Farrar Dairy Stream and Wetland Restoration Site
Monitoring Report – MY04
Harnett County, NC
EEP Project # 92552
EEP Contract # D06002

Submitted to:

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EXECUTIVE SUMMARY

The Farrar Dairy Stream and Wetland Restoration Site is a full-delivery project that was developed for the North Carolina Ecosystem Enhancement Program (EEP). Construction was completed in March 2009 on the North Prong of Anderson Creek (NPAC), its tributaries, and an associated Coastal Plain Small Stream Swamp wetland community. The project is located within the USGS 8-digit HUC 03030004 and the NCDWQ Sub-basin 03-06-14 in the Cape Fear River Basin. The project restored, enhanced and preserved 13,044 linear feet of channel and 112.0 acres of Coastal Plain Small Stream Swamp wetland community, generating 11,881 stream mitigation units and 64.0 wetland mitigation units. The restoration reaches utilized a combination of Priority 1 and 2 approaches. The stream design addressed vertical instability problems and a lack of bed variability by stabilizing stream banks, installing in-stream structures, adjusting stream planform, reconnecting the stream to the historic floodplain and replanting the riparian areas with native vegetation. The wetlands were restored by filling ditches, creating microtopography, and planting native trees and shrubs. This report describes the findings from the fourth year of monitoring that took place in 2012.

The riparian buffer and the restored wetlands were planted with bare root trees and shrubs, and the stream banks were planted with live stakes. Vegetation monitoring plots were established during the as-built survey and included 15 monitoring plots placed throughout the stream buffer and 30 monitoring plots installed in the restored wetland. Vegetation must meet a minimum average density of 260 stems/acre after five years. The fourth-year monitoring counted an average of 451 planted stems/acre in the stream plots and 422 planted stems/acre in the wetland plots. After the fourth-year monitoring, the vegetation component of the project is on track to meeting the success criterion.

The stream assessment completed during fourth-year monitoring found the stream to be stable and functioning properly. Channel dimensions have not changed significantly from previous monitoring. Beavers have created a series of dams on the site. Beaver management has been a continual process at this site and will continue throughout the monitoring period. These areas have been documented in the Current Condition Plan View. Due to the frequent beaver activity throughout the site, many parts of the site have had extended periods of backwater, therefore it has been difficult to determine bankfull events. From examining precipitation data in 2010 and the corresponding bankfull events, it is likely that the 2.10” rain event on March 21, 2012 and the 2.52" rain event on August 28, 2012 produced bankfull events.

During the 2012 monitoring year, wetland hydrology was achieved at six of the seven groundwater monitoring gauges in the restoration area and at the reference gauge. To meet the hydrology success criterion, the water table of the restored wetlands must be within 12” of the soil surface continuously for at least 5% (12.5 days) of the 251-day growing season during a year experiencing average rainfall.

The daily rainfall data depicted on the gauge data graphs were obtained from a local weather station and shows that the area had average rainfall during the 2012 growing season.

1.0 PROJECT BACKGROUND

Project Goals and Objectives

The goals and objectives of the restoration project are as follows:

Restoration Goals:

- Restore the site's riparian buffers and forested wetlands.
- Create a stable stream and wetland complex through an interconnected floodplain corridor.

Restoration Objectives:

- Connect the new stream planform to its original floodplain.
- Fill and plug ditches in the drained hydric soils to restore saturated hydrologic conditions to the upper soil horizons.
- Plant a functional Coastal Plain Small Swamp Stream community to create an effective riparian buffer and wetland complex.
- Exclude livestock from the riparian and wetland areas with fencing.

1.1 Project Structure, Restoration Type, and Approach

The pre-restoration channel of NPAC had been moved and channelized to maximize the use of an agricultural field adjacent to Powell Farm Road. The other significant hydrologic alterations to the site included ditched wetlands and straightened tributaries that helped convey water through the property. Due to the clearing of the riparian areas, the streams were experiencing significant bank erosion prior to restoration. In addition to the ditching that drained the historic wetlands, ponds were also built to attract migratory waterfowl. The project restored, enhanced and preserved 13,044 linear feet of channel using a combination of Priority 1 and 2 Approaches and Enhancement II, and restored, enhanced, and preserved 111.9 acres of Coastal Plain Small Stream Swamp wetland community, generating 11,881 stream mitigation units and 64.0 wetland mitigation units (Table 1).

1.1.1 Project Streams

The three design reaches of NPAC (Stations 10+00 to 76+00) were restored to C5 channels. Following a Priority 1 approach, the channel was relocated to its historic location and the bed elevation was brought up, reconnecting the stream to the original floodplain. At Station 10+00, the restored channel begins online at the culvert under Powell Farm Road. At Station 21+00, the channel leaves the pre-restoration location and was returned to the adjacent forest in the location of its historic channel. The new channel comes back online at the end of the project at Station 76+00.

T1.1 and T1.2 (Stations 80+00 to 88+25 and Stations 90+00 to 99+80, respectively) were both restored to C5/B5c headwater channels. At the confluence of these two channels, T1 begins. T1 (Stations 100+00 to 108+84) was restored using the same approach as T1.1 and T1.2. A 31'-wide easement exception occurs at Station 101+00, where a ford crossing was installed for the landowner. The restoration created a new planform, profile, and dimension and increased the sinuosity of these previously straightened channels with a combination of Priority 1 and 2 approaches. Grade control structures such as log sills and step pools were installed along the new channels to create a stable profile. This restoration also

created a bankfull bench in entrenched sections and reconnected the stream to the existing floodplain in others.

T2 was divided into two reaches based on the changing slope of the tributary. T2A (Stations 110+00 to 115+00) was restored to a C5/B5c stream and T2B (Stations 115+00 to 120+22) was restored to an E5 stream type. The hydrologic source for the channel is a seep at the top of T2A. The restoration created a new planform, profile, and dimension and increased the sinuosity of the previously straightened channel with a combination of Priority 1 and 2 approaches. Grade control structures such as log sills and step pools were installed along the new channels to create a stable profile. This restoration created a bankfull bench in some places and reconnected the stream to the existing floodplain in others.

T3 (Stations 130+00 to 141+67) is comprised of a single reach that was restored to a C5 channel. This channel was restored using a Priority 1 approach, with a new planform, profile, and dimension being reconnected to the original floodplain. Two drainage ditches that were adjacent to T3 were filled as part of the wetland restoration, reestablishing T3 as the primary hydrologic feature in this area.

T4 is separated into two reaches. The first reach (Stations 150+00 to 151+80) was enhanced (EII) by planting portions of the easement that had been logged and by removing significant amounts of logging debris that had accumulated in the channel, creating unstable conditions. The second reach (Stations 151+80 to 164+20) was preserved. Near Station 162+00, the stream flows out of the easement for approximately 100 feet, but then comes back into the easement. The stationing continues from where the stream left the easement.

1.1.2 Project Wetlands

Wetland Area 1 preserves approximately 46 acres of well-vegetated palustrine forested, scrub-shrub and emergent wetlands that are along the floodplain of the NPAC. The preservation area is dominated by various wetland sedges, rushes and persistent emergent vegetation, but also contains large scrub-shrub alder thickets that are permanently inundated.

Starting from the west and continuing to the east, Wetland Area 2 is located in the general vicinity of Tributary 1. Portions of this area, which is comprised of six wetlands separated by the restored stream, were historically cleared as part of the site's agricultural operations. This area was enhanced through the planting of bare root material. This wetland also borders the restored NPAC channel, and because NPAC has been reconnected to its floodplain, overbank flooding inundates the adjacent wetlands.

Enhancement in Wetland Area 3 took place in the central portion of the site. The wetland includes a shallow pond and adjacent overbank areas of NPAC. Wetland Area 3 is located adjacent to a section of NPAC where overbank flows will have regular access to the floodplain, thus increasing hydrology to the wetlands. This area was planted with wetland trees and shrubs and graded to eliminate the man-made berms that impounded excess surface water.

Wetland Area 4 is located in an area that was heavily manipulated by the landowner to create a series of shallow impoundments intended to attract migratory

waterfowl. Water control structures allowed the landowner to manipulate water levels within the impoundments. These impoundments were regraded to create a mosaic of vegetated wet hummocks throughout the wetland. Wetland W4 serves as a transitional area between the ponded features and the wetland preservation area. This area was planted with bare root seedlings and treated to control invasive species.

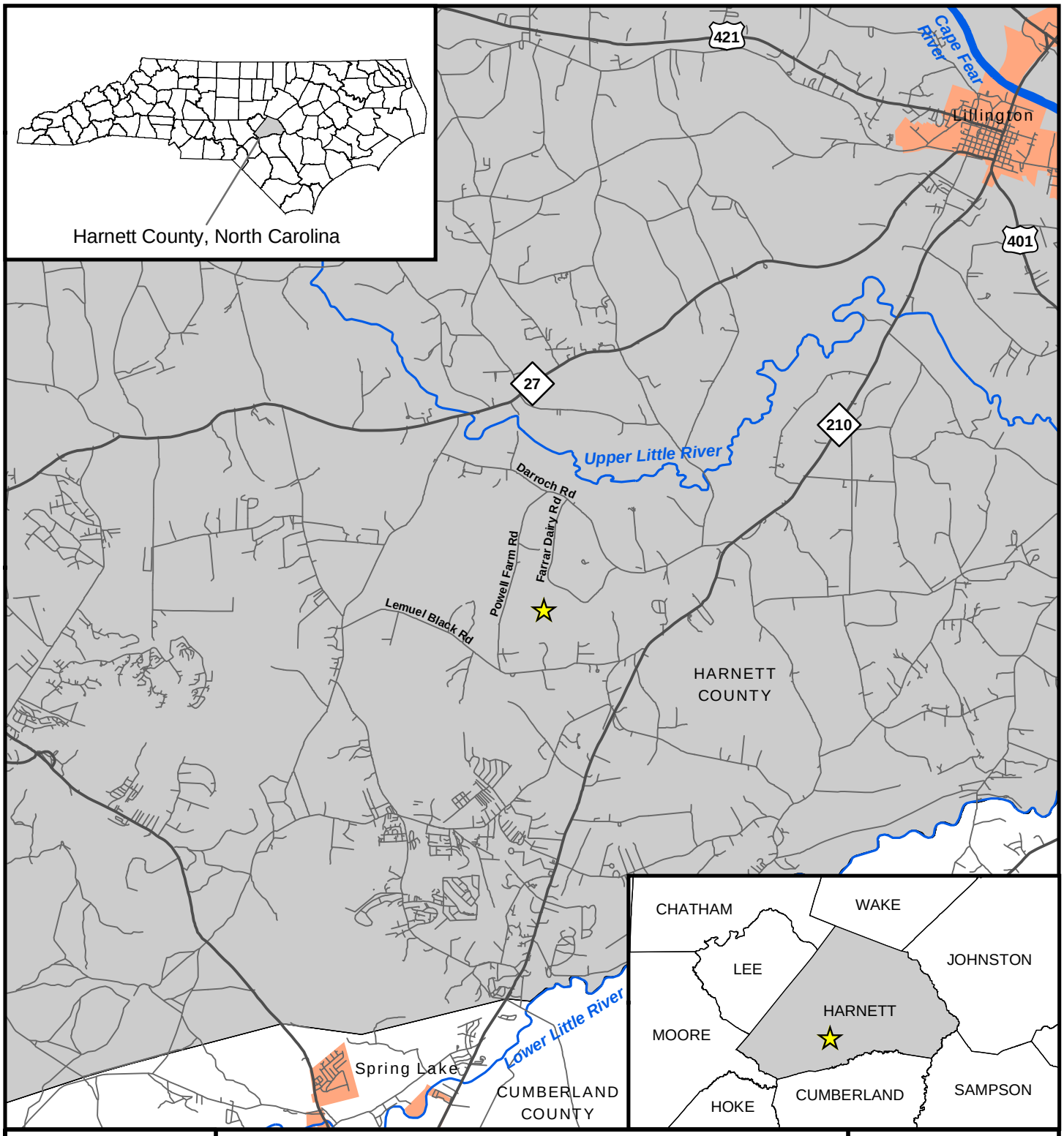
Wetland Area 5 includes all of the site's restored wetlands. These areas are within the floodplain of the NPAC and its tributaries, which had historically been hydrologically altered to allow for agricultural production. Four main construction techniques were utilized to restore these wetland areas:

1. Raising the elevation of the NPAC and its tributaries to re-establish an active floodplain connected to the adjacent wetlands.
2. Filling existing ditches and removing tile drains to discourage rapid groundwater discharge to surface water receptors.
3. Scarifying the top 0.5'of organic surface soil to re-establish soil structure and allow for increased surface storage (microtopography). This material was not removed from the site, but simply re-worked to maximize the ability of the surface soils to retain surface and groundwater hydrology.
4. Planting native species of wetland plants and shrubs.

Table 1 below provides a summary of the mitigation actions and units generated from this project.

1.2 Location and Setting

The Farrar Dairy Site is located off of Farrar Dairy Road in southern Harnett County, North Carolina, and is approximately 8.5 miles southwest of Lillington, North Carolina (Figure 1). To reach the site from Raleigh, drive south out of Raleigh on US 401 toward Fuquay-Varina, continuing south from Fuquay-Varina on US-401/US-421 toward Lillington. Turn right onto NC-210 and continue south through Lillington for approximately 6.5 miles to Darroch Road. Turn right onto Darroch Road and continue approximately 3 miles to Powell Farm Road. Turn left onto Powell Farm Road, drive approximately 1.5 miles and the entrance to the site will be on the left through the driveway of the red ranch style home.



KCI TECHNOLOGIES

Figure 1. Vicinity Map

- Project Site Location
- Major Roads
- Other Roads
- Major Rivers
- Municipalities
- County Boundaries

1:126,720
1 inch equals 2 miles
2 1 0 2 Miles

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Figure 2 - Farrar Dairy Stream and Wetland Restoration Site Map

KCI TECHNOLOGIES

Project Easement Boundary
Enhancement II
Preservation
Restoration
Other Streams
Reach Breaks

Wetland Restoration (43.8 ac)
Wetland Enhancement (22.1 ac)
Wetland Preservation (45.9 ac)

1:7,200
1 inch = 600 feet

600 300 0 600 Feet

Source: NC Statewide Orthoimagery, 2010.

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T1.1
T1.2
T1
NPAC-1
Wetland Area 2 Enhancement
Wetland Area 3 Enhancement
Wetland Area 4 Enhancement
T2A
T2B
NPAC-2
NPAC-3
T3
Wetland Area 5 Restoration
Wetland Area 1 Preservation
T4.2
T4.1

1.3 Project History and Background

Table 1. Project Restoration Components
Farrar Dairy Stream and Wetland Restoration Site

Project Streams

Project Segment / Reach ID	Pre-Restoration Feet	Type	Approach	As - Built Footage or Acreage	Stationing	Stream Mitigation Units (SMU)
NPAC	4,565	R	P1	6,746	10+00-77+46	6,714*
T1.1	864	R	P1/2	825	80+00-88+25	825
T1.2	995	R	P1/2	980	90+00-99+80	980
T1	818	R	P1/2	884	100+00-108+84	853*
T2A	977	R	P1/2	500	110+00-115+00	500
T2B		R	P1/2	522	115+00-120+22	522
T3	1,335	R	P1	1,167	130+00-141+67	1,167
T4.1	180	E II	-	180	150+00-151+80	72
T4.2	1,240	P	-	1,240	151+80-164+20	248
TOTAL				**13,044**		**11,881**

R = Restoration P1 = Priority 1
E= Enhancement II P2 = Priority 2
P= Preservation
* Easement exceptions for landowner ford crossings were excluded for these calculations.

Project Wetlands

Project Segment	Type	Acreage	Community Type	Wetland Mitigation Units (WMU)
Area 1	P	45.93	Coastal Plain Small Stream Swamp	9.19
Area 2	E	6.88	Coastal Plain Small Stream Swamp	3.44
Area 3	E	2.57	Coastal Plain Small Stream Swamp	1.29
Area 4	E	12.67	Coastal Plain Small Stream Swamp	6.34
Area 5	R	43.8	Coastal Plain Small Stream Swamp	43.8
TOTAL		**111.85**		**64.06**

Table 2. Project Activity and Reporting History Farrar Dairy Stream and Wetland Restoration		
Activity or Report	**Data Collection Complete**	**Completion or Delivery**
Restoration Plan	2007	May 08
Final Design	2007	May 08
Construction	N/A	Mar 09
Planting	N/A	Jan 09
Mitigation Plan / As-Built (Year 0 Monitoring - Baseline)	May 09	Jun 09
Year 1 Monitoring	Dec 09	Dec 09
Year 2 Monitoring	Dec 10	Dec 10
Year 3 Monitoring	Oct 11	Dec 11
Year 4 Monitoring	July-Aug 12	Dec 12

Table 3. Project Contact Table Farrar Dairy Stream and Wetland Restoration	
Design Firm	KCI Associates of North Carolina Landmark Center II, Suite 220 4601 Six Forks Rd. Raleigh, NC 27609 Contact: Mr. Tim Morris Phone: (919) 278-2512 Fax: (919) 783-9266
Construction Contractor	Land Mechanics, Inc. 126 Circle G Lane Willow Springs, NC 27592 Contact: Mr. Lloyd Glover Phone: (919) 639-6132 Fax: (919) 639-7079
Planting Contractor	Bruton Nurseries and Landscapes PO Box 1197 Freemont, NC 27830 Contact: Mr. Charlie Bruton Phone: (919) 242-6555
Monitoring Performers	
MY-00 - MY-05	KCI Associates of North Carolina 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 Background Table	
Farrar Dairy Stream and Wetland Restoration Site	
Project County	Harnett County
Physiographic Region	Coastal Plain
Ecoregion	Sand Hills
Project River Basin	Cape Fear
USGS HUC for Project and Reference	03030004110010 (Anderson Creek)
	03030004150050 (Little Rockfish Creek - reference)
	03030002050100 (UT to Wilkinson Creek - reference)
NCDWQ Sub-basin for Project and Reference	03-06-14 (Anderson Creek)
	03-06-15 (Little Rockfish Creek - reference)
	03-06-04 (UT to Wilkinson Creek - reference)
Drainage Area	5.7 sq. mi.
Stream Order	First and Second Order
Watershed Type (Rural, Urban, Developing, etc.)	Rural
Watershed LULC Distribution Urban	<1%
Ag-Row Crop	21%
Ag-Livestock	1%
Forested	72%
Water/Wetlands	6%
Watershed impervious cover (%)	3%
Rosgen Classification of As-built (Stream)	C5 (NPAC)
	C5/B5c (T1.1, T1.2, T1, T2A, T2B, T3, T4)
NCDWQ Classification for Project	Class C (Anderson Creek)
Within EEP Watershed Plan?	No
Any portion of the project segment upstream of a 303d listed segment?	No
Reasons for 303d Listing or Stressor	N/A
Total project acreage of easement	166.9 Acres
Total planted acreage	93.0 Acres
WRC Class (Warm, Cool, Cold)	Warm
Species of concern, endangered etc.	None
Pre-construction Beaver activity?	Yes
Dominant Soil Types	Wehadkee loam and Gilead sandy loam
% of Project Easement Fenced	85%

2.0 PROJECT CONDITIONS AND MONITORING RESULTS

2.1 Vegetation Assessment

The planted vegetation on the site is growing well. The low base flow throughout the summer months has allowed vegetation to become established in the stream channels on T1.1, T1.2, T1, T2, and T3.

