50+00 – 80+78	3,100	P2	Restoration	3,078	1:1
Lower A	80+78 – 100+13	2,284	P2	Restoration	1,935	1:1
Reach B	1500+00 – 1524+92	2,550	P2	Restoration	2,492	1:1
Reach C	1000+00 – 1014+89	1,560	P1	Restoration	1,489	1:1
Reach D	200+00 – 202+95	240	P1	Restoration	295	1:1
Reach J (Pond Tributary)	350+00 – 350+61	61	P2	Restoration	61	1:1
Reach A	100+13 – 102+89	276	-	Preservation	276	5:1
Reach E	-	2,930	-	Preservation	2,930	5:1
Reach F	-	1,840	-	Preservation	1,840	5:1
Reach G	-	1,200	-	Preservation	1,200	5:1
Reach H	-	1,400	-	Preservation	1,400	5:1
Reach K	-	240	-	Preservation	240	5:1
Reach L	-	700	-	Preservation	700	5:1
Reach M	-	420	-	Preservation	420	5:1
Wetland A-5	-	-	-	Restoration	3.00	1:1
Wetland A-4	-	-	-	Restoration	0.10	1:1
Wetland B-1	-	0.10	-	Enhancement	0.02	2:1
Wetland B-2	-	0.70	-	Enhancement	-	2:1
Wetland B-3	-	0.20	-	Enhancement	-	2:1
Wetland D-1	-	0.20	-	Enhancement	0.05	2:1
Wetland A-6	-	1.70	-	Enhancement	1.70	2:1
Wetland A-4	-	1.80	-	Enhancement	1.80	2:1
Wetland A-3	-	0.20	-	Enhancement	0.20	2:1
Wetland A-1	-	0.60	-	Preservation	0.60	5:1
Wetland A-2	-	0.50	-	Preservation	0.50	5:1
Wetland A-7	-	0.40	-	Preservation	-	5:1
Wetland A-8	-	1.20	-	Preservation	0.57	5:1

Component Summation						
Restoration Level	**Stream (linear feet)**	**Riparian Wetland (acres)**		**Non-riparian Wetland (acres)**	**Buffer (acres)**	**Upland (acres)**
		Riverine	Non-riverine			
Restoration	9,350	3.1	-	-	-	-
Enhancement		3.8	-	-	-	-
Enhancement I	-					
Enhancement II	-					
Creation		-	-	-	-	-
Preservation	9,006	1.7	-	-	-	-
High Quality Preservation	-	-	-	-	-	-
TOTAL	18,356	8.6	-	-	-	-

TABLE 2. PROJECT ACTIVITY AND REPORTING HISTORY

Elapsed Time Since Grading Complete: 6 yrs 7 months
Elapsed Time Since Planting Complete: 6 yrs 7 months
Number of Reporting Years: 1

Activity or Report	**Data Collection Complete**	**Actual Completion or Delivery**
Mitigation Plan	N/A	3/1/2006
Final Design – Construction Plans	N/A	1/31/2007
Construction	N/A	5/16/2008
Planting	N/A	5/16/2008
Repair	N/A	11/15/2008
Baseline Monitoring/Report	6/1/2009	8/17/2009
Year 1 Monitoring	10/15/2010	3/28/2011
Year 2 Monitoring	11/4/2010	12/15/2011
Year 3 Monitoring	12/6/2013	1/23/2014
Year 4 Monitoring	6/17/2014	12/2014
Year 5 Monitoring	12/8/2015	12/2015

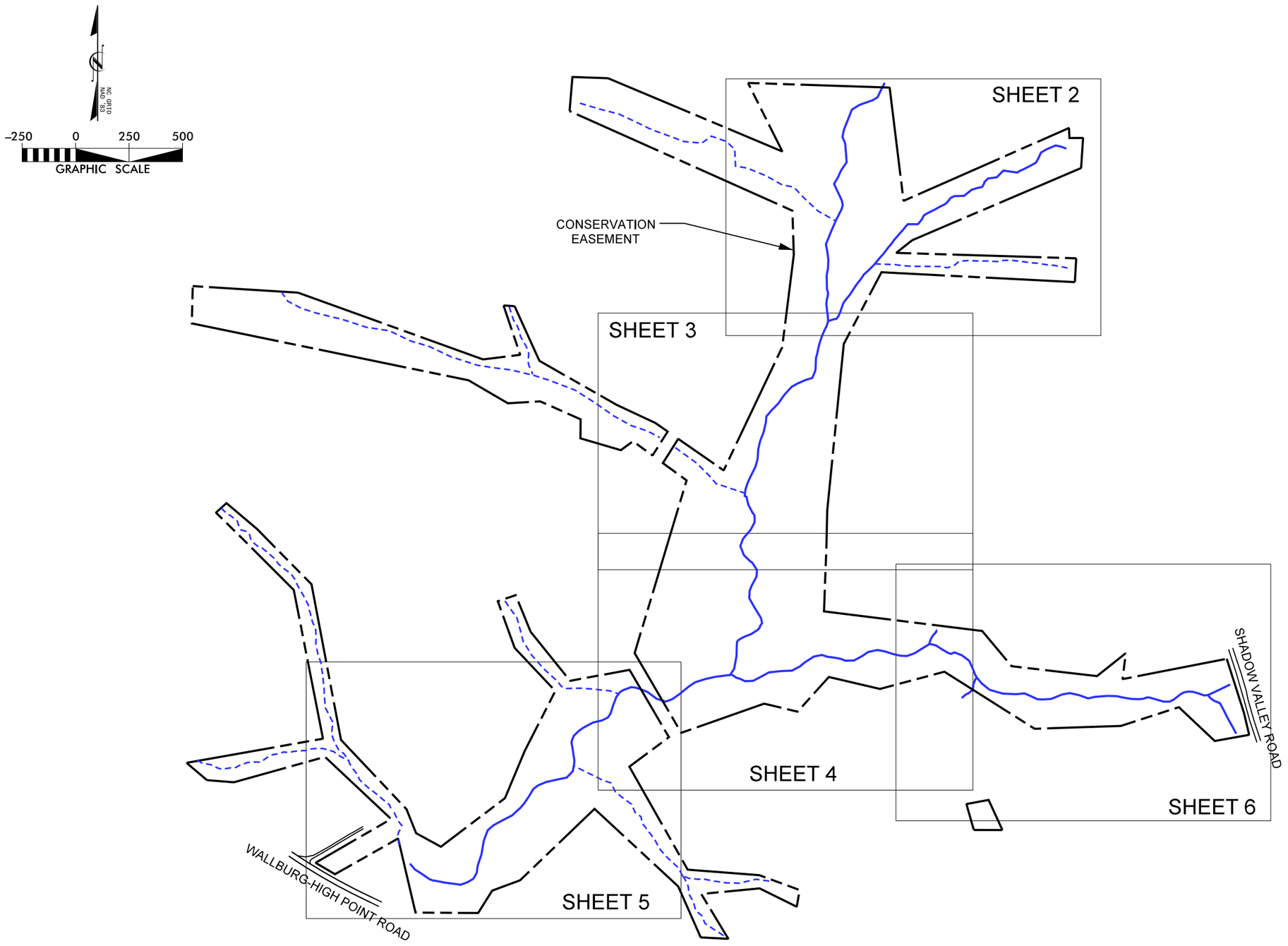
TABLE 3. PROJECT CONTACTS

Design Firm	Kimley-Horn and Associates, Inc. P.O. Box 33068 Raleigh, North Carolina 27636 Phone: (704)333-5131
Construction Contractor	North State Environmental 2889 Lowery Street Winston-Salem, NC 27101 Phone: (336)725-2010
Planting Contractor	North State Environmental 2889 Lowery Street Winston-Salem, NC 27101 Phone: (336)725-2010
Monitoring Performers	
MY01-02	Kimley-Horn and Associates, Inc. P.O. Box 33068 Raleigh, North Carolina 27636 Phone: (704)333-5131
MY03-MY05	KCI Associates of North Carolina, PA Landmark Center II, Suite 220 4601 Six Forks Rd. Raleigh, NC 27609 Contact: Mr. Adam Spiller Phone: (919) 278-2514 Fax: (919) 783-9266

TABLE 4. PROJECT ATTRIBUTE TABLE

Project County	Davidson County					
Physiographic Region	Piedmont					
Ecoregion	Southern Outer Piedmont					
River Basin	Yadkin					
USGS HUC	3040103030030					
NCDWQ Sub-Basin	Yadkin Sub Basin					
Within Extent of EEP Watershed Plan	Upper Yadkin River Basin Restoration Priorities 2009					
WRC Class	Cool					
% of Project Easement Demarcated	0%					
Beaver Activity Observed During Design Phase	Yes					
Restoration Component Attributes						
	Reach A	Reach B	Reach C	Reach D	Reach J	Wetland A-5
Drainage Area (sq.mi.)	6.5	2.3	0.2	0.2	0.1	N/A
Stream Order	3	2	1	1	1	N/A
Restored Length (feet)	5660	2492	1489	295	61	N/A
Perennial or Intermittent	P	P	P	P	P	N/A
Watershed Type	Developing	Developing	Developing	Developing	Developing	N/A
Watershed LULC Distribution						
Forest/Wetland	43%					
Cultivated	22%					
Developed	35%					
Watershed Impervious Cover	47%	23.5	1.9	1	1	N/A
NCDWQ AU/Index Number	C/3	C/2	C/1	C/1	C/1	N/A
NCDWQ Classification	C	C	C	C	C	N/A
303d Listed	Yes	Yes	Yes	Yes	Yes	N/A
Upstream of 303d Listed Segment	Yes	Yes	Yes	Yes	Yes	N/A
Reasons for 303d Listing or Stressor	Degraded water quality due to sediment					
Total Acreage of Easement	31.0	8.5	2.3	0.5	0.1	N/A
Total Vegetated Acreage within Easement	22.4	6.9	1.7	0.4	0.1	N/A
Total Planted Acreage as Part of Restoration	22.4	6.9	1.7	0.4	0.08	N/A
Rosgen Classification of Pre-Existing	G5	G5	Incised B5	Incised B5	G	N/A
Rosgen Classification of As-Built	B5	B5c	C5	B5c	Ba	N/A
Valley Type	VIII	VIII	VIII	VIII	VIII	N/A
Valley Slope	0.003	0.005	0.011	0.011	0.15	N/A
Valley Side Slope Range	15-20%	12-20%	15-40%	25-30%	30-35%	N/A
Valley Toe Slope Range	2-3%	1-3%	3-5%	10-14%	1-2%	N/A
Cowardin Classification	N/A	N/A	N/A	N/A	N/A	NC
Trout Waters Designation	No	No	No	No	No	N/A
Species of Concern, Endangered, Etc.	Greensboro burrowing crayfish is of concern					
Dominant Soil Series and Characteristics	Chewacla loam and Wehadkee loam					
Series	N/A	N/A	N/A	N/A	N/A	ChA
Depth	N/A	N/A	N/A	N/A	N/A	80"
Clay%	N/A	N/A	N/A	N/A	N/A	5-40%
K	N/A	N/A	N/A	N/A	N/A	0.28
T	N/A	N/A	N/A	N/A	N/A	5

APPENDIX B – VISUAL ASSESMENT DATA



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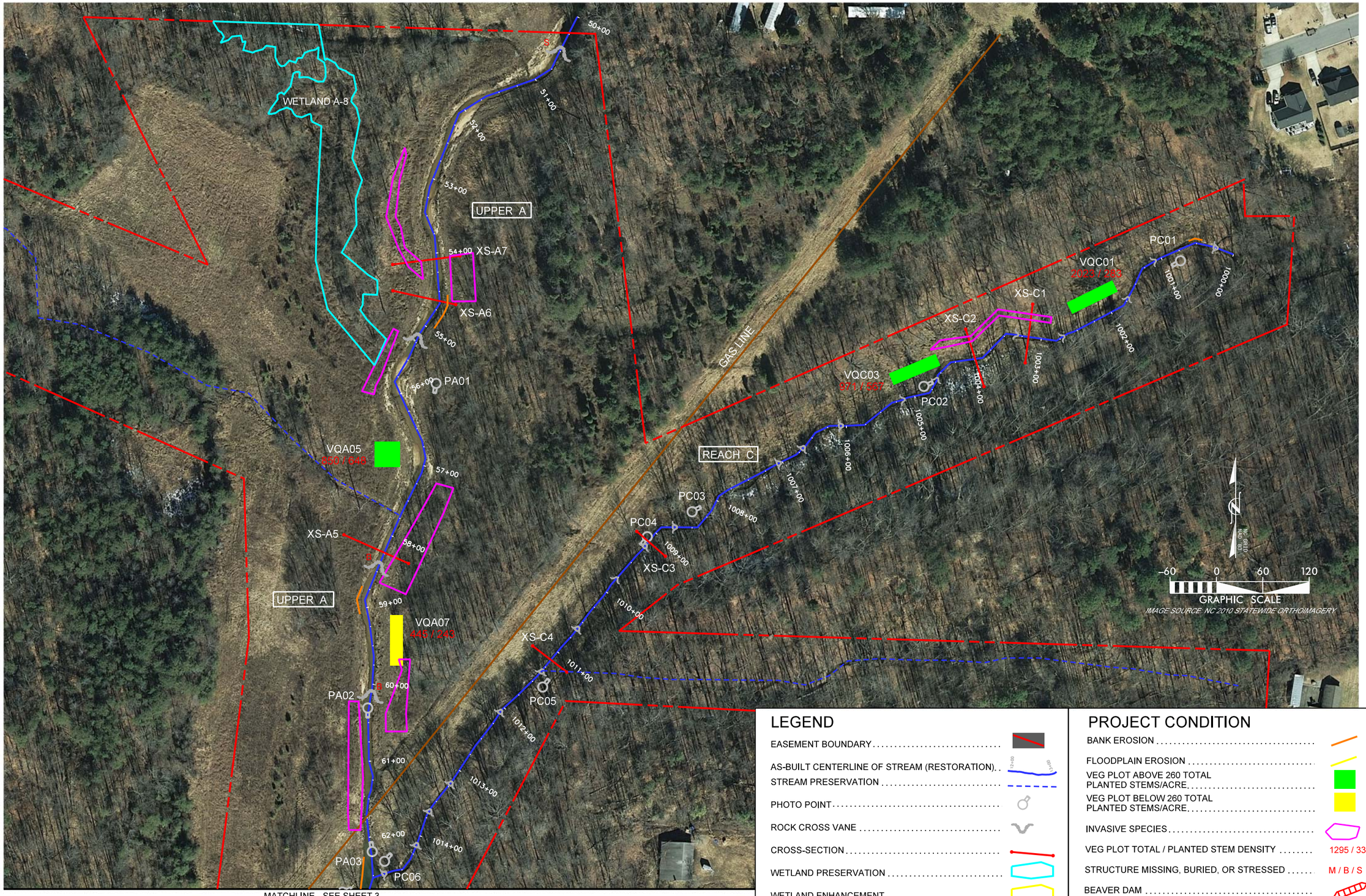
VALLEY FIELDS FARM
STREAM & WETLAND RESTORATION PROJECT
(MONITORING YEAR 5)

DAVIDSON COUNTY, NORTH CAROLINA

DATE: DEC 2015
SCALE: GRAPHIC

CURRENT CONDITION PLAN VIEW

SHEET 1 OF 6



LEGEND

- EASEMENT BOUNDARY
- AS-BUILT CENTERLINE OF STREAM (RESTORATION)
- STREAM PRESERVATION
- PHOTO POINT
- ROCK CROSS VANE
- CROSS-SECTION
- WETLAND PRESERVATION
- WETLAND ENHANCEMENT
- WETLAND RESTORATION
- EASEMENT ENCROACHMENT

PROJECT CONDITION

- BANK EROSION
- FLOODPLAIN EROSION
- VEG PLOT ABOVE 260 TOTAL PLANTED STEMS/ACRE
- VEG PLOT BELOW 260 TOTAL PLANTED STEMS/ACRE
- INVASIVE SPECIES
- VEG PLOT TOTAL / PLANTED STEM DENSITY — 1295 / 339
- STRUCTURE MISSING, BURIED, OR STRESSED — M / B / S
- BEAVER DAM
- BLUE=ACHIEVING HYDROLOGIC CRITERION
  RED=BELOW HYDROLOGIC CRITERION

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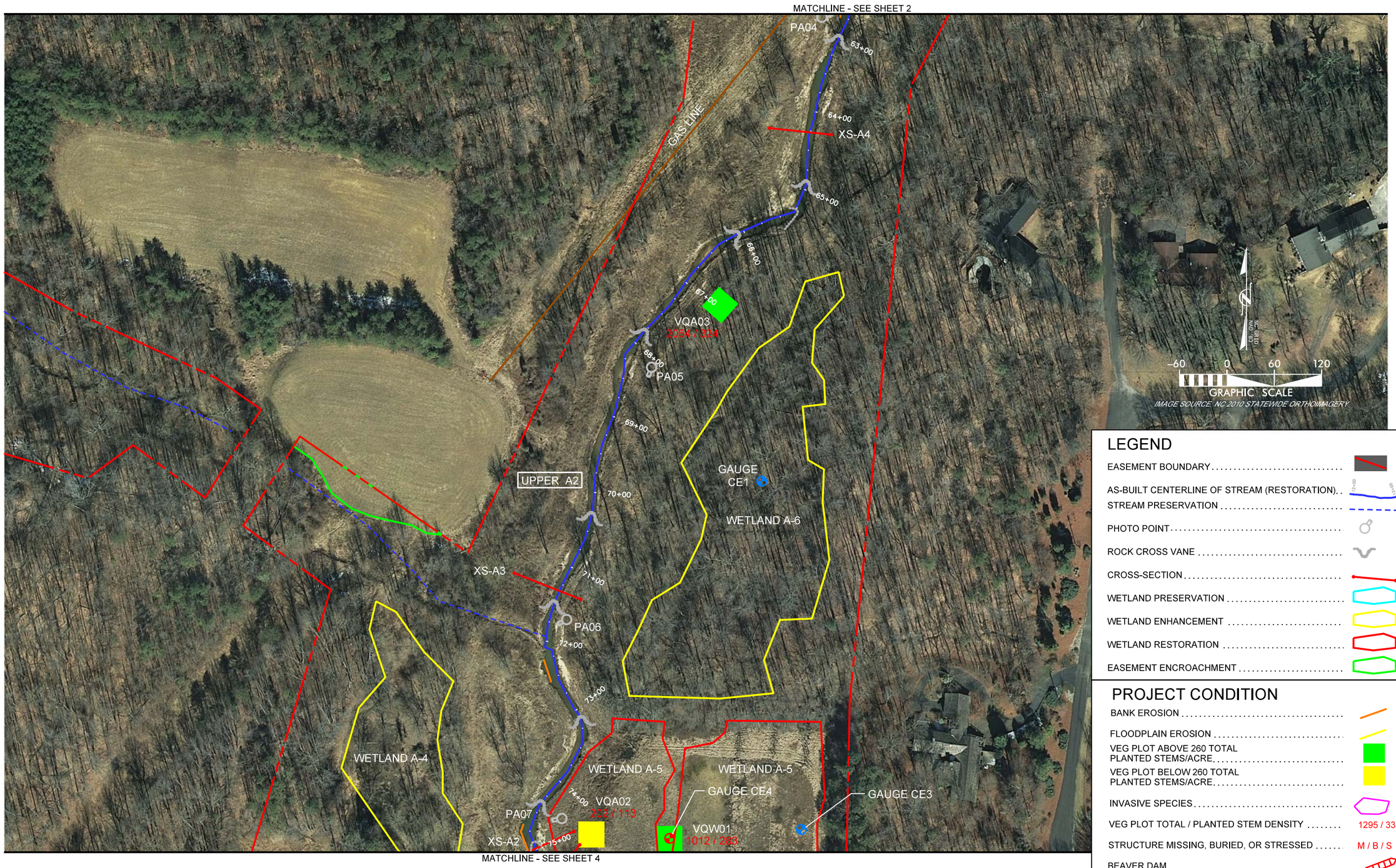

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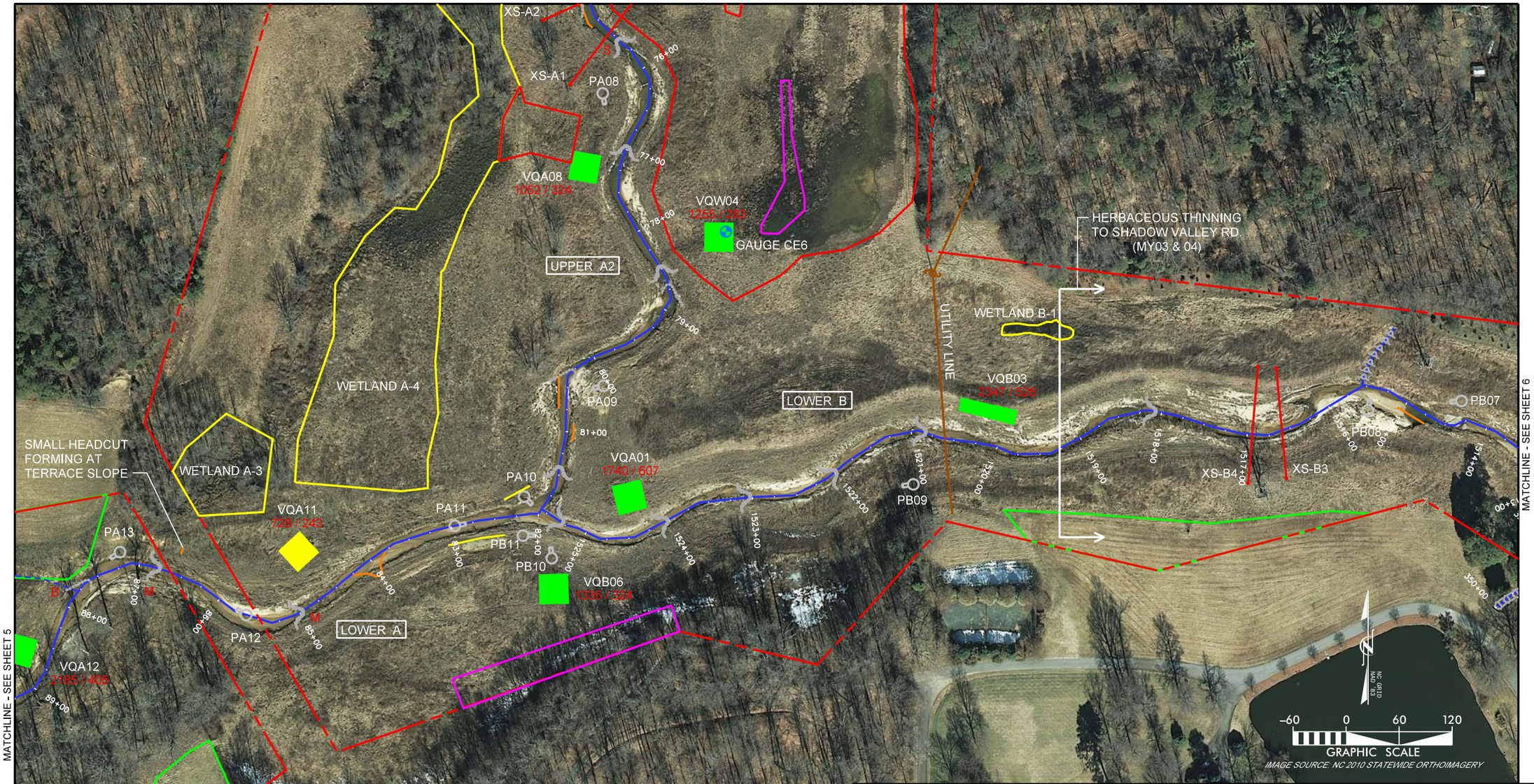

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NC GRID NAD 1983

−60 0 60 120

GRAPHIC SCALE

IMAGE SOURCE: NC 2010 STATEWIDE ORTHOIMAGERY

VQA12
2185 / 405

VQA13
647 / 81

LOWER A

PA14
PA15
PA16
PA17

XS-A10
XS-A11

WETLAND A-1
WETLAND A-2

88+00
89+00
90+00
91+00
92+00
93+00
94+00
95+00
96+00
97+00
98+00
99+00
100+00
101+00
102+00

WALLBURG-HIGH POINT ROAD

MATCHLINE - SEE SHEET 4

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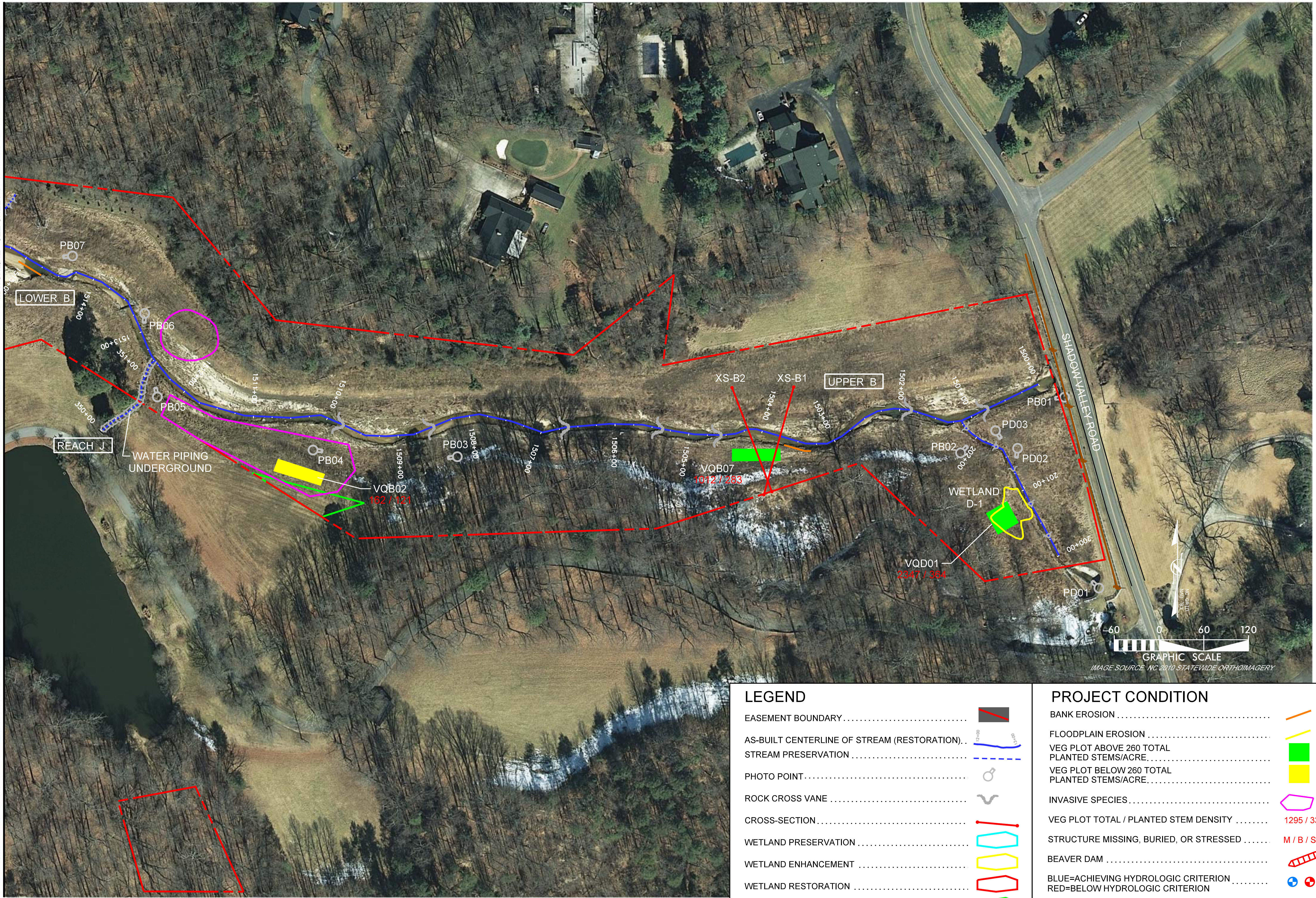

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SHEET 6 OF 6

TABLE 5. VISUAL STREAM MORPHOLOGY STABILITY ASSESMENT

Project Number and Name: 407 - Valley Fields Farm							
Assessed Length	1,250	Reach - Upper A					
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	2	5			40%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	2	5			40%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	2	5			40%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	5	5			100%
		2. Thalweg centering at downstream of meander (Glide)	5	5			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			2	87	97%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	2	87	97%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	4	4			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	4	4			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	4	4			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	3	4			75%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	2	4			50%

Project Number and Name: 407 - Valley Fields Farm							
Assessed Length	2,050		Reach - Upper A2				
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	2	20			10%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	14	20			70%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	14	20			70%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	20	20			100%
		2. Thalweg centering at downstream of meander (Glide)	20	20			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			4	157	96%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	4	157	96%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	13	13			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	13	13			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	13	13			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	13	13			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	13	13			100%

Project Number and Name: 407 - Valley Fields Farm							
Assessed Length	2,000		Reach - Lower A				
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	1	10			10%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	5	10			50%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	5	10			50%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	9	10			90%
		2. Thalweg centering at downstream of meander (Glide)	9	10			90%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			2	116	97%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	2	116	97%
3. Engineered Structures*	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	9	9			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	9	9			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	9	9			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	9	9			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	3	9			33%

*=Though present, several of these structures have been buried by sand due to a history of beaver dams trapping sediment in this reach

Project Number and Name: 407 - Valley Fields Farm							
Assessed Length	1,275		Reach - Upper B				
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	2	2			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	2	2			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	2	2			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	2	2			100%
		2. Thalweg centering at downstream of meander (Glide)	2	2			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			2	61	98%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	2	61	98%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	2	2			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	2	2			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	2	2			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	2	2			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	2	2			100%

Project Number and Name: 407 - Valley Fields Farm							
Assessed Length	1,275		Reach - Lower B				
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	2	2			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	2	2			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	2	2			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	2	2			100%
		2. Thalweg centering at downstream of meander (Glide)	2	2			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			3	105	96%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	3	105	96%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	1	1			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	1	1			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	1	1			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	1	1			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	1	1			100%

Project Number and Name: 407 - Valley Fields Farm							
Assessed Length	1,500		Reach - C				
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	2	24			8%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	6	24			25%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	6	24			25%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	24	24			100%
		2. Thalweg centering at downstream of meander (Glide)	24	24			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			1	20	99%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	1	20	99%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	17	17			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	17	17			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	17	17			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	17	17			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	17	17			100%

TABLE 6. VEGETATION CONDITION ASSESMENT

Table 6. Vegetation Condition Assessment
Project Number and Name: 407 - Valley Fields Farm
Planted Acreage 81.9 **Easement Acreage 97.5**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acre	Pattern and Color	0	0.00	0.0%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acre	Pattern and Color	0	0.00	0.0%
			Total	0	0.00	0.0%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 acre	Pattern and Color	0	0.00	0.0%
			Cumulative Total	0	0.00	0.0%
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	1,000 SF	Purple Polygon	12	2.20	2.3%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	none	Green Polygon	7	1.50	1.5%

STREAM AND WETLAND PHOTOS

PA 01 – 12/7/2015

PA 02 – 12/7/2015

PA 03 – 12/7/2015

PA 04 – 12/7/2015

PA 05 – 12/7/2015

PA 06 – 12/7/2015

PA 07 – 12/7/2015

PA 08 – 12/7/2015

PA 09 – 12/7/2015

PA 10 – 12/7/2015

PA 11 – 12/7/2015

PA 12 – 12/7/2015

PA 13 – 12/7/2015

PA 14 – 12/7/2015

PA 15 – 12/7/2015

PA 16 – 12/7/2015

PA 17 – 12/7/2015

PB 01 – 12/7/2015

PB 02 – 12/7/2015

PB 03 – 12/7/2015

PB 04 – 12/7/2015

PB 05 – 12/7/2015

PB 06 – 12/7/2015

PB 07 – 12/7/2015

PB 08 – 12/7/2015

PB 09 – 12/7/2015

PB 10 – 12/7/2015

PB 11 – 12/7/2015

PC 01 – 12/7/2015

PC 02 – 12/7/2015

PC 03 – 12/7/2015

PC 04 – 12/7/2015

PC 05 – 12/7/2015

PC 06 – 12/7/2015

PD 01 – 12/7/2015

PD 02 – 12/7/2015

PD 03 – 12/7/2015

STREAM PROBLEM AREA PHOTOS

Bank erosion (Station 55+00) – 12/7/2015

Thalweg shift (Station 84+00) – 12/7/2015

Bank erosion (Station 95+75) – 12/7/2015

Bank erosion (Station 100+50) – 12/7/2015

Deposition and bank aggradation (typical along Reaches A and B) – 12/7/2015

VEGETATION PLOT PHOTOS

Plot VQA01 – 9/22/2015

Plot VQA05 – 9/22/2015

Plot VQA02 – 9/22/2015

Plot VQA07 – 9/22/2015

Plot VQA03 – 9/22/2015

Plot VQA08 – 9/22/2015

Plot VQA11 – 9/22/2015

Plot VQB02 – 9/22/2015

Plot VQA12 – 9/22/2015

Plot VQB03 – 9/22/2015

Plot VQA13 – 9/22/2015

Plot VQB06 – 9/22/2015

Plot VQB07 – 9/22/2015

Plot VQD01 – 9/22/2015

Plot VQC01 – 9/22/2015

Plot VQW01 – 9/22/2015

Plot VQC03 – 9/22/2015

Plot VQW04 – 9/22/2015

APPENDIX C – VEGETATION PLOT DATA

TABLE 7. VEGETATION PLOTS WOODY STEM SUCCESS CRITERIA ATTAINMENT TABLE

Success Criteria Achieved/Number of Planted Stems per Acre					
Plot Name	MY-01 (2010)	MY-02 (2011)	MY-03 (2013)	MY-04 (2014)	MY-05 (2015)
VQA1	No	Yes	No/0	No/243	Yes/607
VQA2	No	No	No/150	No/202	No/202
VQA3	No	No	No/50	Yes/324	Yes/324
VQA5	Yes	Yes	No/300	Yes/648	Yes/648
VQA7	No	Yes	No/250	No/243	No/243
VQA8	No	No	Yes/400	Yes/324	Yes/324
VQA11	Yes	Yes	No/300	No/243	No/243
VQA12	No	Yes	Yes/400	Yes/324	Yes/405
VQA13	Yes	Yes	No/100	No/81	No/81
VQB2	No	No	No/200	No/162	No/121
VQB3	Yes	Yes	Yes/450	Yes/526	Yes/526
VQB6	No	No	No/300	Yes/324	Yes/324
VQB7	No	Yes	Yes/350	Yes/324	Yes/283
VQC1	Yes	Yes	Yes/400	No/283	Yes/283
VQC3	Yes	Yes	Yes/700	Yes/567	Yes/567
VQD1	No	No	No/150	Yes/445	Yes/364
VQW1	Yes	Yes	No/300	No/283	Yes/283
VQW4	No	No	No/300	No/283	Yes/283