There are isolated populations of invasive species at the site, but no areas of significant concern. Invasive species will be treated as they become problematic.

The monitored vegetation plots revealed that the planted vegetation is growing well with an average of 451 and 422 stems/acre within the stream buffer and wetlands, respectively. There are six monitoring plots that have calculated planted stem densities less than 260 stems/acre; two in the stream buffer (Plot 3 and 11) and three in the restored wetland (Plot 27, 32, 38, and 45). This is not seen as problematic given the high potential for desirable volunteers to become established in the plots and across the site. Like natural vegetative communities, some areas will have slightly higher densities than others, but the data from the vegetation monitoring plots reveal that the site has an adequate average stem density. To ensure continued vegetative success, some parts of the site

received supplemental planting in early 2011 and 2012. The overall vegetation assessment found the site to be on track to meeting the vegetative success criterion.

The vegetative monitoring results are displayed in Appendix A, and the Current Condition Plan View (CCPV). See Section 4.0 for additional maintenance details concerning invasive control and additional planting.

2.2 Stream Assessment

As has occurred in previous dry summers, vegetation has grown into the active channel along some streams, predominantly the smaller tributaries. Overall, this vegetation is contributing to stream stability by trapping fine materials and rooting into the erosive silt and clay bottom in these channels. Vegetated headwater channels are typical of small stream swamp communities without developed canopies. It is expected that as the channels receive more shade, the herbaceous vegetation in the channel bottom will decrease.

The stream assessment found the project streams to be stable. T1.1 and T1 had experienced isolated bed degradation during the first year of monitoring, but no further migration has been shown since. The additional log sills installed in 2010 in T1 are intact and holding grade. As previously reported a few of these new structures are piping during low flow conditions. This is not problematic and will not lead to a destabilizing stream. The monitored stream profiles, particularly those on NPAC, show yearly variation, but this is not an indicator of instability. For active sand bed systems, such as these, this type of variation is expected as sand moves through the system. All of these stream features will continue to be monitored to make sure that any observed changes are within the range of variability found in stable stream systems.

The stream monitoring data are described in Appendix B. The stream maintenance from 2011 is described in Section 4.0 and shown in the CCPV.

2.2.1 Bankfull Events

Table 5. Hydrological (Bankfull) Verifications
Farrar Dairy Stream and Wetland Restoration Site

Date of Data Collection	Date of Occurrence	Method	Photo Number	Rainfall Event
3/5/2010	1/21/2010	automated stream gauge	N/A	1.84"
3/5/2010	2/6/2010	automated stream gauge	N/A	1.79"
3/21/2012	3/21/2012	N/A	N/A	2.10"
8/28/2012	8/28/2012	N/A	N/A	2.52"

Due to the frequent beaver activity throughout the site, many parts of the site have had extended periods of backwater. Combined with large precipitation events, there have been instances (at least two in 2012) where flows have gone out of the bankfull channel in 2012, but it is difficult to determine if these events are true bankfull events. From examining precipitation data in 2010 and the corresponding bankfull events, it is likely that the 2.10” rain event on March 21, 2012 and 2.52" rain event on August 28, 2012 produced bankfull events.

2.2.2 Quantitative Measures Summary Tables

Table 6a. NPAC-1 Baseline Stream Summary
Farrar Dairy Site

Parameter	Pre-Existing Condition					Reference Reach(es) Data					Design		As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	Min	Max	Min	Mean	Max	n
Bankfull Width (ft)	13.9	16.9	14.8	24.3	4	19.5	20.3		21.0	2	19.0		18.4	19.6	20.7	4
Floodprone Width (ft)	20	32	24	60	4			300		2	>60		>60	>60	>60	4
Bankfull Mean Depth (ft)	1.2	1.9	2.1	2.2	4			2.3		2	1.6		1.4	1.5	1.6	4
Bankfull Max Depth (ft)	2.5	2.7	2.7	3.0	4	3.0	3.3		3.5	2	2.4		2.3	2.5	2.7	4
Bankfull Cross-Sectional Area (ft^2)	30.0	30.2	30.2	30.2	4	45.4	47.3		49.1	2	30.0		26.5	29.1	32.2	4
Width/Depth Ratio	6.4	10.1	7.3	19.6	4	8.4	8.8		9.1	2	12.0		12.4	13.2	14.4	4
Entrenchment Ratio	1.3	2.3	1.8	4.3	4	14.3	14.9		15.4	2	>3.0		>3.0	>3.0	>3.0	4
Bank Height Ratio	1.0	1.9	2.1	2.5	4			1.0		2	1.0		1.0	1.0	1.0	4
Pattern																
Channel Beltwidth (ft)	*					25			36		35	60	35		60	
Radius of Curvature (ft)	*					22			36		20	35	20		35	
Rc:Bankfull width (ft/ft)	*					1.0			1.8		1.1	1.8	1.0		1.8	
Meander Wavelength (ft)	*					119			325		95	150	95		150	
Meander Width Ratio	*					1.2			1.8		1.8	3.2	1.8		3.1	
Profile																
Riffle Length (ft)													11	24	38	20
Riffle Slope (ft/ft)	0.0030			0.0210		0.0010			0.0080		0.0034	0.0059	0.0007	0.0034	0.0098	20
Pool Length (ft)	8			42		27			81		20	40	9	30	57	20
Pool Spacing (ft)	60			97		68			123		65	95	62	79	99	20
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / B% / Be%	0% / 100% / 0% / 0% / 0% / 0%					6% / 81% / 15% / 0% / 0% / 0%							7% / 57% / 32% / 3% / 0% / 1%			
d16 / d35 / d50 / d84 / d95 (mm)						0.0 / 0.18 / 0.25 / 1.8 / 9.0							0.12 / 0.28 / 0.42 / 11 / 45			
Additional Reach Parameters																
Channel length (ft)	2,179					620					4,541		4,528			
Drainage Area (SM)	3.92					16.48					3.92		3.92			
Rosgen Classification	C/E5					E5					C5		C5			
Sinuosity	1.00					1.30					1.30		1.39			
Water Surface Slope (ft/ft)	0.0040					0.0020					0.0020		0.0020			

*There was no defined pattern for the NPAC due to the stream being channelized.
-The As-built Dimension is from the monitored riffle cross-sections on this reach.
-The As-built Pattern and Profile data were calculated from the monitored longitudinal profile for NPAC, which contains parts of both NPAC 1 and 2.

Table 6b. NPAC-2 Baseline Stream Summary
Farrar Dairy Site

Parameter	Pre-Existing Condition					Reference Reach(es) Data					Design		As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	Min	Max	Min	Mean	Max	n
Bankfull Width (ft)			13.2		1	19.5	20.3		21.0	2	19.6		19.5	21.1	22.6	2
Floodprone Width (ft)			>75		1			300		2	>60		>60	>60	>60	2
Bankfull Mean Depth (ft)			2.4		1			2.3		2	1.6		1.6	1.7	1.8	2
Bankfull Max Depth (ft)			3.9		1	3.0	3.3		3.5	2	2.4		2.7	3.1	3.4	2
Bankfull Cross-Sectional Area (ft^2)			31.2		1	45.4	47.3		49.1	2	32.0		35.8	35.9	35.9	2
Width/Depth Ratio			5.6		1	8.4	8.8		9.1	2	12.0		10.6	12.5	14.3	2
Entrenchment Ratio			5.7		1	14.3	14.9		15.4	2	>3.0		>3.0	>3.0	>3.0	2
Bank Height Ratio			1.0		1			1.0		2	1.0		1.0	1.0	1.0	2
Pattern																
Channel Beltwidth (ft)	*					25			36		35	60	35		60	
Radius of Curvature (ft)	*					22			36		20	35	20		35	
Rc:Bankfull width (ft/ft)	*					1.0			1.8		1.0	1.8	1.0		1.7	
Meander Wavelength (ft)	*					119			325		95	150	95		150	
Meander Width Ratio	*					1.2			1.8		1.8	3.1	1.7		2.8	
Profile																
Riffle Length (ft)													7	22	29	7
Riffle Slope (ft/ft)	0.0030			0.0210		0.0010			0.0080		0.0037	0.0075	0.0007	0.0099	0.0236	7
Pool Length (ft)	8			42		27			81		20	40	14	23	41	8
Pool Spacing (ft)	60			97		68			123		50	80	61	74	93	8
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / B% / Be%	0% / 100% / 0% / 0% / 0% / 0%					6% / 81% / 15% / 0% / 0% / 0%							21% / 45% / 31% / 2% / 0% / 0%			
d16 / d35 / d50 / d84 / d95 (mm)						0.0 / 0.18 / 0.25 / 1.8 / 9.0							0.062 / 0.11 / 0.32 / 17 / 35			
Additional Reach Parameters																
Channel length (ft)	985					620					1,185		1,212			
Drainage Area (SM)	4.65					16.48					4.65		4.65			
Rosgen Classification	C/E5					E5					C5		C5			
Sinuosity	1.00					1.30					1.30		1.25			
Water Surface Slope (ft/ft)	0.0040					0.0020					0.0030		0.0039			

*There was no defined pattern for the NPAC due to the stream being channelized.

-The As-built Dimension is from the monitored riffle cross-sections on this reach.

-The As-built Pattern and Profile data were calculated from the monitored longitudinal profile for NPAC, which contains parts of both NPAC 1 and 2.

Table 6c. NPAC-3 Baseline Stream Summary
Farrar Dairy Site

Parameter	Pre-Existing Condition					Reference Reach(es) Data					Design		As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	Min	Max	Min	Mean	Max	n
Bankfull Width (ft)			13.2		1	19.5	20.3		21.0	2	21.0			24.2		1
Floodprone Width (ft)			>75		1			300		2	>60			>60		1
Bankfull Mean Depth (ft)			2.4		1			2.3		2	1.7			2.3		1
Bankfull Max Depth (ft)			3.9		1	3.0	3.3		3.5	2	2.6			3.6		1
Bankfull Cross-Sectional Area (ft^2)			31.2		1	45.4	47.3		49.1	2	36.7			55.8		1
Width/Depth Ratio			5.6		1	8.4	8.8		9.1	2	12.0			10.5		1
Entrenchment Ratio			5.7		1	14.3	14.9		15.4	2	>3.0			>3.0		1
Bank Height Ratio			1.0		1			1.0		2	1.0			1.0		1
Pattern																
Channel Beltwidth (ft)	*					25			36		35	60	35		60	
Radius of Curvature (ft)	*					22			36		20	35	22		36	
Rc:Bankfull width (ft/ft)	*					1.0			1.8		1.0	1.7	0.9		1.5	
Meander Wavelength (ft)	*					119			325		105	265	105		265	
Meander Width Ratio	*					1.2			1.8		1.7	2.9	1.4		2.5	
Profile																
Riffle Length (ft)																
Riffle Slope (ft/ft)	0.0030			0.0210		0.0010			0.0080		0.0040	0.0054				
Pool Length (ft)	8			42		27			81		10	40				
Pool Spacing (ft)	60			97		68			123		85	145				
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / B% / Be%	0% / 100% / 0% / 0% / 0% / 0%					6% / 81% / 15% / 0% / 0% / 0%							21% / 45% / 31% / 2% / 0% / 0%			
d16 / d35 / d50 / d84 / d95 (mm)						0.0 / 0.18 / 0.25 / 1.8 / 9.0							0.062 / 0.11 / 0.32 / 17 / 35			
Additional Reach Parameters																
Channel length (ft)	880					620					998		1,006			
Drainage Area (SM)	4.82					16.48					4.82		4.82			
Rosgen Classification	C/E5					E5					C5		C5			
Sinuosity	1.00					1.30					1.30		1.09			
Water Surface Slope (ft/ft)	0.0040					0.0020					0.0030					

*There was no defined pattern for the NPAC due to the stream being channelized.
-The As-built Dimension is from the monitored riffle cross-sections on this reach.
-The As-built survey was completed on NPAC-3, but the monitored detailed longitudinal profile for NPAC does not run through NPAC-3.

Table 6d. Trib 1.1 Baseline Stream Summary
Farrar Dairy Site

Parameter	Pre-Existing Condition					Reference Reach(es) Data					Design		As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	Min	Max	Min	Mean	Max	n
Bankfull Width (ft)	3.5	4.3		5.0	2	7.7	7.9	7.7	8.3	3	4.5		5.9	6.4	6.9	2
Floodprone Width (ft)	6	11		15	2	13	14	13	16	3	>9		16	23	29	2
Bankfull Mean Depth (ft)	0.4	0.5		0.6	2	0.7	0.8	0.8	0.9	3	0.5		0.3	0.4	0.4	2
Bankfull Max Depth (ft)	0.9	1.0		1.1	2	1.1	1.3	1.3	1.4	3	0.7		0.6	0.7	0.7	2
Bankfull Cross-Sectional Area (ft^2)	2.0	2.0		2.0	2	6.1	6.4	6.2	7.0	3	2.0		2.3	2.4	2.4	2
Width/Depth Ratio	6.2	9.4		12.5	2	8.5	9.8	9.6	11.4	3	10.0		15.1	17.5	19.8	2
Entrenchment Ratio	1.7	7.4		13.0	2	1.6	1.9	2.1	2.1	3	>2		2.3	3.6	4.9	2
Bank Height Ratio	1.7	3.1		4.4	2			1.0		3	1.0		1.0	1.0	1.0	2
Pattern																
Channel Beltwidth (ft)	10			21				22			13	17	13		17	
Radius of Curvature (ft)	6			13		11			23		8	13	8		13	
Rc:Bankfull width (ft/ft)	0.7			2.5		1.0			3.0		1.8	2.9	1.3		2.0	
Meander Wavelength (ft)	42			44		49			59		30	45	30		45	
Meander Width Ratio	1.1			4.1		2.0			2.9		2.9	3.8	2.0		2.7	
.																
Riffle Length (ft)	#												8	14	21	22
Riffle Slope (ft/ft)	#					0.0120			0.0280		0.0170	0.0180	0	0.0144	0.0380	22
Pool Length (ft)	#					5			9		2	5	2	5	7	21
Pool Spacing (ft)	#										15	30	19	25	31	21
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / B% / Be%	0% / 100% / 0% / 0% / 0% / 0%					0% / 100% / 0% / 0% / 0% / 0%							13% / 64% / 23% / 0% / 0% / 0%			
d16 / d35 / d50 / d84 / d95 (mm)													0.07 / 0.14 / 0.29 / 8.6 / 15			
Additional Reach Parameters																
Channel length (ft)	864					204					827		825			
Drainage Area (SM)	0.02					0.15					0.02		0.02			
Rosgen Classification	G5					B4c					C5/B5c		C5			
Sinuosity	1.12					1.20					1.13		1.12			
Water Surface Slope (ft/ft)	0.0240					0.0120					0.0140		0.0131			

No flow during survey, therefore these dimensions were not recorded.

Table 6e. Trib 1.2 Baseline Stream Summary
Farrar Dairy Site

Parameter	Pre-Existing Condition					Reference Reach(es) Data					Design		As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	Min	Max	Min	Mean	Max	n
Bankfull Width (ft)	3.6	5.0		6.4	2	7.7	7.9	7.7	8.3	3	7.6		6.9	7.6	8.3	2
Floodprone Width (ft)	7	34		60	2	13	14	13	16	3	>15.2		26	36	46	2
Bankfull Mean Depth (ft)	0.9	1.3		1.6	2	0.7	0.8	0.8	0.9	3	0.8		0.7	0.8	0.8	2
Bankfull Max Depth (ft)	2.1	2.2		2.2	2	1.1	1.3	1.3	1.4	3	1.2		1.2	1.2	1.2	2
Bankfull Cross-Sectional Area (ft^2)	5.8	5.8		5.8	2	6.1	6.4	6.2	7.0	3	5.8		5.2	5.5	5.7	2
Width/Depth Ratio	2.2	4.7		7.1	2	8.5	9.8	9.6	11.4	3	10.0		9.2	10.7	12.1	2
Entrenchment Ratio	2.0	5.7		9.4	2	1.6	1.9	2.1	2.1	3	>2		3.8	4.7	5.5	2
Bank Height Ratio	1.1	1.6		2.0	2			1.0		3	1.0		1.0	1.0	1.0	2
Pattern																
Channel Beltwidth (ft)	22			34				22			17	26	17		26	
Radius of Curvature (ft)	8			11		11			23		13	20	13		20	
Rc:Bankfull width (ft/ft)	1.4			3.7		1.0			3.0		1.7	2.6	1.7		2.6	
Meander Wavelength (ft)	54			74		49			59		54	75	54		75	
Meander Width Ratio	3.9			11.3		2.0			2.9		2.2	3.4	2.2		3.4	
Profile																
Riffle Length (ft)	#												21	25	35	14
Riffle Slope (ft/ft)	#					0.0120			0.0280		0.0150	0.0180	0.0115	0.0178	0.0234	14
Pool Length (ft)	#					5			9		4	9	3	6	13	14
Pool Spacing (ft)	#										20	40	29	37	50	14
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / B% / Be%	0% / 100% / 0% / 0% / 0% / 0%					0% / 100% / 0% / 0% / 0% / 0%							22% / 76% / 3% / 0% / 0% / 0%			
d16 / d35 / d50 / d84 / d95 (mm)													0.062 / 0.079 / 0.1 / 0.22 / 0.44			
Additional Reach Parameters																
Channel length (ft)	1,006					620					986		980			
Drainage Area (SM)	0.10					16.48					0.10		0.10			
Rosgen Classification	G5					E5					C5/B5c		C5/B5c			
Sinuosity	1.10					1.30					1.14		1.14			
Water Surface Slope (ft/ft)	0.0130					0.0020					0.0130		0.0142			

No flow during survey, therefore these dimensions were not recorded.