TABLE 8. VEGETATION PLOT SAMPLING METADATA

Report Prepared By	Bethany Williams
Date Prepared	10/21/2015 16:39
database name	ValleyFields-KCI-2013-A.mdb
database location	KCI-2014-V.mdb
computer name	M:\2013\16133830_Valley Fields Monitoring\Valleyfields MY-05 2015\Veg
file size	12-3ZV4FP1
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 Code	407
project Name	Valley Fields Farm
Description	Stream and Wetland Restoration
River Basin	Yadkin-Pee Dee
Sampled Plots	18

TABLE 9. TOTAL AND PLANTED STEM COUNT BY PLOT AND SPECIES

EEP Project Code 407. Project Name: Valley Fields Farm			Current Plot Data (MY5 2015)																												
			407-01-VQA01			407-01-VQA02			407-01-VQA03			407-01-VQA05			407-01-VQA07			407-01-VQA08			407-01-VQA11			407-01-VQA12			407-01-VQA13			407-01-VQB02		
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	PnoLS	P-all	T
Acer floridanum	Southern Sugar Maple,	Tree																													
Acer negundo	boxelder	Tree			4	2	2	7	2	2	2				1	1	1	1	1	11	2	2	3	1	1	4						
Acer rubrum	red maple	Tree															3									1					
Acer saccharinum	silver maple	Tree																													
Aesculus flava	yellow buckeye	Tree									1																				
Alnus serrulata	hazel alder	Shrub	5	5	5										2	2	2						1								
Aronia arbutifolia	Red Chokeberry	Shrub																						1	1	1					
Asimina triloba	pawpaw	Tree																													
Betula nigra	river birch	Tree							1	1	1				1	1	1														
Carpinus caroliniana	American hornbeam	Tree																													
Carya alba	mockernut hickory	Tree									2																				
Celtis laevigata	sugarberry	Tree																													
Celtis occidentalis	common hackberry	Tree									2																				
Cephalanthus occidentali	common buttonbush	Shrub																													
Cercis canadensis	eastern redbud	Tree																													
Cornus amomum	silky dogwood	Shrub	3	3	6													1	1	2				5	5	5					
Corylus americana	American hazelnut	Shrub							2	2	3	1	1	1				2	2	3											
Diospyros virginiana	common persimmon	Tree							1	1	1													1	1	1	2	2	3	1	1	2
Fagus grandifolia	American beech	Tree																													
Fraxinus pennsylvanica	green ash	Tree	3	3	16	3	3	19			11	2	2	2						1	4	4	10	1	1	3			11			
Hamamelis virginiana	American witchhazel	Tree																													
Juglans nigra	black walnut	Tree																2	2	5											
Juniperus virginiana	eastern redcedar	Tree									2															3			2			
Lindera benzoin	northern spicebush	Shrub									18																				
Liquidambar styraciflua	sweetgum	Tree			2															2			4			33					
Liriodendron tulipifera	tuliptree	Tree									1													1	1	1					
Nyssa sylvatica	blackgum	Tree																													
Pinus taeda	loblolly pine	Tree						1																							
Platanus occidentalis	American sycamore	Tree	1	1	5						1	11	11	16	2	2	2	2	2	2						2					
Prunus serotina	black cherry	Tree									3																				
Quercus lyrata	overcup oak	Tree																													
Quercus phellos	willow oak	Tree							2	2	2	1	1	1																	
Quercus rubra	northern red oak	Tree									1																				
Salix nigra	black willow	Tree	2	2	4							1	1	1			2														
Salix sericea	silky willow	Shrub	1	1	1																										
Ulmus alata	winged elm	Tree																												2	2	2
Ulmus americana	American elm	Tree						1																							
		Stem count	15	15	43	5	5	28	8	8	51	16	16	21	6	6	11	8	8	26	6	6	18	10	10	54	2	2	16	3	3	4
		size (ares)	1			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			0.02		
		Species count	6	6	8	2	2	4	5	5	15	5	5	5	4	4	6	5	5	7	2	2	4	6	6	10	1	1	3	2	2	2
		Stems per ACRE	607	607	1740	202	202	1133	324	324	2064	647	647	850	243	243	445	324	324	1052	243	243	728	405	405	2185	81	81	647	121	121	162

EEP Project Code 407. Project Name: Valley Fields Farm																																
			Current Plot Data (MY5 2015)																						Annual Means								
			407-01-VQB03			407-01-VQB06			407-01-VQB07			407-01-VQC01			407-01-VQC03			407-01-VQD01			407-01-VQW01			407-01-VQW04			MY5 (2015)			MY4 (2014)			MY3 (2013)		
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	PnoLS	P-all	T	PnoLS	P-all	T
Acer floridanum	Southern Sugar Maple,	Tree																										3					
Acer negundo	boxelder	Tree				5	5	28												2			3			9	14	14	74	14	14	101	9	9	48
Acer rubrum	red maple	Tree												1									1						6			5			5
Acer saccharinum	silver maple	Tree																														1			
Aesculus flava	yellow buckeye	Tree																											1			16			9
Alnus serrulata	hazel alder	Shrub	1	1	1										6	6	6										14	14	15	14	14	15	8	8	8
Aronia arbutifolia	Red Chokeberry	Shrub																									1	1	1	1	1	1			
Asimina triloba	pawpaw	Tree												4															4			1			1
Betula nigra	river birch	Tree	5	5	8									3													7	7	13	8	8	21	4	4	11
Carpinus caroliniana	American hornbeam	Tree																																	5
Carya alba	mockernut hickory	Tree																											2						
Celtis laevigata	sugarberry	Tree																						1	1	1	1	1	1	1	1	2	1	1	2
Celtis occidentalis	common hackberry	Tree																											2						
Cephalanthus occidentali	common buttonbush	Shrub																2	2	2							2	2	2	6	6	7	2	2	2
Cercis canadensis	eastern redbud	Tree									1																		1			1			1
Cornus amomum	silky dogwood	Shrub	1	1	1													1	1	1							11	11	15	8	8	9	6	6	6
Corylus americana	American hazelnut	Shrub			1																						5	5	8	5	5	10	3	3	7
Diospyros virginiana	common persimmon	Tree						1													1	1	2	1	1	1	7	7	11	7	7	17	6	6	13
Fagus grandifolia	American beech	Tree																														2			
Fraxinus pennsylvanica	green ash	Tree	1	1	2	1	1	1													4	4	16	4	4	18	23	23	110	23	23	125	16	16	80
Hamamelis virginiana	American witchhazel	Tree																			1	1	1				1	1	1	1	1	2	1	1	1
Juglans nigra	black walnut	Tree															1										2	2	6	2	2	10	2	2	7
Juniperus virginiana	eastern redcedar	Tree												1															8			5			2
Lindera benzoin	northern spicebush	Shrub																											18			16			14
Liquidambar styraciflua	sweetgum	Tree			18			1			7			2						42			1						112			94			74
Liriodendron tulipifera	tuliptree	Tree							1	1	1	1	1	6						2							3	3	11	3	3	7	3	3	8
Nyssa sylvatica	blackgum	Tree																																	1
Pinus taeda	loblolly pine	Tree									1																		2			1			1
Platanus occidentalis	American sycamore	Tree	4	4	26				4	4	12			1	3	3	7			3							27	27	77	27	27	73	17	17	65
Prunus serotina	black cherry	Tree																											3						
Quercus lyrata	overcup oak	Tree	1	1	1																						1	1	1	3	3	3	1	1	1
Quercus phellos	willow oak	Tree							1	1	1																4	4	4	4	4	4	2	2	4
Quercus rubra	northern red oak	Tree																											1			1			
Salix nigra	black willow	Tree										5	5	31	5	5	10	3	3	3							16	16	51	14	14	48	12	12	55
Salix sericea	silky willow	Shrub							1	1	1							3	3	3							5	5	5	5	5	7	2	2	2
Ulmus alata	winged elm	Tree																									2	2	2	2	2	2	2	2	2
Ulmus americana	American elm	Tree				2	2	2				1	1	1							1	1	1	1	1	2	5	5	7	5	5	7	5	5	6
		Stem count	13	13	58	8	8	33	7	7	25	7	7	50	14	14	24	9	9	58	7	7	25	7	7	31	151	151	576	153	153	623	102	102	446
		size (ares)	1			1			1			1			1			1			1			1			18			18			6		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.44			0.44			0.15		
		Species count	6	6	8	3	3	5	4	4	8	3	3	9	3	3	4	4	4	8	4	4	7	4	4	5	20	20	33	20	20	35	19	19	32
		Stems per ACRE	526	526	2347	324	324	1335	283	283	1012	283	283	2023	567	567	971	364	364	2347	283	283	1012	283	283	1255	339	339	1295	344	344	1401	688	688	3008

APPENDIX D – STREAM SURVEY DATA

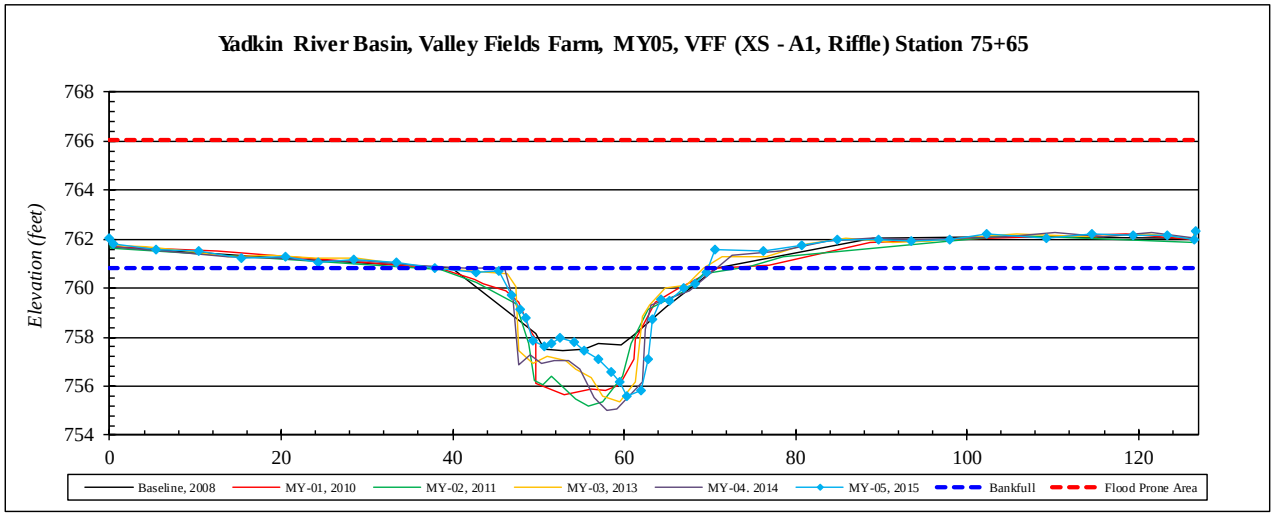
CROSS-SECTION PLOTS

River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - A1, Riffle) Station 75+65
Drainage Area (sq mi):	6.5
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	762.06
0.4	761.79
5.4	761.57
10.3	761.51
15.4	761.24
20.4	761.28
24.3	761.07
28.5	761.16
33.5	761.07
37.9	760.83
42.8	760.62
45.4	760.69
46.9	759.74
47.8	759.11
48.6	758.81
49.4	757.84
50.7	757.64
51.5	757.76
52.6	757.95
54.2	757.79
55.4	757.43
57.0	757.09
58.4	756.57
59.4	756.16
60.4	755.58
61.9	755.81
62.9	757.07
63.3	758.73
64.2	759.55
65.4	759.46
67.0	760.02
68.2	760.19
69.6	760.67
70.7	761.55
76.2	761.50
80.7	761.76
84.9	761.97

SUMMARY DATA	
Bankfull Elevation:	760.8
Bankfull Cross-Sectional Area:	57.6
Bankfull Width:	23.7
Flood Prone Area Elevation:	766.0
Flood Prone Width:	>120
Max Depth at Bankfull:	5.2
Mean Depth at Bankfull:	2.4
W / D Ratio:	9.8
Entrenchment Ratio:	5.1
Bank Height Ratio:	1.0

Stream Type	E5

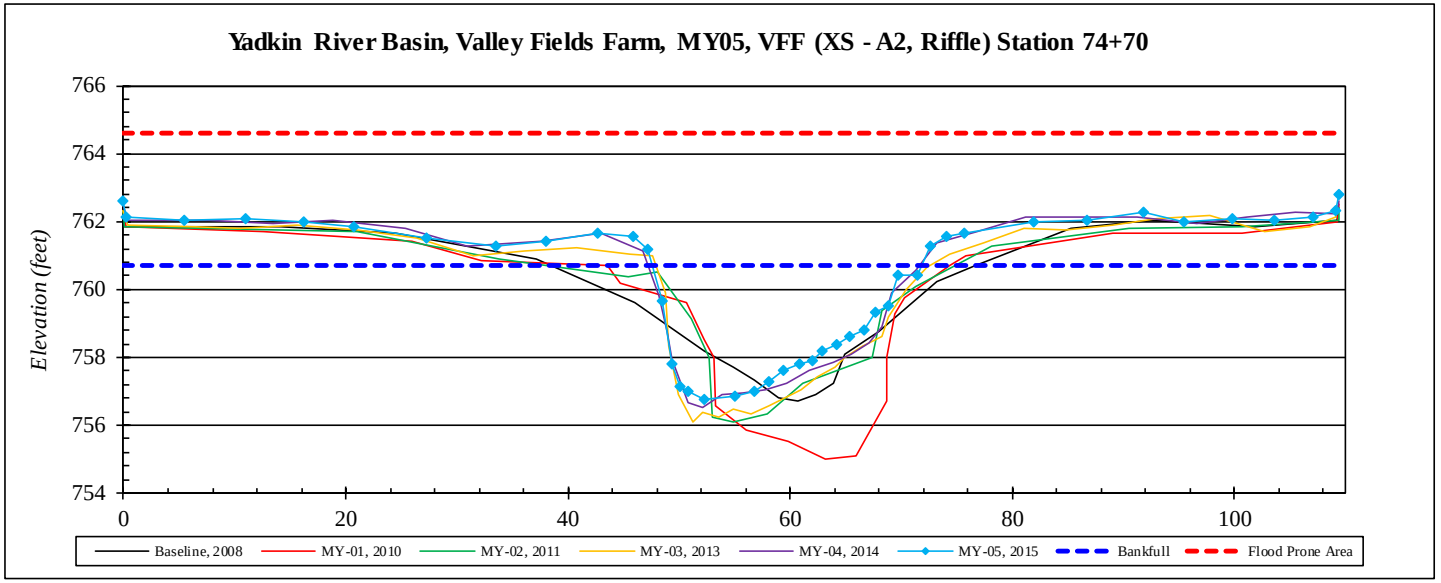


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - A2, Riffle) Station 74+70
Drainage Area (sq mi):	6.5
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	762.60
0.3	762.13
5.4	762.02
11.0	762.06
16.2	762.00
20.7	761.84
27.3	761.51
33.6	761.28
38.0	761.40
42.6	761.66
45.9	761.54
47.2	761.19
48.4	759.64
49.3	757.80
50.0	757.16
50.8	757.01
52.3	756.79
55.1	756.85
56.7	756.98
58.1	757.30
59.4	757.63
60.8	757.81
62.1	757.90
62.9	758.20
64.2	758.37
65.4	758.60
66.7	758.82
67.7	759.33
68.8	759.54
69.6	760.42
71.4	760.40
72.6	761.29
74.1	761.54
75.6	761.63
81.9	761.98
86.8	762.03

SUMMARY DATA	
Bankfull Elevation:	760.7
Bankfull Cross-Sectional Area:	61.6
Bankfull Width:	24.2
Flood Prone Area Elevation:	764.6
Flood Prone Width:	>100
Max Depth at Bankfull:	3.9
Mean Depth at Bankfull:	2.5
W / D Ratio:	9.5
Entrenchment Ratio:	4.1
Bank Height Ratio:	1.0

Stream Type	E5

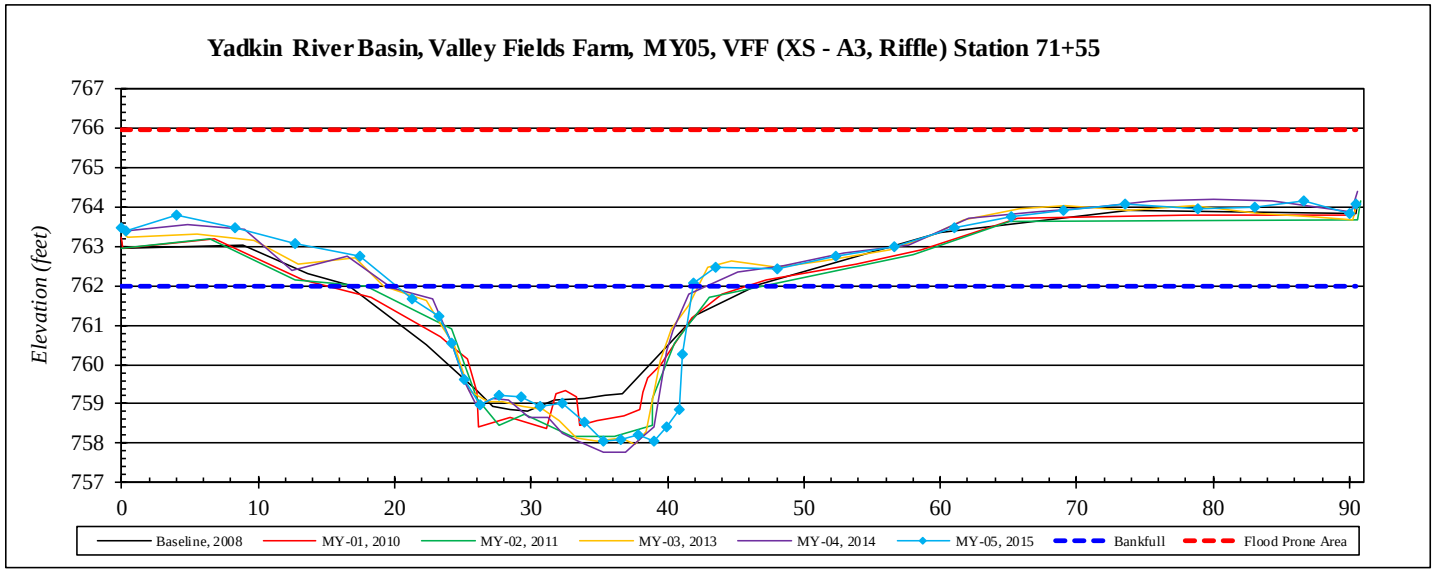


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - A3, Riffle) Station 71+55
Drainage Area (sq mi):	6.5
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	763.46
0.3	763.37
4.1	763.78
8.2	763.48
12.7	763.07
17.5	762.75
21.3	761.65
23.3	761.23
24.2	760.55
25.1	759.62
26.3	759.00
27.6	759.21
29.3	759.16
30.7	758.93
32.3	759.03
33.9	758.53
35.3	758.05
36.6	758.11
37.9	758.21
39.0	758.07
40.0	758.41
40.9	758.88
41.1	760.26
41.9	762.06
43.6	762.47
48.0	762.41
52.3	762.75
56.6	762.98
61.0	763.49
65.2	763.77
69.0	763.91
73.6	764.09
78.8	763.97
83.1	764.00
86.6	764.14
90.0	763.81
90.4	764.08

SUMMARY DATA	
Bankfull Elevation:	762.0
Bankfull Cross-Sectional Area:	57.5
Bankfull Width:	21.8
Flood Prone Area Elevation:	766.0
Flood Prone Width:	>90
Max Depth at Bankfull:	4.0
Mean Depth at Bankfull:	2.6
W / D Ratio:	8.3
Entrenchment Ratio:	4.1
Bank Height Ratio:	1.0

Stream Type	E5

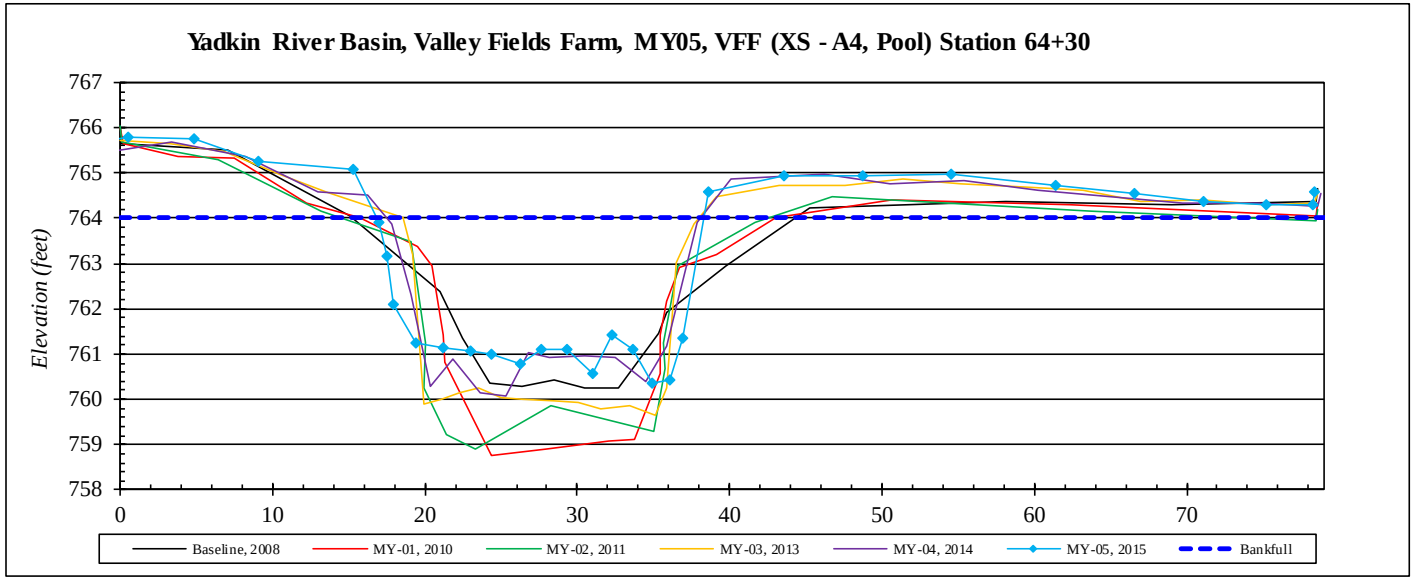


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - A4, Pool) Station 64+30
Drainage Area (sq mi):	6.5
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	766.03
0.4	765.58
4.5	765.53
9.0	765.80
13.3	765.75
17.6	765.28
23.8	765.07
25.5	763.90
26.0	763.16
26.4	762.12
27.9	761.24
29.7	761.13
31.5	761.08
32.9	760.99
34.7	760.79
36.1	761.09
37.8	761.11
39.5	760.58
40.8	761.41
42.1	761.11
43.4	760.36
44.5	760.44
45.5	761.35
47.1	764.60
52.1	764.93
57.2	764.92
63.0	764.97
69.9	764.73
75.1	764.53
79.6	764.38
83.7	764.29
86.8	764.30
86.8	764.58

SUMMARY DATA	
Bankfull Elevation:	764.0
Bankfull Cross-Sectional Area:	59.3
Bankfull Width:	21.4
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	3.6
Mean Depth at Bankfull:	2.8
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	E5

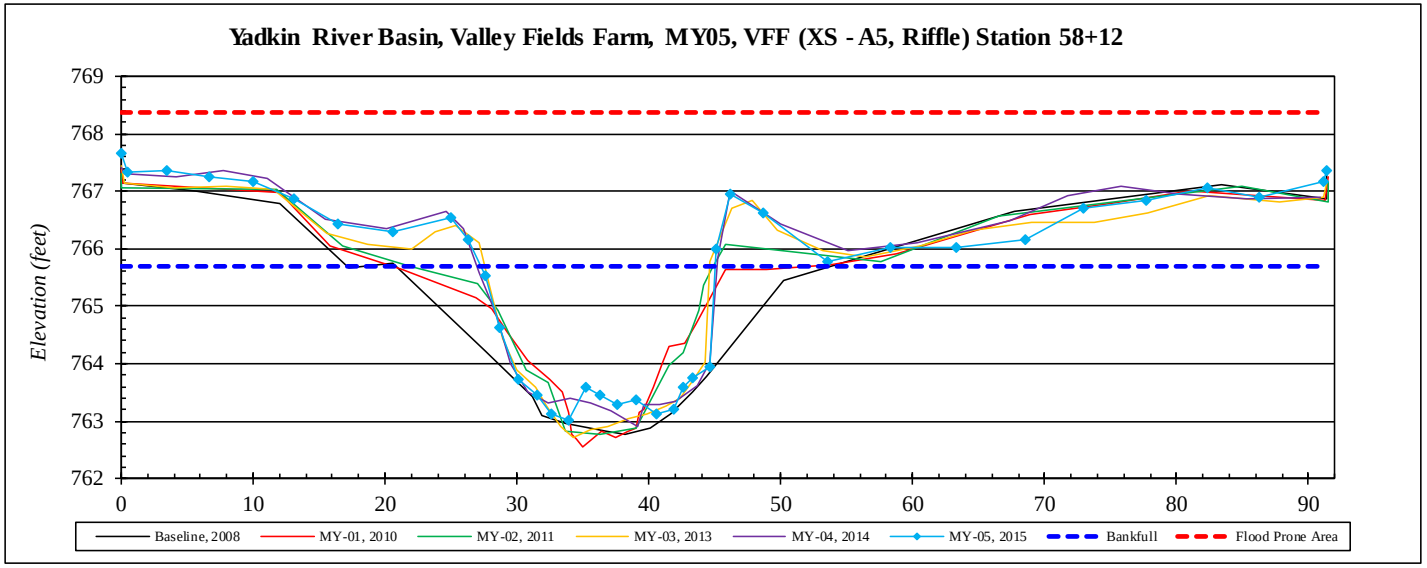


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - A5, Riffle) Station 58+12
Drainage Area (sq mi):	6.5
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	767.66
0.5	767.32
3.4	767.35
6.6	767.24
10.0	767.17
13.1	766.88
16.4	766.42
20.6	766.30
25.0	766.54
26.3	766.16
27.6	765.53
28.7	764.62
30.1	763.73
31.5	763.46
32.7	763.14
33.9	763.03
35.2	763.59
36.3	763.47
37.6	763.28
39.1	763.37
40.6	763.13
41.9	763.22
42.6	763.61
43.4	763.76
44.6	763.95
45.1	765.99
46.1	766.95
48.6	766.61
53.5	765.76
58.3	766.01
63.3	766.01
68.5	766.16
73.0	766.69
77.7	766.85

SUMMARY DATA	
Bankfull Elevation:	765.7
Bankfull Cross-Sectional Area:	33.1
Bankfull Width:	17.4
Flood Prone Area Elevation:	768.4
Flood Prone Width:	>90
Max Depth at Bankfull:	2.7
Mean Depth at Bankfull:	1.9
W / D Ratio:	9.1
Entrenchment Ratio:	5.2
Bank Height Ratio:	1.0

Stream Type	E5

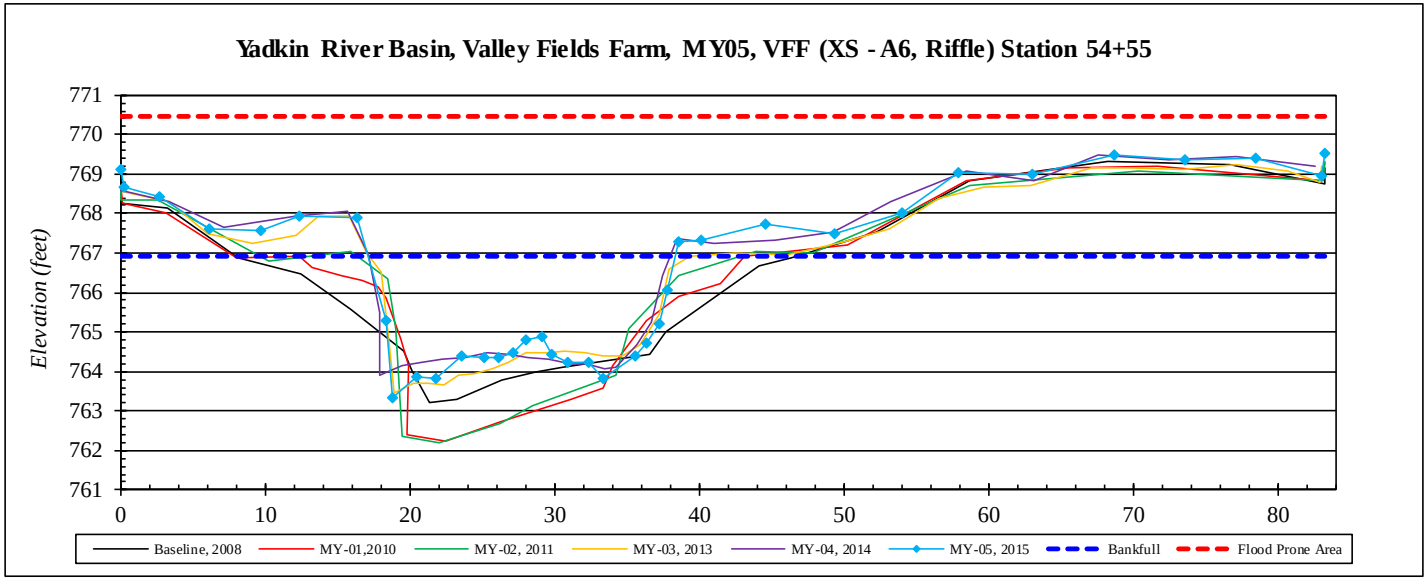


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - A6, Riffle) Station 54+55
Drainage Area (sq mi):	6.5
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	769.10
0.2	768.67
2.6	768.44
6.2	767.62
9.7	767.58
12.3	767.94
16.3	767.91
18.4	765.30
18.8	763.33
20.4	763.88
21.8	763.82
23.6	764.39
25.1	764.36
26.1	764.36
27.1	764.49
28.0	764.80
29.1	764.89
29.8	764.42
30.8	764.24
32.4	764.24
33.4	763.81
35.5	764.41
36.4	764.74
37.2	765.20
37.8	766.05
38.6	767.26
40.1	767.32
44.6	767.72
49.4	767.49
54.0	768.03
57.9	769.05
63.0	769.01
68.7	769.47
73.5	769.35

SUMMARY DATA	
Bankfull Elevation:	766.9
Bankfull Cross-Sectional Area:	51.6
Bankfull Width:	21.3
Flood Prone Area Elevation:	770.5
Flood Prone Width:	>90
Max Depth at Bankfull:	3.6
Mean Depth at Bankfull:	2.4
W / D Ratio:	8.8
Entrenchment Ratio:	4.2
Bank Height Ratio:	1.0