Table 6f. Trib 1 Baseline Stream Summary
Farrar Dairy Site

Parameter	Pre-Existing Condition					Reference Reach(es) Data					Design		As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	Min	Max	Min	Mean	Max	n
Bankfull Width (ft)	^					7.7	7.9	7.7	8.3	3	10.0		8.6	9.5	10.3	2
Floodprone Width (ft)	^					13	14	13	16	3	>20		>60	>60	>60	2
Bankfull Mean Depth (ft)	^					0.7	0.8	0.8	0.9	3	1.0		0.9	1.0	1.0	2
Bankfull Max Depth (ft)	^					1.1	1.3	1.3	1.4	3	1.6		1.7	1.8	1.9	2
Bankfull Cross-Sectional Area (ft^2)	^					6.1	6.4	6.2	7.0	3	10.0		8.2	9.0	9.7	2
Width/Depth Ratio	^					8.5	9.8	9.6	11.4	3	10.0		9.0	10.0	10.9	2
Entrenchment Ratio	^					1.6	1.9	2.1	2.1	3	>2		>3.0	>3.0	>3.0	2
Bank Height Ratio	^							1.0		3	1.0		1.0	1.0	1.0	2
Pattern																
Channel Beltwidth (ft)	8			16				22			23	40	23		40	
Radius of Curvature (ft)	6			20		11			23		15	25	15		25	
Rc:Bankfull width (ft/ft)	^					1.0			3.0		1.5	2.5	1.6		2.6	
Meander Wavelength (ft)	22			50		49			59		55	90	55		90	
Meander Width Ratio	^					2.0			2.9		2.3	4.0	2.4		4.2	
Profile																
Riffle Length (ft)	^												6	24	37	12
Riffle Slope (ft/ft)	^					0.0120			0.0280		0.0150	0.0180	0.0077	0.0184	0.0350	12
Pool Length (ft)	^					5			9		5	12	3	9	21	9
Pool Spacing (ft)	^										35	55	37	46	59	9
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / B% / Be%	0% / 100% / 0% / 0% / 0% / 0%					0% / 100% / 0% / 0% / 0% / 0%							22% / 76% / 3% / 0% / 0% / 0%			
d16 / d35 / d50 / d84 / d95 (mm)													0.062 / 0.079 / 0.1 / 0.22 / 0.44			
Additional Reach Parameters																
Channel length (ft)	370					620					881		884			
Drainage Area (SM)	0.18					16.48					0.18		0.18			
Rosgen Classification	DA5					E5					C5/B5c		C5/B5c			
Sinuosity	1.19					1.30					1.22		1.21			
Water Surface Slope (ft/ft)	0.0100					0.0020					0.0110		0.0112			

^ These existing conditions data were not collected on T1.

Table 6g. Trib 2A Baseline Stream Summary
Farrar Dairy Site

Parameter	Pre-Existing Condition					Reference Reach(es) Data					Design		As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	Min	Max	Min	Mean	Max	n
Bankfull Width (ft)			3.6		1	7.7	7.9	7.7	8.3	3	5.0			5.7		1
Floodprone Width (ft)			4		1	13	14	13	16	3	>10			30		1
Bankfull Mean Depth (ft)			0.7		1	0.7	0.8	0.8	0.9	3	0.5			0.5		1
Bankfull Max Depth (ft)			1.0		1	1.1	1.3	1.3	1.4	3	0.8			0.8		1
Bankfull Cross-Sectional Area (ft^2)			2.5		1	6.1	6.4	6.2	7.0	3	2.5			2.8		1
Width/Depth Ratio			5.2		1	8.5	9.8	9.6	11.4	3	10.0			11.6		1
Entrenchment Ratio			1.1		1	1.6	1.9	2.1	2.1	3	>2			5.3		1
Bank Height Ratio			3.5		1			1.0		3	1.0			1.0		1
Pattern																
Channel Beltwidth (ft)	*							22			11	17	11		17	
Radius of Curvature (ft)	*					11			23		8	10	8		10	
Rc:Bankfull width (ft/ft)	*					1.0			3.0		1.6	2.0	1.4		1.8	
Meander Wavelength (ft)	*					49			59		35	45	35		45	
Meander Width Ratio	*					2.0			2.9		2.2	3.4	1.9		3.0	
Profile																
Riffle Length (ft)	#												8	15	28	17
Riffle Slope (ft/ft)	#					0.012			0.028		0.016	0.018	#	#	#	#
Pool Length (ft)	#					5			9		2	6	2	7	28	17
Pool Spacing (ft)	#										15	25	14	31	70	17
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / B% / Be%	0% / 100% / 0% / 0% / 0% / 0%					0% / 100% / 0% / 0% / 0% / 0%							22% / 76% / 3% / 0% / 0% / 0%			
d16 / d35 / d50 / d84 / d95 (mm)													0.062 / 0.079 / 0.1 / 0.22 / 0.44			
Additional Reach Parameters																
Channel length (ft)	423					620					500		500			
Drainage Area (SM)	0.04					16.48					0.04		0.04			
Rosgen Classification	G5					E5					C5/B5c		C5/B5c			
Sinuosity	1.00					1.30					1.16		1.13			
Water Surface Slope (ft/ft)	0.0260					0.0020					0.0180		#			

No flow during survey, therefore these dimensions were not recorded.
*There was no defined pattern for T2 due to the stream being channelized.

Table 6h. Trib 2B Baseline Stream Summary
Farrar Dairy Site

Parameter	Pre-Existing Condition					Reference Reach(es) Data					Design		As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	Min	Max	Min	Mean	Max	n
Bankfull Width (ft)			4.5		1	6.7	7.2	7.1	7.9	3	5.3			5.2		1
Floodprone Width (ft)			8		1	34	63	68	88	3	>25			>60		1
Bankfull Mean Depth (ft)			0.6		1	0.7	0.9	0.9	1.0	3	0.5			0.5		1
Bankfull Max Depth (ft)			0.9		1	1.1	1.2	1.1	1.3	3	0.8			0.8		1
Bankfull Cross-Sectional Area (ft^2)			2.5		1	5.7	6.1	5.8	6.7	3	2.6			2.5		1
Width/Depth Ratio			8.1		1	7.4	8.9	8.0	11.3	3	11.0			10.8		1
Entrenchment Ratio			1.8		1	4.9	8.8	8.6	13	3	>2.4			>3.0		1
Bank Height Ratio			3.2		1			1.0		3	1.0			1.0		1
Pattern																
Channel Beltwidth (ft)	*					15			48		23	40	23		40	
Radius of Curvature (ft)	*					21			47		15	20	15		20	
Rc:Bankfull width (ft/ft)	*					2.7			7.0		2.8	3.8	2.9		3.8	
Meander Wavelength (ft)	*					43			84		70	90	70		90	
Meander Width Ratio	*					1.9			7.2		4.3	7.5	4.4		7.7	
Profile																
Riffle Length (ft)	#												8	15	28	17
Riffle Slope (ft/ft)	#										0.0090	0.0170	#	#	#	#
Pool Length (ft)	#										10	30	2	7	28	17
Pool Spacing (ft)	#							45			30	40	14	31	70	17
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / B% / Be%	0% / 100% / 0% / 0% / 0% / 0%					0% / 100% / 0% / 0% / 0% / 0%							22% / 76% / 3% / 0% / 0% / 0%			
d16 / d35 / d50 / d84 / d95 (mm)						0.28 / 0.37 / 0.44 / 0.82 / 0.97							0.062 / 0.079 / 0.1 / 0.22 / 0.44			
Additional Reach Parameters																
Channel length (ft)	554					529					509		522			
Drainage Area (SM)	0.04					0.35					0.04		0.04			
Rosgen Classification	G5					E5					E5		E5			
Sinuosity	1.22					1.30					1.22		1.23			
Water Surface Slope (ft/ft)	0.0080					0.0070					0.0080		#			

*There was no defined pattern for T2 due to the stream being channelized.

No flow during survey, therefore these dimensions were not recorded.

Table 6i. Trib 3 Baseline Stream Summary
Farrar Dairy Site

Parameter	Pre-Existing Condition					Reference Reach(es) Data					Design		As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	Min	Max	Min	Mean	Max	n
Bankfull Width (ft)	12.3	15.9		19.5	2	19.5	20.3		21.0	2	15.5		14.9	16.7	18.4	2
Floodprone Width (ft)	50			>70	2			300		2	>31		>60	>60	>60	2
Bankfull Mean Depth (ft)	1.0	1.3		1.6	2			2.3		2	1.3		1.2	1.2	1.2	2
Bankfull Max Depth (ft)	2.3	2.8		3.2	2	3.0	3.3		3.5	2	2.0		1.9	1.9	1.9	2
Bankfull Cross-Sectional Area (ft^2)	20.0	20.1		20.1	2	45.4	47.3		49.1	2	20.0		18.4	19.9	21.4	2
Width/Depth Ratio	7.6	13.3		18.9	2	8.4	8.8		9.1	2	12.0		12.1	14.0	15.8	2
Entrenchment Ratio	3.6	3.9		4.1	2	14.3	14.9		15.4	2	>2		>3	>3	>3	2
Bank Height Ratio	1.0	1.2		1.4	2			1.0		2	1.0		1.0	1.0	1.0	2
Pattern																
Channel Beltwidth (ft)	*					25			36		35	45	35		45	
Radius of Curvature (ft)	*					22			36		20	28	20		28	
Rc:Bankfull width (ft/ft)	*					1.0			1.8		1.3	1.8	1.2		1.7	
Meander Wavelength (ft)	*					119			325		80	125	80		125	
Meander Width Ratio	*					1.2			1.8		2.3	2.9	2.1		2.7	
Profile																
Riffle Length (ft)	#												12	21	35	11
Riffle Slope (ft/ft)	#					0.0130			0.0280		0.0020	0.0050	0.0000	0.0023	0.0058	11
Pool Length (ft)	#					3			25		12	20	3	13	21	9
Pool Spacing (ft)	#					30			59		45	70	45	64	115	9
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / B% / Be%	0% / 100% / 0% / 0% / 0% / 0%					6% / 81% / 15% / 0% / 0% / 0%							22% / 76% / 3% / 0% / 0% / 0%			
d16 / d35 / d50 / d84 / d95 (mm)						0.0 / 0.18 / 0.25 / 1.8 / 9.0							0.062 / 0.079 / 0.1 / 0.22 / 0.44			
Additional Reach Parameters																
Channel length (ft)	1,335					620					1,151		1,167			
Drainage Area (SM)	0.39					16.48					0.39		0.39			
Rosgen Classification	C5/E5					E5					C5		C5			
Sinuosity	1.00					1.30					1.17		1.17			
Water Surface Slope (ft/ft)	0.0020					0.0020					0.0030		0.0211			

*There was no defined pattern for T3 due to the stream being channelized.

No flow during survey, therefore these dimensions were not recorded.

Table 7a. Morphology and Hydraulic Monitoring Summary
Farrar Dairy Site

Parameter	Cross-Section 1						Cross-Section 2						Cross-Section 3					
	NPAC 1						NPAC 1						NPAC 1					
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5
Bankfull Width (ft)	19.6	20.0	18.5	19.2	18.5		20.9	23.9	24.8	22.3	21.1		19.6	16.0	16.0	18.9	19.2	
Floodprone Width (ft)	>60	>60	>60	>60	>60		-	-	-	-	-		>60	>60	>60	>60	>60	
Bankfull Cross-Sectional Area (ft^2)	31.0	31.7	31.6	32.4	31.0		29.2	28.8	32.9	31.1	31.6		26.6	19.9	19.9	23.4	24.0	
Bankfull Mean Depth (ft)	1.6	1.6	1.7	1.7	1.7		1.4	1.2	1.3	1.4	1.5		1.4	1.2	1.2	1.3	1.2	
Bankfull Maximum Depth (ft)	2.4	2.7	2.9	3.2	3.2		3.3	3.2	3.3	3.3	3.5		2.5	2.0	2.3	2.3	2.3	
Width/Depth Ratio	12.4	12.6	10.8	11.4	11.1		-	-	-	-	-		14.4	12.9	12.9	15.3	15.4	
Entrenchment Ratio	>3.0	>3.0	>3.0	>3.0	>3.0		-	-	-	-	-		>3.0	>3.0	>3.0	>3.0	>3.0	
Bank Height Ratio	1.0	1.0	1.0	1.0	1.0		-	-	-	-	-		1.0	1.0	1.0	1.0	1.0	
Wetted Perimeter (ft)	20.5	20.9	19.6	20.4	19.8		22.3	25.0	26.8	20.7	22.9		20.5	16.9	17.9	21.7	20.0	
Hydraulic Radius (ft)	1.5	1.5	1.6	1.6	1.6		1.3	1.2	1.2	1.4	1.4		1.3	1.2	1.2	1.2	1.2	
Substrate																		
d50 (mm)	0.07	0.06	0.06	0.06	0.13		0.09	0.14	0.28	0.06	0.43		0.06	0.18	0.062	0.06	0.07	
d84 (mm)	0.22	0.11	0.11	0.10	0.22		0.65	0.49	3.70	0.26	3.40		0.11	0.44	0.09	0.06	0.11	

Table 7b. Morphology and Hydraulic Monitoring Summary
Farrar Dairy Site

Parameter	Cross-Section 4						Cross-Section 5						Cross-Section 6					
	NPAC 1						NPAC 1						NPAC 1					
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5
Bankfull Width (ft)	18.9	18.5	18.6	18.3	19.0		18.4	18.0	18.0	17.9	19.1		20.4	18.6	20.4	21.1	20.8	
Floodprone Width (ft)	-	-	-	-	-		>60	>60	>60	>60	>60		-	-	-	-	-	
Bankfull Cross-Sectional Area (ft^2)	24.7	26.7	28.7	24.5	21.3		26.5	24.6	24.6	26.7	31.5		26.6	25.1	28.1	27.2	27.8	
Bankfull Mean Depth (ft)	1.3	1.4	1.5	1.3	1.1		1.4	1.4	1.4	1.5	1.6		1.3	1.5	1.4	1.3	1.3	
Bankfull Maximum Depth (ft)	2.8	3.2	3.0	2.7	2.5		2.3	2.3	2.9	2.7	2.9		3.0	3.1	3.5	3.3	3.5	
Width/Depth Ratio	-	-	-	-	-		12.8	13.1	13.1	12.0	11.6		-	-	-	-	-	
Entrenchment Ratio	-	-	-	-	-		>3.0	>3.0	>3.0	>3.0	>3.0		-	-	-	-	-	
Bank Height Ratio	-	-	-	-	-		1.0	1.0	1.0	1.0	1.0		-	-	-	-	-	
Wetted Perimeter (ft)	20.9	20.1	20.8	19.6	20.6		19.2	22.2	22.0	17.7	19.9		22.0	19.9	22.1	22.7	20.4	
Hydraulic Radius (ft)	1.2	1.3	1.4	1.3	1.0		1.4	1.1	1.1	1.3	1.6		1.2	1.3	1.3	1.2	1.4	
Substrate																		
d50 (mm)	0.54	0.11	0.10	0.11	0.11		0.09	0.09	0.21	0.20	0.09		0.12	0.07	0.073	0.06	0.13	
d84 (mm)	0.82	0.40	0.34	0.36	0.33		0.37	0.38	0.38	0.37	0.23		0.29	0.26	0.14	0.06	0.27	

Table 7c. Morphology and Hydraulic Monitoring Summary Farrar Dairy Site																		
Parameter	Cross-Section 7						*Cross-Section 8						Cross-Section 9					
	NPAC-1						NPAC-2						NPAC-2					
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5
Bankfull Width (ft)	20.7	20.0	20.9	20.3	20.6		19.5	18.9	19.2	21.2	20.7		22.9	22.2	24.7	23.3	23.2	
Floodprone Width (ft)	>60	>60	>60	>60	>60		>60	>60	>60	>60	>60		-	-	-	-	-	
Bankfull Cross-Sectional Area (ft^2)	32.2	30.7	33.6	33.5	32.5		35.9	35.0	36.0	28.0	29.9		36.0	34.3	36.7	31.9	34.6	
Bankfull Mean Depth (ft)	1.6	1.5	1.6	1.7	1.6		1.8	1.9	1.9	1.3	1.4		1.6	1.5	1.5	1.4	1.5	
Bankfull Maximum Depth (ft)	2.7	2.9	3.2	3.4	3.2		3.4	3.6	3.9	2.7	2.9		3.4	3.2	4.2	3.6	3.7	
Width/Depth Ratio	13.3	13.0	13.0	12.3	13.1		10.6	10.2	10.2	16.1	14.3		-	-	-	-	-	
Entrenchment Ratio	>3.0	>3.0	>3.0	>3.0	>3.0		>3.0	>3.0	>3.0	>3.0	>3.0		-	-	-	-	-	
Bank Height Ratio	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0		-	-	-	-	-	
Wetted Perimeter (ft)	21.5	21.0	22.1	21.6	21.7		24.9	20.6	20.9	22.0	18.0		24.5	23.9	27.1	25.1	25.2	
Hydraulic Radius (ft)	1.5	1.5	1.5	1.6	1.5		1.4	1.7	1.7	1.3	1.6		1.5	1.4	1.4	1.3	1.4	
Substrate																		
d50 (mm)	0.06	0.06	0.06	0.06	0.06		0.06	0.06	0.06	57	35		0.11	0.29	0.17	1.20	0.19	
d84 (mm)	0.10	0.10	0.06	0.06	0.06		0.07	0.10	0.09	110	69		0.66	0.69	0.23	1.80	0.44	

* In 2011, a constructed riffle was installed at XS8 due to stream maintenance issues.