Stream Type	E5

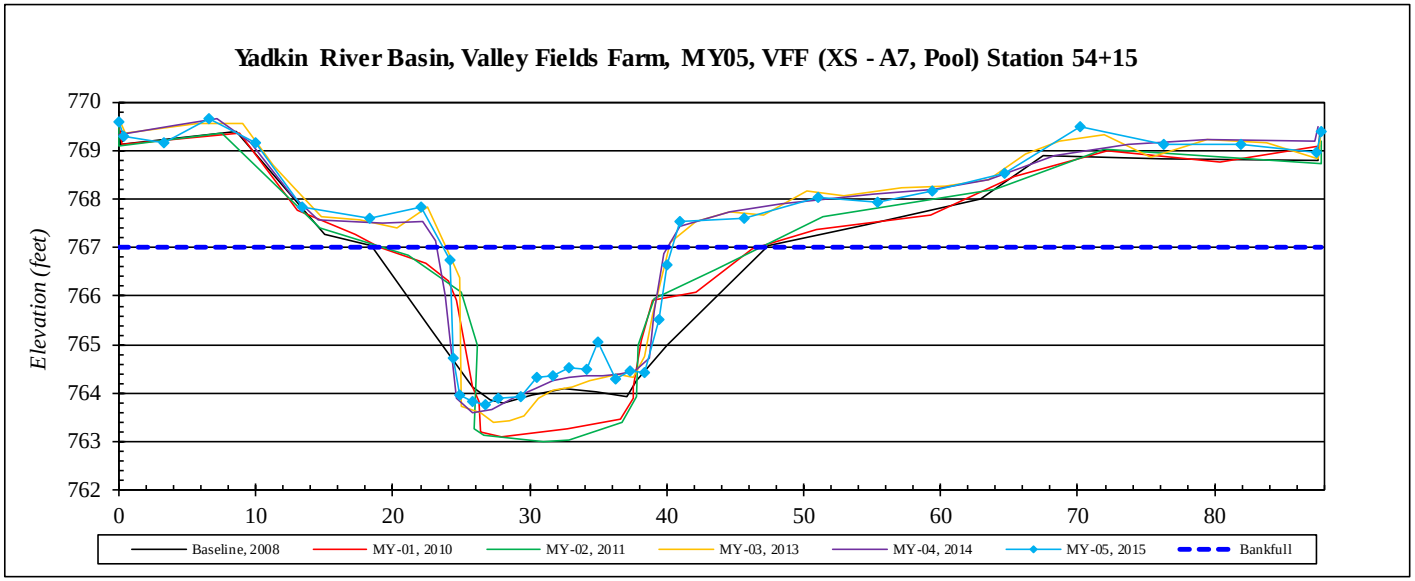


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - A7, Pool) Station 54+15
Drainage Area (sq mi):	6.5
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	769.59
0.3	769.29
3.3	769.14
6.5	769.64
10.0	769.14
13.4	767.82
18.4	767.61
22.1	767.85
24.1	766.76
24.5	764.74
24.9	763.97
25.8	763.83
26.8	763.76
27.7	763.90
29.3	763.93
30.5	764.33
31.7	764.37
32.8	764.54
34.1	764.50
35.0	765.06
36.2	764.29
37.3	764.45
38.4	764.41
39.4	765.51
40.1	766.64
40.9	767.53
45.7	767.61
51.0	768.04
55.4	767.92
59.4	768.18
64.6	768.55
70.2	769.48
76.2	769.12
81.9	769.14
87.5	768.95
87.8	769.39

SUMMARY DATA	
Bankfull Elevation:	767.0
Bankfull Cross-Sectional Area:	41.3
Bankfull Width:	16.7
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	3.2
Mean Depth at Bankfull:	2.5
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	E5

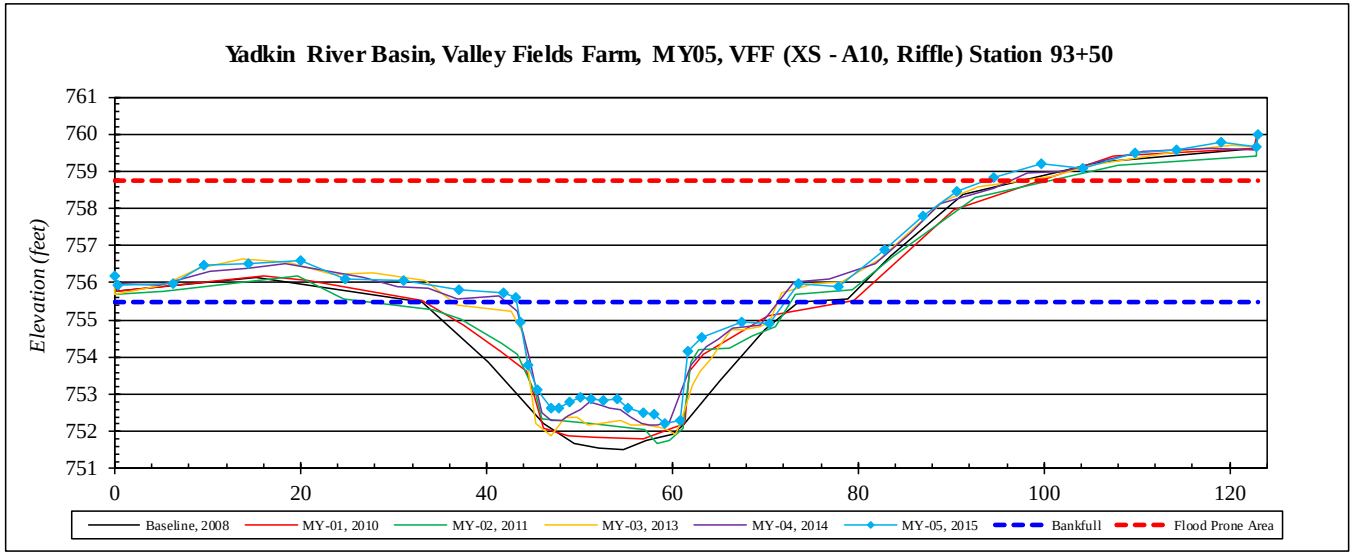


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - A10, Riffle) Station 93+50
Drainage Area (sq mi):	6.5
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	756.20
0.3	755.95
6.3	756.00
9.5	756.47
14.4	756.52
20.0	756.61
24.8	756.12
31.0	756.04
37.0	755.80
41.8	755.73
43.1	755.62
43.7	754.94
44.4	753.80
45.5	753.12
47.0	752.64
47.8	752.64
48.9	752.80
50.1	752.93
51.2	752.88
52.5	752.85
54.1	752.90
55.3	752.62
56.9	752.50
58.0	752.45
59.2	752.24
60.8	752.30
61.6	754.18
63.1	754.52
67.5	754.95
70.4	754.91
73.6	755.98
77.9	755.89
82.8	756.87
86.9	757.81
90.6	758.48
94.6	758.82
99.73	759.20
104.3	759.10
109.8	759.49
114.3	759.56

SUMMARY DATA	
Bankfull Elevation:	755.5
Bankfull Cross-Sectional Area:	55.5
Bankfull Width:	28.9
Flood Prone Area Elevation:	758.8
Flood Prone Width:	>90
Max Depth at Bankfull:	3.3
Mean Depth at Bankfull:	1.9
W / D Ratio:	15.0
Entrenchment Ratio:	3.1
Bank Height Ratio:	1.0

Stream Type	C5

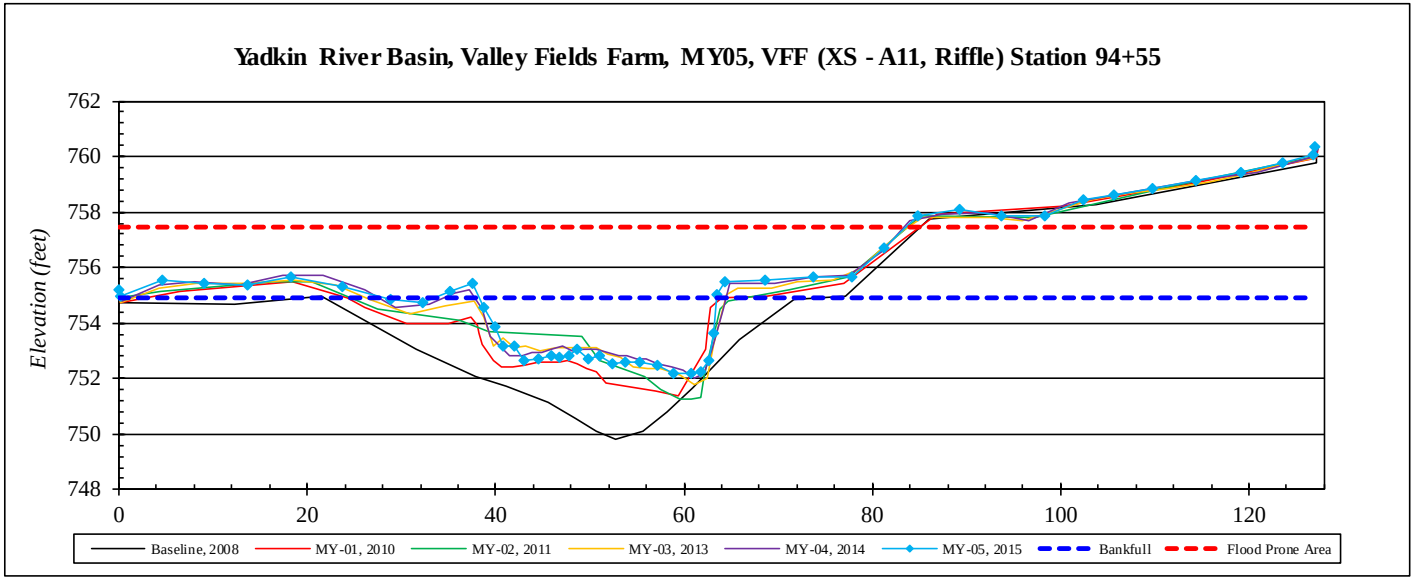


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - A11, Riffle) Station 94+55
Drainage Area (sq mi):	6.5
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	755.40
0.2	755.16
4.6	755.78
9.1	755.65
13.7	755.60
18.2	755.87
23.7	755.53
28.8	755.07
32.3	754.94
35.2	755.35
37.6	755.63
38.7	754.78
39.9	754.06
40.9	753.35
42.0	753.36
43.0	752.83
44.6	752.90
45.9	753.01
46.8	752.99
47.7	753.03
48.7	753.23
49.9	752.93
51.1	753.05
52.3	752.72
53.8	752.82
55.3	752.80
57.2	752.68
58.9	752.38
60.7	752.37
61.8	752.47
62.7	752.83
63.2	753.83
63.5	755.21
64.4	755.67
68.6	755.75

SUMMARY DATA	
Bankfull Elevation:	754.9
Bankfull Cross-Sectional Area:	47.8
Bankfull Width:	24.8
Flood Prone Area Elevation:	757.4
Flood Prone Width:	>90
Max Depth at Bankfull:	2.5
Mean Depth at Bankfull:	1.9
W / D Ratio:	12.9
Entrenchment Ratio:	3.6
Bank Height Ratio:	1.0

Stream Type	C5

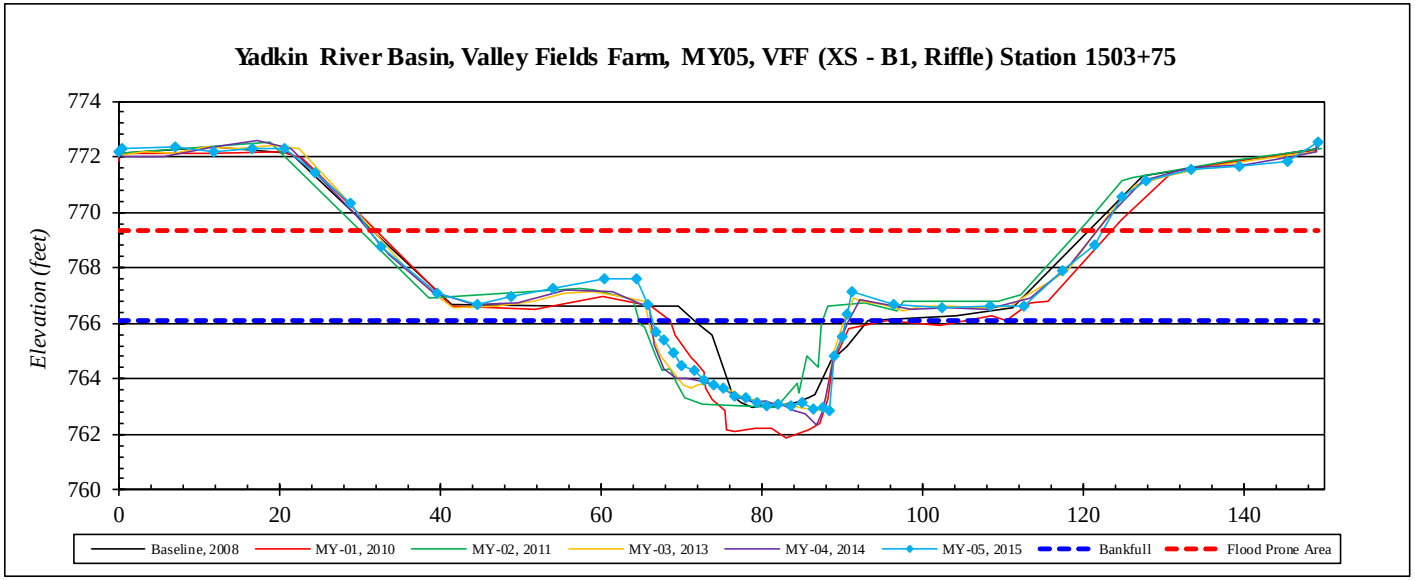


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - B1, Riffle) Station 1503+75
Drainage Area (sq mi):	2.3
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	772.20
0.4	772.28
7.1	772.37
11.8	772.21
16.6	772.27
20.5	772.27
24.4	771.45
28.7	770.34
32.7	768.77
39.6	767.07
44.6	766.70
48.8	766.97
54.0	767.25
60.4	767.63
64.5	767.62
65.9	766.69
66.8	765.67
67.8	765.41
68.9	764.95
70.1	764.46
71.6	764.32
72.8	763.98
74.0	763.80
75.2	763.65
76.6	763.40
78.0	763.30
79.4	763.18
80.6	763.02
82.1	763.11
83.6	763.02
85.1	763.18
86.5	762.91
87.7	762.99
88.4	762.88
89.0	764.82

SUMMARY DATA	
Bankfull Elevation:	766.1
Bankfull Cross-Sectional Area:	55.2
Bankfull Width:	24.1
Flood Prone Area Elevation:	769.3
Flood Prone Width:	93.5
Max Depth at Bankfull:	3.2
Mean Depth at Bankfull:	2.3
W / D Ratio:	10.5
Entrenchment Ratio:	3.9
Bank Height Ratio:	1.0

Stream Type	E5

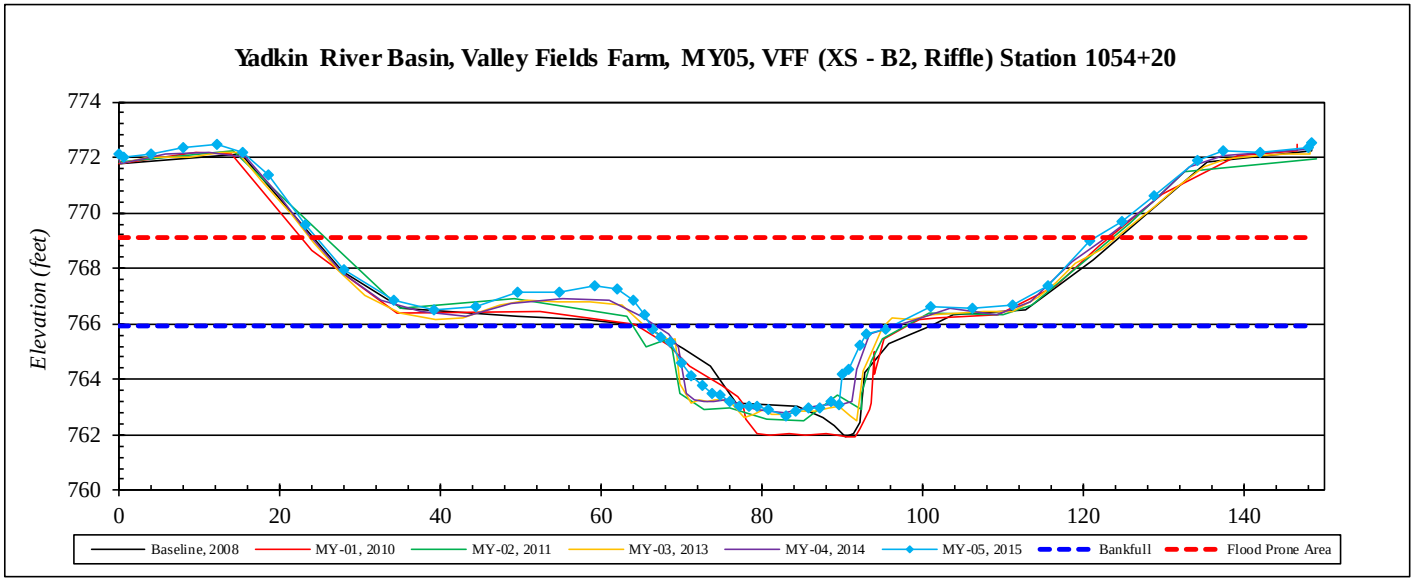


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - B2, Riffle) Station 1054+20
Drainage Area (sq mi):	2.3
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	772.15
0.5	772.02
4.1	772.13
8.0	772.35
12.2	772.48
15.4	772.18
18.6	771.37
23.2	769.55
28.0	767.96
34.1	766.87
39.3	766.51
44.4	766.63
49.6	767.12
54.9	767.15
59.2	767.37
62.0	767.26
64.0	766.86
65.3	766.31
66.5	765.81
67.5	765.50
68.7	765.33
70.0	764.57
71.3	764.13
72.5	763.78
73.8	763.50
74.8	763.47
76.0	763.20
77.2	763.05
78.5	763.01
79.5	763.06
80.9	762.94
83.0	762.69
84.3	762.86
85.8	762.98
87.2	762.97
88.6	763.20
89.6	763.09

SUMMARY DATA	
Bankfull Elevation:	765.9
Bankfull Cross-Sectional Area:	59.3
Bankfull Width:	29.7
Flood Prone Area Elevation:	769.1
Flood Prone Width:	94.6
Max Depth at Bankfull:	3.2
Mean Depth at Bankfull:	2.0
W / D Ratio:	14.9
Entrenchment Ratio:	3.2
Bank Height Ratio:	1.0

Stream Type	C5

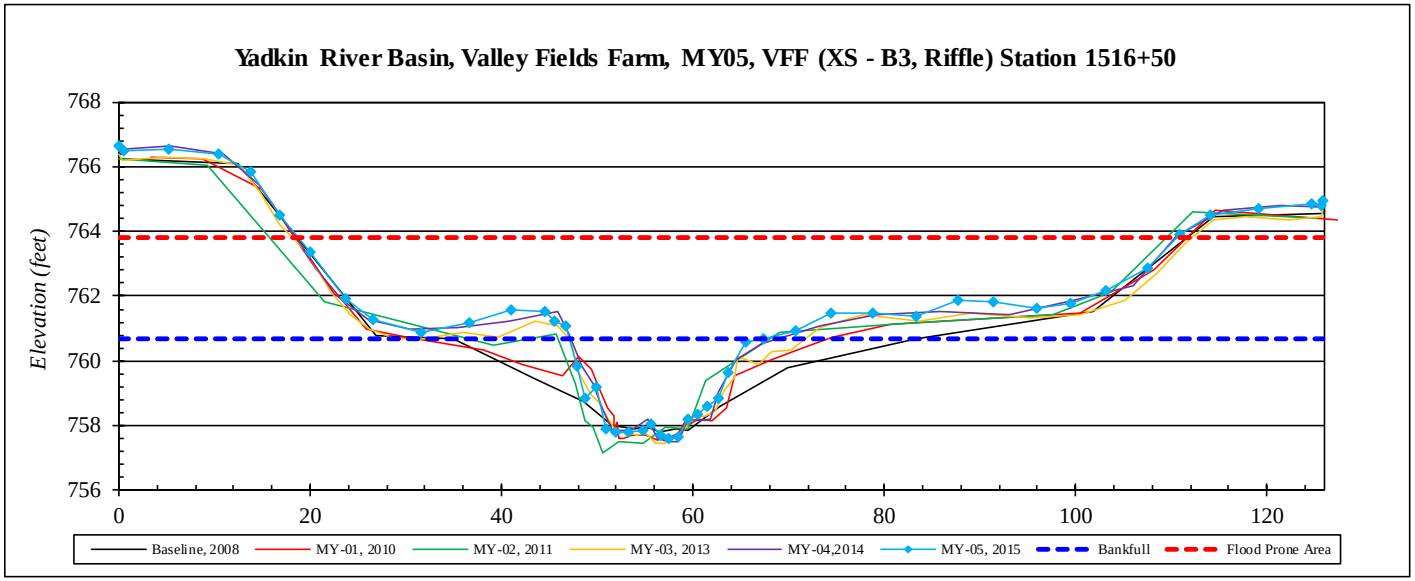


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - B3, Riffle) Station 1516+50
Drainage Area (sq mi):	2.3
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	766.64
0.5	766.51
5.2	766.52
10.3	766.39
13.8	765.84
16.8	764.49
19.9	763.36
23.6	761.90
26.5	761.28
31.6	760.88
36.5	761.20
41.0	761.60
44.5	761.51
45.5	761.24
46.7	761.07
48.0	759.85
48.8	758.87
50.0	759.20
50.9	757.89
52.0	757.81
53.3	757.83
54.7	757.87
55.6	758.03
56.5	757.71
57.4	757.61
58.5	757.66
59.4	758.23
60.5	758.34
61.4	758.59
62.7	758.83
63.8	759.63
65.6	760.57
67.4	760.68
70.8	760.95
74.4	761.47
78.7	761.50
83.4	761.40

SUMMARY DATA	
Bankfull Elevation:	760.7
Bankfull Cross-Sectional Area:	40.0
Bankfull Width:	20.6
Flood Prone Area Elevation:	763.8
Flood Prone Width:	92.6
Max Depth at Bankfull:	3.1
Mean Depth at Bankfull:	1.9
W / D Ratio:	10.6
Entrenchment Ratio:	4.5
Bank Height Ratio:	1.0

Stream Type	E5

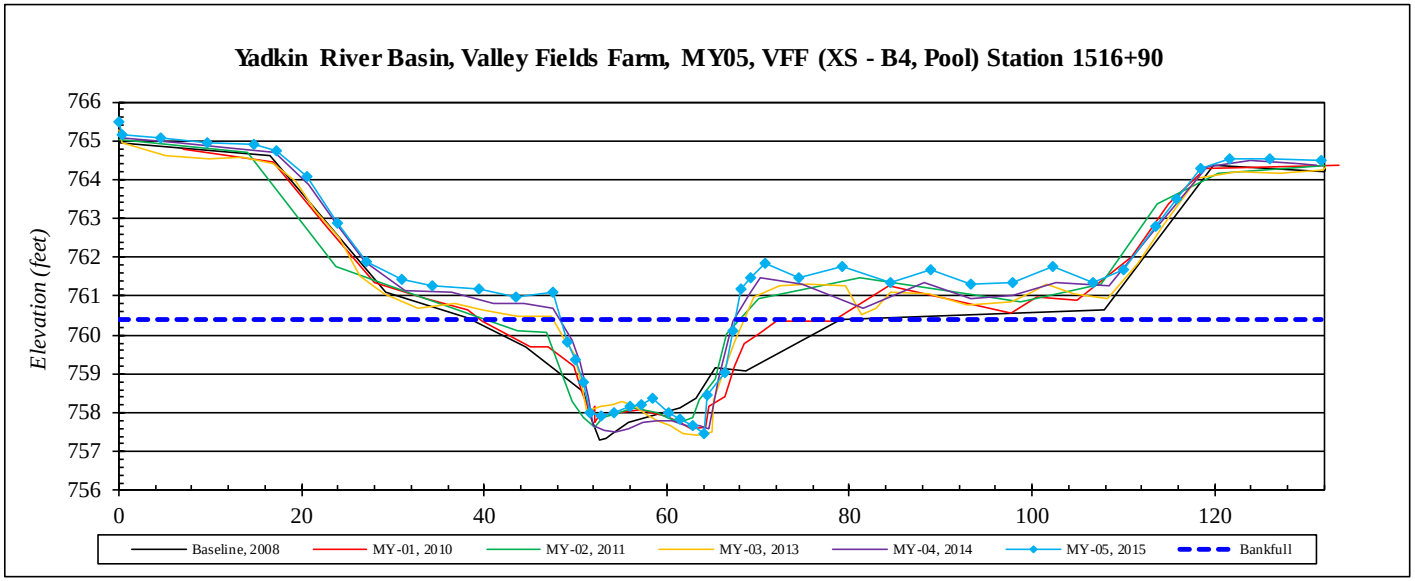


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - B4, Pool) Station 1516+90
Drainage Area (sq mi):	2.3
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	765.49
0.4	765.14
4.5	765.09
9.7	764.93
14.8	764.90
17.3	764.72
20.5	764.09
23.9	762.86
27.1	761.89
30.9	761.43
34.4	761.27
39.4	761.17
43.4	760.99
47.4	761.10
49.0	759.83
50.1	759.35
50.9	758.77
51.5	757.99
52.8	757.90
54.2	758.00
56.0	758.18
57.3	758.21
58.5	758.35
60.1	758.00
61.5	757.83
62.9	757.69
64.1	757.47
64.5	758.45
66.3	759.02
67.2	760.10
68.1	761.19
69.2	761.47
70.8	761.84
74.4	761.48
79.2	761.75
84.5	761.36
89.0	761.66

SUMMARY DATA	
Bankfull Elevation:	760.4
Bankfull Cross-Sectional Area:	38.4
Bankfull Width:	19.1
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	2.9
Mean Depth at Bankfull:	2.0
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	E5

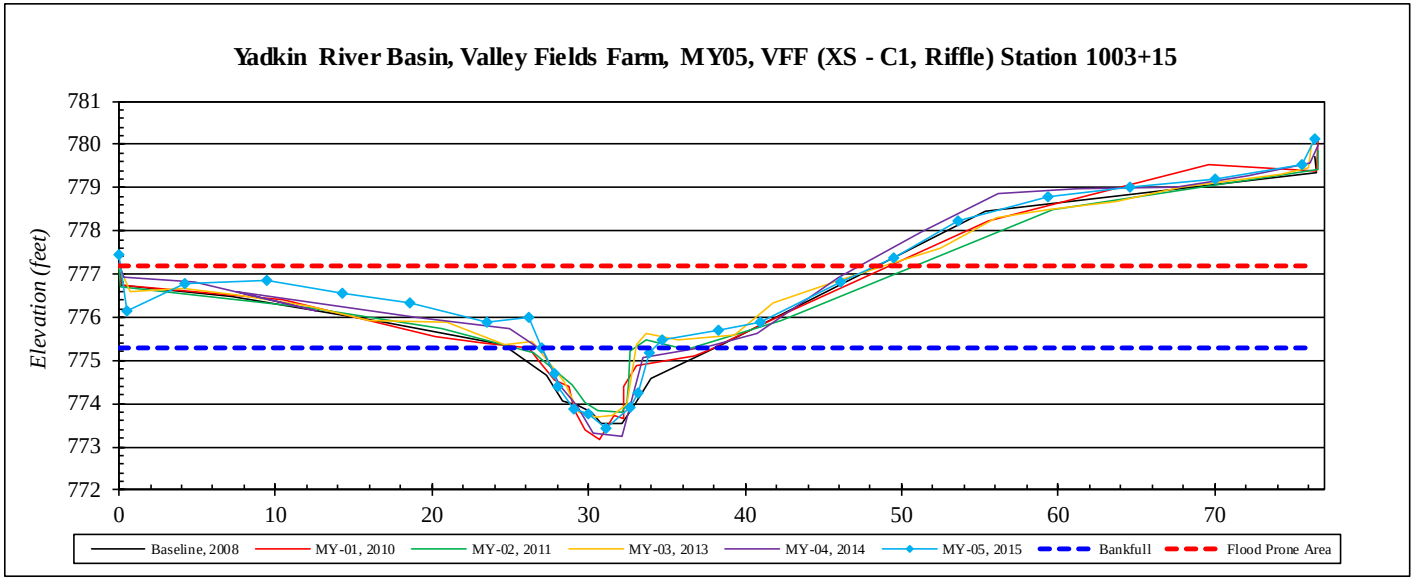


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - C1, Riffle) Station 1003+15
Drainage Area (sq mi):	0.2
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	777.44
0.5	776.14
4.2	776.79
9.5	776.86
14.2	776.57
18.6	776.35
23.5	775.88
26.1	775.98
27.0	775.30
27.8	774.70
28.0	774.41
29.1	773.86
30.0	773.75
31.2	773.42
32.6	773.91
33.2	774.24
33.9	775.18
34.7	775.48
38.3	775.68
40.9	775.89
46.1	776.80
49.5	777.39
53.6	778.23
59.4	778.78
64.6	779.00
70.0	779.20
75.6	779.52
76.4	780.12

SUMMARY DATA	
Bankfull Elevation:	775.3
Bankfull Cross-Sectional Area:	8.5
Bankfull Width:	7.2
Flood Prone Area Elevation:	777.2
Flood Prone Width:	48.0
Max Depth at Bankfull:	1.9
Mean Depth at Bankfull:	1.2
W / D Ratio:	6.1
Entrenchment Ratio:	6.7
Bank Height Ratio:	1.0

Stream Type	E5

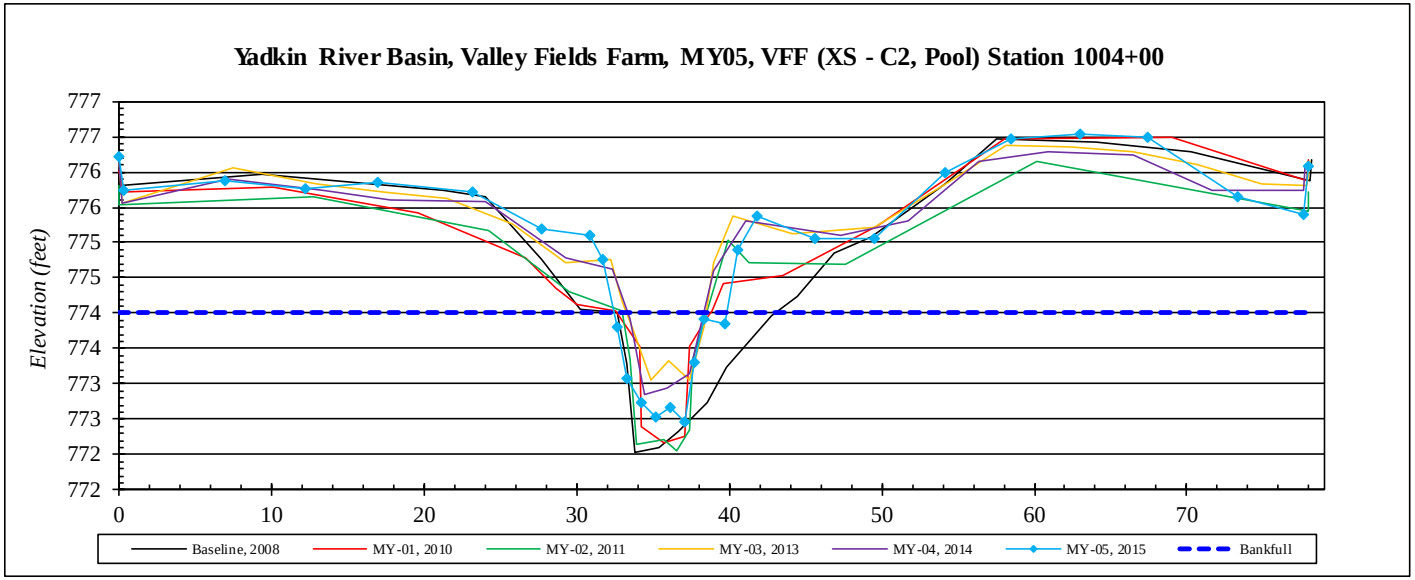


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - C2, Pool) Station 1004+00
Drainage Area (sq mi):	0.2
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	776.22
0.4	775.73
6.9	775.88
12.2	775.76
16.9	775.85
23.2	775.72
27.7	775.20
30.9	775.10
31.7	774.77
32.7	773.80
33.3	773.08
34.2	772.73
35.2	772.53
36.2	772.66
37.1	772.47
37.7	773.31
38.4	773.91
39.8	773.86
40.6	774.91
41.8	775.38
45.7	775.05
49.5	775.05
54.1	775.99
58.5	776.47
63.0	776.54
67.4	776.48
73.3	775.65
77.6	775.39
78.0	776.08

SUMMARY DATA	
Bankfull Elevation:	774.0
Bankfull Cross-Sectional Area:	6.5
Bankfull Width:	7.4
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	1.5
Mean Depth at Bankfull:	0.9
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	E5

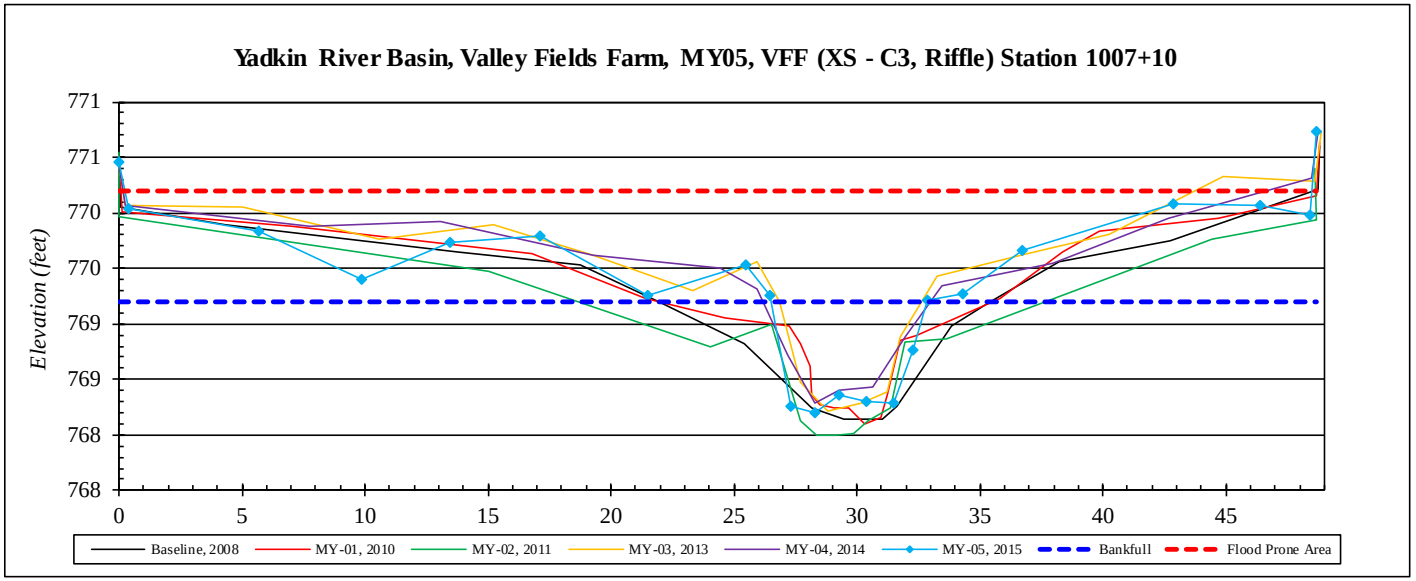


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - C3, Riffle) Station 1007+10
Drainage Area (sq mi):	0.2
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

Station	Elevation
0.0	770.46
0.4	770.04
5.7	769.84
9.8	769.41
13.4	769.74
17.1	769.80
21.5	769.26
25.5	769.53
26.5	769.25
27.3	768.26
28.3	768.20
29.3	768.36
30.4	768.30
31.5	768.29
32.3	768.77
32.8	769.21
34.3	769.27
36.7	769.66
42.8	770.09
46.4	770.06
48.4	769.98
48.7	770.73

SUMMARY DATA	
Bankfull Elevation:	769.2
Bankfull Cross-Sectional Area:	4.9
Bankfull Width:	6.3
Flood Prone Area Elevation:	770.2
Flood Prone Width:	37.8
Max Depth at Bankfull:	1.0
Mean Depth at Bankfull:	0.8
W / D Ratio:	8.1
Entrenchment Ratio:	6.0
Bank Height Ratio:	1.0

Stream Type	E5

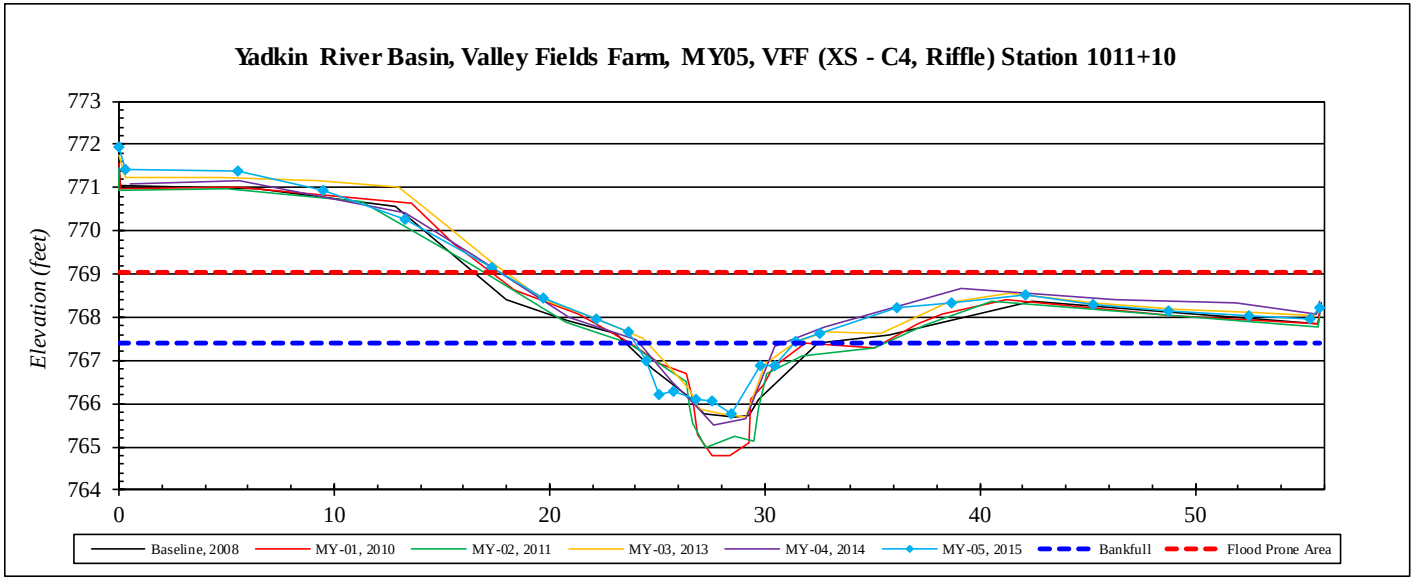


River Basin:	Yadkin
Watershed:	Valley Fields Farm, MY05
XS ID	VFF (XS - C4, Riffle) Station 1011+10
Drainage Area (sq mi):	0.2
Date:	12/8/2015
Field Crew:	T. Seelinger, M. Koss

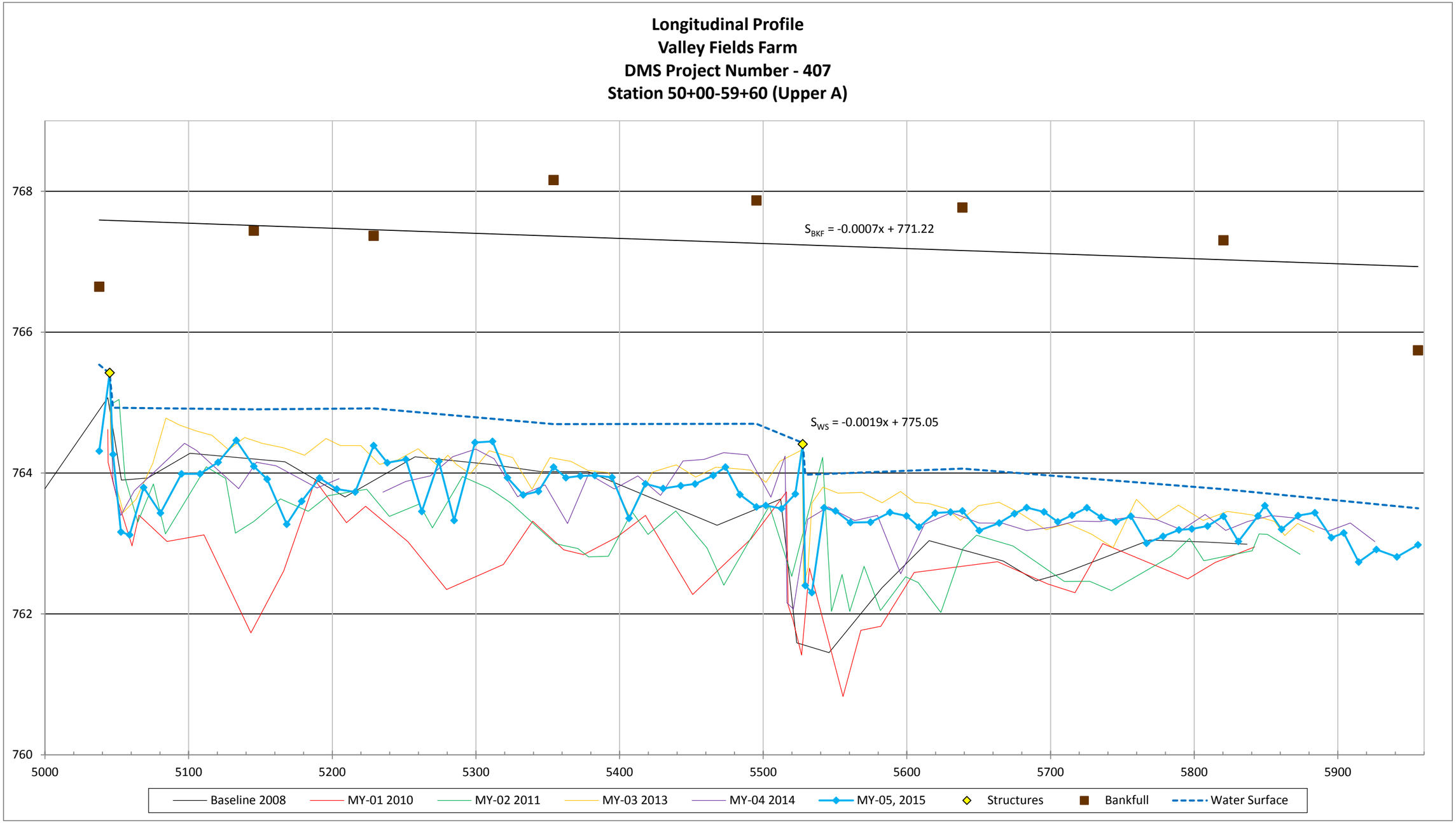
Station	Elevation
0.0	771.94
0.3	771.41
5.5	771.38
9.4	770.93
13.3	770.26
17.4	769.16
19.7	768.44
22.2	767.95
23.7	767.68
24.5	767.01
25.1	766.20
25.8	766.30
26.8	766.09
27.6	766.06
28.5	765.76
29.8	766.89
30.4	766.87
31.4	767.44
32.5	767.64
36.1	768.21
38.7	768.35
42.1	768.50
45.2	768.28
48.8	768.15
52.5	768.04
55.4	767.97
55.8	768.23

SUMMARY DATA	
Bankfull Elevation:	767.4
Bankfull Cross-Sectional Area:	7.0
Bankfull Width:	7.4
Flood Prone Area Elevation:	769.0
Flood Prone Width:	38.9
Max Depth at Bankfull:	1.6
Mean Depth at Bankfull:	0.9
W / D Ratio:	7.8
Entrenchment Ratio:	5.3
Bank Height Ratio:	1.0

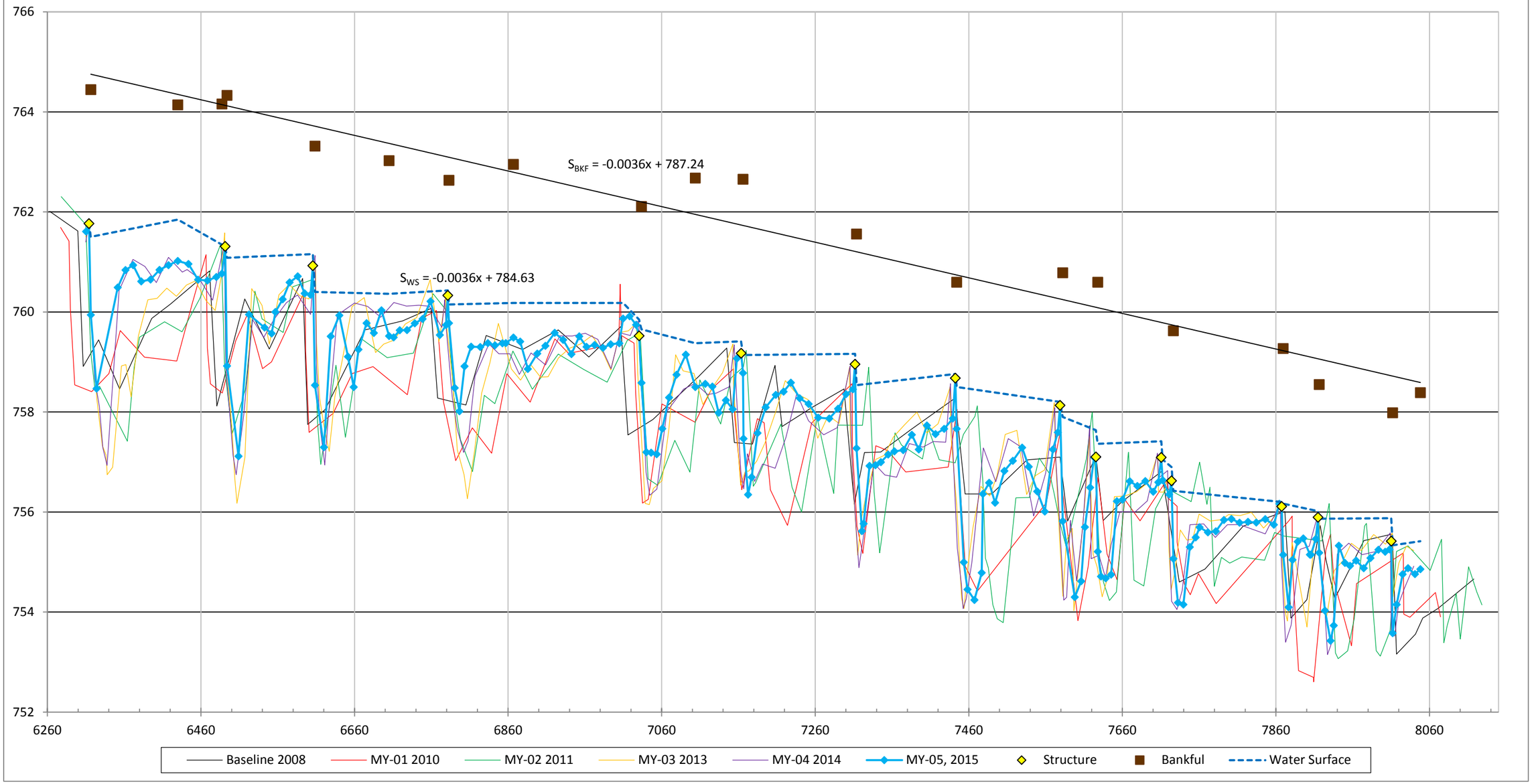
Stream Type	E5



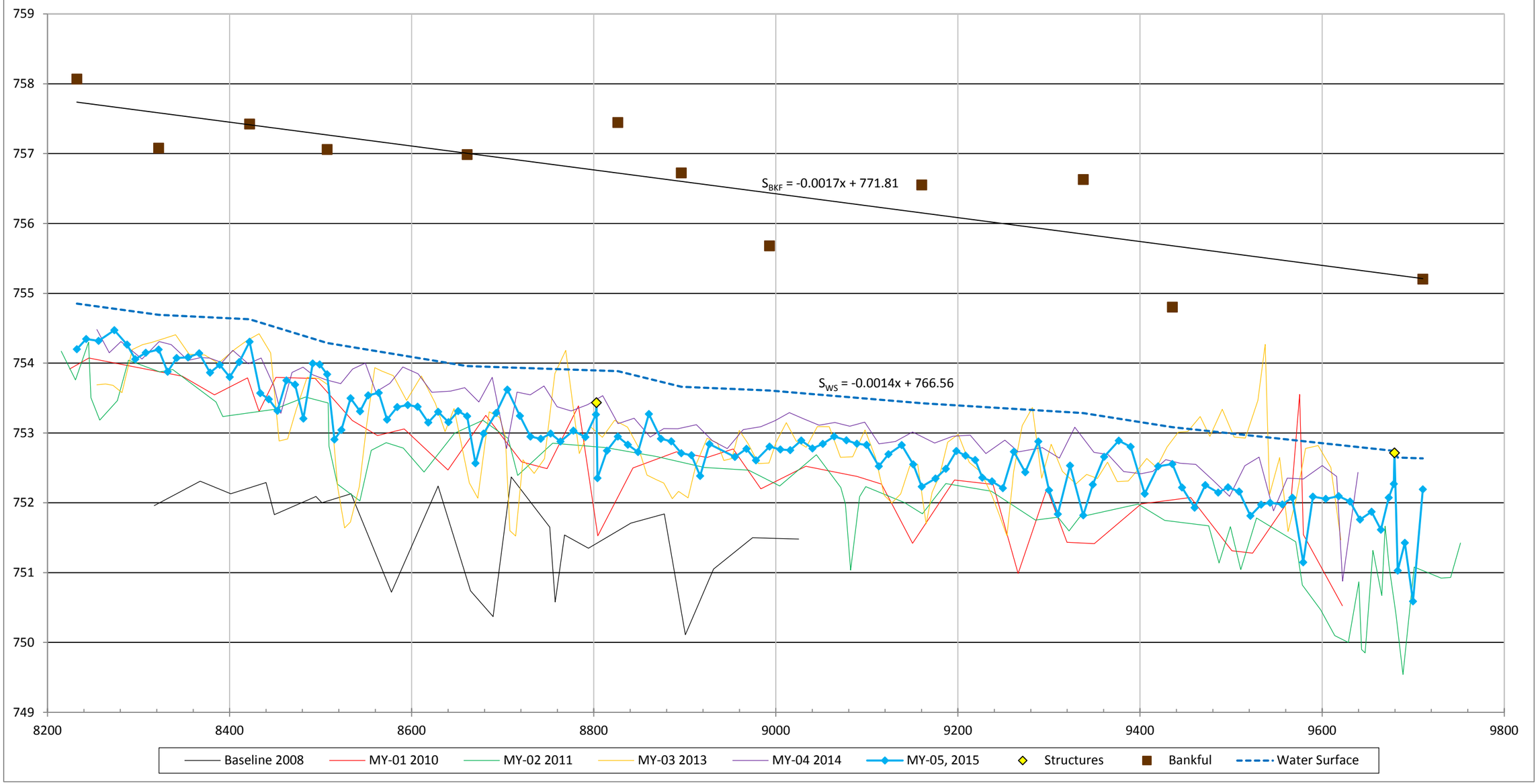
LONGITUDINAL PROFILE PLOTS



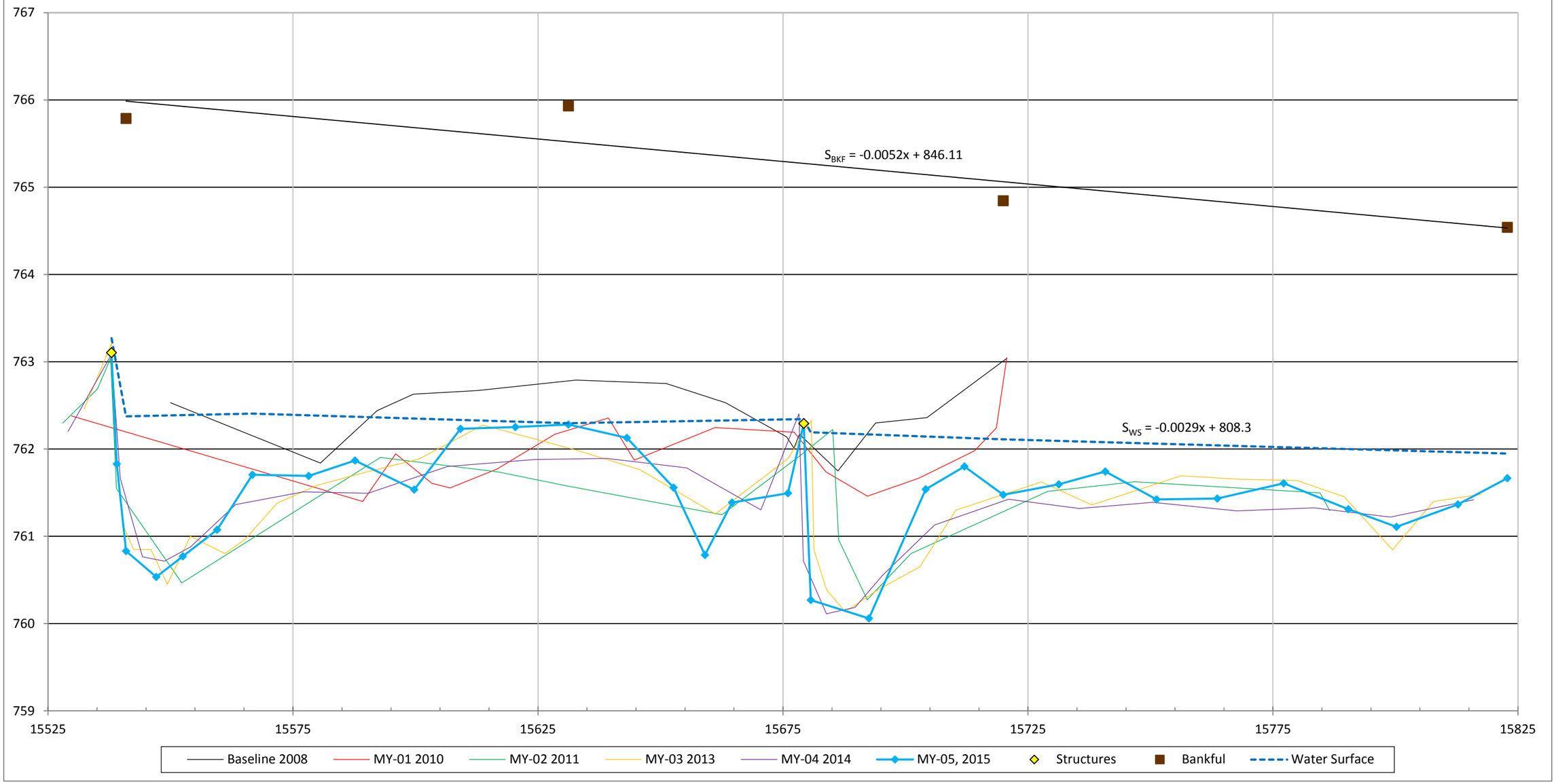
Longitudinal Profile
Valley Fields Farm
DMS Project Number - 407
Station 62+60-81+50 (Upper A2)



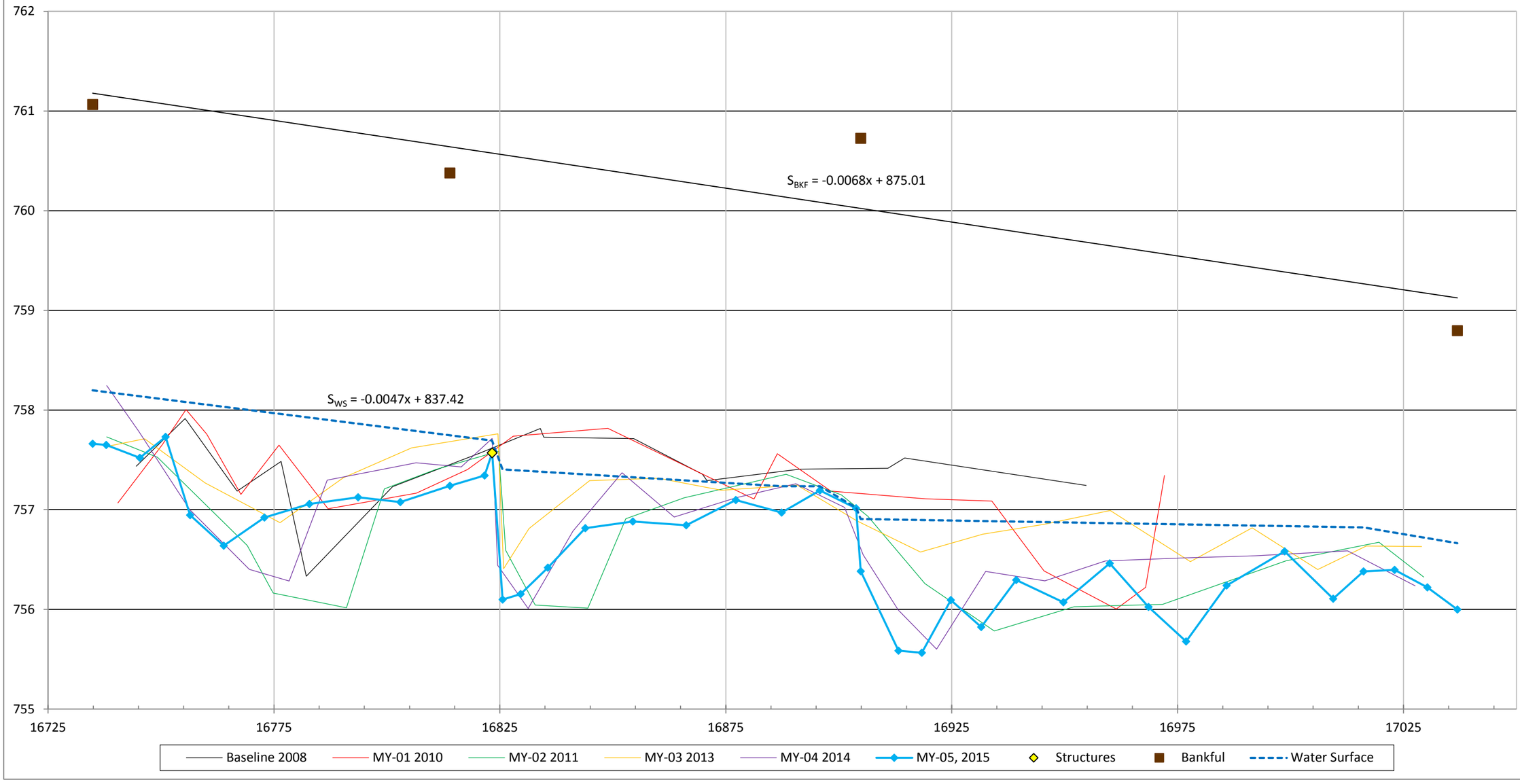
Longitudinal Profile
Valley Fields Farm
DMS Project Number - 407
Station 82+00-98+00 (Lower A)



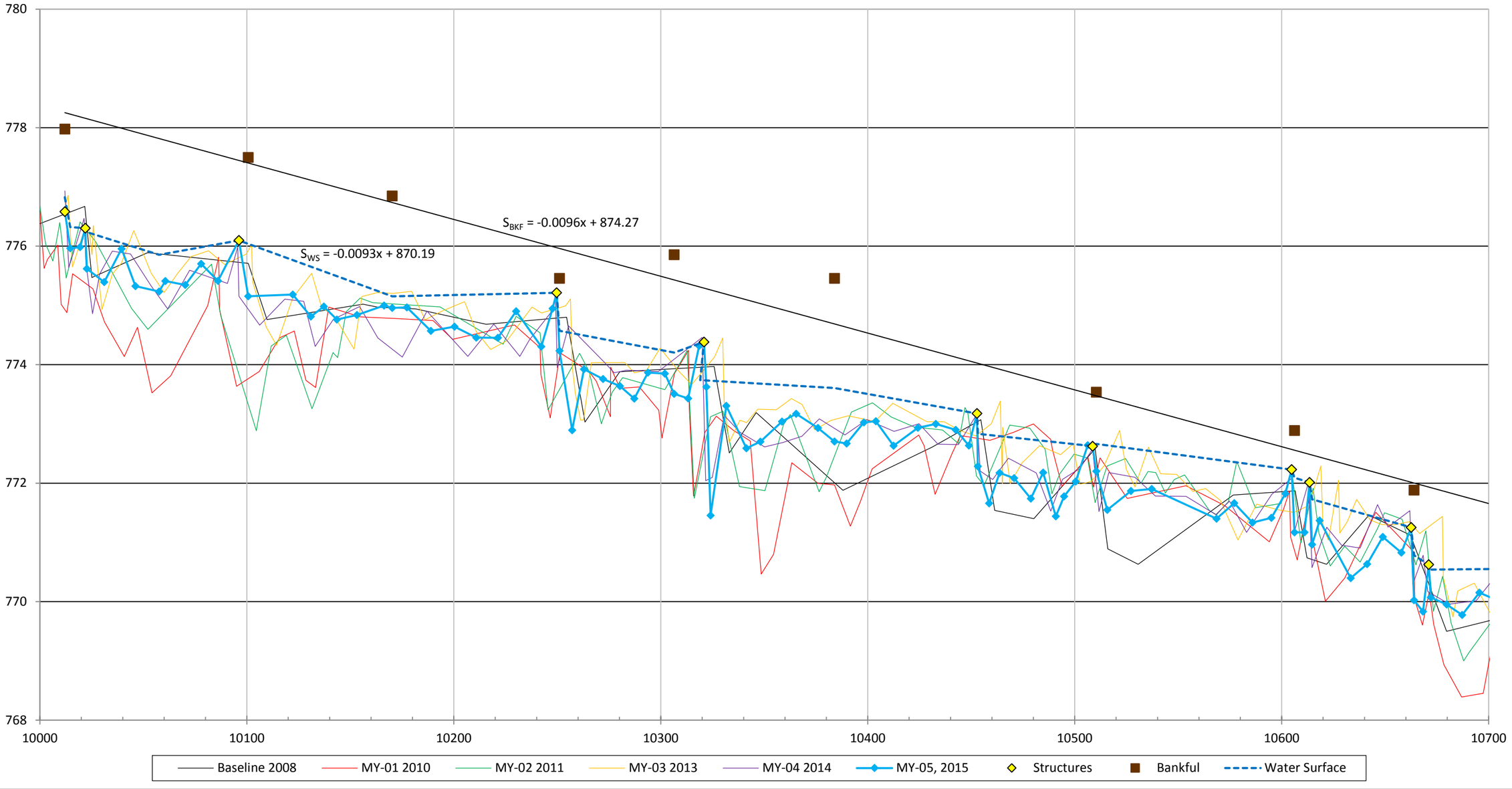
Longitudinal Profile
Valley Fields Farm
DMS Project Number - 407
Station 155+25 - 158+25 (Upper B)



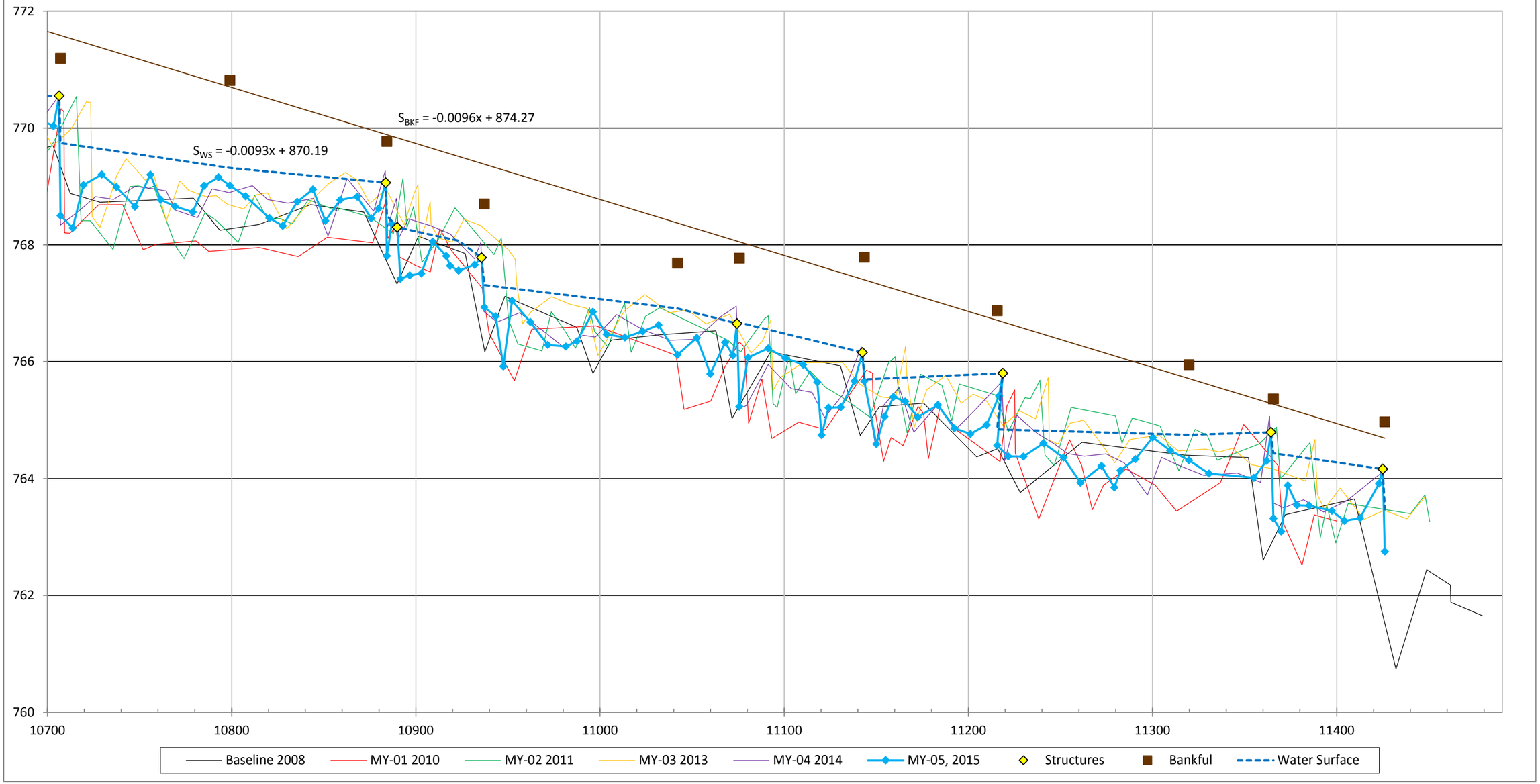
Longitudinal Profile
Valley Fields Farm
DMS Project Number - 407
Station 167+25 - 170+50 (Lower B)