Table 7d. Morphology and Hydraulic Monitoring Summary Farrar Dairy Site																		
Parameter	Cross-Section 10						Cross-Section 11						Cross-Section 12					
	NPAC-2						NPAC-3						NPAC-3					
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5
Bankfull Width (ft)	22.6	21.0	20.2	19.7	19.3		24.2	21.6	23.9	23.9	24.3		22.3	21.0	22.8	22.7	22.6	
Floodprone Width (ft)	>60	>60	>60	>60	>60		>60	>60	>60	>60	>60		-	-	-	-	-	
Bankfull Cross-Sectional Area (ft^2)	35.8	34.0	31.3	28.0	29.9		55.8	53.1	59.8	54.9	60.4		42.0	38.0	50.9	49.0	49.9	
Bankfull Mean Depth (ft)	1.6	1.6	1.5	1.4	1.6		2.3	2.2	2.5	2.3	2.5		1.9	1.8	2.2	2.2	2.2	
Bankfull Maximum Depth (ft)	2.7	2.8	2.7	2.6	2.7		3.6	3.5	4.0	3.6	4.2		3.2	3.5	4.5	4.4	4.6	
Width/Depth Ratio	14.3	13.0	13.0	13.9	12.4		10.5	8.7	9.6	10.4	9.8		-	-	-	-	-	
Entrenchment Ratio	>3.0	>3.0	>3.0	>3.0	>3.0		>3.0	>3.0	>3.0	>3.0	>3.0		-	-	-	-	-	
Bank Height Ratio	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0		-	-	-	-	-	
Wetted Perimeter (ft)	23.7	22.0	21.4	20.7	20.2		23.5	23.1	25.8	25.5	26.0		23.9	23.0	25.3	24.9	24.8	
Hydraulic Radius (ft)	1.5	1.5	1.5	1.4	1.5		2.3	2.3	2.3	2.1	2.3		1.8	1.7	2.0	2.0	2.0	
Substrate																		
d50 (mm)	0.06	0.49	0.35	0.32	0.22		0.71	0.29	0.15	0.07	0.06		1.40	0.23	0.09	0.08	0.35	
d84 (mm)	3.10	9.60	18.0	8.90	0.39		0.90	0.44	0.21	0.12	0.62		3.00	0.40	0.11	0.11	0.45	

Table 7e. Morphology and Hydraulic Monitoring Summary
Farrar Dairy Site

Parameter	Cross-Section 13						Cross-Section 14						Cross-Section 15					
	T1.1						T1.1						T1.1					
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5
Bankfull Width (ft)	6.9	8.0	7.2	7.4	7.7		7.1	6.9	7.3	7.6	7.6		5.9	5.8	6.5	6.0	6.5	
Floodprone Width (ft)	16	16	16	16	16		-	-	-	-	-		29	30	30	30	30	
Bankfull Cross-Sectional Area (ft^2)	2.4	2.8	2.8	2.8	2.7		5.1	5.2	5.5	5.4	5.4		2.3	2.5	2.2	2.1	2.8	
Bankfull Mean Depth (ft)	0.3	0.4	0.4	0.4	0.4		0.7	0.7	0.8	0.7	0.7		0.4	0.4	0.3	0.4	0.4	
Bankfull Maximum Depth (ft)	0.7	0.7	0.8	0.7	0.8		1.3	1.3	1.5	1.3	1.5		0.6	0.7	0.6	0.6	0.7	
Width/Depth Ratio	19.8	22.9	18.5	19.6	21.9		-	-	-	-	-		15.1	13.2	13.2	17.1	15.2	
Entrenchment Ratio	2.3	2.0	2.2	2.2	2.1		-	-	-	-	-		4.9	5.2	5.2	5.1	4.6	
Bank Height Ratio	1.0	1.0	1.0	1.0	1.0		-	-	-	-	-		1.0	1.0	1.1	1.1	1.0	
Wetted Perimeter (ft)	7.1	8.2	7.3	7.6	7.9		7.7	7.6	8.3	8.2	7.5		6.1	6.0	6.0	6.2	6.7	
Hydraulic Radius (ft)	0.3	0.3	0.4	0.4	0.3		0.7	0.7	0.7	0.7	0.7		0.4	0.4	0.4	0.3	0.4	
Substrate																		
d50 (mm)	0.06	0.06	0.06	0.06	0.06		0.06	0.06	0.06	0.06	0.06		0.06	0.06	0.06	0.06	0.06	
d84 (mm)	0.07	0.06	0.06	0.06	0.50		0.06	37.00	0.06	0.06	0.06		0.09	11.00	0.48	0.50	13.00	

Table 7f. Morphology and Hydraulic Monitoring Summary
Farrar Dairy Site

Parameter	Cross-Section 16						Cross-Section 17						Cross-Section 18					
	T1.2						T1.2						T1.2					
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5
Bankfull Width (ft)	8.9	9.2	9.3	9.0	8.8		8.3	8.5	8.5	8.2	8.7		6.9	6.9	7.0	6.9	6.7	
Floodprone Width (ft)	-	-	-	-	-		46	46	46	46	46		26	26	26	26	26	
Bankfull Cross-Sectional Area (ft^2)	6.4	6.8	6.8	6.4	6.4		5.7	5.8	5.7	5.4	5.7		5.2	5.1	5.6	5.1	4.6	
Bankfull Mean Depth (ft)	0.7	0.7	0.7	0.7	0.7		0.7	0.7	0.7	0.7	0.7		0.8	0.7	0.8	0.7	0.7	
Bankfull Maximum Depth (ft)	1.6	1.4	1.5	1.4	1.3		1.2	1.2	1.3	1.1	1.2		1.2	1.2	1.3	1.2	1.2	
Width/Depth Ratio	-	-	-	-	-		12.1	12.5	12.7	12.5	11.6		9.2	9.3	8.8	9.3	9.8	
Entrenchment Ratio	-	-	-	-	-		5.5	5.4	5.4	5.6	5.7		3.8	3.8	3.7	3.8	3.5	
Bank Height Ratio	-	-	-	-	-		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Wetted Perimeter (ft)	9.5	9.7	10.9	9.5	9.2		8.7	8.9	8.9	8.6	8.4		7.5	7.5	7.7	7.5	7.2	
Hydraulic Radius (ft)	0.7	0.7	0.7	0.7	0.7		0.6	0.7	0.6	0.6	0.7		0.7	0.7	0.7	0.7	0.6	
Substrate																		
d50 (mm)	0.31	0.12	0.30	0.31	0.13		0.06	0.06	0.06	0.06	0.06		0.06	0.25	0.28	0.26	0.79	
d84 (mm)	0.48	0.35	0.42	0.43	2.00		0.08	44.00	0.42	0.37	1.40		0.10	0.65	0.42	0.41	3.40	

Table 7g. Morphology and Hydraulic Monitoring Summary
Farrar Dairy Site

Parameter	Cross-Section 19						Cross-Section 20						Cross-Section 21					
	T1						T1						T1					
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5
Bankfull Width (ft)	9.5	10.5	9.3	10.6	10.6		10.3	9.1	8.9	8.9	12.1		8.6	10.1	10.1	13.5	14.1	
Floodprone Width (ft)	-	-	-	-	-		>60	>60	>60	>60	>60		>60	>60	>60	>60	>60	
Bankfull Cross-Sectional Area (ft^2)	10.9	12.0	10.8	11.7	10.3		9.7	8.3	8.5	8.1	10.2		8.2	9.9	10.3	11.3	11.1	
Bankfull Mean Depth (ft)	1.1	1.1	1.2	0.9	1.0		0.9	0.9	1.0	0.9	0.8		1.0	1.0	1.0	0.8	0.8	
Bankfull Maximum Depth (ft)	2.4	2.5	2.3	2.1	1.8		1.9	1.8	1.9	1.8	2.0		1.7	1.8	1.8	1.6	1.8	
Width/Depth Ratio	-	-	-	-	-		10.9	10.1	12.0	9.8	15.1		9.0	10.3	9.9	16.1	17.9	
Entrenchment Ratio	-	-	-	-	-		>3.0	>3.0	>3.0	>3.0	>3.0		>3.0	>30	>30	>30	>30	
Bank Height Ratio	-	-	-	-	-		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Wetted Perimeter (ft)	10.7	11.8	10.5	15.3	8.9		11.2	10.0	11.7	10.9	10.5		9.5	10.9	10.9	14.1	14.7	
Hydraulic Radius (ft)	1.0	1.0	1.0	0.8	1.2		0.9	0.8	0.8	0.8	0.9		0.9	0.9	0.9	0.8	0.8	
Substrate																		
d50 (mm)	0.06	0.06	0.33	0.33	0.26		0.062	0.06	0.06	0.06	0.16		0.53	0.06	0.3	0.06	0.062	
d84 (mm)	0.12	0.06	0.44	0.44	0.44		0.10	0.06	0.33	0.06	2.40		2.0	7.3	0.44	0.21	1.10	

Table 7h. Morphology and Hydraulic Monitoring Summary
Farrar Dairy Site

Parameter	Cross-Section 22						Cross-Section 23						Cross-Section 24					
	T2						T2						T2					
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5
Bankfull Width (ft)	7.5	7.5	8.9	8.5	8.4		5.7	5.9	6.0	6.8	6.8		7.1	6.5	7.7	6.9	9.0	
Floodprone Width (ft)	-	-	-	-	-		30	31	31	31	30		-	-	-	-	-	
Bankfull Cross-Sectional Area (ft^2)	5.1	5.0	5.5	5.6	5.8		2.8	2.8	2.9	3.4	2.5		4.2	3.9	4.5	4.1	4.7	
Bankfull Mean Depth (ft)	0.7	0.7	0.6	0.7	0.7		0.5	0.5	0.5	0.5	0.4		0.6	0.6	0.6	0.6	0.5	
Bankfull Maximum Depth (ft)	1.1	1.1	1.1	1.1	1.2		0.8	0.8	0.8	0.9	0.8		1.1	1.0	1.1	1.0	0.9	
Width/Depth Ratio	-	-	-	-	-		11.6	12.8	13.2	13.6	18.4		-	-	-	-	-	
Entrenchment Ratio	-	-	-	-	-		5.3	5.2	4.0	4.4	4.4		-	-	-	-	-	
Bank Height Ratio	-	-	-	-	-		1.0	1.0	1.0	1.0	1.0		-	-	-	-	-	
Wetted Perimeter (ft)	7.9	7.9	9.2	9.8	8.8		6.0	6.2	6.3	7.1	7.1		7.5	6.9	8.2	7.4	7.2	
Hydraulic Radius (ft)	0.7	0.6	0.6	0.6	0.7		0.5	0.4	0.5	0.5	0.3		0.6	0.6	0.5	0.6	0.6	
Substrate																		
d50 (mm)	0.06	0.06	0.06	0.06	0.16		0.06	0.06	0.06	0.06	0.82		0.06	0.06	0.06	0.06	0.06	
d84 (mm)	0.06	0.06	0.06	0.06	0.22		16	52	0.19	17.0	25.0		0.06	0.06	0.06	0.06	0.06	

Table 7i. Morphology and Hydraulic Monitoring Summary
Farrar Dairy Site

Parameter	Cross-Section 25						Cross-Section 26						Cross-Section 27					
	T2						T3						T3					
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5
Bankfull Width (ft)	5.2	5.6	6.7	5.9	8.4		18.4	17.6	17.6	17.9	17.9		19.2	18.9	21.2	19.1	20.1	
Floodprone Width (ft)	>60	>60	>60	>60	>60		>60	>60	>60	>60	>60		-	-	-	-	-	
Bankfull Cross-Sectional Area (ft^2)	2.5	2.7	2.9	2.7	3.2		21.4	20.1	15.8	14.7	15.8		24.2	22.1	18.3	17.9	20.5	
Bankfull Mean Depth (ft)	0.5	0.5	0.4	0.5	0.4		1.2	1.1	0.9	0.8	0.9		1.3	1.2	0.9	0.9	1.0	
Bankfull Maximum Depth (ft)	0.8	0.8	0.8	0.8	1.0		1.9	1.8	1.3	1.3	1.5		2.5	2.3	1.6	1.6	2.0	
Width/Depth Ratio	10.8	11.7	15.5	12.9	22.1		15.8	15.5	19.6	21.8	20.3		-	-	-	-	-	
Entrenchment Ratio	>3.0	>3.0	>3.0	>3.0	>3.0		>3.0	>3.0	>3.0	>3.0	>3.0		-	-	-	-	-	
Bank Height Ratio	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0		-	-	-	-	-	
Wetted Perimeter (ft)	5.5	5.9	7.0	6.1	8.3		18.9	18.1	18.1	20.7	18.1		18.2	19.6	23.9	19.6	20.6	
Hydraulic Radius (ft)	0.5	0.5	0.4	0.4	0.4		1.1	1.1	0.9	0.9	0.9		1.3	1.1	0.9	0.9	1.0	
Substrate																		
d50 (mm)	0.06	0.06	0.06	0.06	0.06		0.06	0.09	0.14	0.06	0.06		0.06	0.06	0.07	0.06	0.30	
d84 (mm)	0.06	0.06	0.06	0.06	0.06		0.09	0.18	0.21	0.10	0.10		0.10	0.08	0.10	0.09	1.00	

Table 7j. Morphology and Hydraulic Monitoring Summary
Farrar Dairy Site

Parameter	Cross-Section 28						Cross-Section 29					
	T3						T3					
Dimension	MY0	MY1	MY2	MY3	MY4	MY5	MY0	MY1	MY2	MY3	MY4	MY5
Bankfull Width (ft)	23.3	23.3	23.5	23.8	23.8		14.9	15.4	15.3	14.8	15.5	
Floodprone Width (ft)	-	-	-	-	-		>60	>60	>60	>60	>60	
Bankfull Cross-Sectional Area (ft^2)	29.1	29.4	22.5	21.9	24.7		18.4	19.4	18.2	15.9	17.6	
Bankfull Mean Depth (ft)	1.2	1.3	1.0	0.9	1.0		1.2	1.3	1.2	1.1	1.1	
Bankfull Maximum Depth (ft)	2.6	2.7	1.4	1.4	1.7		1.9	2.0	1.9	1.7	1.9	
Width/Depth Ratio	-	-	-	-	-		12.1	12.2	12.9	13.8	13.7	
Entrenchment Ratio	-	-	-	-	-		>3.0	>3.0	>3.0	>3.0	>3.0	
Bank Height Ratio	-	-	-	-	-		1.0	1.0	1.0	1.0	1.0	
Wetted Perimeter (ft)	23.9	24.1	25.1	28.4	24.2		15.6	16.1	15.9	15.3	16.0	
Hydraulic Radius (ft)	1.2	1.2	1.0	0.8	1.0		1.2	1.2	1.1	1.0	1.1	
Substrate												
d50 (mm)	0.06	0.06	0.08	0.07	0.07		0.06	0.06	0.06	0.06	0.06	
d84 (mm)	0.06	0.06	0.11	0.10	0.10		0.06	0.06	0.46	0.08	0.19	

2.3 Wetland Assessment

The maximum number of consecutive days that the groundwater was within 12 inches of the surface was determined for each groundwater gauge. This number was converted into a percentage of the 251-day growing season (March 11 to November 16). Table 8 presents the hydrological monitoring results for 2012. The wetland gauges used to monitor site hydrology were installed in March 2009. During the fourth year of monitoring, wetland hydrology was achieved at all of the gauges on the site except for gauge 6 (Table 8). Based on these data, the majority of the site has exceeded the minimum duration of 12.5 consecutive days (5% of the growing season) with the water table within 12 inches of the soil surface for the 2012 growing season (Appendix C). Climatic data for the 2012 growing season were analyzed in comparison to historical data to determine whether 2012 was a normal year in terms of climatic conditions. The historical data were collected from the NRCS, Water and Climate Center, "Climate Analysis for Wetlands by County" website. This evaluation concluded that 2012 was a normal year for rainfall. Rainfall was within the 30th to 70th percentiles for the months of January, March, April, May, June, July, August, September, and October. Rainfall was less than the 30th percentile threshold in February, November, and December (Appendix C).

Table 8. Hydrologic Monitoring Results
Farrar Dairy Site

	Hydroperiod					
Gauge #	**<5%**	**5% - 8%**	**8% - 12.5%**	**>12.5%**	**Max. No. of Consecutive Days / Exact Hydroperiod Percentage**	**Dates Meeting Success**
1				X	59 / 23%	March 11 - May 8
2				X	41 / 16%	March 11 - April 20
3			X		20 / 8%	March 11 - March 30
4			X		19 / 8%	March 11 - March 29
5				X	100 / 40%	March 11 - June 18
6	X				None	
7		X			16 / 6%	March 11 - March 26
Ref				X	46 / 18%	March 11 - May 11

Table 9. Hydroperiod History
Farrar Dairy Site

Gauge #	Year 1	Year 2	Year 3	Year 4	Year 5
1	16%	13%	24%	23%	
2	11%	4%	59%	16%	
3	10%	11%	6%	8%	
4	10%	3%	6%	8%	
5	12%	13%	21%	40%	
6	8%	16%	0	0	
7	18%	16%	8%	6%	
Ref	44%	25%	100%	18%	

3.0 CONCLUSIONS

The stream is functioning as designed and has not developed any significant problems. The monitored cross-sections and profiles indicate some changes over the course of monitoring, but the stream in these areas is not trending towards instability. Any feature changes will be tracked to see if the stream is moving beyond its expected variability. There were no bankfull events in the fourth monitoring year.

The hydrology data in Section 2.3 indicate that only one gauge (Gauge 6) did not demonstrate wetland hydrology in 2012. These are the similar results as 2011, but this gauge attained the hydrology criteria in the previous two years. The precipitation data show that 2012 was a below average year for rainfall, with particularly low rainfall in the first four months of the year. During typical years, it is the normal rainfall during this part of the year that provides the wetland hydrology for these wetlands during the early spring.

The planted vegetation has been doing well, with some plots experiencing more mortality than others. This mortality can be attributed to normal losses after the initial planting as well as aggressive growth from the site's herbaceous vegetation. The site also has vigorous volunteers, which will increase the overall vegetation success of the site. The vegetation is on track to meeting the success criteria in the steam and wetland for the fourth year of monitoring.

4.0 MAINTENANCE

The maintenance actions in 2012 included: scattered areas of invasive treatment, small areas of supplemental planting in areas impacted during previous maintenance, and beaver dam removal.

The beaver dams will continue to be removed throughout the monitoring period.