Longitudinal Profile
Valley Fields Farm
DMS Project Number - 407
Station 100+00 - 107+00 (Reach C)



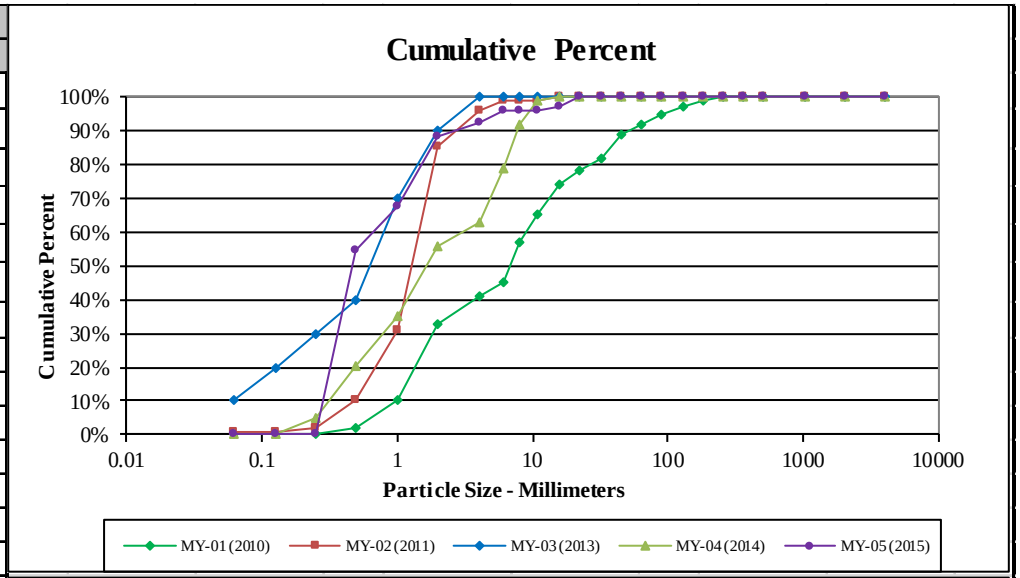
Longitudinal Profile
Valley Fields Farm
DMS Project Number - 407
Station 107+00 - 114+90 (Reach C)

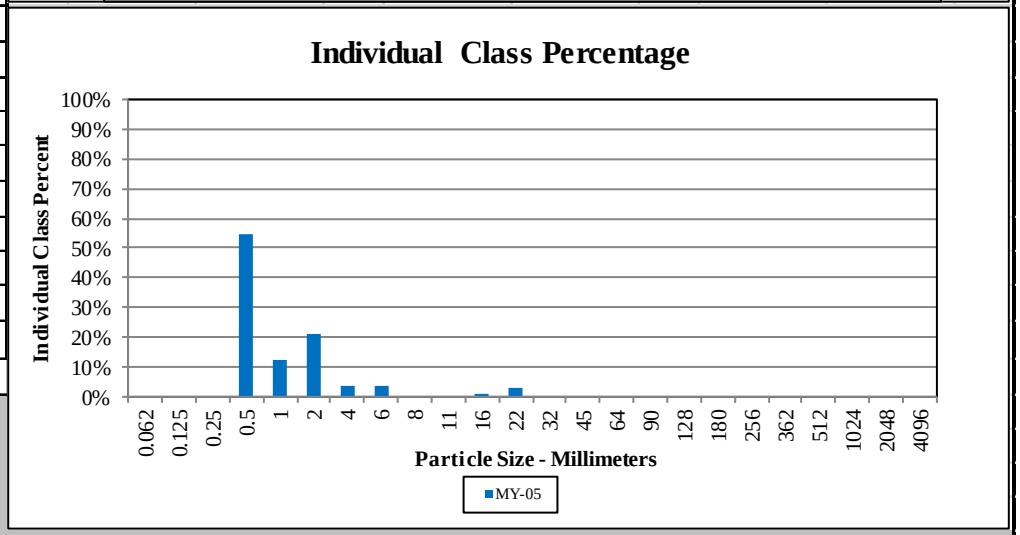


PEBBLE COUNT PLOTS

Cross-Section A1 Riffle - VFF MY-05					
Particle	Millimeter	Material	Count	Item %	Cum %
Silt/Clay	< 0.062	S/C		0%	0%
Very Fine	.062 - .125	S		0%	0%
Fine	.125 - .25	A		0%	0%
Medium	.25 - .50	N	57	55%	55%
Coarse	.50 - 1	D	13	13%	67%
Very Coarse	1 - 2	S	22	21%	88%
Very Fine	2 - 4		4	4%	92%
Fine	4 - 5.7	G	4	4%	96%
Fine	5.7 - 8	R		0%	96%
Medium	8 - 11.3	A		0%	96%
Medium	11.3 - 16	V	1	1%	97%
Coarse	16 - 22.6	E	3	3%	100%
Coarse	22.6 - 32	L		0%	100%
Very Coarse	32 - 45	S		0%	100%
Very Coarse	45 - 64			0%	100%
Small	64 - 90	C		0%	100%
Small	90 - 128	O		0%	100%
Large	128 - 180	B		0%	100%
Large	180 - 256	L		0%	100%
Small	256 - 362	B		0%	100%
Small	362 - 512	L		0%	100%
Medium	512 - 1024	D		0%	100%
Lrg- Very Lrg	1024 - 2048	R		0%	100%
Bedrock	>2048	BDRK		0%	100%
		Total	104	100%	100%

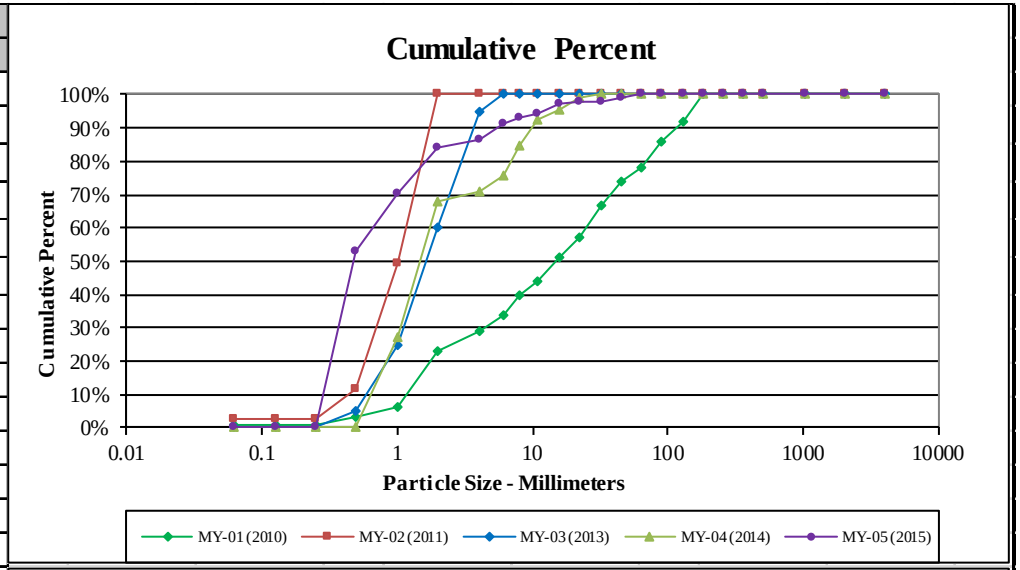
Size (mm)		Type	
D50	0.47	silt/clay	0%
D84	1.7	sand	88%
D95	5.3	gravel	12%
		cobble	0%

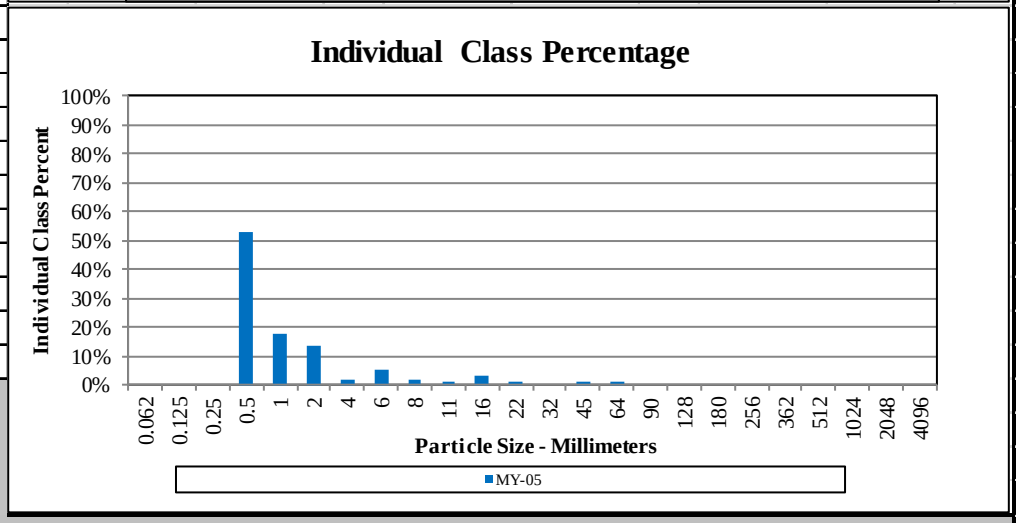




Cross-Section A2 Pool - VFF MY-05					
Particle	Millimeter	Material	Count	Item %	Cum %
Silt/Clay	< 0.062	S/C		0%	0%
Very Fine	.062 - .125	S		0%	0%
Fine	.125 - .25	A		0%	0%
Medium	.25 - .50	N	54	53%	53%
Coarse	.50 - 1	D	18	18%	71%
Very Coarse	1 - 2	S	14	14%	84%
Very Fine	2 - 4		2	2%	86%
Fine	4 - 5.7	G	5	5%	91%
Fine	5.7 - 8	R	2	2%	93%
Medium	8 - 11.3	A	1	1%	94%
Medium	11.3 - 16	V	3	3%	97%
Coarse	16 - 22.6	E	1	1%	98%
Coarse	22.6 - 32	L		0%	98%
Very Coarse	32 - 45	S	1	1%	99%
Very Coarse	45 - 64		1	1%	100%
Small	64 - 90	C		0%	100%
Small	90 - 128	O		0%	100%
Large	128 - 180	B		0%	100%
Large	180 - 256	L		0%	100%
Small	256 - 362	B		0%	100%
Small	362 - 512	L		0%	100%
Medium	512 - 1024	D		0%	100%
Lrg- Very Lrg	1024 - 2048	R		0%	100%
Bedrock	>2048	BDRK		0%	100%
		Total	102	100%	100%

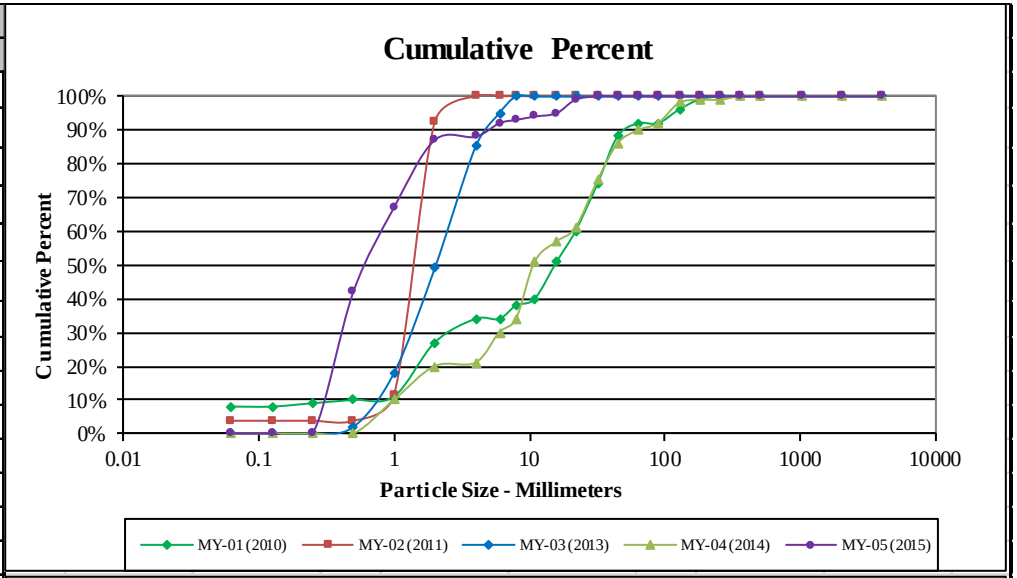
Size (mm)		Type	
D50	0.48	silt/clay	0%
D84	2	sand	84%
D95	12	gravel	16%
		cobble	0%

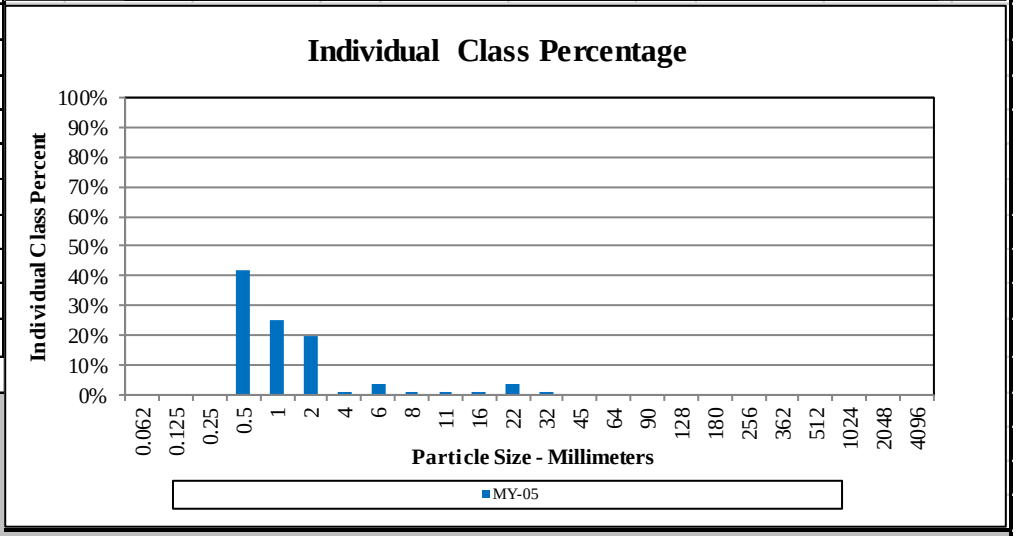




Cross-Section A3 Riffle - VFF MY-05					
Particle	Millimeter	Material	Count	Item %	Cum %
Silt/Clay	< 0.062	S/C		0%	0%
Very Fine	.062 - .125	S		0%	0%
Fine	.125 - .25	A		0%	0%
Medium	.25 - .50	N	42	42%	42%
Coarse	.50 - 1	D	25	25%	67%
Very Coarse	1 - 2	S	20	20%	87%
Very Fine	2 - 4		1	1%	88%
Fine	4 - 5.7	G	4	4%	92%
Fine	5.7 - 8	R	1	1%	93%
Medium	8 - 11.3	A	1	1%	94%
Medium	11.3 - 16	V	1	1%	95%
Coarse	16 - 22.6	E	4	4%	99%
Coarse	22.6 - 32	L	1	1%	100%
Very Coarse	32 - 45	S		0%	100%
Very Coarse	45 - 64			0%	100%
Small	64 - 90	C		0%	100%
Small	90 - 128	O		0%	100%
Large	128 - 180	B		0%	100%
Large	180 - 256	L		0%	100%
Small	256 - 362	B		0%	100%
Small	362 - 512	L		0%	100%
Medium	512 - 1024	D		0%	100%
Lrg- Very Lrg	1024 - 2048	R		0%	100%
Bedrock	>2048	BDRK		0%	100%
		Total	100	100%	100%

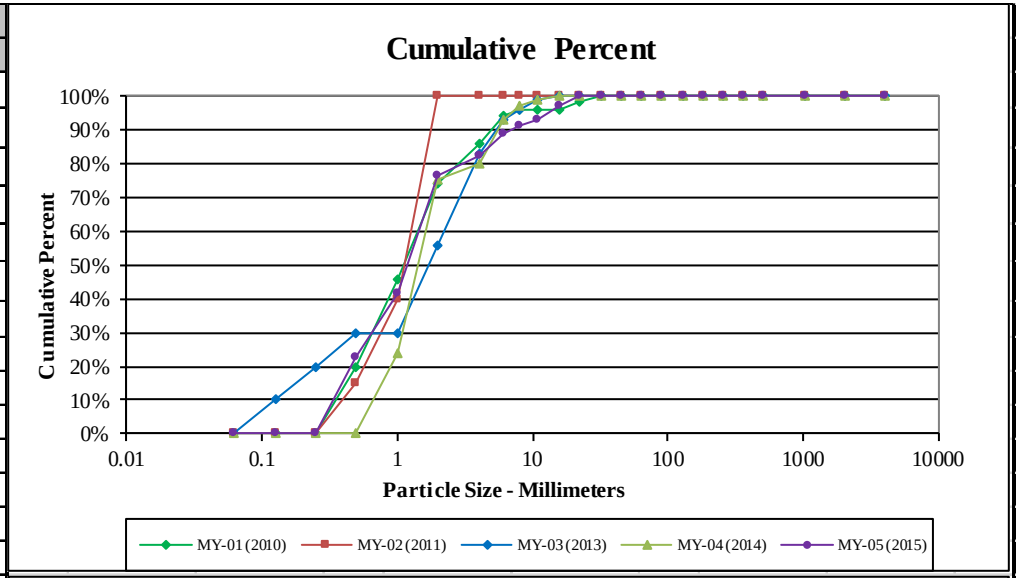
Size (mm)		Type	
D50	0.62	silt/clay	0%
D84	1.8	sand	87%
D95	16	gravel	13%
		cobble	0%

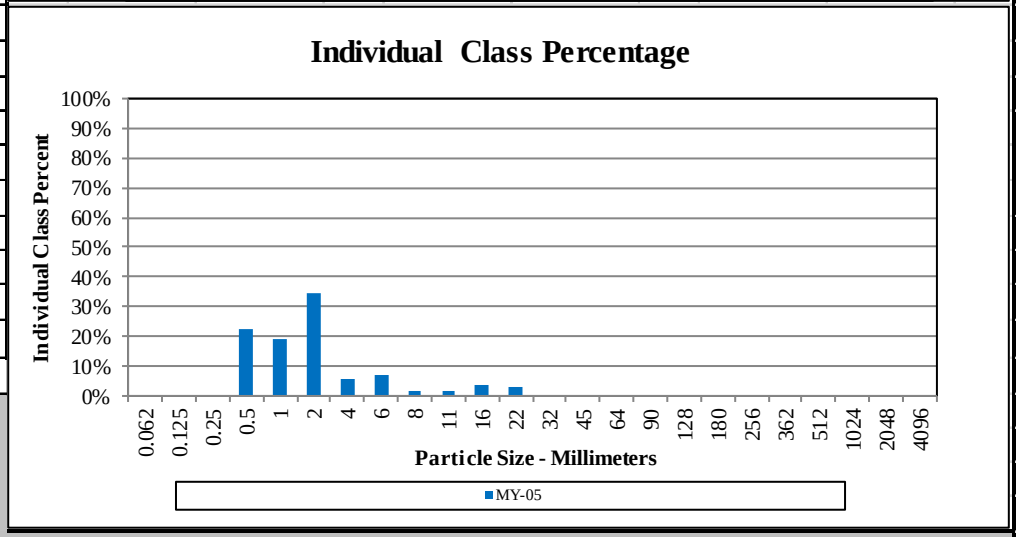




Cross-Section A10 Riffle - VFF MY-05					
Particle	Millimeter	Material	Count	Item %	Cum %
Silt/Clay	< 0.062	S/C		0%	0%
Very Fine	.062 - .125	S		0%	0%
Fine	.125 - .25	A		0%	0%
Medium	.25 - .50	N	23	23%	23%
Coarse	.50 - 1	D	19	19%	42%
Very Coarse	1 - 2	S	35	35%	76%
Very Fine	2 - 4		6	6%	82%
Fine	4 - 5.7	G	7	7%	89%
Fine	5.7 - 8	R	2	2%	91%
Medium	8 - 11.3	A	2	2%	93%
Medium	11.3 - 16	V	4	4%	97%
Coarse	16 - 22.6	E	3	3%	100%
Coarse	22.6 - 32	L		0%	100%
Very Coarse	32 - 45	S		0%	100%
Very Coarse	45 - 64			0%	100%
Small	64 - 90	C		0%	100%
Small	90 - 128	O		0%	100%
Large	128 - 180	B		0%	100%
Large	180 - 256	L		0%	100%
Small	256 - 362	B		0%	100%
Small	362 - 512	L		0%	100%
Medium	512 - 1024	D		0%	100%
Lrg- Very Lrg	1024 - 2048	R		0%	100%
Bedrock	>2048	BDRK		0%	100%
		Total	101	100%	100%

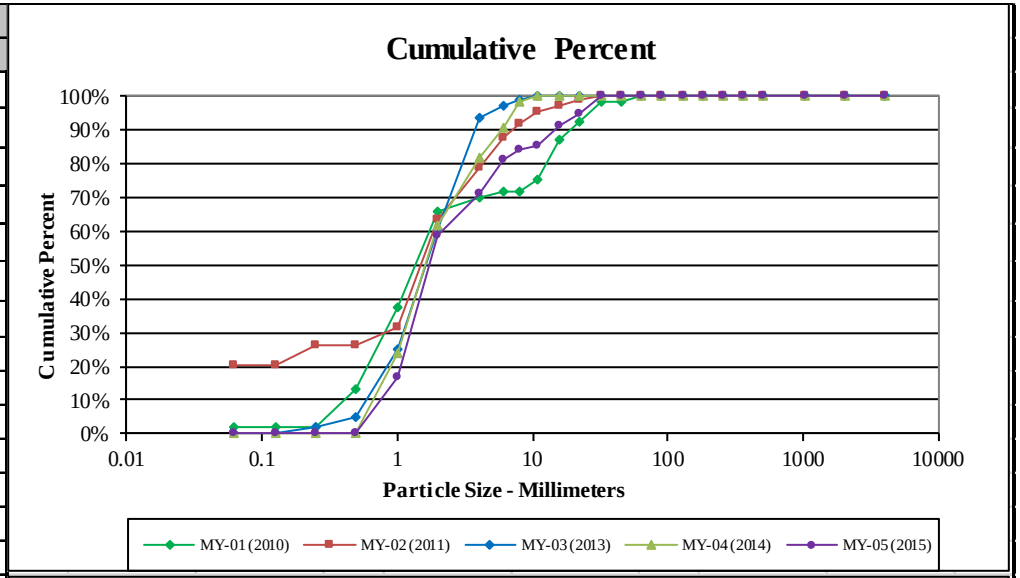
Size (mm)		Type	
D50	1.2	silt/clay	0%
D84	4.4	sand	76%
D95	13	gravel	24%
		cobble	0%

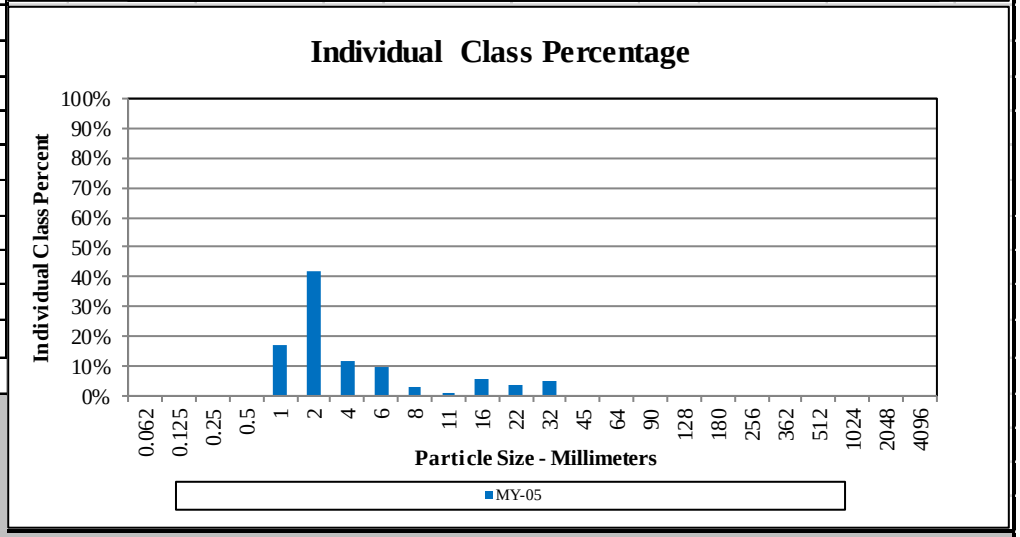




Cross-Section B1 Riffle - VFF MY-05					
Particle	Millimeter	Material	Count	Item %	Cum %
Silt/Clay	< 0.062	S/C		0%	0%
Very Fine	.062 - .125	S		0%	0%
Fine	.125 - .25	A		0%	0%
Medium	.25 - .50	N		0%	0%
Coarse	.50 - 1	D	17	17%	17%
Very Coarse	1 - 2	S	42	42%	59%
Very Fine	2 - 4		12	12%	71%
Fine	4 - 5.7	G	10	10%	81%
Fine	5.7 - 8	R	3	3%	84%
Medium	8 - 11.3	A	1	1%	85%
Medium	11.3 - 16	V	6	6%	91%
Coarse	16 - 22.6	E	4	4%	95%
Coarse	22.6 - 32	L	5	5%	100%
Very Coarse	32 - 45	S		0%	100%
Very Coarse	45 - 64			0%	100%
Small	64 - 90	C		0%	100%
Small	90 - 128	O		0%	100%
Large	128 - 180	B		0%	100%
Large	180 - 256	L		0%	100%
Small	256 - 362	B		0%	100%
Small	362 - 512	L		0%	100%
Medium	512 - 1024	D		0%	100%
Lrg- Very Lrg	1024 - 2048	R		0%	100%
Bedrock	>2048	BDRK		0%	100%
		Total	100	100%	100%

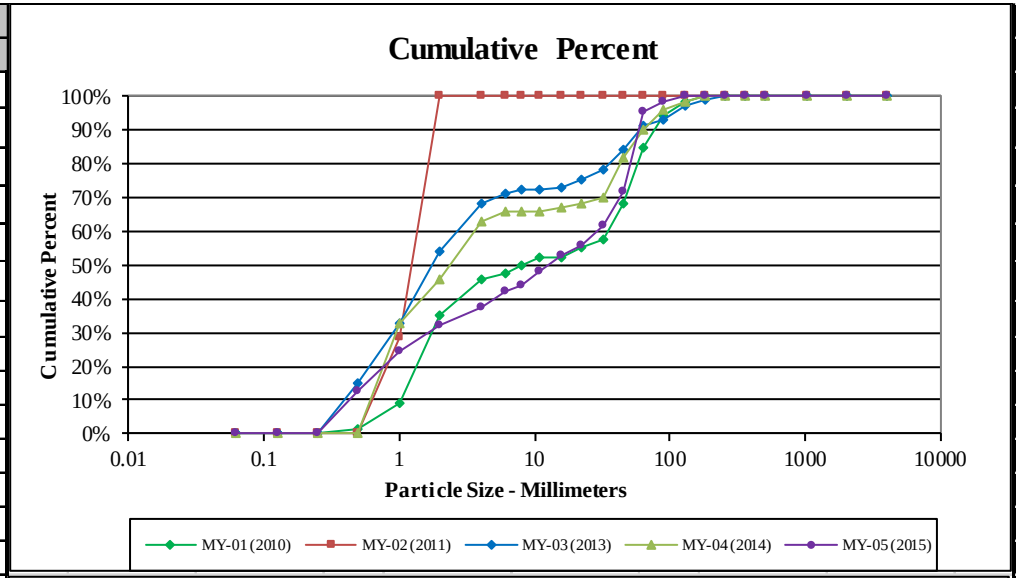
Size (mm)		Type	
D50	1.7	silt/clay	0%
D84	8	sand	59%
D95	22	gravel	41%
		cobble	0%





Cross-Section C3 Riffle - VFF MY-05					
Particle	Millimeter	Material	Count	Item %	Cum %
Silt/Clay	< 0.062	S/C		0%	0%
Very Fine	.062 - .125	S		0%	0%
Fine	.125 - .25	A		0%	0%
Medium	.25 - .50	N	13	13%	13%
Coarse	.50 - 1	D	12	12%	25%
Very Coarse	1 - 2	S	8	8%	32%
Very Fine	2 - 4		5	5%	37%
Fine	4 - 5.7	G	5	5%	42%
Fine	5.7 - 8	R	2	2%	44%
Medium	8 - 11.3	A	4	4%	48%
Medium	11.3 - 16	V	5	5%	53%
Coarse	16 - 22.6	E	3	3%	56%
Coarse	22.6 - 32	L	6	6%	62%
Very Coarse	32 - 45	S	10	10%	72%
Very Coarse	45 - 64		24	24%	95%
Small	64 - 90	C	3	3%	98%
Small	90 - 128	O	2	2%	100%
Large	128 - 180	B		0%	100%
Large	180 - 256	L		0%	100%
Small	256 - 362	B		0%	100%
Small	362 - 512	L		0%	100%
Medium	512 - 1024	D		0%	100%
Lrg- Very Lrg	1024 - 2048	R		0%	100%
Bedrock	>2048	BDRK		0%	100%
		Total	102	100%	100%

Size (mm)		Type	
D50	13	silt/clay	0%
D84	54	sand	32%
D95	64	gravel	39%
		cobble	5%



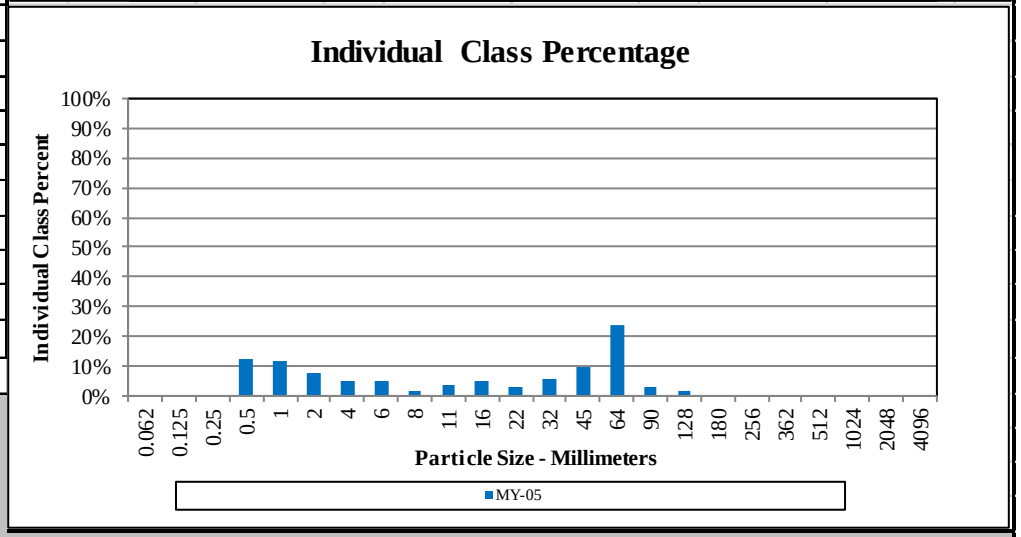


TABLE 10. BASELINE STREAM DATA SUMMARY TABLE

Table 10a.1 Baseline Stream Data Summary
Valley Fields Farm/407 - Upper A: 800 feet

Parameter	Gauge[2]	Regional Curve			Pre-Existing Condition						Reference Reach(es) Data						Design			Monitoring Baseline					
		LL	UL	Eq.	Min	Mean	Med	Max	SD[5]	n	Min	Mean	Med	Max	SD[5]	n	Min	Med	Max	Min	Mean	Med	Max	SD[5]	n
Dimension and Substrate - Riffle Only																									
Bankfull Width (ft)		20.502	22.66	21.581			18.2			1	5.7	10.1	9.4	15.2		3		30		29.1	30.05		31		2
Floodprone Width (ft)							20.8			1	23.3	53.033	49.9	85.9		3		66		90	90.7		91.4		2
Bankfull Mean Depth (ft)		2.2206	2.4544	2.3375			1.7			1	0.5	0.9	1	1.2		3		1.9		1.6	1.85		2.1		2
[1]Bankfull Max Depth (ft)							1.9			1	1.2	1.5333	1.5	1.9		3		2.9		2.8	3		3.2		2
Bankfull Cross Sectional Area (ft^2)		52.257	57.758	55.008			30.9			1	2.7	10.2	8.9	19		3		57.5		50.1	55.1		60.1		2
Width/Depth Ratio							10.7			1	9.4	11.167	11.4	12.7		3		15.8		14.2	16.65		19.1		2
Entrenchment Ratio							1.1			1	1.5	6.4667	8.8	9.1		3		2.2		3	3		3		2
[1]Bank Height Ratio							2.8			1	1.1	1.3333	1.4	1.5		3		1		1	1		1		2
Profile																									
Riffle Length (ft)																				56.5	88.5		120.4		1
Riffle Slope (ft/ft)					0.0026	0.003		0.0033		2	0.0061	0.0337	0.0173	0.0961	0.0361	6	0.0031	0.0031	0.0064	0.0034	0.0034		0.0034		1
Pool Length (ft)																				38.5	74.1		98.5		3
Pool Max depth (ft)					2.6	2.6		2.6		1	0.9	1.9	1.4	3.9	1.13	6	2.5	3.8	4.8	3.72	4.21		5.1		3
Pool Spacing (ft)					30	42		77		2	15.3	31.7	31.6	52.4	13.8	6	120	120	150	155.7	248.2		340.6		2
Pattern																									
Channel Beltwidth (ft)					36		59	79		3	43.2	79.2	84.3	105.1	26.1	4	201	229	256	22.1	118.1	126	197.2	71.914	4
Radius of Curvature (ft)					17		72	248		3	16.4	29.5	22	51	14.7	5	60	90	120	10.1	45.7	49.2	79.8	28.527	5
Rc:Bankfull width (ft/ft)					0.9341		3.956	13.626		3	1.7	4.1	3.7	6.8	1.7	6	2	3	4	0.3	1.5		2.6	1.1141	6
Meander Wavelength (ft)					76		143	196		3	44.7	141.3	114	320.6	106.5	6	240	300	360	117	302.2	292..4	613.9	251.12	6
Meander Width Ratio					4.1758		7.8571	10.769		3	7.6	10.9	11.2	15.5	3.1	5	8	10	12	4.0	10.1		19.8	7.9637	5
Transport parameters																									
Reach Shear Stress (competency) lb/ft^2							0.31824											0.560976					0.386724		
Max part size (mm) mobilized at bankfull							23.64698193											42.68793974					28.97191657		
Stream Power (transport capacity) W/m^2							45.2088											46.71576					50.48316		
Additional Reach Parameters																									
Rosgen Classification							G5c/F5						B4/E5/C4					B5c/C5					C5		
Bankfull Velocity (fps)		4.1722	4.6114	4.3918			6.9											4.2					4.382940109		
Bankfull Discharge (cfs)		229.5	253.66	241.58			213.1																		
Valley length (ft)																									
Channel Thalweg length (ft)																									
Sinuosity (ft)							1.1						1.1-1.3					1.2							
Water Surface Slope (Channel) (ft/ft)							0.003						0.0080-0.0215					0.0028					0.0029		
BF slope (ft/ft)							0.003						0.0082-0.0522					0.0031					0.0024		
[3]Bankfull Floodplain Area (acres)																									
[4]% of Reach with Eroding Banks																									
Channel Stability or Habitat Metric																									
Biological or Other																									

Shaded cells indicate that these will typically not be filled in.

1 = The distributions for these parameters can include information from both the cross-section surveys and the longitudinal profile. 2 = For projects with a proximal USGS gauge in-line with the project reach (added bankfull verification - rare).

3. Utilizing survey data produce an estimate of the bankfull floodplain area in acres, which should be the area from the top of bank to the toe of the terrace riser/slope.

4 = Proportion of reach exhibiting banks that are eroding based on the visual survey for comparison to monitoring data; 5. Of value/needed only if the n exceeds 3

Table 10a.2 Baseline Stream Data Summary
Valley Fields Farm/407 - Upper A2: 1,850 feet

Parameter	Gauge[2]	Regional Curve			Pre-Existing Condition						Reference Reach(es) Data						Design			Monitoring Baseline					
Dimension and Substrate - Riffle Only		LL	UL	Eq.	Min	Mean	Med	Max	SD[5]	n	Min	Mean	Med	Max	SD[5]	n	Min	Med	Max	Min	Mean	Med	Max	SD[5]	n
Bankfull Width (ft)		20.502	22.66	21.581	14.6	16.55		18.5		2	5.7	10.1	9.4	15.2		3		30		30.1	30.8		31.1		3
Floodprone Width (ft)					23.7	75.25		126.8		2	23.3	53.033	49.9	85.9		3		66		78.6	98.6		126.6		3
Bankfull Mean Depth (ft)		2.2206	2.4544	2.3375	2.7	2.75		2.8		2	0.5	0.9	1	1.2		3		1.9		1.8	2		2.2		3
[1]Bankfull Max Depth (ft)					3.4	3.45		3.5		2	1.2	1.5333	1.5	1.9		3		2.9		3.2	3.5		4		3
Bankfull Cross Sectional Area (ft^2)		52.257	57.758	55.008	40.4	45		49.6		2	2.7	10.2	8.9	19		3		57.5		55.2	62.2		69		3
Width/Depth Ratio					5.2	6.05		6.9		2	9.4	11.167	11.4	12.7		3		15.8		14	15.3		16.4		3
Entrenchment Ratio					1.6	4.25		6.9		2	1.5	6.4667	8.8	9.1		3		2.2		2.5	3.2		4.1		3
[1]Bank Height Ratio					1.5	1.8		2.1		2	1.1	1.3333	1.4	1.5		3		1		1	1		1		3
Profile																									
Riffle Length (ft)																				33.3	52		86.3		3
Riffle Slope (ft/ft)					0.0026	0.003	0.0044	0.0033	0.0008	4	0.0061	0.0337	0.0173	0.0961	0.0361	6	0.0031	0.0031	0.0064	0.0016	0.0086		0.0135		5
Pool Length (ft)																				60.8	110.4		238.6		3
Pool Max depth (ft)					2.5	2.8	2.6	3.2		3	0.9	1.9	1.4	3.9	1.13	6	2.5	3.8	4.8	4.15	5.03		5.94		11
Pool Spacing (ft)					30	42	53.7	77		3	15.3	31.7	31.6	52.4	13.8	6	120	120	150	142.7	238		300.6		5
Pattern																									
Channel Beltwidth (ft)					36	60	59.2	79	16	6	43.2	79.2	84.3	105.1	26.1	4	201	229	256	22.1	118.1	126	197.2	71.914	
Radius of Curvature (ft)					14	87.4	58.5	248	87.4	6	16.4	29.5	22	51	14.7	5	60	90	120	10.1	45.7	49.2	79.8	28.527	
Rc:Bankfull width (ft/ft)					0.8459	5.3	3.7	17	6	6	1.7	4.1	3.7	6.8	1.7	6	2	3	4	0.3	1.5		2.6	1.1153	
Meander Wavelength (ft)					58	139.8	58.5	228	65.9	6	44.7	141.3	114	320.6	106.5	6	240	300	360	117	302.2	292..4	613.9	251.12	
Meander Width Ratio					2.5	3.6	3.6	5.4	1.1	6	7.6	10.9	11.2	15.5	3.1	5	8	10	12	3.9	9.8		19.7	8.0101	
Transport parameters																									
Reach Shear Stress (competency) lb/f^2							0.5148											0.560976					1.07328		
Max part size (mm) mobilized at bankfull							39.03306101											42.68793974					83.92826353		
Stream Power (transport capacity) W/m^2							45.2088											46.71576					129.59856		
Additional Reach Parameters																									
Rosgen Classification							G5/Incised E5						B4/E5/C4					B5c/C5					C5		
Bankfull Velocity (fps)		4.1722	4.6114	4.3918			4.9-5.7											4.2					3.882636656		
Bankfull Discharge (cfs)		229.5	253.66	241.58			241.1																		
Valley length (ft)																									
Channel Thalweg length (ft)																									
Sinuosity (ft)							1.0-1.1						1.1-1.3					1.2							
Water Surface Slope (Channel) (ft/ft)							0.0025-0.0040						0.0080-0.0215					0.0028					0.0036		
BF slope (ft/ft)							0.0030-0.0035						0.0082-0.0522					0.0031					0.0036		
[3]Bankfull Floodplain Area (acres)																									
[4]% of Reach with Eroding Banks																									
Channel Stability or Habitat Metric																									
Biological or Other																									

Shaded cells indicate that these will typically not be filled in.

1 = The distributions for these parameters can include information from both the cross-section surveys and the longitudinal profile. 2 = For projects with a proximal USGS gauge in-line with the project reach (added bankfull verification - rare).

3. Utilizing survey data produce an estimate of the bankfull floodplain area in acres, which should be the area from the top of bank to the toe of the terrace riser/slope.

4 = Proportion of reach exhibiting banks that are eroding based on the visual survey for comparison to monitoring data; 5. Of value/needed only if the n exceeds 3

Table 10a.3 Baseline Stream Data Summary
Valley Fields Farm/407 - Lower A: 1,400 feet

Parameter	Gauge[2]	Regional Curve			Pre-Existing Condition						Reference Reach(es) Data						Design			Monitoring Baseline					
Dimension and Substrate - Riffle Only		LL	UL	Eq.	Min	Mean	Med	Max	SD[5]	n	Min	Mean	Med	Max	SD[5]	n	Min	Med	Max	Min	Mean	Med	Max	SD[5]	n
Bankfull Width (ft)		25.261	27.921	26.591			45.1			1	5.7	10.1	9.4	15.2		3		30		30.1	30.8		31.1		3
Floodprone Width (ft)							63.3			1	23.3	53.033	49.9	85.9		3		66		78.6	98.6		126.6		3
Bankfull Mean Depth (ft)		2.5939	2.8669	2.7304			2			1	0.5	0.9	1	1.2		3		1.9		1.8	2		2.2		3
[1]Bankfull Max Depth (ft)							3.5			1	1.2	1.5333	1.5	1.9		3		2.9		3.2	3.5		4		3
Bankfull Cross Sectional Area (ft^2)		72.699	80.351	76.525			91.3			1	2.7	10.2	8.9	19		3		57.5		55.2	62.2		69		3
Width/Depth Ratio							22.6			1	9.4	11.167	11.4	12.7		3		15.8		14	15.3		16.4		3
Entrenchment Ratio							1.4			1	1.5	6.4667	8.8	9.1		3		2.2		2.5	3.2		4.1		3
[1]Bank Height Ratio							1.7			1	1.1	1.3333	1.4	1.5		3		1		1	1		1		3
Profile																									
Riffle Length (ft)																				36.8	44.4		51.6		3
Riffle Slope (ft/ft)					0.0075	0.0089		0.0102		2	0.0061	0.0337	0.0173	0.0961	0.0361	6	0.0031	0.0031	0.0064	0.0016	0.0086		0.0135		5
Pool Length (ft)																				89.6	119.8		152.8		3
Pool Max depth (ft)					4	4.6		5.3		2	0.9	1.9	1.4	3.9	1.13	6	2.5	3.8	4.8	4.15	5.03		5.94		11
Pool Spacing (ft)					53	104		156		2	15.3	31.7	31.6	52.4	13.8	6	120	120	150	142.7	238		300.6		5
Pattern																									
Channel Beltwidth (ft)					36	60	59.2	79	16	6	43.2	79.2	84.3	105.1	26.1	4	201	229	256	22.1	118.1	126	197.2	71.914	
Radius of Curvature (ft)					14	87.4	58.5	248	87.4	6	16.4	29.5	22	51	14.7	5	60	90	120	10.1	45.7	49.2	79.8	28.527	
Rc:Bankfull width (ft/ft)					2	5.3	3.7	17	6	6	1.7	4.1	3.7	6.8	1.7	6	2	3	4	0.3	1.5		2.6	1.1153	
Meander Wavelength (ft)					58	139.8	58.5	228	65.9	6	44.7	141.3	114	320.6	106.5	6	240	300	360	117	302.2	292..4	613.9	251.12	
Meander Width Ratio					2.5	3.6	3.6	5.4	1.1	6	7.6	10.9	11.2	15.5	3.1	5	8	10	12	3.9	9.8		19.7	8.0101	
Transport parameters																									
Reach Shear Stress (competency) lb/ft^2							1.11072										0.560976						1.07328		
Max part size (mm) mobilized at bankfull							86.98116865										42.68793974						83.92826353		
Stream Power (transport capacity) W/m^2							134.11944										46.71576						129.59856		
Additional Reach Parameters																									
Rosgen Classification							G5/Incised E5						B4/E5/C4				B5c/C5						C5		
Bankfull Velocity (fps)		4.2541	4.7019	4.478			4.9-5.7										4.2						3.882636656		
Bankfull Discharge (cfs)		325.54	359.81	342.68			241.1																		
Valley length (ft)																									
Channel Thalweg length (ft)																									
Sinuosity (ft)							1.0-1.1						1.1-1.3				1.2								
Water Surface Slope (Channel) (ft/ft)							0.0025-0.0040						0.0080-0.0215				0.0028						0.0015		
BF slope (ft/ft)							0.0030-0.0035						0.0082-0.0522				0.0031						0.002		
[3]Bankfull Floodplain Area (acres)																									
[4]% of Reach with Eroding Banks																									
Channel Stability or Habitat Metric																									
Biological or Other																									

Shaded cells indicate that these will typically not be filled in.

1 = The distributions for these parameters can include information from both the cross-section surveys and the longitudinal profile. 2 = For projects with a proximal USGS gauge in-line with the project reach (added bankfull verification - rare).

3. Utilizing survey data produce an estimate of the bankfull floodplain area in acres, which should be the area from the top of bank to the toe of the terrace riser/slope.

4 = Proportion of reach exhibiting banks that are eroding based on the visual survey for comparison to monitoring data; 5. Of value/needed only if the n exceeds 3

Table 10a.4 Baseline Stream Data Summary
Valley Fields Farm/407 - Upper B: 200 feet

Parameter	Gauge[2]	Regional Curve			Pre-Existing Condition						Reference Reach(es) Data						Design			Monitoring Baseline					
Dimension and Substrate - Riffle Only		LL	UL	Eq.	Min	Mean	Med	Max	SD[5]	n	Min	Mean	Med	Max	SD[5]	n	Min	Med	Max	Min	Mean	Med	Max	SD[5]	n
Bankfull Width (ft)		15.54	17.176	16.358	14.3	15.4		16.4		2	5.7	10.1	9.4	15.2		3		27.5				21.4			1
Floodprone Width (ft)					20	20.8		21.6		2	23.3	53.033	49.9	85.9		3		60.5				88.1			1
Bankfull Mean Depth (ft)		1.8069	1.9971	1.902	1.9	2.1		2.2		2	0.5	0.9	1	1.2		3		1.6				2			1
[1]Bankfull Max Depth (ft)					2.5	2.7		2.8		2	1.2	1.5333	1.5	1.9		3		2.3				3.1			1
Bankfull Cross Sectional Area (ft^2)		33.717	37.267	35.492	27.1	31.7		36.2		2	2.7	10.2	8.9	19		3		43.1				42.4			1
Width/Depth Ratio					7.3	7.4		7.5		2	9.4	11.167	11.4	12.7		3		17.5				10.8			1
Entrenchment Ratio					1.3	1.4		1.4		2	1.5	6.4667	8.8	9.1		3		2.2				4.1			1
[1]Bank Height Ratio					2.6	2.8		3		2	1.1	1.3333	1.4	1.5		3		1				1			1
Profile																									
Riffle Length (ft)																						18.4			1
Riffle Slope (ft/ft)					0.0053	0.0131		0.0181		2	0.0061	0.0337	0.0173	0.0961	0.0361	6		0.0039				0.0005			1
Pool Length (ft)																				41.1	41.6		42.2		2
Pool Max depth (ft)					2.8	3		3.2		2	0.9	1.9	1.4	3.9	1.13	6	2	3.2	3.9	3.23	3.24		3.24		2
Pool Spacing (ft)					31	42		61		2	15.3	31.7	31.6	52.4	13.8	6	110	110	138			107.5			1
Pattern																									
Channel Beltwidth (ft)					29	50	46	75		3	43.2	79.2	84.3	105.1	26.1	4	101	109	120	108.7	170.8	164.6	261..6	34.204	4
Radius of Curvature (ft)					15	105.67	76	226		3	16.4	29.5	22	51	14.7	5	55	83	110	23.8	55.4	50.5	110.1	36.202	5
Rc:Bankfull width (ft/ft)					1	6.8667	4.9	14.7		3	1.7	4.1	3.7	6.8	1.7	6	2	3.0182	4			2.4			6
Meander Wavelength (ft)					108	358.67	296	672		3	44.7	141.3	114	320.6	106.5	6	220	275	330	148.2	327.6	266.7	621	201.06	6
Meander Width Ratio					7	23.267	19.2	43.6		3	7.6	10.9	11.2	15.5	3.1	5	8	10	12			12.5			5
Transport parameters																									
Reach Shear Stress (competency) lb/ft^2					1.716624												0.559728			0.067392					
Max part size (mm) mobilized at bankfull					136.9105109												42.58898812			4.691537038					
Stream Power (transport capacity) W/m^2					197.41176												58.77144			8.137584					
Additional Reach Parameters																									
Rosgen Classification					G5/Incised E5						B4/E5/C4						B5c/C5			E5					
Bankfull Velocity (fps)		4.0661	4.4941	4.2801	4.5-5.6												4.2			3.837264151					
Bankfull Discharge (cfs)		144.31	159.5	151.91	162.7																				
Valley length (ft)																									
Channel Thalweg length (ft)																									
Sinuosity (ft)					1.1						1.1-1.3						1.1								
Water Surface Slope (Channel) (ft/ft)					0.0046						0.0080-0.0215						0.0039			Flat					
BF slope (ft/ft)					0.0131						0.0082-0.0522						0.0047			0.0047					
[3]Bankfull Floodplain Area (acres)																									
[4]% of Reach with Eroding Banks																									
Channel Stability or Habitat Metric																									
Biological or Other																									

Shaded cells indicate that these will typically not be filled in.

1 = The distributions for these parameters can include information from both the cross-section surveys and the longitudinal profile. 2 = For projects with a proximal USGS gauge in-line with the project reach (added bankfull verification - rare).

3. Utilizing survey data produce an estimate of the bankfull floodplain area in acres, which should be the area from the top of bank to the toe of the terrace riser/slope.

4 = Proportion of reach exhibiting banks that are eroding based on the visual survey for comparison to monitoring data; 5. Of value/needed only if the n exceeds 3

Table 10a.5 Baseline Stream Data Summary
Valley Fields Farm/407 - Lower B: 230 feet

Parameter	Gauge[2]	Regional Curve			Pre-Existing Condition						Reference Reach(es) Data						Design			Monitoring Baseline					
Dimension and Substrate - Riffle Only		LL	UL	Eq.	Min	Mean	Med	Max	SD[5]	n	Min	Mean	Med	Max	SD[5]	n	Min	Med	Max	Min	Mean	Med	Max	SD[5]	n
Bankfull Width (ft)		16.16	17.861	17.011	14.3	15.4		16.4		2	5.7	10.1	9.4	15.2		3		27.5				48.4			1
Floodprone Width (ft)					20	20.8		21.6		2	23.3	53.033	49.9	85.9		3		60.5				91.3			1
Bankfull Mean Depth (ft)		1.8602	2.056	1.9581	1.9	2.1		2.2		2	0.5	0.9	1	1.2		3		1.6				1.4			1
[1]Bankfull Max Depth (ft)					2.5	2.7		2.8		2	1.2	1.5333	1.5	1.9		3		2.3				2.9			1
Bankfull Cross Sectional Area (ft^2)		35.869	39.645	37.757	27.1	31.7		36.2		2	2.7	10.2	8.9	19		3		43.1				67.8			1
Width/Depth Ratio					7.3	7.4		7.5		2	9.4	11.167	11.4	12.7		3		17.5				34.5			1
Entrenchment Ratio					1.3	1.4		1.4		2	1.5	6.4667	8.8	9.1		3		2.2				1.9			1
[1]Bank Height Ratio					2.6	2.8		3		2	1.1	1.3333	1.4	1.5		3		1				1			1
Profile																									
Riffle Length (ft)																				14	25.5		40.2		2
Riffle Slope (ft/ft)					0.0053	0.0131		0.0181		2	0.0061	0.0337	0.0173	0.0961	0.0361	6		0.0039		0.0027	0.0067		0.0087		2
Pool Length (ft)																				19.1	20.3		21.5		2
Pool Max depth (ft)					2.8	3		3.2		2	0.9	1.9	1.4	3.9	1.13	6	2	3.2	3.9			4.1			1
Pool Spacing (ft)					31	42		61		2	15.3	31.7	31.6	52.4	13.8	6	110	110	138			88.9			1
Pattern																									
Channel Beltwidth (ft)					29	50	46	75		3	43.2	79.2	84.3	105.1	26.1	4	97	106	122	108.7	170.8	164.6	261..6	34.204	4
Radius of Curvature (ft)					15	105.67	76	226		3	16.4	29.5	22	51	14.7	5	57	85	114	23.8	55.4	50.5	110.1	36.202	5
Rc:Bankfull width (ft/ft)					1	6.8667	4.9	14.7		3	1.7	4.1	3.7	6.8	1.7	6	2.0727	3.0909	4.1455			1.0			6
Meander Wavelength (ft)					108	358.67	296	672		3	44.7	141.3	114	320.6	106.5	6	227	284	341	148.2	327.6	266.7	621	201.06	6
Meander Width Ratio					7	23.267	19.2	43.6		3	7.6	10.9	11.2	15.5	3.1	5	8.2545	10.327	12.4			5.5			5
Transport parameters																									
Reach Shear Stress (competency) lb/f^2					1.716624												0.559728			0.5826912					
Max part size (mm) mobilized at bankfull					136.9105109												42.58898812			44.41116115					
Stream Power (transport capacity) W/m^2					197.41176												58.77144			100.514232					
Additional Reach Parameters																									
Rosgen Classification					G5/Incised E5						B4/E5/C4						B5c/C5			B5					
Bankfull Velocity (fps)		4.0809	4.5105	4.2957	4.5-5.6												4.2			2.399705015					
Bankfull Discharge (cfs)		154.08	170.3	162.19	162.7																				
Valley length (ft)																									
Channel Thalweg length (ft)																									
Sinuosity (ft)					1.1						1.1-1.3						1.1								
Water Surface Slope (Channel) (ft/ft)					0.0046						0.0080-0.0215						0.0039			0.0035					
BF slope (ft/ft)					0.0131						0.0082-0.0522						0.0047			0.0047					
[3]Bankfull Floodplain Area (acres)																									
[4]% of Reach with Eroding Banks																									
Channel Stability or Habitat Metric																									
Biological or Other																									

Shaded cells indicate that these will typically not be filled in.

1 = The distributions for these parameters can include information from both the cross-section surveys and the longitudinal profile. 2 = For projects with a proximal USGS gauge in-line with the project reach (added bankfull verification - rare).

3. Utilizing survey data produce an estimate of the bankfull floodplain area in acres, which should be the area from the top of bank to the toe of the terrace riser/slope.

4 = Proportion of reach exhibiting banks that are eroding based on the visual survey for comparison to monitoring data; 5. Of value/needed only if the n exceeds 3

Table 10a.6 Baseline Stream Data Summary
Valley Fields Farm/407 - Reach C: 1,400 feet

Parameter	Gauge[2]	Regional Curve			Pre-Existing Condition						Reference Reach(es) Data						Design			Monitoring Baseline					
Dimension and Substrate - Riffle Only		LL	UL	Eq.	Min	Mean	Med	Max	SD[5]	n	Min	Mean	Med	Max	SD[5]	n	Min	Med	Max	Min	Mean	Med	Max	SD[5]	n
Bankfull Width (ft)		5.1366	5.6773	5.407			7			1	5.7	10.1	9.4	15.2		3		11.5		8.9	12.133	13.5	14		3
Floodprone Width (ft)							14.1			1	23.3	53.033	49.9	85.9		3		25.3		39.6	45.6	48.5	48.7		3
Bankfull Mean Depth (ft)		0.7927	0.8762	0.8345			0.6			1	0.5	0.9	1	1.2		3		0.7		0.6	0.8333	0.9	1		3
[1]Bankfull Max Depth (ft)							0.9			1	1.2	1.5333	1.5	1.9		3		1.2		1.1	1.5333	1.7	1.8		3
Bankfull Cross Sectional Area (ft^2)		5.8553	6.4716	6.1634			3.3			1	2.7	10.2	8.9	19		3		7.8		7.5	9.6	8.9	12.4		3
Width/Depth Ratio							11.7			1	9.4	11.167	11.4	12.7		3		17.2		8.9	16.267	15.9	24		3
Entrenchment Ratio							2			1	1.5	6.4667	8.8	9.1		3		2.2		3.5	3.8333	3.6	4.4		3
[1]Bank Height Ratio							1			1	1.1	1.3333	1.4	1.5		3		1		1	1	1	1		3
Profile																									
Riffle Length (ft)																				21.7	41.6	36.7	90.8	23.5	7
Riffle Slope (ft/ft)											0.0061	0.0337	0.0173	0.0961	0.0361	6		0.0086		0.0017	0.0066	0.0082	0.0104	0.0035	7
Pool Length (ft)																				25.8	50.2	56.4	66.7	16.7	6
Pool Max depth (ft)											0.9	1.9	1.4	3.9	1.13	6	0.9	1.5	1.7	2.18	2.52	2.58	2.78	0.25	7
Pool Spacing (ft)											15.3	31.7	31.6	52.4	13.8	6	45	69	92	46	92.5	91.9	152.2	37.9	9
Pattern																									
Channel Beltwidth (ft)											43.2	79.2	84.3	105.1	26.1	4	33	46	58	84.1	97.4	96.4	112	11.417	4
Radius of Curvature (ft)											16.4	29.5	22	51	14.7	5	23	35	46	20.8	32.5	30.7	59.4	16.521	5
Rc:Bankfull width (ft/ft)											1.7	4.1	3.7	6.8	1.7	6	2	3.0435	4	2.3	2.7	2.3	4.2	0.9237	6
Meander Wavelength (ft)											44.7	141.3	114	320.6	106.5	6	92	115	138	72.5	187.8	131.2	595.1	237.02	6
Meander Width Ratio											7.6	10.9	11.2	15.5	3.1	5	8	10	12	8.1	15.5	9.7	42.5	16.01	5
Transport parameters																									
Reach Shear Stress (competency) lb/f^2																	0.643968			0.370656					
Max part size (mm) mobilized at bankfull																	49.28807318			27.71871363					
Stream Power (transport capacity) W/m^2																	129.59856			123.57072					
Additional Reach Parameters																									
Rosgen Classification							Incised B5						B4/E5/C4				C5/E5			E5					
Bankfull Velocity (fps)		3.6682	4.0543	3.8612			6.5										3.1			18.28089888					
Bankfull Discharge (cfs)		22.609	24.989	23.799			21.6																		
Valley length (ft)																									
Channel Thalweg length (ft)																									
Sinuosity (ft)													1.1-1.3				1.1								
Water Surface Slope (Channel) (ft/ft)													0.0080-0.0215				0.0066			0.0099					
BF slope (ft/ft)													0.0082-0.0522				0.0086			0.0095					
[3]Bankfull Floodplain Area (acres)																									
[4]% of Reach with Eroding Banks																									
Channel Stability or Habitat Metric																									
Biological or Other																									

Shaded cells indicate that these will typically not be filled in.

1 = The distributions for these parameters can include information from both the cross-section surveys and the longitudinal profile. 2 = For projects with a proximal USGS gauge in-line with the project reach (added bankfull verification - rare).

3. Utilizing survey data produce an estimate of the bankfull floodplain area in acres, which should be the area from the top of bank to the toe of the terrace riser/slope.

4 = Proportion of reach exhibiting banks that are eroding based on the visual survey for comparison to monitoring data; 5. Of value/needed only if the n exceeds 3

Table 10b. Baseline Stream Data Summary (Substrate, Bed, Bank, and Hydrologic Containment Parameter Distributions)
Valley Fields Farm/407

	Parameter	Pre-Existing Condition							Reference Reach(es) Data							Design							As-built/Baseline						
Upper A (800 feet)	[1]Ri% / Ru% / P% / G% / S%	10	20	30	40	0										30	10	40	20	0			30	10	40	20	0		
	[1]SC% / Sa% / G% / C% / B% / Be%	16	1.18	69.41	29.41	0	0		2.85	31.7	59.76	4.06	0.82	0.81															
	[1]d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)	0.6	0.93	1.35	6.49	9.96			0.43	2.25	12.08	39.69	71.35																
	[2]Entrenchment Class <1.5 / 1.5-1.99 / 2.0-4.9 / 5.0-9.9 / >10	800	0	0	0	0						X	X										0	0	0	300	500		
	[3]Incision Class <1.2 / 1.2-1.49 / 1.5-1.99 / >2.0	0	0	200	600				X														800	0	0	0			
Upper A2 (1,850 feet)	Parameter	Pre-Existing Condition							Reference Reach(es) Data							Design							As-built/Baseline						
	[1]Ri% / Ru% / P% / G% / S%	10	10	20	60	0										30	10	40	20	0			30	10	40	20	0		
	[1]SC% / Sa% / G% / C% / B% / Be%	14	60	26	0	0	0		2.85	31.7	59.76	4.06	0.82	0.81															
	[1]d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)	0.09	0.65	1.25	6.16	11.3			0.43	2.25	12.08	39.69	71.35																
	[2]Entrenchment Class <1.5 / 1.5-1.99 / 2.0-4.9 / 5.0-9.9 / >10	1500	350	0	0	0						X	X										0	0	0	0	1850		
	[3]Incision Class <1.2 / 1.2-1.49 / 1.5-1.99 / >2.0	0	0	1000	850				X														1850	0	0	0			
Lower A (1,400 feet)	Parameter	Pre-Existing Condition							Reference Reach(es) Data							Design							As-built/Baseline						
	[1]Ri% / Ru% / P% / G% / S%	5	10	5	80	0										30	10	40	20	0			30	10	40	20	0		
	[1]SC% / Sa% / G% / C% / B% / Be%	8.33	33.3	58.3	0	0	0		2.85	31.7	59.76	4.06	0.82	0.81															
	[1]d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)	0.19	1.5	2.62	8.88	11.3			0.43	2.25	12.08	39.69	71.35																
	[2]Entrenchment Class <1.5 / 1.5-1.99 / 2.0-4.9 / 5.0-9.9 / >10	100	900	400	0	0						X	X										0	0	1400	0	0		
	[3]Incision Class <1.2 / 1.2-1.49 / 1.5-1.99 / >2.0	0	0	1200	200				X														1400	0	0	0			
Reach B (430 feet)	Parameter	Pre-Existing Condition							Reference Reach(es) Data							Design							As-built/Baseline						
	[1]Ri% / Ru% / P% / G% / S%	10	10	30	50	0										30	10	40	20	0			30	10	40	20	0		
	[1]SC% / Sa% / G% / C% / B% / Be%	0	19	81	0	0	0		2.85	31.7	59.76	4.06	0.82	0.81															
	[1]d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)	1.81	4	7.01	22.23	29.83			0.43	2.25	12.08	39.69	71.35																
	[2]Entrenchment Class <1.5 / 1.5-1.99 / 2.0-4.9 / 5.0-9.9 / >10	430	0	0	0	0						X	X										0	0	430	0	0		
	[3]Incision Class <1.2 / 1.2-1.49 / 1.5-1.99 / >2.0	0	0	0	430				X														430	0	0	0			
Reach C (1,400 feet)	Parameter	Pre-Existing Condition							Reference Reach(es) Data							Design							As-built/Baseline						
	[1]Ri% / Ru% / P% / G% / S%															30	10	40	20	0			30	10	40	20	0		
	[1]SC% / Sa% / G% / C% / B% / Be%	18.63	34.31	47.06	0	0	0		2.85	31.7	59.76	4.06	0.82	0.81															
	[1]d16 / d35 / d50 / d84 / d95 / di^p / di^{sp} (mm)	0.05	1.17	1.86	5.67	7.49			0.43	2.25	12.08	39.69	71.35																
	[2]Entrenchment Class <1.5 / 1.5-1.99 / 2.0-4.9 / 5.0-9.9 / >10	600	800	0	0	0						X	X										0	0	1000	400	0		
	[3]Incision Class <1.2 / 1.2-1.49 / 1.5-1.99 / >2.0	1000	400	0	0				X														1400	0	0	0			

Shaded cells indicate that these will typically not be filled in.