Appendix A
Vegetation Data

Table A1. Stream Riparian Buffer Stem Density and Species Count by Plot
Farrar Dairy Stream and Wetland Restoration

Species	Plot #															Total (Year 4)
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	
Asimina triloba					2											2
Betula nigra	3	1		4		2	3	5	4			2	6	6	4	40
Celtis laevigata	1	1					1	3								6
Cephalanthus occidentalis	1	4			2	1			4			1			5	18
Cornus amomum	10			4	3	7	3	1						3	2	33
Diospyros virginiana	1	1	3							2					1	8
Fraxinus pennsylvanica		4		1	4		2	4				5	2	2	1	25
Platanus occidentalis										3						3
Quercus alba										6						6
Quercus laurifolia		1	2		1	1										5
Quercus lyrata										1						1
Quercus palustris					2											2
Salix nigra				1			2									3
Salix sericea							6				5		3			14
Sambucus canadensis													1			1
Total (Year 4)	16	12	5	10	14	11	17	13	8	12	5	8	12	11	13	167
Average Density (Stems/Acre)	648	486	202	405	567	445	688	526	324	486	202	324	486	445	526	
				Total Density (Stems/Acre)										**451**		

Table A2. Wetland Stem Density and Species Count by Plot
Farrar Dairy Stream and Wetland Restoration

Species	Plot #																														Total (Year 4)
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	
Asimina triloba																															0
Betula nigra		1																													1
Celtis laevigata																															0
Cephalanthus occidentalis																															0
Cornus amomum	1	1	1	2	2				2		1							5							1	6	3	1			26
Diospyros virginiana		7	3	1																											11
Fraxinus pennsylvanica	1			3	5	1	7	4		1	4	2		4	8	4			4		1	7		3	7	2	3	2	3		76
Platanus occidentalis																															0
Quercus				1															1												2
Quercus alba																															0
Quercus falcata								1			1					1			1	3	1		1								9
Quercus laurifolia				4		1	2	3		1	2										2					3	4	4			26
Quercus lyrata										1								3	1		4										9
Quercus michauxii	1		1		1	1	2	2				1	7	6	3	1	3	1			3			2	2		4	1	4	2	48
Quercus pagoda		3		4	2	2	5	3								2				3			1								25
Quercus palustris	1		5	3	1	3	3	3		3	4					1		1			1	3	1						3		36
Quercus phellos	5			5	2			1	6	3	1	2	2				3			1	4		1	4	4						44
Salix nigra																															0
Salix sericea																															0
Sambucus canadensis																															0
Total (Year 4)	9	12	10	23	13	8	19	17	8	9	13	5	9	10	11	9	6	10	7	7	16	10	4	9	14	11	14	8	10	2	313
Average Density (Stems/Acre)	364	486	405	931	526	324	769	688	324	364	526	202	364	405	445	364	243	405	283	283	648	405	162	364	567	445	567	324	405	81	
																					Total Density (Stems/Acre)								**422**		

Table A3. Riparian Buffer Vegetation History (stems/acre)
Farrar Dairy Site

Plot Number	MY-00	MY-01	MY-02		MY-03		MY-04		MY-05	
	planted	planted	planted	total	planted	total	planted	total	planted	total
1	880	840	840	840	720	1,578	648	2,065		
2	720	560	520	1,000	486	1,133	486	1,134		
3	320	400	440	5,720	243	2,226	202	3,117		
4	840	400	520	3,960	445	1,983	405	2,024		
5	760	640	680	2,240	567	890	567	1,457		
6	560	440	440	480	445	445	445	972		
7	840	720	680	840	688	1,174	688	1,296		
8	560	560	560	560	526	607	526	688		
9	600	600	600	600	567	647	324	324		
10	520	520	480	560	486	567	486	931		
11	680	360	240	440	202	1,214	202	1,012		
12	520	240	320	320	324	364	324	445		
13	720	480	480	600	486	1,295	486	1,660		
14	520	480	480	680	486	769	445	1,498		
15	560	520	520	520	526	607	526	850		
Buffer Average	640	517	520	1,291	480	1,033	451	1,401		

Table A4. Wetland Vegetation History (stems/acre)
Farrar Dairy Site

Plot Number	MY-00	MY-01	MY-02		MY-03		MY-04		MY-05	
	planted	planted	planted	total	planted	total	planted	total	planted	total
16	400	400	360	400	364	890	364	1,134		
17	560	520	520	520	526	809	486	1,215		
18	400	400	400	480	405	890	405	1,174		
19	1,000	960	920	1,040	971	1,012	931	1,053		
20	520	520	480	480	526	1,012	526	1,377		
21	520	480	480	6,080	486	4,168	324	2,996		
22	840	840	880	6,280	850	8,134	769	8,016		
23	920	800	760	3,320	769	5,949	688	5,466		
24	520	480	400	480	405	567	324	850		
25	440	440	440	680	445	890	364	850		
26	520	520	520	560	526	668	526	1,255		
27	480	480	480	920	405	647	202	486		
28	480	400	400	800	364	688	364	1,296		
29	520	560	440	920	405	850	405	1,215		
30	440	440	440	480	445	931	445	1,093		
31	440	400	360	480	364	526	364	688		
32	400	400	400	400	243	364	243	607		
33	440	400	400	400	405	486	405	688		
34	480	360	320	360	283	324	283	405		
35	400	360	280	320	283	324	283	405		
36	640	640	640	640	607	607	648	729		
37	480	440	400	560	405	567	405	1,296		
38	520	280	280	280	162	283	162	526		
39	520	440	440	440	364	486	364	729		
40	600	600	560	600	567	607	567	607		
41	600	440	440	440	445	526	445	526		
42	680	560	560	560	567	567	567	1255		
43	480	400	400	400	405	688	324	607		
44	560	400	480	480	445	445	405	972		
45	480	320	120	160	81	81	81	648		
Wetland Average	543	489	467	999	451	1,166	422	1,339		

Stream and Wetland Vegetation Plot Photos

Vegetation Plot 1 – MY-04 – 6/4/12

Vegetation Plot 2 – MY-04 – 6/4/12

Vegetation Plot 3 – MY-04 – 6/8/12

Vegetation Plot 4 – MY-04 – 6/6/12

Vegetation Plot 5 – MY-04 – 6/4/12

Vegetation Plot 6 – MY-04 – 6/5/12


Vegetation Plot 7 – MY-04 – 6/5/12


Vegetation Plot 8 – MY-04 – 6/7/12


Vegetation Plot 9 – MY-04 – 6/8/12


Vegetation Plot 10 – MY-04 – 6/4/12

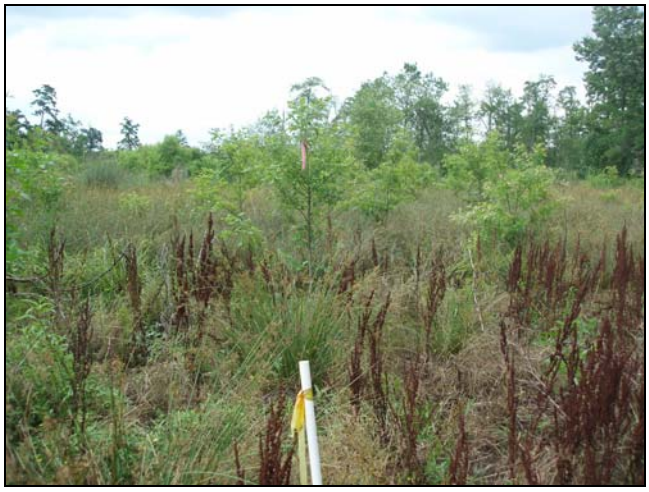

Vegetation Plot 11 – MY-04 – 6/4/12


Vegetation Plot 12 – MY-04 – 6/4/12

Vegetation Plot 13 – MY-04 – 6/8/12

Vegetation Plot 14 – MY-04 – 6/7/12

Vegetation Plot 15 – MY-04 – 6/7/12



Vegetation Plot 16 – MY-04 – 6/4/12

Vegetation Plot 17 – MY-04 – 6/4/12

Vegetation Plot 18 – MY-04 – 6/4/12

Vegetation Plot 19 – MY-04 – 6/4/12

Vegetation Plot 20 – MY-04 – 6/5/12

Vegetation Plot 21 – MY-04 – 6/5/12

Vegetation Plot 22 – MY-04 – 6/5/12

Vegetation Plot 23 – MY-04 – 6/5/12

Vegetation Plot 24 – MY-04 – 6/6/12


Vegetation Plot 25 – MY-04 – 6/6/12


Vegetation Plot 26 – MY-04 – 6/5/12


Vegetation Plot 27 – MY-04 – 6/5/12


Vegetation Plot 28 – MY-04 – 6/5/12


Vegetation Plot 29 – MY-04 – 6/5/12


Vegetation Plot 30 – MY-04 – 6/5/12


Vegetation Plot 31 – MY-04 – 6/8/12


Vegetation Plot 32 – MY-04 – 6/8/12


Vegetation Plot 33 – MY-04 – 6/8/12


Vegetation Plot 34 – MY-04 – 6/8/12


Vegetation Plot 35 – MY-04 – 6/8/12


Vegetation Plot 36 – MY-04 – 6/7/12

Vegetation Plot 37 – MY-04 – 6/7/12

Vegetation Plot 38 – MY-04 – 6/7/12

Vegetation Plot 39 – MY-04 – 6/7/12

Vegetation Plot 40 – MY-04 – 6/7/12

Vegetation Plot 41 – MY-04 – 6/7/12

Vegetation Plot 42 – MY-04 – 6/7/12

Vegetation Plot 43 – MY-04 – 6/7/12

Vegetation Plot 44 – MY-04 – 6/5/12

Vegetation Plot 45 – MY-04 – 6/5/12

Appendix B
Stream and Wetland Photos

Stream and Wetland Photo Points

PP 1 – MY-04 – 11/19/12

PP 2 – MY-04 – 11/19/12

PP 3 – MY-04 – 11/19/12

PP 4 – MY-04 – 11/19/12

PP 5 – MY-04 – 11/26/12

PP 6 – MY-04 – 11/26/12

PP 7 – MY-04 – 11/26/12

PP 8 – MY-04 – 11/19/12

PP 9 – MY-04 – 11/26/12

PP 10 – MY-04 – 11/26/12

PP 11 – MY-04 – 11/26/12

PP 12 – MY-04 – 11/26/12

PP 13 – MY-04 – 11/26/12

PP 14 – MY-04 – 11/26/12

PP 15 – MY-04 – 11/26/12

PP 16 – MY-04 – 11/26/12

PP 17 – MY-04 – 11/26/12

PP 18 – MY-04 – 11/26/12

PP 19 – MY-04 – 11/19/12

PP 20 – MY-04 – 11/19/12

PP 21 – MY-04 – 11/19/12

PP 22 – MY-04 – 11/19/12

PP 23 – MY-04 – 11/19/12

PP 24 – MY-04 – 11/19/12

PP 25 – MY-04 – 11/19/12

PP 26 – MY-04 – 11/19/12

PP 27 – MY-04 – 11/26/12

PP 28 – MY-04 – 11/26/12

PP 29 – MY-04 – 11/26/12

PP 30 – MY-04 – 11/26/12

PP 31 – MY-04 – 11/26/12

PP 32 – MY-04 – 11/26/12

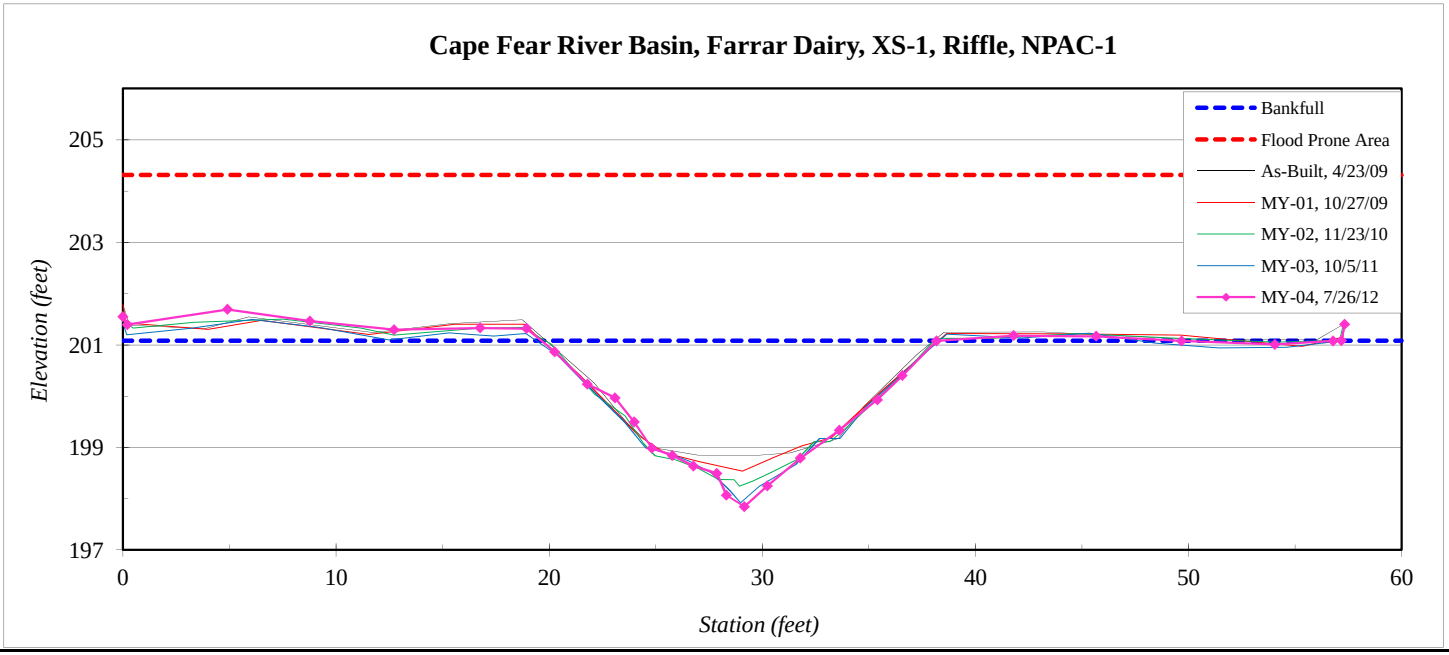
Appendix C
Geomorphologic and Hydrologic Data

River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-1, Riffle, NPAC-1
Drainage Area (sq mi):	3.92
Date:	7/26/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	201.55
0.2	201.40
4.9	201.69
8.8	201.47
12.7	201.30
16.8	201.33
18.9	201.32
20.3	200.86
21.8	200.24
23.1	199.97
24.0	199.50
24.8	198.99
25.8	198.84
26.8	198.64
27.9	198.49
28.3	198.07
29.2	197.84
30.2	198.25
31.8	198.79
33.6	199.34
35.4	199.93
36.6	200.40
38.2	201.08
41.8	201.18
45.7	201.17
49.7	201.08
54.1	201.01
56.8	201.08
57.2	201.08
57.3	201.40

SUMMARY DATA	
Bankfull Elevation:	201.1
Bankfull Cross-Sectional Area:	31.0
Bankfull Width:	18.5
Flood Prone Area Elevation:	204.3
Flood Prone Width:	>60
Max Depth at Bankfull:	3.2
Mean Depth at Bankfull:	1.7
W / D Ratio:	11.0
Entrenchment Ratio:	>3.0
Bank Height Ratio:	1.0

Stream Type	C5

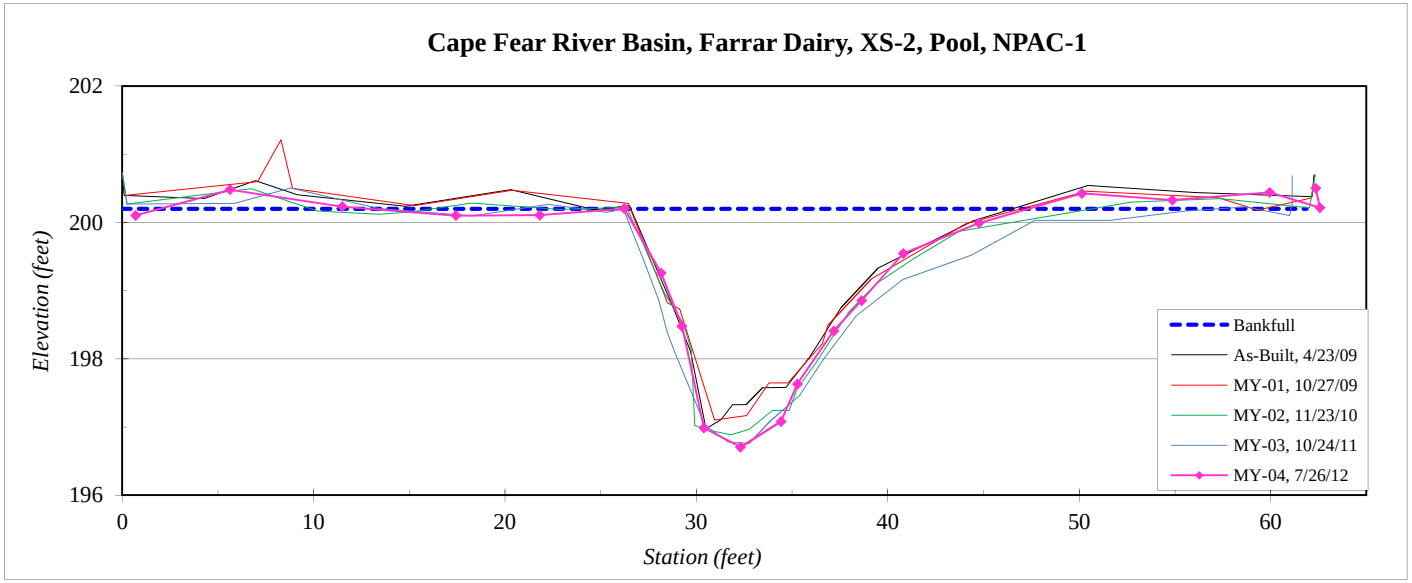


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-2, Pool, NPAC-1
Drainage Area (sq mi):	3.92
Date:	7/26/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	200.10
4.9	200.48
10.8	200.23
16.7	200.10
21.1	200.11
25.5	200.20
27.5	199.26
28.5	198.48
29.7	196.99
31.6	196.71
33.7	197.08
34.6	197.63
36.5	198.41
37.9	198.86
40.1	199.54
44.1	199.99
49.4	200.42
54.2	200.33
59.2	200.44
61.9	200.21
61.6	200.50

SUMMARY DATA	
Bankfull Elevation:	200.2
Bankfull Cross-Sectional Area:	31.6
Bankfull Width:	21.1
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	3.5
Mean Depth at Bankfull:	1.5
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	C5

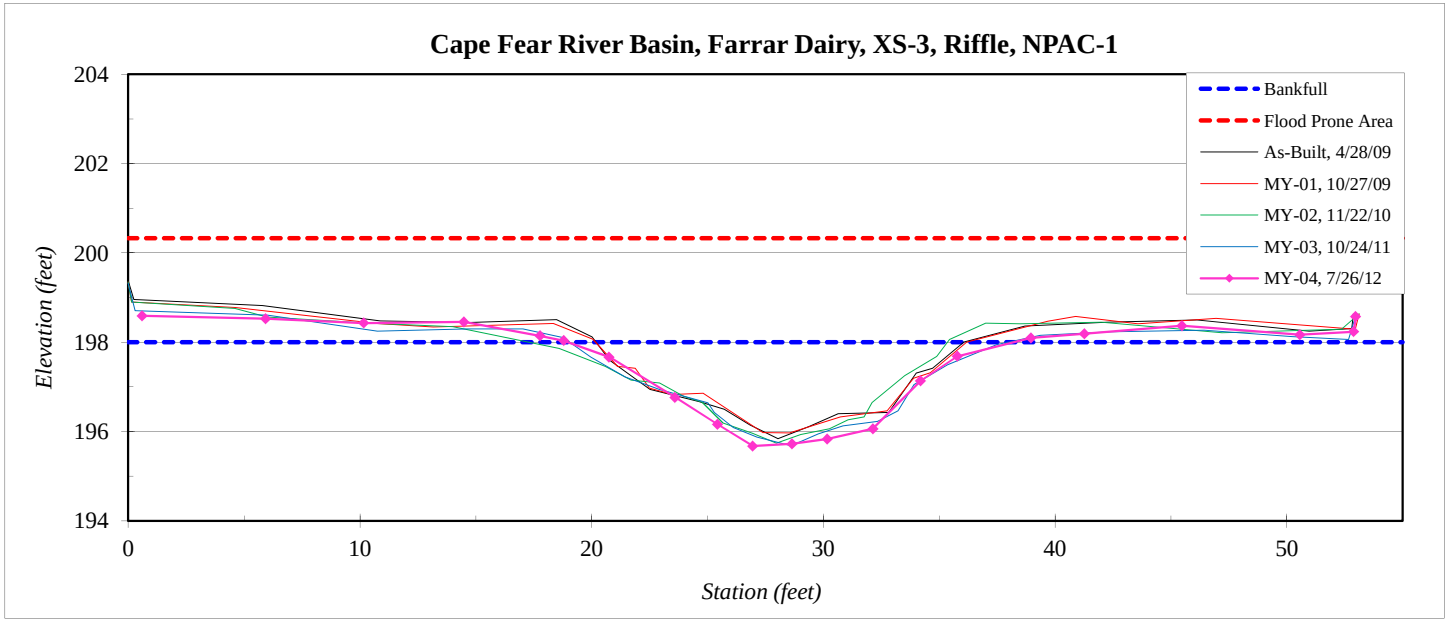


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-3, Riffle, NPAC-1
Drainage Area (sq mi):	3.92
Date:	7/26/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	198.59
5.3	198.53
9.6	198.43
13.9	198.45
17.2	198.14
18.2	198.04
20.2	197.67
23.0	196.76
24.8	196.16
26.4	195.67
28.0	195.73
29.6	195.83
31.5	196.06
33.6	197.14
35.2	197.69
38.4	198.10
40.7	198.19
44.9	198.37
50.0	198.17
52.3	198.24
52.4	198.58

SUMMARY DATA	
Bankfull Elevation:	198.0
Bankfull Cross-Sectional Area:	24.0
Bankfull Width:	19.2
Flood Prone Area Elevation:	200.3
Flood Prone Width:	>60
Max Depth at Bankfull:	2.3
Mean Depth at Bankfull:	1.2
W / D Ratio:	15.4
Entrenchment Ratio:	>3.0
Bank Height Ratio:	1.0

Stream Type	C5

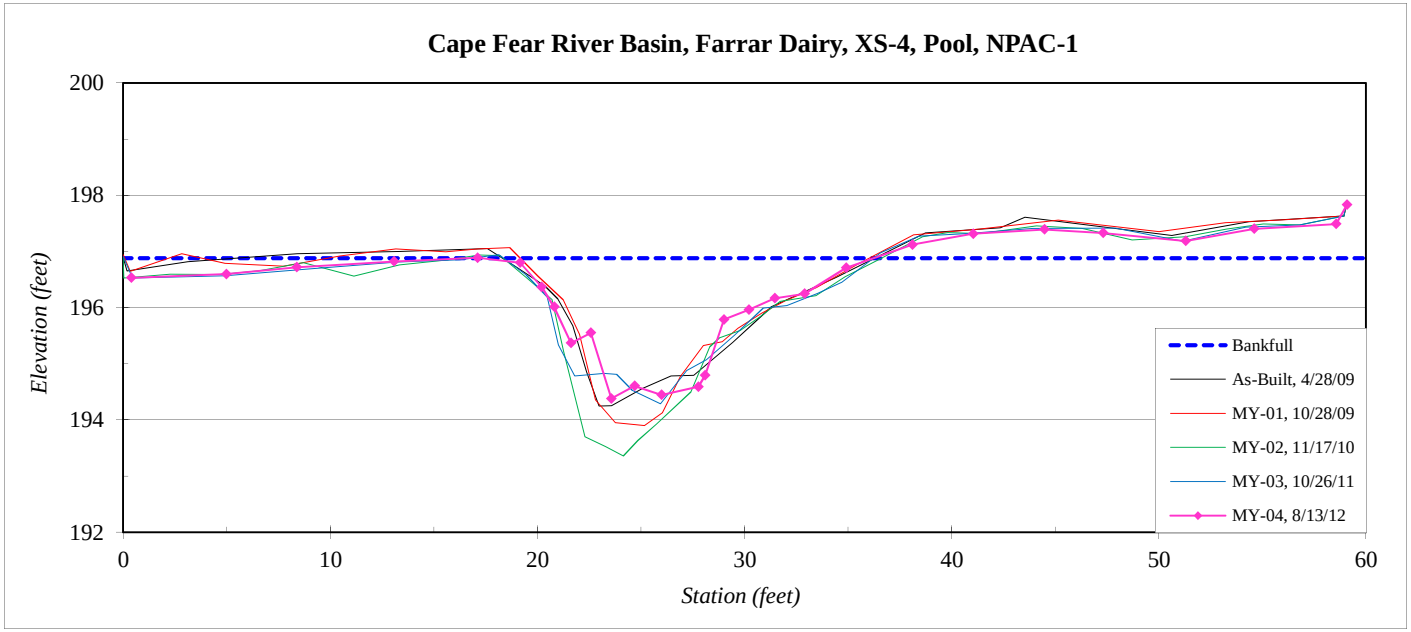


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-4, Pool, NPAC-1
Drainage Area (sq mi):	4.10
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	196.53
4.6	196.60
8.0	196.72
12.7	196.82
16.7	196.89
18.8	196.80
19.8	196.37
20.4	196.01
21.2	195.37
22.2	195.55
23.2	194.38
24.3	194.60
25.6	194.45
27.4	194.59
27.7	194.79
28.6	195.79
29.8	195.96
31.1	196.17
32.5	196.24
34.5	196.71
37.7	197.12
40.6	197.31
44.1	197.39
46.9	197.33
50.9	197.19
54.2	197.40
58.2	197.49
58.7	197.83

SUMMARY DATA	
Bankfull Elevation:	196.9
Bankfull Cross-Sectional Area:	21.3
Bankfull Width:	19.0
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	2.5
Mean Depth at Bankfull:	1.1
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	C5

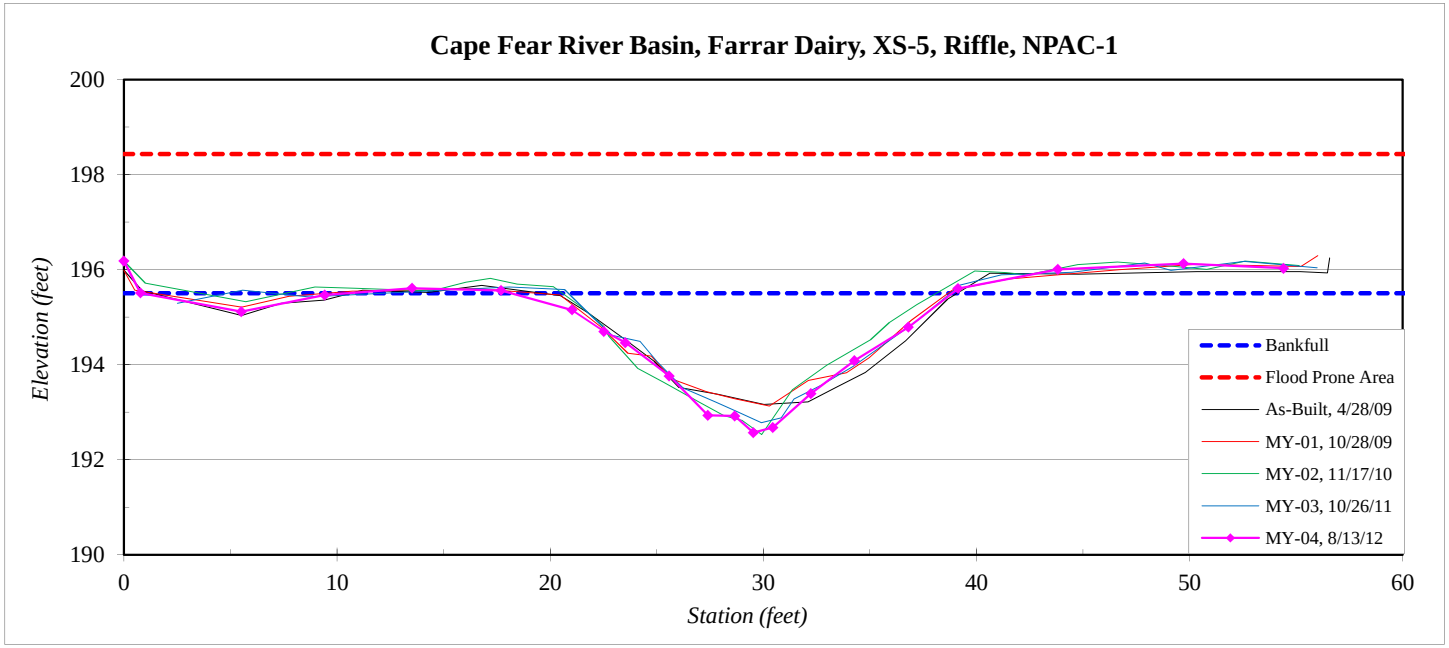


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-5, Riffle, NPAC-1
Drainage Area (sq mi):	4.10
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	196.18
0.8	195.51
5.5	195.12
9.4	195.46
13.5	195.16
17.7	195.11
21.0	195.15
22.5	194.70
23.5	194.46
25.6	193.76
27.4	192.93
28.7	192.92
29.5	192.57
30.4	192.68
32.2	193.39
34.3	194.08
36.8	194.79
39.1	195.15
43.8	195.56
49.7	195.68
54.4	195.58
58.9	195.59
61.4	195.45

SUMMARY DATA	
Bankfull Elevation:	195.5
Bankfull Cross-Sectional Area:	31.5
Bankfull Width:	19.1
Flood Prone Area Elevation:	198.4
Flood Prone Width:	>60
Max Depth at Bankfull:	2.9
Mean Depth at Bankfull:	1.6
W / D Ratio:	11.6
Entrenchment Ratio:	>3.0
Bank Height Ratio:	1.0

Stream Type	C5

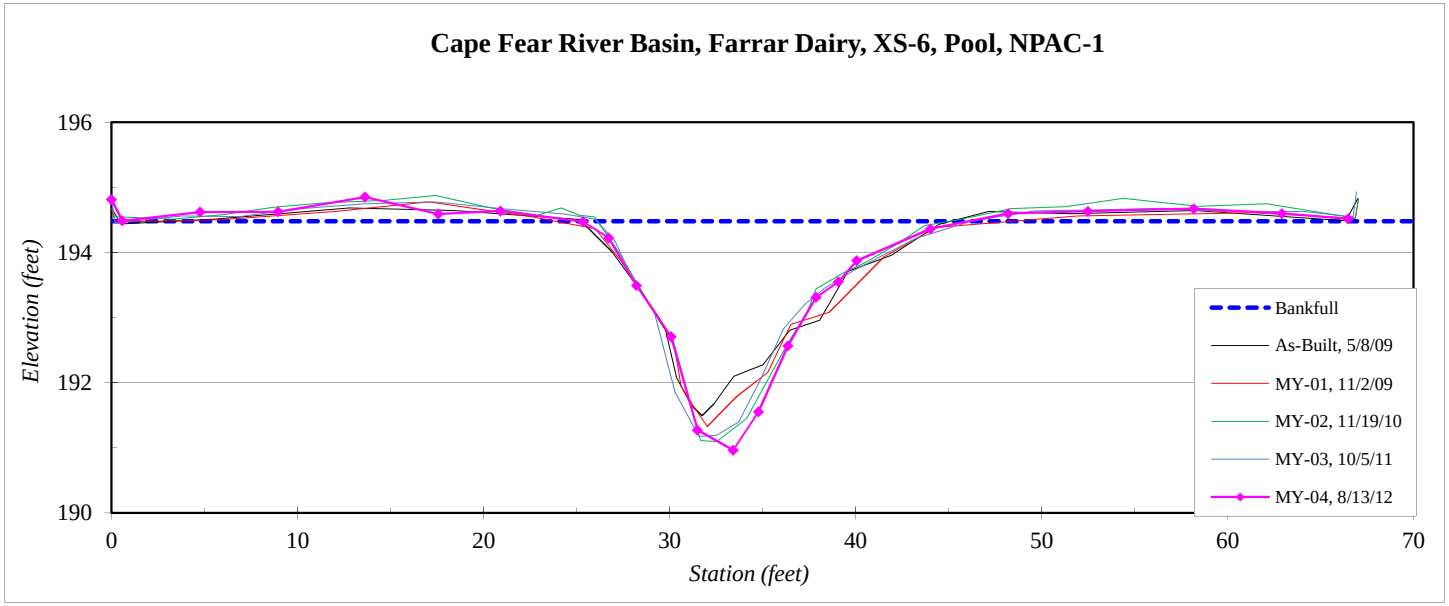


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-6, Pool, NPAC-1
Drainage Area (sq mi):	4.1
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	194.82
0.6	194.49
4.8	194.62
9.0	194.63
13.6	194.85
17.6	194.59
20.9	194.64
25.3	194.48
26.7	194.23
28.2	193.49
30.1	192.71
31.5	191.27
33.4	190.96
34.8	191.55
36.4	192.57
37.9	193.31
39.1	193.55
40.1	193.88
44.0	194.36
48.2	194.60
52.5	194.63
58.2	194.67
62.9	194.60
66.5	194.52

SUMMARY DATA	
Bankfull Elevation:	194.5
Bankfull Cross-Sectional Area:	27.8
Bankfull Width:	20.8
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	3.5
Mean Depth at Bankfull:	1.3
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	C5

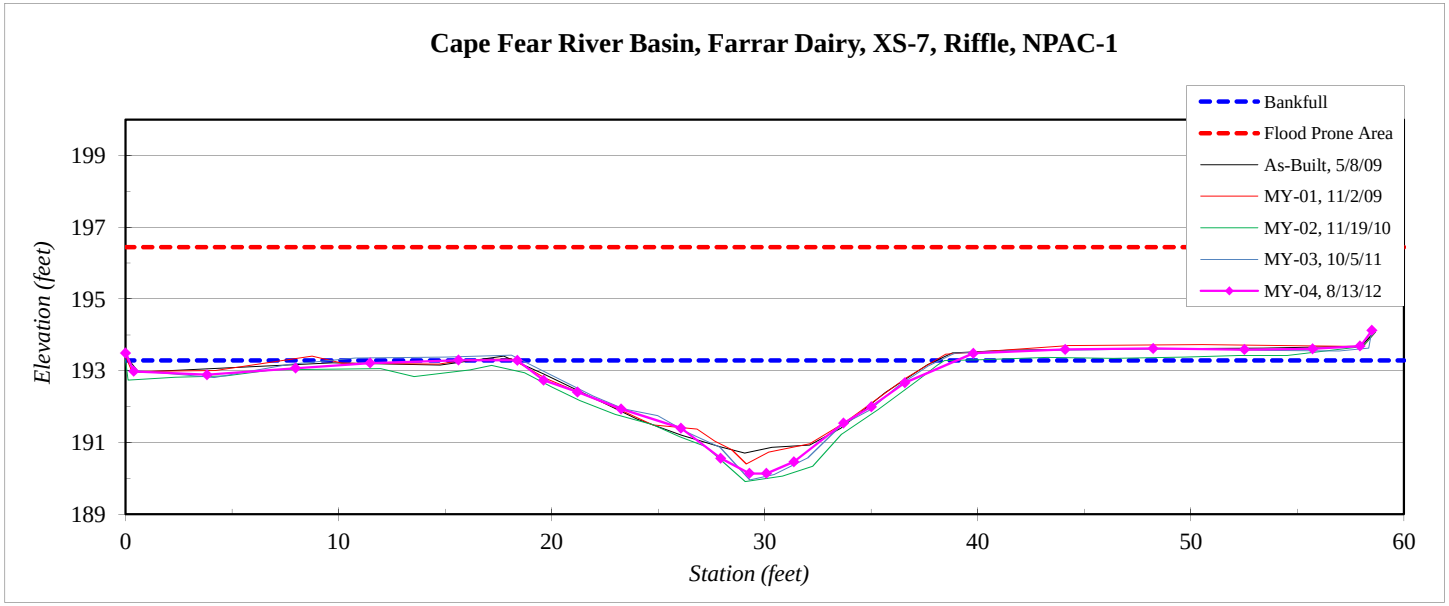


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-7, Riffle, NPAC-1
Drainage Area (sq mi):	4.1
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	193.49
0.4	192.98
3.8	192.89
8.0	193.07
11.5	193.22
15.6	193.30
18.4	193.29
19.6	192.74
21.2	192.41
23.3	191.94
26.1	191.40
27.9	190.56
29.3	190.14
30.1	190.14
31.4	190.47
33.7	191.54
35.0	192.00
36.6	192.67
39.8	193.49
44.1	193.59
48.2	193.62
52.5	193.59
55.7	193.61
57.9	193.69

SUMMARY DATA	
Bankfull Elevation:	193.3
Bankfull Cross-Sectional Area:	32.5
Bankfull Width:	20.6
Flood Prone Area Elevation:	196.4
Flood Prone Width:	>60
Max Depth at Bankfull:	3.2
Mean Depth at Bankfull:	1.6
W / D Ratio:	13.1
Entrenchment Ratio:	>3.0
Bank Height Ratio:	1.0

Stream Type	C5

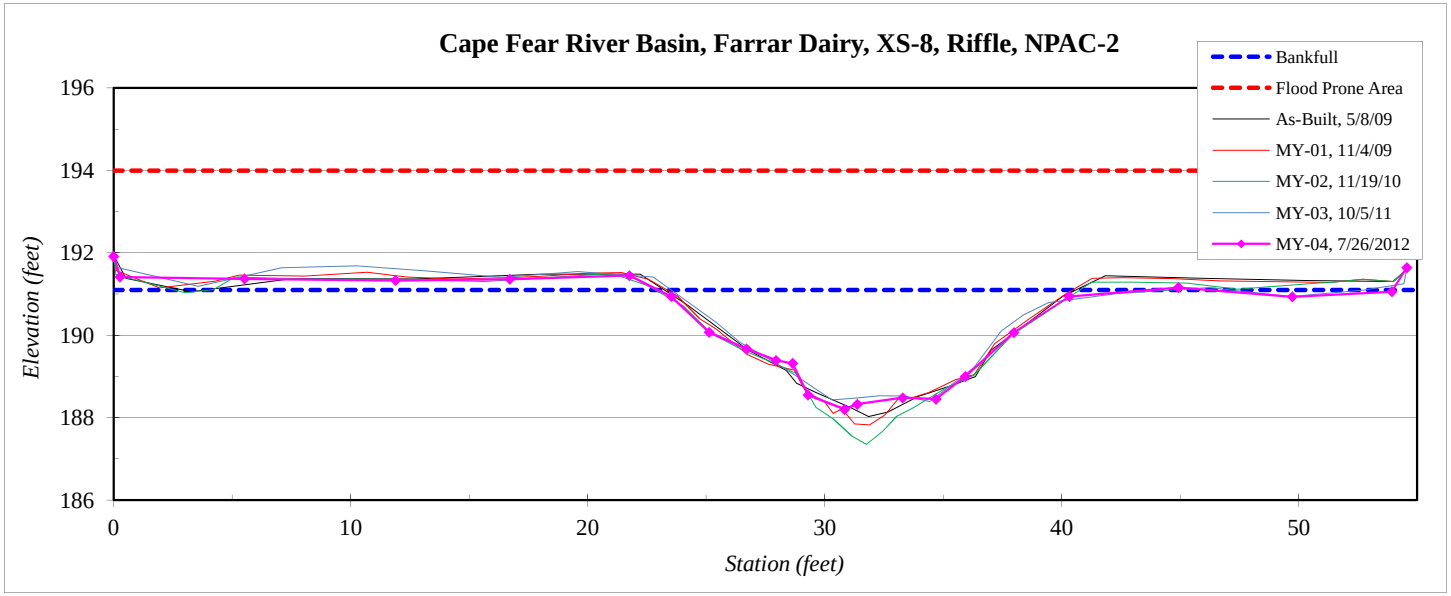


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-8, Riffle, NPAC-2
Drainage Area (sq mi):	4.1
Date:	7/26/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	191.92
0.3	191.41
5.5	191.37
11.9	191.33
16.7	191.36
21.8	191.45
23.5	190.94
25.1	190.08
26.7	189.67
27.9	189.39
28.6	189.32
29.3	188.55
30.8	188.20
31.4	188.33
33.3	188.48
34.7	188.45
35.9	189.01
38.0	190.07
40.3	190.94
44.9	191.16
49.7	190.93
53.9	191.06