1 = Riffle, Run, Pool, Glide, Step; Silt/Clay, Sand, Gravel, Cobble, Boulder, Bedrock; dip = max pave, disp = max subpave

2 = Entrenchment Class - Assign/bin the reach footage into the classes indicated and provide the percentage of the total reach footage in each class in the table. This will result from the measured cross-sections as well as visual estimates

3 = Assign/bin the reach footage into the classes indicated and provide the percentage of the total reach footage in each class in the table. This will result from the measured cross-sections as well as the longitudinal profile

TABLE 11. MONITORING MORPHOLOGY DATA TABLE

Table 11a. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters – Cross Sections)
Valley Fields Farm/407

	Cross Section A1 (Riffle)							Cross Section A2 (Riffle)							Cross Section A3 (Riffle)							Cross Section A4 (Pool)							Cross Section A5 (Riffle)						
Based on fixed baseline bankfull elevation[1]	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Record elevation (datum) used	760.8	760.8	760.8	760.8	760.8	760.8		760.7	760.7	760.7	760.7	760.7	760.7		762.0	762.0	762.0	762.0	762.0	762.0		764.0	764.0	764.0	764.0	764.0	764.0		765.7	765.7	765.7	765.7	765.7	765.7	
Bankfull Width (ft)	31.1	33.3	37.3	23.6	23.8	23.7		38.2	30.8	37.1	23.6	24.4	24.2		30.1	33.4	29.7	23.1	23.4	21.8		31.1	27.5	32.0	19.4	20.6	21.4		31.0	29.9	23.2	16.6	17.8	17.4	
Floodprone Width (ft)	>120	>120	>120	>120	>120	>120		>100	>100	>100	>100	>100	>100		>90	>90	>90	>90	>90	>90		-	-	-	-	-	-		>90	>90	>90	>90	>90	>90	
Bankfull Mean Depth (ft)	2.0	2.3	2.1	2.7	3.0	2.4		1.9	3.0	1.9	2.9	2.7	2.5		1.8	1.7	2.0	2.4	2.4	2.6		2.2	2.8	2.4	3.5	2.9	2.8		1.6	1.2	1.5	2.0	1.9	1.9	
Bankfull Max Depth (ft)	3.4	5.2	5.6	5.5	5.8	5.2		4.0	5.7	4.6	4.6	4.4	3.9		3.2	3.6	3.8	4.0	4.2	4.0		4.0	5.2	5.1	4.3	3.9	3.6		2.8	3.1	2.9	3.0	2.8	2.7	
Bankfull Cross Sectional Area (ft^2)	62.5	76.4	79.1	64.2	72.2	57.6		72.8	92.8	69.1	67.7	66.9	61.6		55.2	57.4	59.5	54.6	57.1	57.5		69.0	75.9	78.2	68.5	59.1	59.3		50.1	35.5	35.3	33.4	34.0	33.1	
Bankfull Width/Depth Ratio	15.5	14.6	17.6	8.7	7.8	9.8		20.1	10.2	19.9	8.2	8.9	9.5		16.4	19.4	14.8	10.1	9.6	8.3		-	-	-	-	-	-		19.1	25.1	15.2	8.3	9.3	9.1	
Bankfull Entrenchment Ratio	4.1	3.8	3.4	5.1	5.0	5.1		2.9	3.6	3.0	4.2	4.1	4.1		3.0	2.7	3.1	3.9	3.8	4.1		-	-	-	-	-	-		3.0	3.1	4.0	5.4	5.1	5.2	
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0		-	-	-	-	-	-		1.0	1.0	1.0	1.0	1.0	1.0	
Cross Sectional Area between end pins (ft^2)	147.0	156.0	199.5	190.2	202.8	174.3		154.0	176.0	193.1	185.8	177.5	172.9		149.0	154.0	189.6	162.1	180.7	150.3		165.0	184.0	215.4	187.0	170.6	171.2		133.0	114.0	125.7	136.9	121.7	121.8	
d50 (mm)		6.7	1.4	0.6	1.7	0.5			15.3	1.4	1.6	1.5	0.5			15.6	26.6	2.0	11.0	0.6		-	-	-	-	-	-		-	-	-	-	-	-	
	Cross Section A6 (Riffle)							**Cross Section A7 (Pool)**							**Cross Section A10 (Riffle)**							**Cross Section A11 (Riffle)**													
Based on fixed baseline bankfull elevation[1]	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+							
Record elevation (datum) used	766.9	766.9	766.9	766.9	766.9	766.9		767.0	767.0	767.0	767.0	767.0	767.0		755.5	755.5	755.5	755.5	755.5	755.5		754.9	754.9	754.9	754.9	754.9	754.9								
Bankfull Width (ft)	38.3	34.7	26.2	20.2	20.9	21.3		29.1	27.2	27.4	16.3	16.9	16.7		41.3	47.1	42.9	35.0	29.5	28.9		72.2	41.6	41.5	26.1	26.1	24.8								
Floodprone Width (ft)	>90	>90	>90	>90	>90	>90		-	-	-	-	-	-		>90	>90	>90	>90	>90	>90		>90	>90	>90	>90	>90	>90								
Bankfull Mean Depth (ft)	1.9	2.2	2.6	2.2	2.4	2.4		2.1	2.0	2.0	2.7	2.6	2.5		2.3	2.3	1.7	2.0	2.0	1.9		1.9	1.8	1.5	1.7	1.8	1.9								
Bankfull Max Depth (ft)	3.7	4.7	4.7	3.4	3.0	3.6		3.2	3.9	4.0	3.6	3.4	3.2		4.0	3.8	3.8	3.6	3.3	3.3		5.1	3.5	3.6	3.1	2.7	2.5								
Bankfull Cross Sectional Area (ft^2)	71.0	75.6	68.7	45.4	50.1	51.6		60.1	54.8	54.7	43.2	43.4	41.3		95.5	85.4	74.0	69.3	59.9	55.5		137.4	74.6	61.4	44.9	46.7	47.8								
Bankfull Width/Depth Ratio	20.6	16.0	10.0	9.0	8.7	8.8		-	-	-	-	-	-		17.9	26.0	24.8	17.7	14.5	15.0		38.0	23.1	28.0	15.2	14.6	12.9								
Bankfull Entrenchment Ratio	2.2	2.4	3.2	4.5	4.3	4.2		-	-	-	-	-	-		2.8	2.3	2.9	2.6	3.1	3.1		1.8	2.5	2.6	3.4	3.4	3.6								
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0	1.0	1.0		-	-	-	-	-	-		1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0								
Cross Sectional Area between end pins (ft^2)	166.0	172.0	200.0	166.7	149.4	144.9		168.0	162.0	189.1	166.9	155.5	143.8		448.0	440.0	456.7	455.2	440.1	433.1		596.0	539.0	565.0	354.2	543.1	547.5								
d50 (mm)	-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	1.7	1.4	1.2		-	-	-	-	-	-								
	Cross Section B1 (Riffle)							**Cross Section B2 (Riffle)**							**Cross Section B3 (Riffle)**							**Cross Section B4 (Pool)**													
Based on fixed baseline bankfull elevation[1]	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+							
Record elevation (datum) used	766.1	766.1	766.1	766.1	766.1	766.1		765.9	765.9	765.9	765.9	765.9	765.9		760.7	760.7	760.7	760.7	760.7	760.7		760.4	760.4	760.4	760.4	760.4	760.4								
Bankfull Width (ft)	21.4	36.4	22.8	24.3	24.7	24.1		35.7	34.3	33.7	27.5	25.9	29.7		48.4	44.4	22.1	23.1	21.6	20.6		44.1	38.3	27.9	15.1	11.9	19.1								
Floodprone Width (ft)	88.1	98.7	88.6	89.9	93.5	93.5		106.1	106.7	99.6	97.2	94.6	94.6		91.3	93.7	96.5	90.8	92.6	92.6		-	-	-	-	-	-								
Bankfull Mean Depth (ft)	2.0	1.8	2.4	2.4	2.4	2.3		1.9	2.4	2.3	2.3	2.3	2.0		1.4	1.2	2.0	1.6	1.9	1.9		1.3	1.3	1.6	2.0	1.9	2.0								
Bankfull Max Depth (ft)	3.1	4.3	3.1	3.2	3.7	3.2		4.0	4.0	3.4	3.1	3.1	3.2		2.9	3.2	3.5	3.2	3.5	3.1		3.2	2.8	2.8	3.0	2.9	2.9								
Bankfull Cross Sectional Area (ft^2)	42.4	66.6	54.7	58.0	59.8	55.2		67.7	81.5	75.9	62.1	58.5	59.3		67.8	55.3	44.0	37.5	40.1	40.0		57.7	49.1	43.8	30.1	22.9	38.4								
Bankfull Width/Depth Ratio	10.8	19.9	9.5	10.2	10.2	10.5		18.8	14.4	15.0	12.2	11.5	14.9		34.5	35.8	11.1	14.2	11.6	10.6		-	-	-	-	-	-								
Bankfull Entrenchment Ratio	4.1	2.7	3.9	3.7	3.8	3.9		3.0	3.1	3.0	3.5	3.7	3.2		1.9	2.1	4.4	3.9	4.3	4.5		-	-	-	-	-	-								
Bankfull Bank Height Ratio	1.0	1.0	1.2	1.0	1.0	1.0		1.0	1.0	1.1	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0		-	-	-	-	-	-								
Cross Sectional Area between end pins (ft^2)	586.0	619.0	574.2	616.2	620.7	613.4		690.0	718.0	638.3	688.0	678.2	675.0		582.0	571.0	549.2	563.8	567.5	559.6		479.0	431.0	444.3	433.3	430.7	458.1								
d50 (mm)	-	1.4	1.6	1.6	1.6	1.7		-	-	-	-	-	-		-	-	-	-	-	-		-	-	-	-	-	-								
	Cross Section C1 (Riffle)							**Cross Section C2 (Pool)**							**Cross Section C3 (Riffle)**							**Cross Section C4 (Riffle)**													
Based on fixed baseline bankfull elevation[1]	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+							
Record elevation (datum) used	775.3	775.3	775.3	775.3	775.3	775.3		774.0	774.0	774.0	774.0	774.0	774.0		769.2	769.2	769.2	769.2	769.2	769.2		767.4	767.4	767.4	767.4	767.4	767.4								
Bankfull Width (ft)	14.0	11.7	7.6	5.8	6.7	7.2		12.9	5.9	5.5	5.2	4.9	7.4		13.5	14.1	19.0	5.8	6.8	6.3		8.9	11.2	11.9	4.6	6.7	7.4								
Floodprone Width (ft)	48.5	50.4	48.0	36.0	48.0	48.0		59.2	54.5	71.3	-	-	-		48.7	48.7	48.7	43.4	37.8	37.8		39.6	40.8	41.5	38.0	38.9	38.9								
Bankfull Mean Depth (ft)	0.9	0.8	0.8	1.0	1.3	1.2		0.9	1.1	1.4	0.6	0.8	0.9		0.6	0.4	0.4	0.7	0.6	0.8		1.0	0.8	0.9	1.1	1.1	0.9								
Bankfull Max Depth (ft)	1.8	2.1	1.5	1.6	2.0	1.9		2.0	1.9	2.0	0.9	1.1	1.5		1.1	1.2	1.2	1.0	0.9	1.0		1.7	2.6	2.4	1.7	1.9	1.6								
Bankfull Cross Sectional Area (ft^2)	12.4	9.1	6.1	5.6	8.7	8.5		12.0	6.3	7.6	3.3	4.0	6.5		7.5	5.7	8.4	3.9	3.8	4.9		8.9	9.4	10.2	5.1	7.4	7.0								
Bankfull Width/Depth Ratio	15.9	14.9	9.4	6.0	5.2	6.1		13.9	5.5	4.0	-	-	-		24.0	34.4	43.3	8.6	12.2	8.1		8.9	13.3	13.8	4.1	6.1	7.8								
Bankfull Entrenchment Ratio	3.5	4.3	6.3	6.2	7.2	6.7		4.6	9.3	12.9	-	-	-		3.6	3.5	2.6	7.5	5.6	6.0		4.4	3.7	3.5	8.3	5.8	5.3								
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.1	1.0	-	-	-		1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0								
Cross Sectional Area between end pins (ft^2)	199.0	199.0	238.1	241.9	229.0	237.4		53.0	52.0	53.5	52.1	56.8	60.3		39.0	33.0	60.7	51.9	50.4	44.6		142.0	133.0	165.1	102.7	128.8	177.3								
d50 (mm)	-	-	-	-	-	-		-	-	-	-	-	-		-	8.6	57.0	1.8	2.4	13.0		-	-	-	-	-	-								

1 = Widths and depths for monitoring resurvey will be based on the baseline bankfull datum regardless of dimensional/depositional development. Input the elevation used as the datum, which should be consistent and based on the baseline datum established. If the performer has inherited the project and cannot acquire the datum used for prior years this must be discussed with EEP. If this cannot be resolved in time for a given years report submission a footnote in this should be included that states: "It is uncertain if the monitoring datum has been consistent over the monitoring history, which may influence calculated values. Additional data from a prior performer is being acquired to provide confirmation. Values will be recalculated in a future submission based on a consistent datum if determined to be necessary."

Exhibit Table 11b.1 Monitoring Data - Stream Reach Data Summary
Valley Fields Farm/407 - Upper A: 800 feet

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)	29.1	30.1		31.0		2	33.3	33.3		33.4		2	23.2	25.6		27.4		3	16.6	18.4		20.2		2	17.8	19.4		20.9		2	17.4	19.4		21.3		2
Floodprone Width (ft)	90.0	90.7		91.4		2	90.5	108.6		126.7		2	83.2	87.5		91.5		3	>90	>90		>90		2	>90	>90		>90		2	>90	>90		>90		2
Bankfull Mean Depth (ft)	1.6	1.9		2.1		2	1.7	2.0		2.3		2	1.5	2.0		2.6		3	2.0	2.1		2.2		2	1.9	2.2		2.4		2	1.9	2.2		2.4		2
[1]Bankfull Max Depth (ft)	2.8	3.0		3.2		2	3.6	4.4		5.2		2	2.9	3.9		4.7		3	3.0	3.2		3.4		2	2.8	2.9		3.0		2	2.7	3.2		3.6		2
Bankfull Cross Sectional Area (ft^2)	50.1	55.1		60.1		2	57.4	66.9		76.4		2	35.3	52.9		68.7		3	33.4	39.4		45.4		2	34.0	42.1		50.1		2	33.1	42.4		51.6		2
Width/Depth Ratio	14.2	16.7		19.1		2	14.6	17.0		19.4		2	10.0	13.0		15.2		3	8.3	8.7		9.0		2	8.7	9.0		9.3		2	8.8	9.0		9.1		2
Entrenchment Ratio	3.0	3.0		3.0		2	2.7	3.3		3.8		2	3.2	3.4		4.0		3	4.5	5.0		5.4		2	4.3	4.7		5.1		2	4.2	4.7		5.2		2
[1]Bank Height Ratio	1.0	1.0		1.0		2	1.0	1.0		1.0		2	1.0	1.0		1.0		3	1.0	1.0		1.0		2	1.0	1.0		1.0		2	1.0	1.0		1.0		2
Profile																																				
Riffle Length (ft)	56.5	88.5		120.4		1	21.7	63.7		105.7		2	14.9	30.0		52.1			No identifiable riffles						No identifiable riffles						No identifiable riffles					
Riffle Slope (ft/ft)	0.0034	0.0034		0.0034		1	0.0032	0.0038		0.0043		2	0.0064	0.0109		0.0137																				
Pool Length (ft)	38.5	74.1		98.5		3	36.9	72.0		95.9		2	47.5	103.2		164.8			5.8	10.1		14.4		2	4.5	27.2		49.9		2	13.1	30.4		47.7		2
Pool Max depth (ft)	3.7	4.2		5.1		3	3.3	4.0		4.5		3	2.1	2.6		3.2			1.4	1.6		1.7		2	1.5	1.7		1.8		2	1.7	1.7		1.8		2
Pool Spacing (ft)	155.7	248.2		340.6		2	80.2	102.9		134.0		3	48.4	122.4		179.7			464.9	464.9		464.9		1	419.4	419.4		419.4		1	434.2	434.2		434.2		1
Pattern																																				
Channel Beltwidth (ft)	22.1	118.1	126.0	197.2	71.9	4																														
Radius of Curvature (ft)	10.1	45.7	49.2	79.8	28.5	5																														
Rc:Bankfull width (ft/ft)	0.3	1.5		2.6	1.1	6																														
Meander Wavelength (ft)	117.0	302.2	292..4	613.9	251.1	6																														
Meander Width Ratio	4.0	10.1		19.8	8.0	5																														
Additional Reach Parameters																																				
Rosgen Classification	C5						C5						C5						C5						C5						E5					
Channel Thalweg length (ft)																																				
Sinuosity (ft)	1.1						1.1						1.1						1.1						1.1						1.1					
Water Surface Slope (Channel) (ft/ft)	0.0029						0.0025						0.0002						0.0017						0.0017						0.0019					
BF slope (ft/ft)	0.0024						0.0020						0.0010						0.0010						0.0016						0.0007					
[3]Ri% / Ru% / P% / G% / S%																																				
[3]SC% / Sa% / G% / C% / B% / Be%																			3%/61%/36%/0%/0%/0%						0%/55%/43%/2%/0%/0%						0%/84%/16%/0%/0%/0%					
[3] d50 / d84 / d95 /																			1.5/3.2/5.0						3.9/15.3/35.3						0.7/2.5/11.6					
[2]% of Reach with Eroding Banks																			3.0%						3.0%						3.0%					
Channel Stability or Habitat Metric																																				
Biological or Other																																				

Shaded cells indicate that these will typically not be filled in.

1 = The distributions for these parameters can include information from both the cross-section surveys and the longitudinal profile.

2 = Proportion of reach exhibiting banks that are eroding based on the visual survey from visual assessment table

3 = Riffle, Run, Pool, Glide, Step; Silt/Clay, Sand, Gravel, Cobble, Boulder, Bedrock; dip = max pave, disp = max subpave

4. = Of value/needed only if the n exceeds 3

Exhibit Table 11b.2 Monitoring Data - Stream Reach Data Summary
Valley Fields Farm/407 - Upper A2: 1,850 feet

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)	30.1	30.8		31.1		3	27.2	28.6		29.9		2	29.7	34.0		37.3	3.8	4	23.1	23.4		23.6		3	23.4	23.9		24.4		3	21.8	23.2		24.2		3
Floodprone Width (ft)	78.6	98.6		126.6		3	87.7	89.6		91.5		2	78.6	101.4		126.7	21.1	4	>90	>90		>90		3	>90	>90		>90		3	>90	>90		>90		3
Bankfull Mean Depth (ft)	1.8	2.0		2.2		3	1.2	1.6		2.0		2	1.9	2.1		2.4	0.2	4	2.4	2.7		2.9		3	2.4	2.7		3.0		3	2.4	2.5		2.6		3
[1]Bankfull Max Depth (ft)	3.2	3.5		4.0		3	3.1	3.5		3.9		2	3.8	4.8		5.6	0.8	4	4.0	4.7		5.5		3	4.2	4.8		5.8		3	3.9	4.4		5.2		3
Bankfull Cross Sectional Area (ft^2)	55.2	62.2		69.0		3	35.5	45.2		54.8		2	59.5	71.5		79.1	9.2	4	54.6	62.2		67.7		3	57.1	65.4		72.2		3	57.5	58.9		61.6		3
Width/Depth Ratio	14.0	15.3		16.4		3	13.6	19.3		25.1		2	13.1	16.4		19.9	3.0	4	8.2	9.0		10.1		3	7.8	8.8		9.6		3	8.3	9.2		9.8		3
Entrenchment Ratio	2.5	3.2		4.1		3	3.1	3.1		3.2		2	2.5	3.0		3.4	0.4	4	3.9	4.4		5.1		3	3.8	4.3		5.0		3	4.1	4.4		5.1		3
[1]Bank Height Ratio	1.0	1.0		1.0		3	1.0	1.0		1.0		2	1.0	1.0		1.0	0.0	4	1.0	1.0		1.0		3	1.0	1.0		1.0		3	1.0	1.0		1.0		3
Profile																																				
Riffle Length (ft)	33.3	52.0		86.3		3	18.8	35.8		52.8		3	5.5	19.2		45.6			18.0	18.0		18.0		1	20.0	20.5		20.9		2	12.1	14.5		16.9		2
Riffle Slope (ft/ft)	0.002	0.009		0.01		5	0.002	0.004		0.005		5	0.006	0.07		0.2			0.008	0.008		0.008		1	0.006	0.008		0.01		2	0.01	0.03		0.06		2
Pool Length (ft)	60.8	110.4		238.6		3	77.4	141.2		405.4		3	14.0	50.9		84.7			7.1	18.6		28.7	6.9	11	9.5	18.7		26.1	4.8	14	12.9	41.1		72.0	16.8	14
Pool Max depth (ft)	4.2	5.0		5.9		11	4.6	4.9		5.4		11	1.9	3.1		4.7			1.8	3.3		4.9	1.1	11	2.0	3.3		4.6	1.0	14	1.8	2.8		4.3	0.7	14
Pool Spacing (ft)	142.7	238.0		300.6		5	50.7	142.4		244.4		5	38.2	122.3		249.5			31.3	117.8		212.4	47.8	10	27.0	110.8		224.3	52.9	13	4.8	88.9		221.9	54.4	13
Pattern																																				
Channel Beltwidth (ft)	22.1	118.1	126.0	197.2	71.9	4																														
Radius of Curvature (ft)	10.1	45.7	49.2	79.8	28.5	5																														
Rc:Bankfull width (ft/ft)	0.3	1.5		2.6	1.1	6																														
Meander Wavelength (ft)	117.0	302.2	292.4	613.9	206.7	6																														
Meander Width Ratio	3.9	9.8		19.7	8.0	5																														
Additional Reach Parameters																																				
Rosgen Classification	C5						C5						C5						C5						C5						E5					
Channel Thalweg length (ft)																																				
Sinuosity (ft)	1.18						1.18						1.18						1.18						1.18						1.18					
Water Surface Slope (Channel) (ft/ft)	0.0036						0.004						0.0035						0.0038						0.0036						0.0036					
BF slope (ft/ft)	0.0036						0.004						0.0036						0.0042						0.0037						0.0036					
[3]Ri% / Ru% / P% / G% / S%																																				
[3]SC% / Sa% / G% / C% / B% / Be%																			3%/61%/36%/0%/0%/0%						0%/55%/43%/2%/0%/0%						0%/84%/16%/0%/0%/0%					
[3]d50 / d84 / d95 /																			1.5/3.2/5.0						3.9/15.3/35.3						0.7/2.5/11.6					
[2]% of Reach with Eroding Banks																			4.1%						4.1%						3.8%					
Channel Stability or Habitat Metric																																				
Biological or Other																																				

Pattern data will not typically be collected unless visual data, dimensional data or profile data indicate significant shifts from baseline

Shaded cells indicate that these will typically not be filled in.

1 = The distributions for these parameters can include information from both the cross-section surveys and the longitudinal profile.

2 = Proportion of reach exhibiting banks that are eroding based on the visual survey from visual assessment table

3 = Riffle, Run, Pool, Glide, Step; Silt/Clay, Sand, Gravel, Cobble, Boulder, Bedrock; dip = max pave, disp = max subpave

4. = Of value/needed only if the n exceeds 3

Exhibit Table 11b.3 Monitoring Data - Stream Reach Data Summary
Valley Fields Farm/447 - Lower A: 1,400 feet

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)	30.1	30.8	31.1	31.1		3			47.1			1	27.4	35.1		42.9		2	26.1	30.6		35.0		2	26.1	27.8		29.5		2	24.8	26.9		28.9		2
Floodprone Width (ft)	78.6	98.6	90.6	126.6		3			109.3			1	87.8	105.4		122.9		2	>90	>90		>90		2	>90	>90		>90		2	>90	>90		>90		2
Bankfull Mean Depth (ft)	1.8	2.0	2.0	2.2		3			1.8			1	1.7	1.9		2.0		2	1.7	1.9		2.0		2	1.8	1.9		2.0		2	1.9	1.9		1.9		2
[1]Bankfull Max Depth (ft)	3.2	3.5	3.4	4.0		3			3.8			1	3.8	3.9		4.0		2	3.1	3.4		3.6		2	2.7	3.0		3.3		2	2.5	2.9		3.3		2
Bankfull Cross Sectional Area (ft^2)	55.2	62.2	62.5	69.0		3			85.4			1	54.7	64.4		74.0		2	44.9	57.1		69.3		2	46.7	53.3		59.9		2	47.8	51.7		55.5		2
Width/Depth Ratio	14.0	15.3	15.5	16.4		3			26.0			1	13.7	19.2		24.8		2	15.2	16.5		17.7		2	14.5	14.6		14.6		2	12.9	14.0		15.0		2
Entrenchment Ratio	2.5	3.2	3.0	4.1		3			2.3			1	2.9	3.0		3.2		2	2.6	3.0		3.4		2	3.1	3.3		3.4		2	3.1	3.4		3.6		2
[1]Bank Height Ratio	1.0	1.0	1.0	1.0		3			1.0			1	1.0	1.0		1.0		2	1.0	1.0		1.0		2	1.0	1.0		1.0		2	1.0	1.0		1.0		2
Profile																																				
Riffle Length (ft)	36.8	44.4		51.6		3							25.1	63.2		118.2									14.3	14.3		14.3		1	15.9	15.9		15.9		1
Riffle Slope (ft/ft)	0.002	0.009		0.014		5							0.002	0.006		0.017									0.005	0.005		0.005		1	0.01	0.01		0.01		1
Pool Length (ft)	89.6	119.8		152.8		3							30.7	58.4		97.7															17.8	34.1		60.0	17.2	5
Pool Max depth (ft)	4.2	5.0		5.9		11							0.9	1.2		2.1															1.1	1.4		2.1	0.4	5
Pool Spacing (ft)	142.7	238.0		300.6		5							54.0	126.7		288.6															20.7	256.3		421.5	169.4	4
Pattern																																				
Channel Beltwidth (ft)	22.1	118.1	126.0	197.2	71.9	4																														
Radius of Curvature (ft)	10.1	45.7	49.2	79.8	28.5	5																														
Rc:Bankfull width (ft/ft)	0.3	1.5		2.6	1.1	6																														
Meander Wavelength (ft)	117.0	302.2	292..4	613.9	251.1	6																														
Meander Width Ratio	3.9	9.8		19.7	8.0	5																														

Pattern data will not typically be collected unless visual data, dimensional data or profile data indicate significant shifts from baseline

No identifiable riffles or pools

No identifiable pools

Additional Reach Parameters																																				
Rosgen Classification	C5						C5						C5						C5						C5						C5					
Channel Thalweg length (ft)																																				
Sinuosity (ft)	1.14						1.14						1.14						1.14						1.14						1.14					
Water Surface Slope (Channel) (ft/ft)	0.0015						0.0004						0.002						0.0005						0.0013						0.0014					
BF slope (ft/ft)	0.002						0.002						0.0012						0.0015						0.0014						0.0017					
[3]Ri% / Ru% / P% / G% / S%																																				
[3]SC% / Sa% / G% / C% / B% / Be%																			3%/61%/36%/0%/0%/0%						0%/55%/43%/2%/0%/0%						0%/84%/16%/0%/0%/0%					
[3]d50 / d84 / d95 /																			1.5/3.2/5.0						3.9/15.3/35.3						0.7/2.5/11.6					
[2]% of Reach with Eroding Banks																			3.6%						3.6%						2.9%					
Channel Stability or Habitat Metric																																				
Biological or Other																																				

Shaded cells indicate that these will typically not be filled in.

1 = The distributions for these parameters can include information from both the cross-section surveys and the longitudinal profile.

2 = Proportion of reach exhibiting banks that are eroding based on the visual survey from visual assessment table

3 = Riffle, Run, Pool, Glide, Step; Silt/Clay, Sand, Gravel, Cobble, Boulder, Bedrock; dip = max pave, disp = max subpave

4. = Of value/needed only if the n exceeds 3

Exhibit Table 11b.4 Monitoring Data - Stream Reach Data Summary
Valley Fields Farm/407 - Upper B: 200 feet

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)			21.4			1			36.36			1	22.77	28.25		33.73		2	24.3	25.9		27.5		2	24.7	25.3		25.9		2	24.1	26.9		29.7		2
Floodprone Width (ft)			88.1			1			98.67			1	88.56	94.09		99.62		2	89.9	93.6		97.2		2	93.5	94.05		94.6		2	93.5	94.1		94.6		2
Bankfull Mean Depth (ft)			2			1			1.83			1	2.25	2.325		2.4		2	2.3	2.4		2.4		2	2.3	2.35		2.4		2	2.0	2.2		2.3		2
[1]Bankfull Max Depth (ft)			3.1			1			4.26			1	3.1	3.255		3.41		2	3.1	3.2		3.2		2	3.1	3.4		3.7		2	3.2	3.2		3.2		2
Bankfull Cross Sectional Area (ft^2)			42.4			1			66.57			1	54.67	65.27		75.87		2	58	60.1		62.1		2	58.5	59.15		59.8		2	55.2	57.3		59.3		2
Width/Depth Ratio			10.8			1			19.87			1	9.49	12.24		14.99		2	10.2	11.2		12.2		2	10.2	10.85		11.5		2	10.5	12.7		14.9		2
Entrenchment Ratio			4.1			1			2.71			1	2.95	3.42		3.89		2	3.5	3.6		3.7		2	3.7	3.75		3.8		2	3.2	3.6		3.9		2
[1]Bank Height Ratio			1.0			1			1.0			1	1.12	1.1		1.16		2	1.0	1.0		1.0		**2**	1.0	1.0		1.0		2	1.0	1.0		1.0		2
Profile																																				
Riffle Length (ft)			18.4			1													No identifiable riffles						No identifiable riffles						No identifiable riffles					
Riffle Slope (ft/ft)			5E-04			1																														
Pool Length (ft)	41.1	41.6		42.2		2			79.3			1	44.25	49.4		136.64			21.6	24.0		26.4		2	21.6	24.0		26.4		2	27.7	29.5		31.4		2
Pool Max depth (ft)	3.23	3.24		3.24		2			3.3				1.5	1.7		1.89			2.0	2.0		2.0		2	2.0	2.0		2.0		2	1.9	2.0		2.1		2
Pool Spacing (ft)			107.5			1								136.64					116.0	116.0		116.0		1	116.0	116.0		116		1	114.0	114.0		114.0		1
Pattern																																				
Channel Beltwidth (ft)	108.7	170.8	164.6	261..6	34.2	4																														
Radius of Curvature (ft)	23.8	55.4	50.5	110.1	36.2	5							Pattern data will not typically be collected unless visual data, dimensional data or profile data indicate significant shifts from baseline																							
Rc:Bankfull width (ft/ft)			2.4			6																														
Meander Wavelength (ft)	148.2	327.6	266.7	621	201.1	6																														
Meander Width Ratio			12.5			5																														
Additional Reach Parameters																																				
Rosgen Classification	E5						C5						C5						C5						C5						C5					
Channel Thalweg length (ft)																																				
Sinuosity (ft)	1.13						1.13						1.13						1.13						1.13						1.13					
Water Surface Slope (Channel) (ft/ft)	Flat						0.00004						0.0041						0.0036						0.0038						0.0029					
BF slope (ft/ft)	0.0047						0.0047						0.0033						0.0052						0.0061						0.0052					
[3]Ri% / Ru% / P% / G% / S%																																				
[3]SC% / Sa% / G% / C% / B% / Be%																			0%/61%/39%/0%/0%/0%						0%/62%/38%/0%/0%/0%						0%/59%/41%/0%/0%/0%					
[3]d50 / d84 / d95 /																			1.6/3.3/4.8						1.6/4.4/7.1						1.7/8/22					
[2]% of Reach with Eroding Banks																			15.2%						2.0%						0%					
Channel Stability or Habitat Metric																																				
Biological or Other																																				

Shaded cells indicate that these will typically not be filled in.

1 = The distributions for these parameters can include information from both the cross-section surveys and the longitudinal profile.

2 = Proportion of reach exhibiting banks that are eroding based on the visual survey from visual assessment table

3 = Riffle, Run, Pool, Glide, Step; Silt/Clay, Sand, Gravel, Cobble, Boulder, Bedrock; dip = max pave, disp = max subpave

4. = Of value/needed only if the n exceeds 3

Exhibit Table 11b.5 Monitoring Data - Stream Reach Data Summary
Valley Fields Farm/407 -Lower B: 230 feet

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)			48.4			1			44.41			1	22.1	25.0		27.9		2	23.1	23.1		23.1		1	21.6	21.6		21.6		1	20.6	20.6		20.6		1
Floodprone Width (ft)			91.3			1			93.68			1	93.9	95.2		96.5		2	90.8	90.8		90.8		1	92.6	92.6		92.6		1	92.6	92.6		92.6		1
Bankfull Mean Depth (ft)			1.4			1			1.24			1	1.6	1.8		2.0		2	1.6	1.6		1.6		1	1.9	1.9		1.9		1	1.9	1.9		1.9		1
[1]Bankfull Max Depth (ft)			2.9			1			3.17			1	2.8	3.1		3.5		2	3.2	3.2		3.2		1	3.5	3.5		3.5		1	3.1	3.1		3.1		1
Bankfull Cross Sectional Area (ft^2)			67.8			1			55.25			1	43.8	43.9		44.0		2	37.5	37.5		37.5		1	40.1	40.1		40.1		1	40	40		40		1
Width/Depth Ratio			34.5			1			35.81			1	11.1	14.5		17.8		2	14.2	14.2		14.2		1	11.6	11.6		11.6		1	10.6	10.6		10.6		1
Entrenchment Ratio			1.9			1			2.11			1	3.4	3.9		4.4		2	3.9	3.9		3.9		1	4.3	4.3		4.3		1	4.5	4.5		4.5		1
[1]Bank Height Ratio			1.0			1			1.0			1	1.0	1.0		1.0		2	1.0	1.0		1.0		1	1.0	1.0		1.0		1	1.0	1.0		1.0		1
Profile																																				
Riffle Length (ft)	14	25.5		40.2		2			23			1	10.9	19.4		29.8			21.7	21.7		21.7		1	15.0	20.5		28.0		3	7.5	12.7		16.5		3
Riffle Slope (ft/ft)	0.0027	0.00667		0.0087		2			0.005			1	0.0	0.0		0.0			0.02	0.02		0.02		1	0.02	0.04		0.07		3	0.003	0.01		0.02		3
Pool Length (ft)	19.1	20.3		21.5		2	40.2	47.1		54.1		2	27.6	59.3		99.9			No identifiable pools						16.7	16.7		16.7		1	18.3	26.4		34.4		2
Pool Max depth (ft)			4.1			1	3.9	4.2		4.4		2	1.2	1.5		1.7									1.7	1.7		1.7		1	1.3	1.3		1.3		2
Pool Spacing (ft)			88.9			1	82.4	87.8		93.1		2	54.2	99.8		145.3															60.9	60.9		60.9		1
Pattern																																				
Channel Beltwidth (ft)	108.7	170.8	164.6	261..6	34.2	4																														
Radius of Curvature (ft)	23.8	55.4	50.5	110.1	36.2	5							Pattern data will not typically be collected unless visual data, dimensional data or profile data indicate significant shifts from baseline																							
Rc:Bankfull width (ft/ft)			1.0			6																														
Meander Wavelength (ft)	148.2	327.6	266.7	621	201.1	6																														
Meander Width Ratio			5.5			5																														
Additional Reach Parameters																																				
Rosgen Classification	B5						B5						B5						B5						B5						E5					
Channel Thalweg length (ft)																																				
Sinuosity (ft)	1.17						1.17						1.17						1.17						1.17						1.17					
Water Surface Slope (Channel) (ft/ft)	0.0035						0.0027						0.0044						0.0041						0.0046						0.0047					
BF slope (ft/ft)	0.0047						0.0047						0.0021						0.0088						0.0071						0.0068					
[3]Ri% / Ru% / P% / G% / S%																																				
[3]SC% / Sa% / G% / C% / B% / Be%																			0%/61%/39%/0%/0%/0%						0%/62%/38%/0%/0%/0%						0%/59%/41%/0%/0%/0%					
[3]d50 / d84 / d95 /																			1.6/3.3/4.8						1.6/4.4/7.1						1.7/8/22					
[2]% of Reach with Eroding Banks																			22.8%						4.0%						4.00%					
Channel Stability or Habitat Metric																																				
Biological or Other																																				

Shaded cells indicate that these will typically not be filled in.

1 = The distributions for these parameters can include information from both the cross-section surveys and the longitudinal profile.

2 = Proportion of reach exhibiting banks that are eroding based on the visual survey from visual assessment table

3 = Riffle, Run, Pool, Glide, Step; Silt/Clay, Sand, Gravel, Cobble, Boulder, Bedrock; dip = max pave, disp = max subpave

4. = Of value/needed only if the n exceeds 3

Exhibit Table 11b.6 Monitoring Data - Stream Reach Data Summary
Valley Fields Farm/407 - Reach C: 1,400 feet

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)	8.9	12.1	13.5	14.0		3	11.2	12.3	11.7	14.1		3	5.5	11.0	9.7	19.0	6.0	4	4.6	5.4	5.8	5.8		3	6.7	6.7	6.7	6.8		3	6.3	7.0		7.4		3
Floodprone Width (ft)	39.6	45.6	48.5	48.7		3	40.8	46.7	48.7	50.4		3	41.5	52.4	48.3	71.3	13.0	4	36.0	39.1	38.0	43.4		3	37.8	41.6	38.9	48		3	37.8	41.6		48		3
Bankfull Mean Depth (ft)	0.6	0.8	0.9	1.0		3	0.4	0.7	0.8	0.8		3	0.4	0.9	0.8	1.4	0.4	4	0.7	0.9	1.0	1.1		3	0.6	1.0	1.1	1.3		3	0.8	1.0		1.2		3
[1]Bankfull Max Depth (ft)	1.1	1.5	1.7	1.8		3	1.2	2.0	2.1	2.6		3	1.2	1.8	1.7	2.4	0.5	4	1.0	1.4	1.6	1.7		3	0.9	1.6	1.9	2		3	1	1.5		1.9		3
Bankfull Cross Sectional Area (ft^2)	7.5	9.6	8.9	12.4		3	5.7	8.1	9.1	9.4		3	6.1	8.1	8.0	10.2	1.7	4	3.9	4.9	5.1	5.6		3	3.8	6.6	7.4	8.7		3	4.9	6.8		8.5		3
Width/Depth Ratio	8.9	16.3	15.9	24.0		3	13.3	20.9	14.9	34.4		3	4.0	17.6	11.6	43.3	17.6	4	4.1	6.2	6.0	8.6		3	5.2	7.8	6.1	12.2		3	6.1	7.3		8.1		3
Entrenchment Ratio	3.5	3.8	3.6	4.4		3	3.5	3.8	3.7	4.3		3	2.6	6.3	4.9	12.9	4.7	4	6.2	7.3	7.5	8.3		3	5.6	6.2	5.8	7.2		3	5.3	6.0		6.7		3
[1]Bank Height Ratio	1.0	1.0	1.0	1.0		3	1.0	1.0	1.0	1.0		3	1.0	1.0	1.0	1.0	0.0	4	1.0	1.0	1.0	1.0		3	1.0	1.0	1.0	1.0		**3**	1.0	1.0		1.0		3
Profile																																				
Riffle Length (ft)	21.7	41.6	36.7	90.8	23.5	7	18.8	31.3		50.4		3	2.3	22.2		51.5			11.6	18.0		24.4		2	5.1	10.7		24.0		5	7.3	13.1		19		2
Riffle Slope (ft/ft)	0.0	0.0	0.0	0.0	0.0	7	0.0	0.0		0.0		3	0.0	0.0		0.3			0.0	0.0		0.0		2	0.005	0.03		0.07		5	0.01	0.02		0.03		2
Pool Length (ft)	25.8	50.2	56.4	66.7	16.7	6	9.4	74.9		166.3		3	11.6	24.0		38.6			3.8	3.8		3.8		1	3.1	6.2		10.0		3	10.5	24.4		51.3	16.0	6
Pool Max depth (ft)	2.2	2.5	2.6	2.8	0.3	7	2.5	2.8		3.1		3	0.7	1.1		1.6			1.8	1.8		1.8		1	0.2	1.1		1.5		3	0.8	1.1		1.5	0.2	6
Pool Spacing (ft)	46.0	92.5	91.9	152.2	37.9	9	22.8	88.5		195.7		3	11.2	39.3		88.6			-	-		-		-	66.3	105		143.9		3	47.5	198.1		395.6	144.6	5
Pattern																																				
Channel Beltwidth (ft)	84.1	97.4	96.4	112.0	11.4	4																														
Radius of Curvature (ft)	20.8	32.5	30.7	59.4	16.5	5																														
Rc:Bankfull width (ft/ft)	2.3	2.7	2.3	4.2	0.9	6																														
Meander Wavelength (ft)	72.5	187.8	131.2	595.1	237.0	6																														
Meander Width Ratio	8.1	15.5	9.7	42.5	16.0	5																														
Additional Reach Parameters																																				
Rosgen Classification							C5						C5						C5						C5						E5					
Channel Thalweg length (ft)																																				
Sinuosity (ft)			1.09					1.09						1.09						1.09						1.09						1.09				
Water Surface Slope (Channel) (ft/ft)			0.0099					0.0086						0.0093						0.0093						0.0094						0.0093				
BF slope (ft/ft)			0.0095					0.0094						0.0093						0.0094						0.0095						0.0096				
[3]Ri% / Ru% / P% / G% / S%																																				
[3]SC% / Sa% / G% / C% / B% / Be%																				0%/54%/30%/9%/0%/0%						0%/46%/36%/10%/0%/0%						0%/32%/39%/5%/0%/0%				
[3]d50 / d84 / d95 /																				1.8/45/110						2.4/49/85						13/54/64				
[2]% of Reach with Eroding Banks																				0%						0%						1.3%				
Channel Stability or Habitat Metric																																				
Biological or Other																																				

Pattern data will not typically be collected unless visual data, dimensional data or profile data indicate significant shifts from baseline

Shaded cells indicate that these will typically not be filled in.

1 = The distributions for these parameters can include information from both the cross-section surveys and the longitudinal profile.

2 = Proportion of reach exhibiting banks that are eroding based on the visual survey from visual assessment table

3 = Riffle, Run, Pool, Glide, Step; Silt/Clay, Sand, Gravel, Cobble, Boulder, Bedrock; dip = max pave, disp = max subpave

4. = Of value/needed only if the n exceeds 3

APPENDIX E – HYDROLOGIC DATA

TABLE 12. VERIFICATION OF BANKFULL EVENTS

Date of Data Collection	Date of Occurrence	Method	Photo # (if available)
7/8/2010	N/A	Wrackline observed in floodplain	See MY-02 report
11/4/2010	N/A	Wrackline observed at bankfull	See MY-02 report
4/10/2011	N/A	Wrackline observed at bankfull	See MY-02 report
11/2/2011	N/A	Wrackline observed at bankfull	See MY-02 report
12/18/2014	N/A	Wracklines and flattened vegetation observed at bankfull	See MY-04 report
12/8/2015	N/A	Wracklines, flattened vegetation and sediment deposition observed at bankfull	Photos 1-3

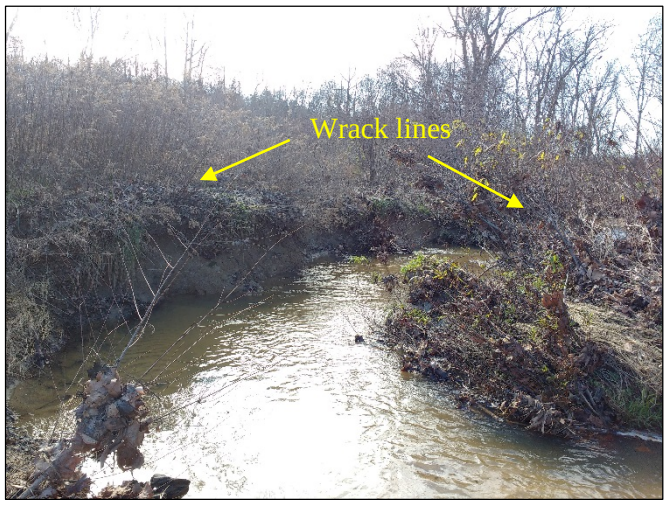


Photo 1. Wracklines along Reach A

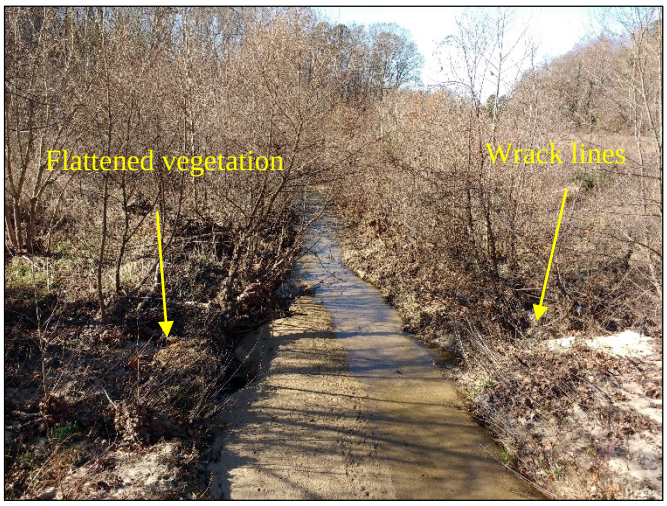


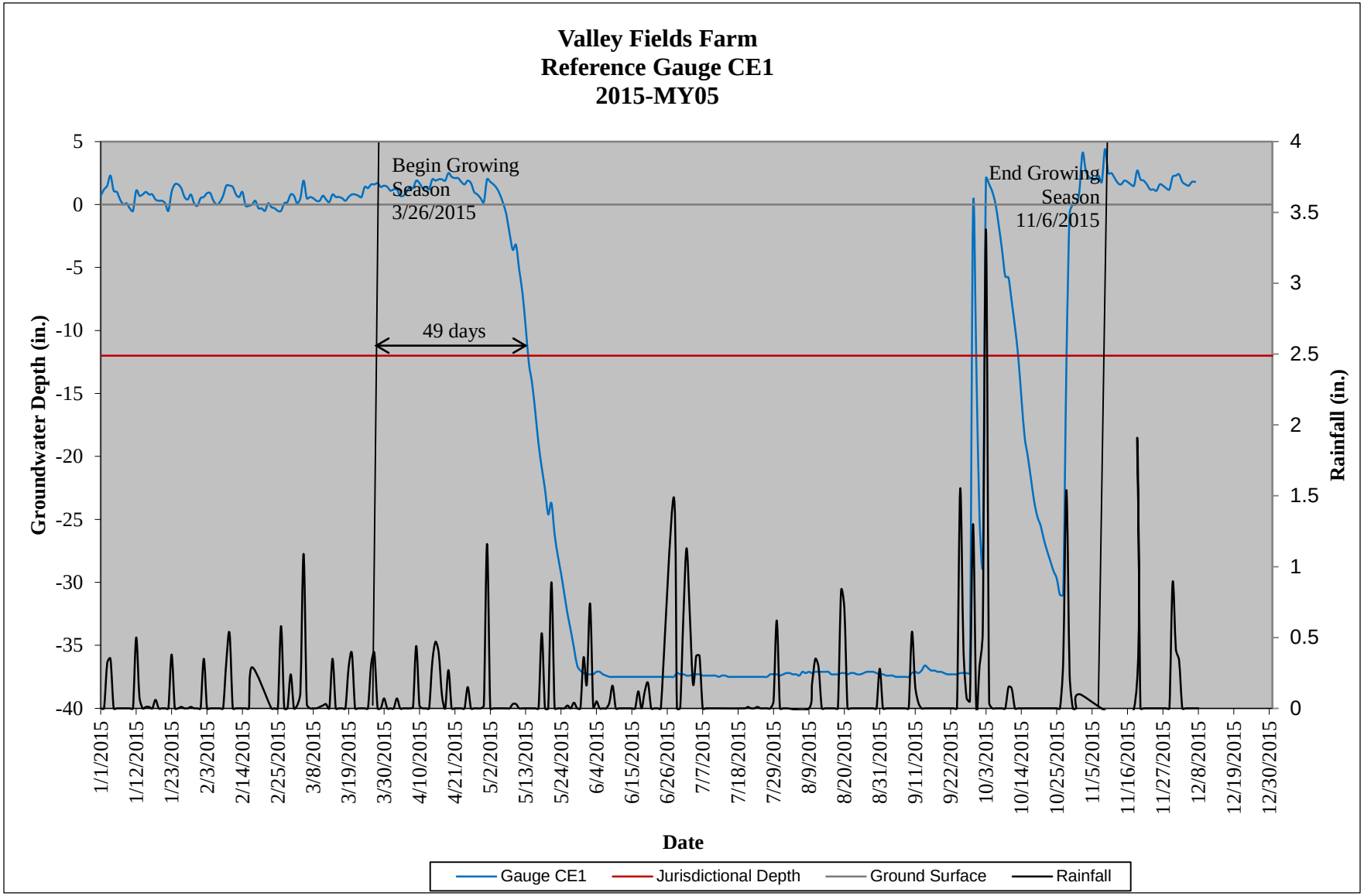
Photo 2. Wracklines and flattened vegetation along Reach B

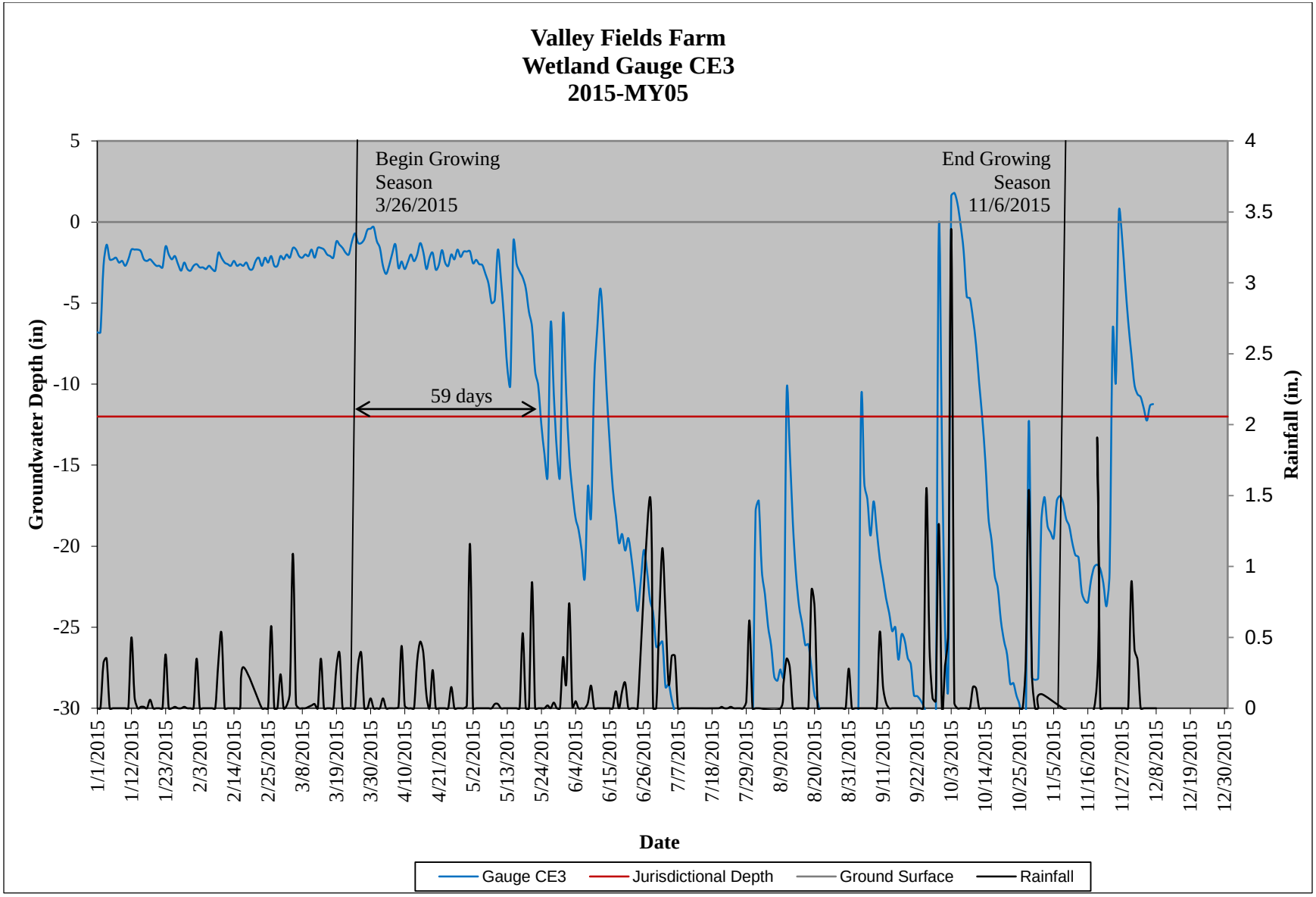
Photo 3. Wracklines along Reach C

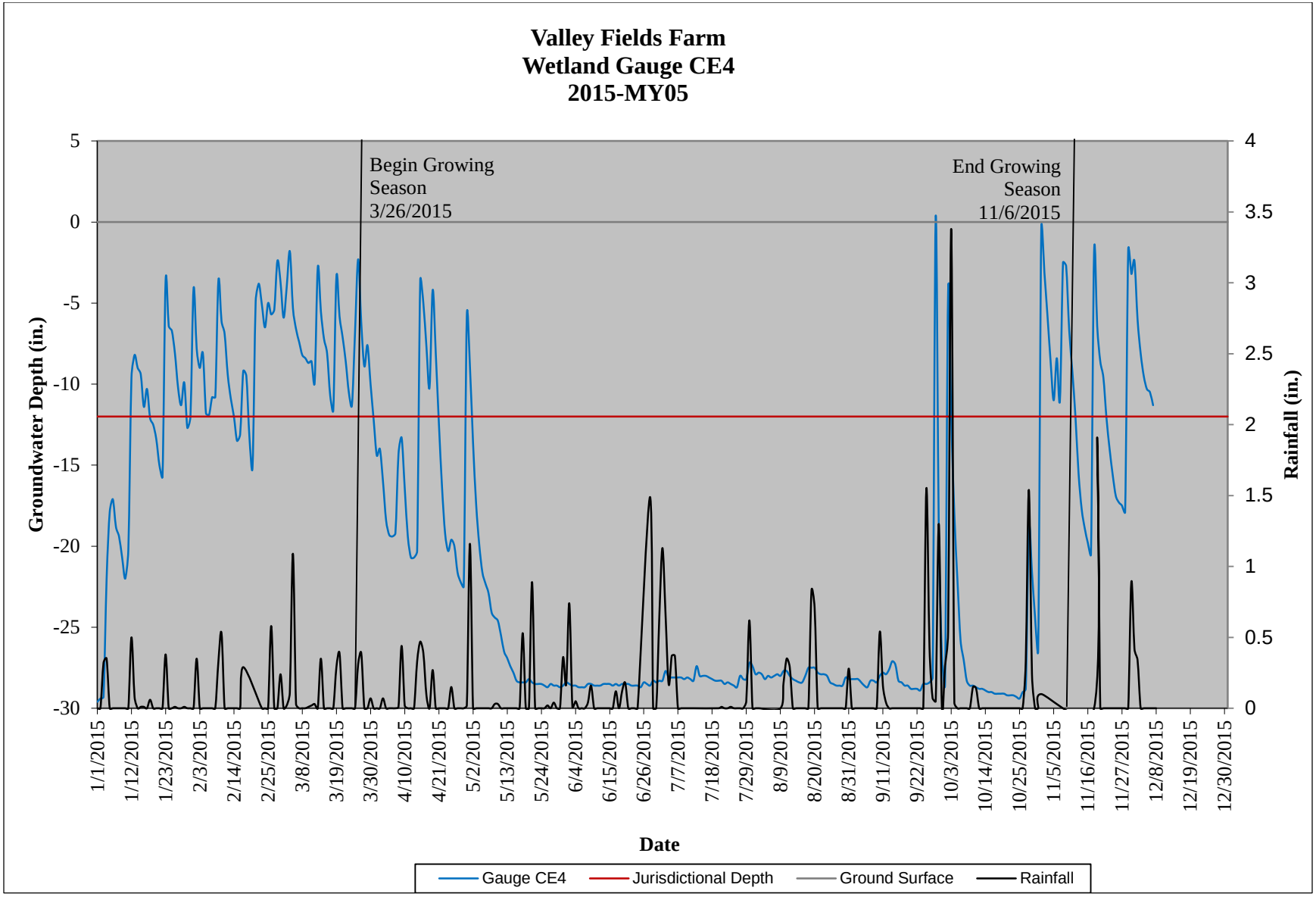
TABLE 13. WETLAND HYDROLOGY CRITERIA ATTAINMENT TABLE

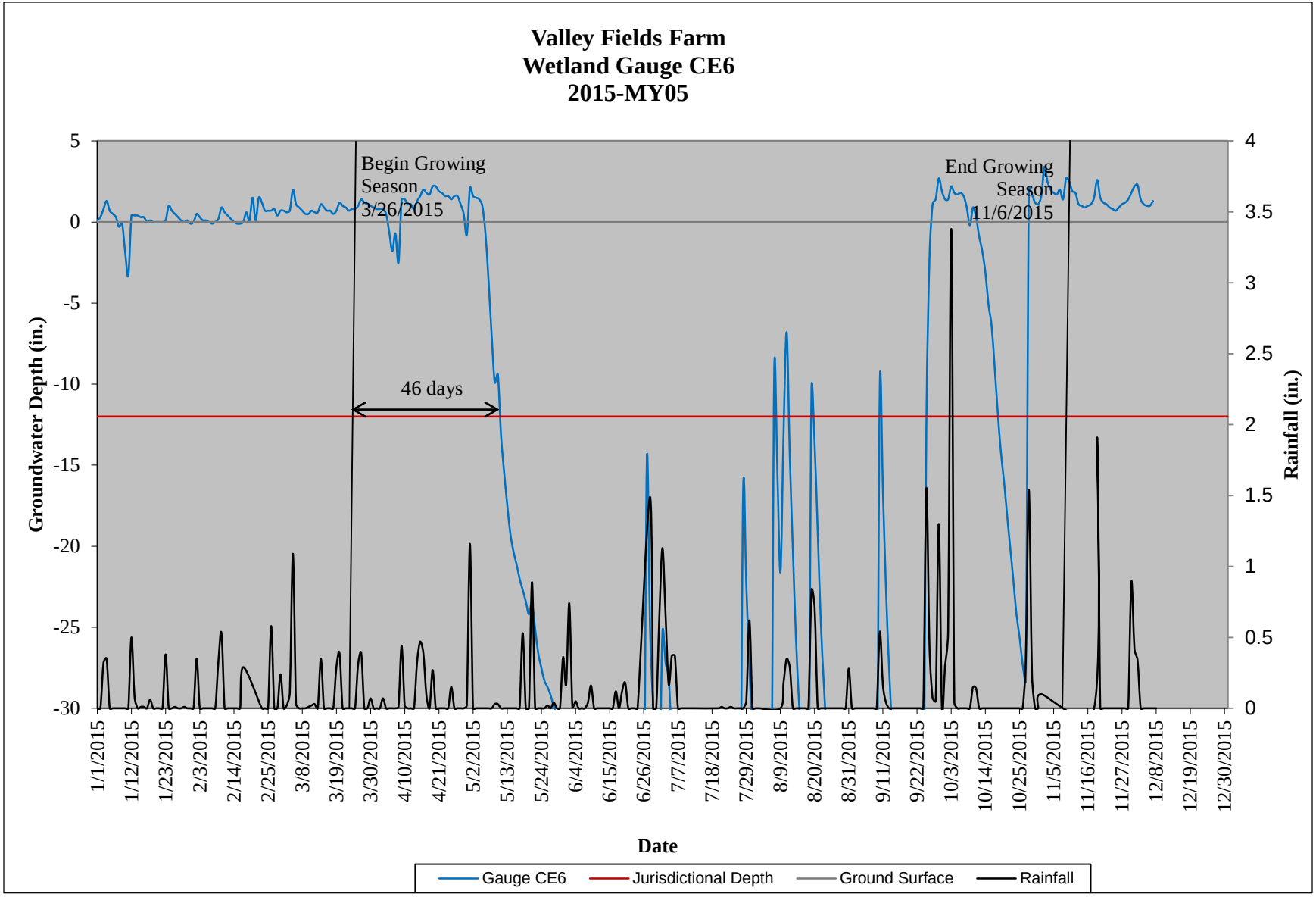
Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)					
Gauge Name	MY-01 (2010)	MY-02 (2011)	MY-03 (2013)*	MY-04 (2014)	MY-05 (2015)
CE1	Yes/103 (45.6%)	Yes/67 (29.6%)	No/0 (0%)	Yes/48 (21.2%)	Yes/49 (21.7%)
CE3	Yes/109 (48.2%)	Yes/68 (30.1%)	No/0 (0%)	Yes/59 (26.1%)	Yes/59 (26.1%)
CE4	Yes/86 (38.1%)	Yes/21 (9.3%)	No/0 (0%)	No/8 (3.5%)	No/6 (2.7%)
CE6	Yes/97 (42.9%)	Yes/38 (16.8%)	No/0 (0%)	Yes/48 (21.2%)	Yes/46 (20.4%)

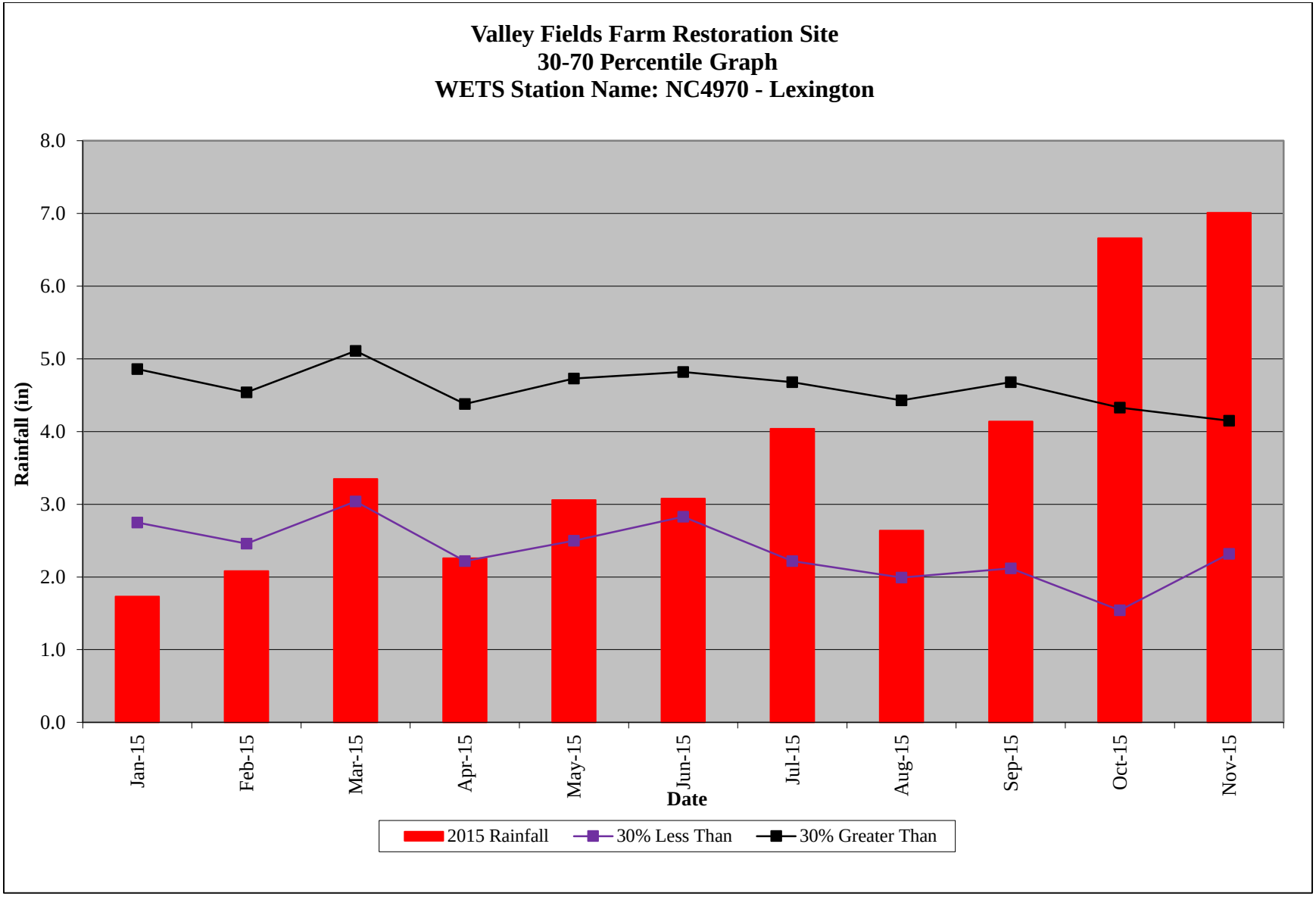
*Gauges reinstalled 9/23/2013, monitoring only occurred for 21% of MY-03 growing season


Valley Fields Farm
Reference Gauge CE1
2015-MY05
Begin Growing Season 3/26/2015
End Growing Season 11/6/2015
49 days
Groundwater Depth (in.)
Rainfall (in.)
Date
Gauge CE1
Jurisdictional Depth
Ground Surface
Rainfall


Valley Fields Farm
Wetland Gauge CE3
2015-MY05
Begin Growing Season 3/26/2015
End Growing Season 11/6/2015
59 days
Groundwater Depth (in)
Rainfall (in.)
Date
Gauge CE3
Jurisdictional Depth
Ground Surface
Rainfall


Valley Fields Farm
Wetland Gauge CE4
2015-MY05
Begin Growing Season 3/26/2015
End Growing Season 11/6/2015
Groundwater Depth (in.)
Rainfall (in.)
Date
Gauge CE4
Jurisdictional Depth
Ground Surface
Rainfall


Valley Fields Farm
Wetland Gauge CE6
2015-MY05
Begin Growing Season 3/26/2015
End Growing Season 11/6/2015
46 days
Groundwater Depth (in.)
Rainfall (in.)
Date
Gauge CE6
Jurisdictional Depth
Ground Surface
Rainfall


Valley Fields Farm Restoration Site
30-70 Percentile Graph
WETS Station Name: NC4970 - Lexington
Rainfall (in)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Jan-15
Feb-15
Mar-15
Apr-15
May-15
Jun-15
Jul-15
Aug-15
Sep-15
Oct-15
Nov-15
Date
2015 Rainfall
30% Less Than
30% Greater Than