SUMMARY DATA	
Bankfull Elevation:	191.1
Bankfull Cross-Sectional Area:	29.9
Bankfull Width:	20.7
Flood Prone Area Elevation:	194.0
Flood Prone Width:	>60
Max Depth at Bankfull:	2.9
Mean Depth at Bankfull:	1.4
W / D Ratio:	14.3
Entrenchment Ratio:	>3.0
Bank Height Ratio:	1.0

Stream Type	C5

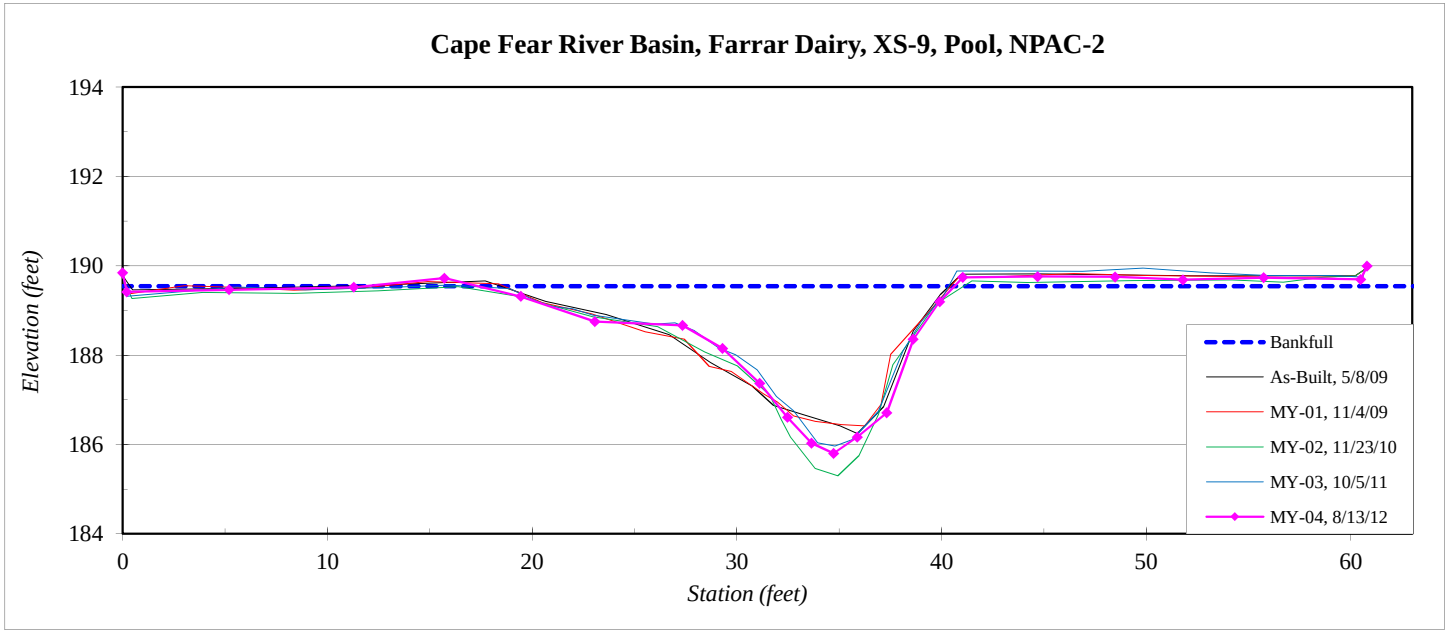


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-9, Pool, NPAC-2
Drainage Area (sq mi):	4.65
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	189.85
0.2	189.42
5.2	189.46
11.3	189.52
15.7	189.72
19.5	189.31
23.1	188.75
27.4	188.66
29.3	188.15
31.1	187.37
32.5	186.61
33.7	186.03
34.7	185.80
35.9	186.16
37.3	186.71
38.6	188.35
39.9	189.19
41.0	189.74
44.7	189.76
48.5	189.75
51.8	189.69
55.7	189.73
60.5	189.70
60.8	190.00

SUMMARY DATA	
Bankfull Elevation:	189.5
Bankfull Cross-Sectional Area:	34.6
Bankfull Width:	23.2
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	3.7
Mean Depth at Bankfull:	1.5
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	C5

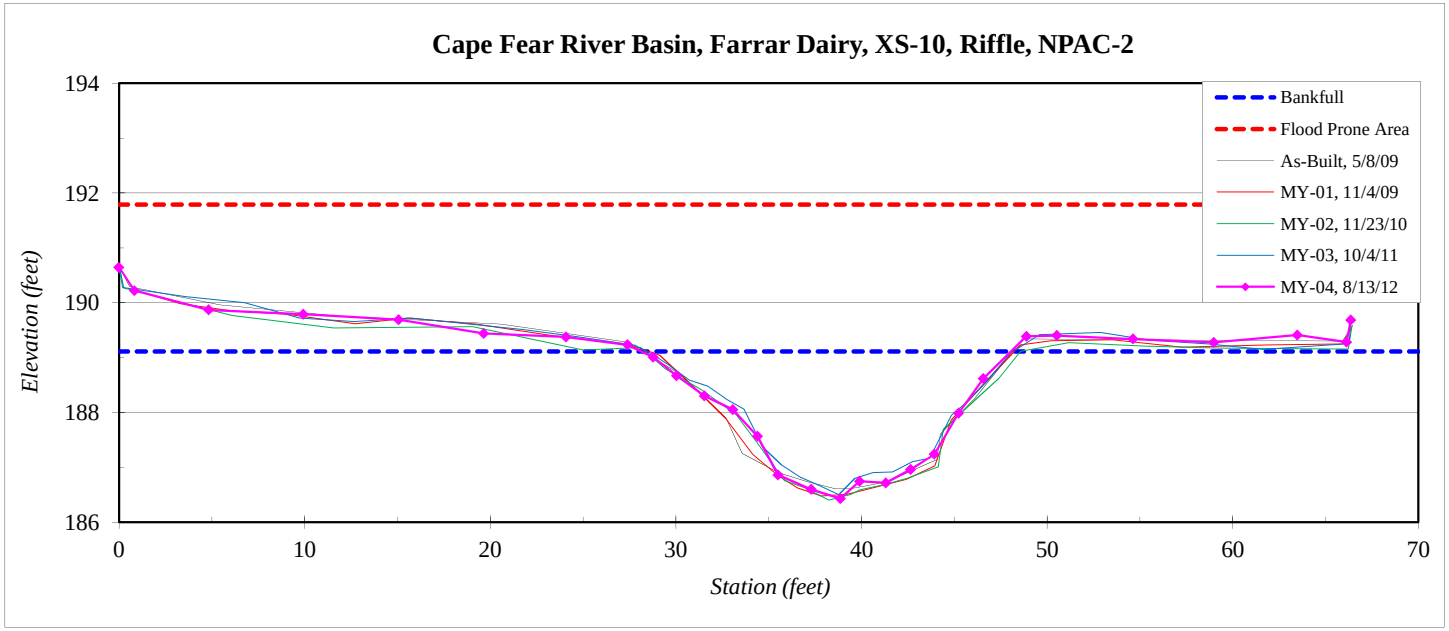


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-10, Riffle, NPAC-2
Drainage Area (sq mi):	4.65
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0	190.65
0.8	190.22
4.8	189.87
9.9	189.79
15.1	189.69
19.6	189.44
24.1	189.37
27.4	189.23
28.8	189.01
30.0	188.67
31.5	188.30
33.1	188.05
34.4	187.56
35.5	186.86
37.3	186.60
38.9	186.43
39.9	186.74
41.3	186.72
42.7	186.96
43.9	187.24
45.2	187.99
46.6	188.62
48.9	189.39
50.5	189.40
54.6	189.34
59.0	189.28
63.5	189.41
66.1	189.28
66.4	189.69

SUMMARY DATA	
Bankfull Elevation:	189.1
Bankfull Cross-Sectional Area:	29.9
Bankfull Width:	19.3
Flood Prone Area Elevation:	191.8
Flood Prone Width:	>60
Max Depth at Bankfull:	2.7
Mean Depth at Bankfull:	1.6
W / D Ratio:	12.4
Entrenchment Ratio:	>3.0
Bank Height Ratio:	1.0

Stream Type	C5

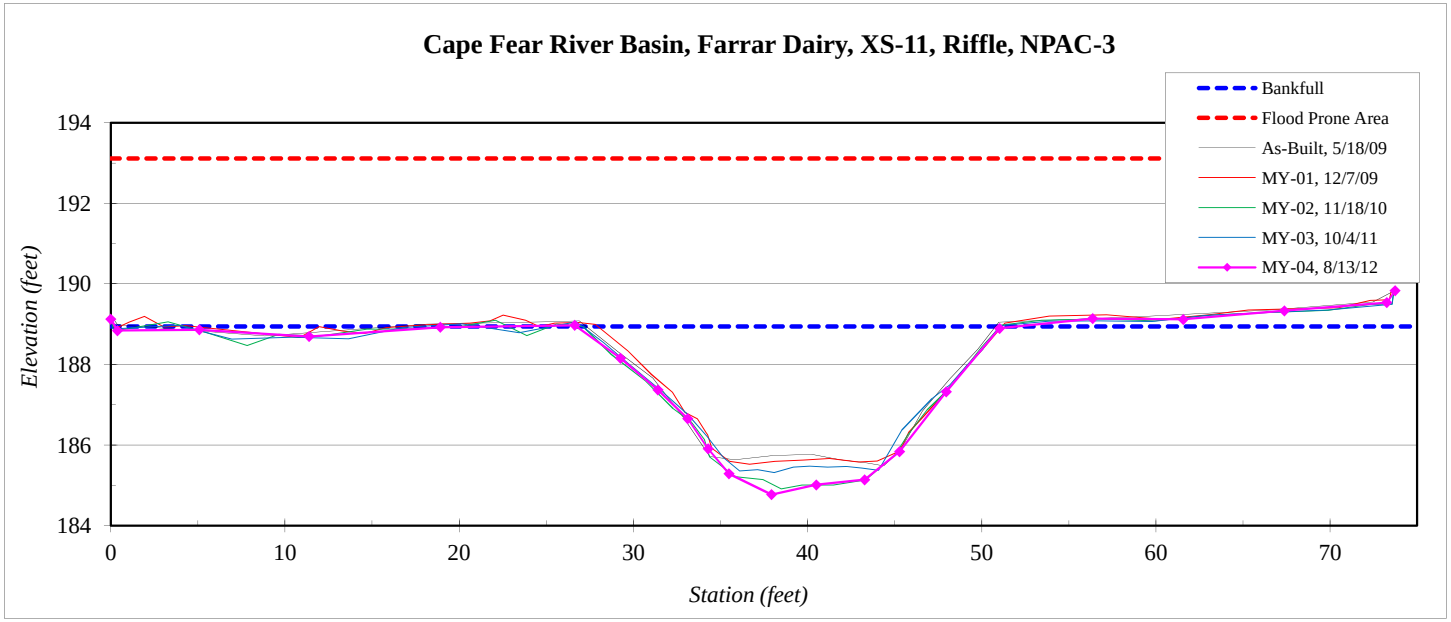


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-11, Riffle, NPAC-3
Drainage Area (sq mi):	4.82
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	189.13
0.4	188.84
5.1	188.86
11.4	188.69
18.9	188.93
26.6	188.97
29.2	188.16
31.4	187.37
33.1	186.65
34.3	185.91
35.5	185.29
37.9	184.77
40.5	185.01
43.3	185.14
45.3	185.84
48.0	187.32
51.0	188.90
56.4	189.14
61.6	189.12
67.4	189.33
73.3	189.54
73.7	189.83

SUMMARY DATA	
Bankfull Elevation:	188.9
Bankfull Cross-Sectional Area:	60.4
Bankfull Width:	24.3
Flood Prone Area Elevation:	193.1
Flood Prone Width:	>60
Max Depth at Bankfull:	4.2
Mean Depth at Bankfull:	2.5
W / D Ratio:	9.8
Entrenchment Ratio:	>3.0
Bank Height Ratio:	1.0

Stream Type	C5

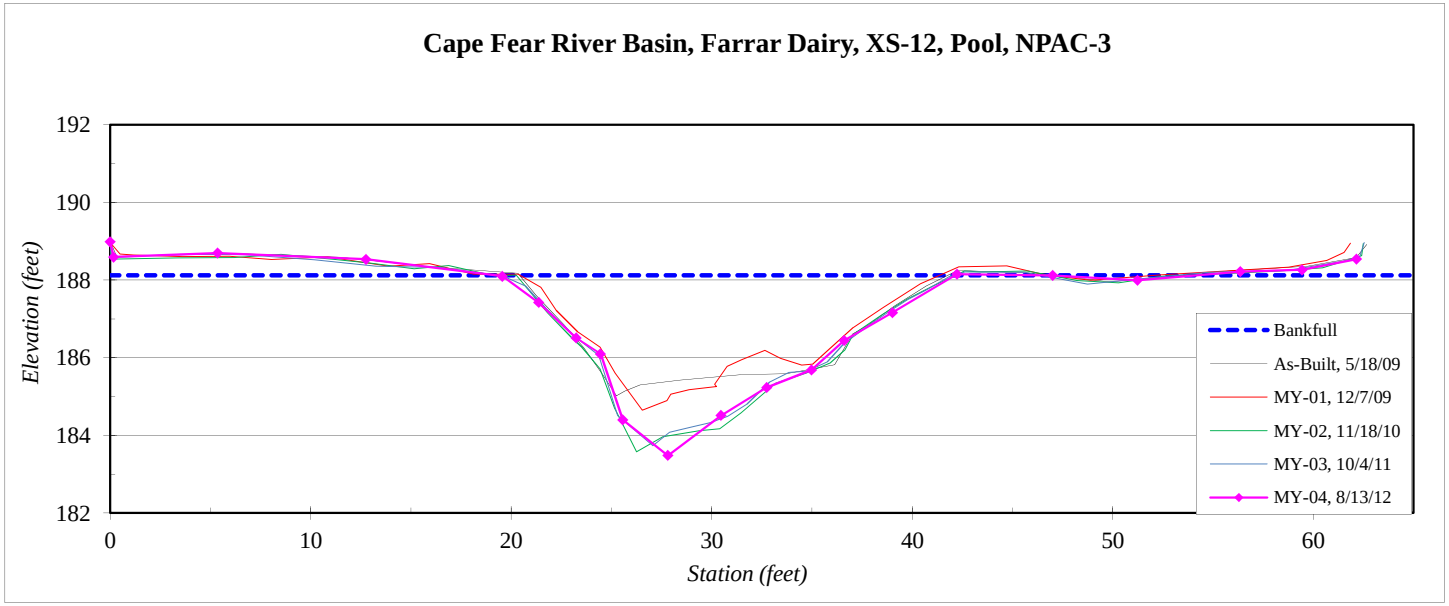


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-12, Pool, NPAC-3
Drainage Area (sq mi):	4.82
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	188.99
0.2	188.59
5.4	188.69
12.8	188.53
19.6	188.10
21.4	187.42
23.2	186.51
24.5	186.10
25.6	184.40
27.8	183.48
30.5	184.51
32.7	185.23
35.0	185.68
36.6	186.44
39.0	187.16
42.2	188.15
47.0	188.12
51.2	188.00
56.4	188.22
59.4	188.26
62.2	188.54

SUMMARY DATA	
Bankfull Elevation:	188.1
Bankfull Cross-Sectional Area:	49.9
Bankfull Width:	22.9
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	4.6
Mean Depth at Bankfull:	2.2
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	C5

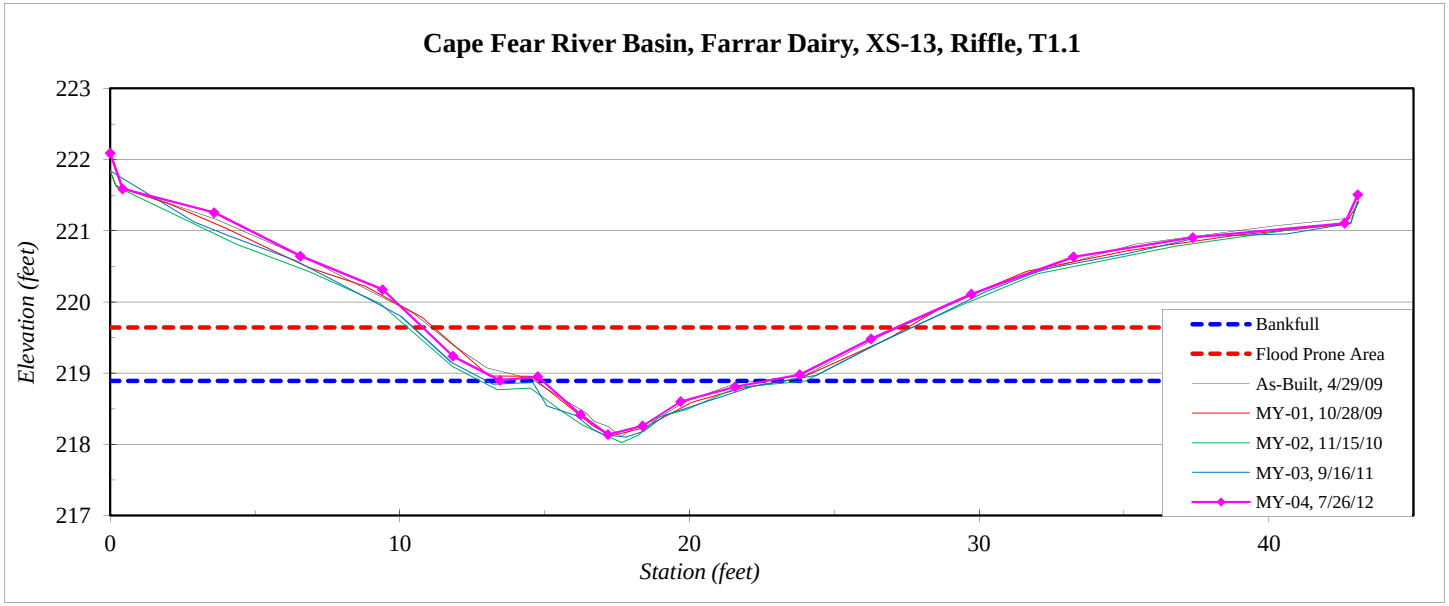


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-13, Riffle, T1.1
Drainage Area (sq mi):	0.02
Date:	7/26/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	222.09
0.4	221.59
3.6	221.26
6.6	220.65
9.4	220.18
11.8	219.24
13.5	218.90
14.8	218.95
16.2	218.42
17.2	218.14
18.4	218.26
19.7	218.60
21.6	218.81
23.8	218.98
26.3	219.48
29.7	220.11
33.3	220.64
37.4	220.91
42.6	221.11
43.1	221.51

SUMMARY DATA	
Bankfull Elevation:	218.9
Bankfull Cross-Sectional Area:	2.7
Bankfull Width:	7.7
Flood Prone Area Elevation:	219.6
Flood Prone Width:	16.4
Max Depth at Bankfull:	0.8
Mean Depth at Bankfull:	0.4
W / D Ratio:	22.0
Entrenchment Ratio:	2.1
Bank Height Ratio:	1.0

Stream Type	C5

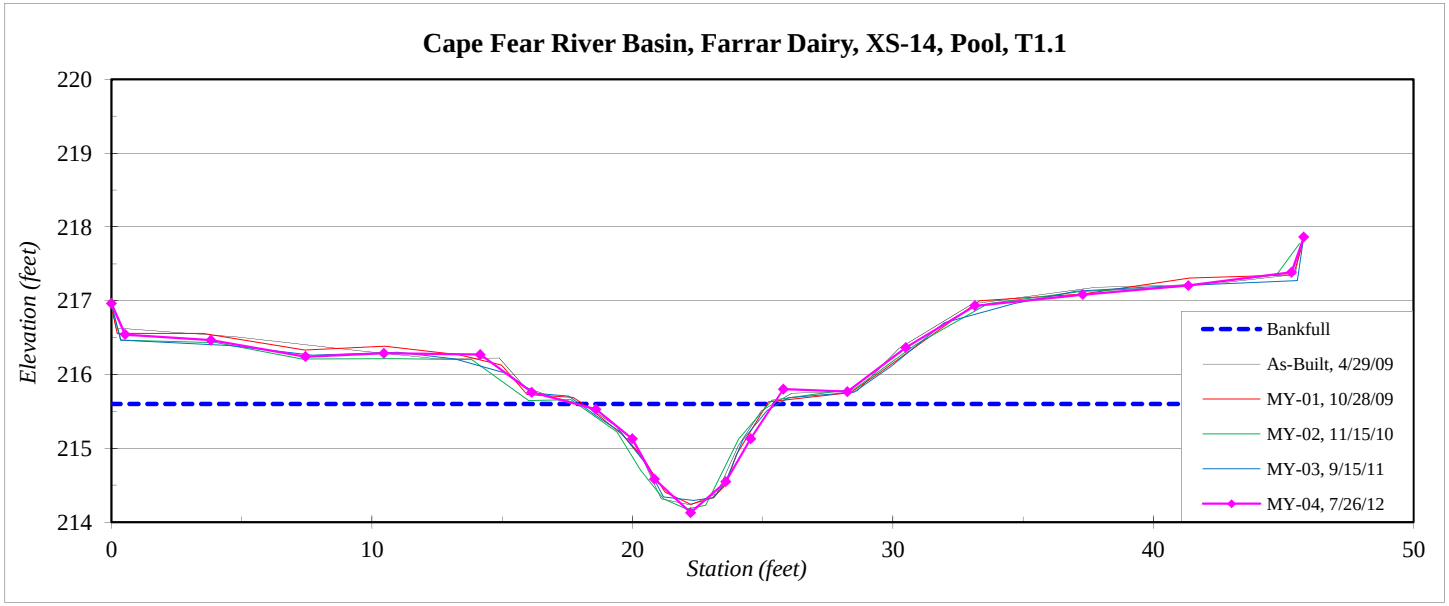


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-14, Pool, T1.1
Drainage Area (sq mi):	0.02
Date:	7/26/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	216.96
0.5	216.54
3.8	216.47
7.5	216.24
10.5	216.29
14.2	216.27
16.1	215.76
18.6	215.53
20.0	215.13
20.8	214.58
22.2	214.13
23.6	214.55
24.5	215.13
25.8	215.80
28.3	215.77
30.5	216.37
33.2	216.93
37.3	217.08
41.3	217.21
45.3	217.39
45.8	217.87

SUMMARY DATA	
Bankfull Elevation:	215.6
Bankfull Cross-Sectional Area:	5.4
Bankfull Width:	7.6
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	1.5
Mean Depth at Bankfull:	0.7
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	C5

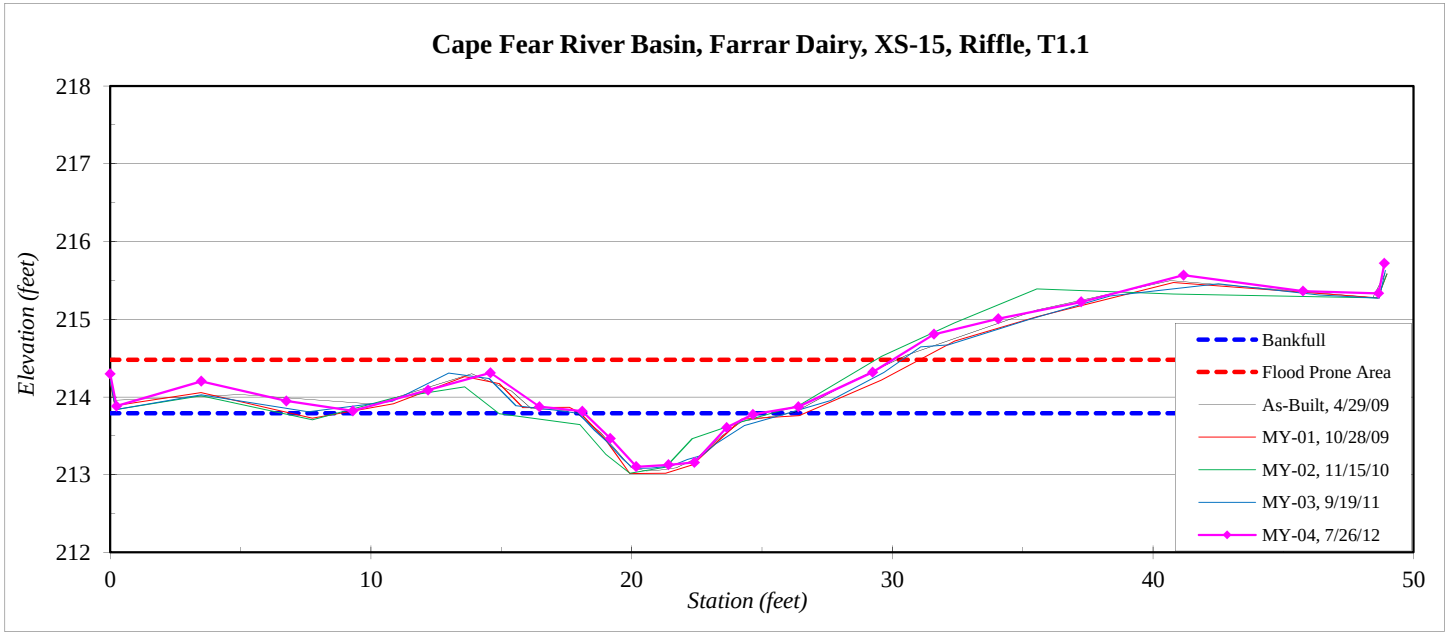


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-15, Riffle, T1.1
Drainage Area (sq mi):	0.02
Date:	7/26/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	214.30
0.2	213.88
3.5	214.20
6.8	213.95
9.3	213.82
12.2	214.09
14.6	214.31
16.5	213.87
18.1	213.82
19.2	213.46
20.2	213.10
21.4	213.13
22.4	213.16
23.7	213.61
24.7	213.77
26.4	213.87
29.2	214.32
31.6	214.81
34.1	215.01
37.2	215.22
41.2	215.57
45.8	215.36
48.7	215.33
48.9	215.72

SUMMARY DATA	
Bankfull Elevation:	213.8
Bankfull Cross-Sectional Area:	2.8
Bankfull Width:	6.5
Flood Prone Area Elevation:	214.5
Flood Prone Width:	30.0
Max Depth at Bankfull:	0.7
Mean Depth at Bankfull:	0.4
W / D Ratio:	15.1
Entrenchment Ratio:	4.6
Bank Height Ratio:	1.0

Stream Type	C5

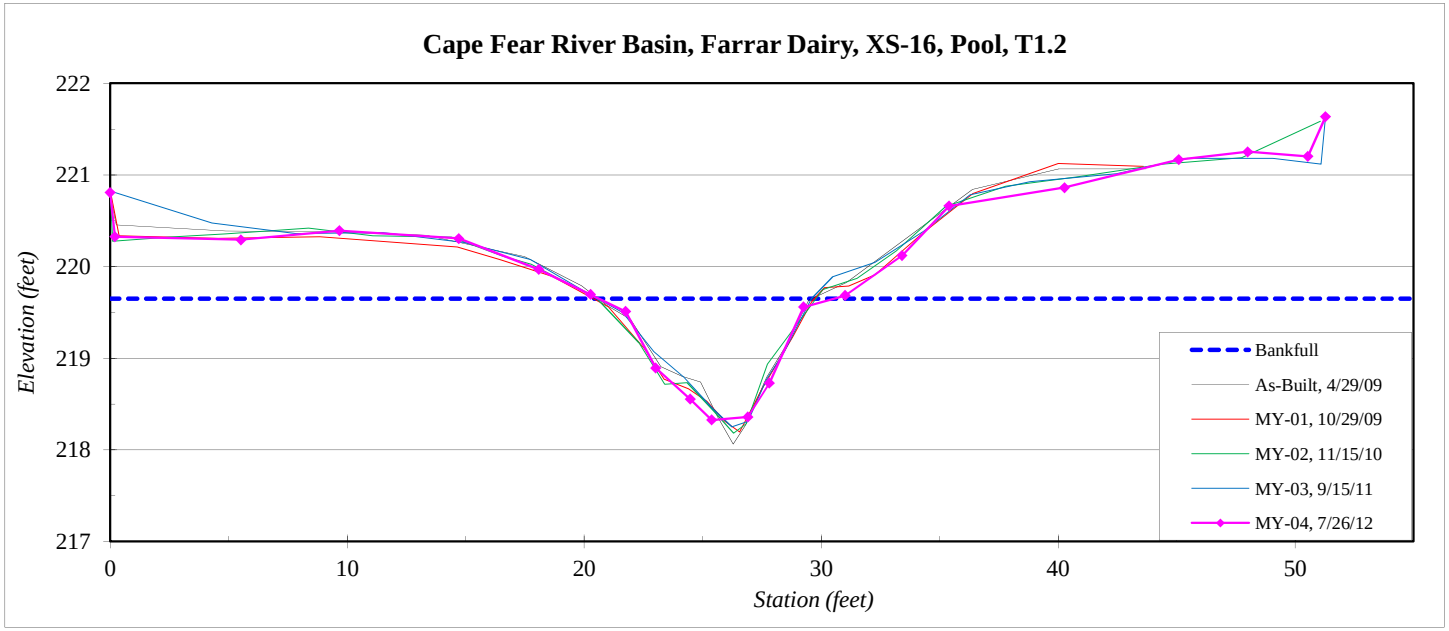


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-16, Pool, T1.2
Drainage Area (sq mi):	0.10
Date:	7/26/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	220.81
0.2	220.33
5.5	220.29
9.7	220.39
14.7	220.31
18.1	219.97
20.3	219.69
21.8	219.51
23.0	218.89
24.5	218.55
25.4	218.33
26.9	218.36
27.8	218.73
29.3	219.56
31.0	219.68
33.4	220.12
35.4	220.66
40.3	220.86
45.1	221.17
48.0	221.25
50.5	221.20
51.3	221.63

SUMMARY DATA	
Bankfull Elevation:	219.7
Bankfull Cross-Sectional Area:	6.4
Bankfull Width:	8.8
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	1.3
Mean Depth at Bankfull:	0.7
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	C5

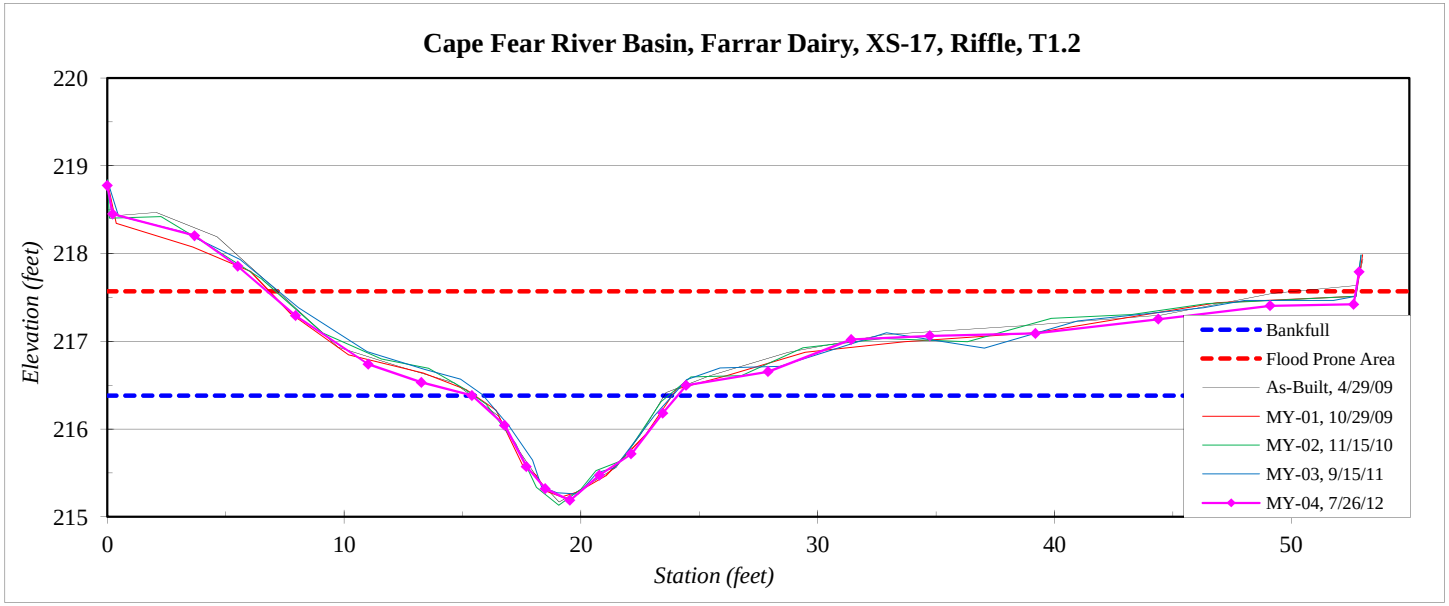


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-17, Riffle, T1.2
Drainage Area (sq mi):	0.10
Date:	7/26/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	218.78
0.2	218.45
3.7	218.21
5.5	217.86
8.0	217.29
11.0	216.74
13.3	216.53
15.4	216.38
16.8	216.04
17.7	215.57
18.5	215.32
19.5	215.19
20.8	215.47
22.1	215.72
23.5	216.18
24.5	216.50
27.9	216.65
31.4	217.02
34.7	217.06
39.2	217.09
44.4	217.25
49.1	217.41
52.6	217.42
52.9	217.79

SUMMARY DATA	
Bankfull Elevation:	216.4
Bankfull Cross-Sectional Area:	5.7
Bankfull Width:	8.7
Flood Prone Area Elevation:	217.6
Flood Prone Width:	46.0
Max Depth at Bankfull:	1.2
Mean Depth at Bankfull:	0.7
W / D Ratio:	11.6
Entrenchment Ratio:	>3.0
Bank Height Ratio:	1.0

Stream Type	C5

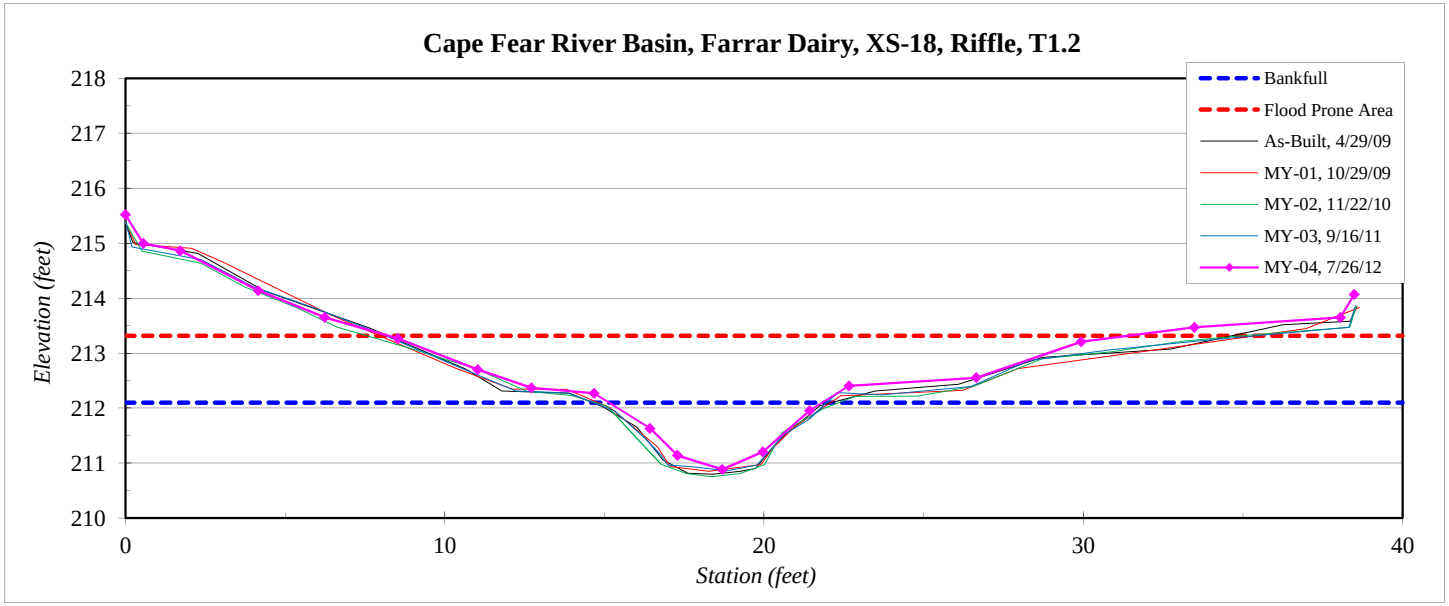


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-18, Riffle, T1.2
Drainage Area (sq mi):	0.10
Date:	7/26/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	215.52
0.6	215.00
1.7	214.86
4.2	214.14
6.2	213.65
8.5	213.27
11.0	212.70
12.7	212.37
14.7	212.27
16.4	211.63
17.3	211.14
18.7	210.88
20.0	211.20
21.4	211.95
22.7	212.40
26.6	212.55
29.9	213.21
33.5	213.47
38.1	213.65
38.5	214.07

SUMMARY DATA	
Bankfull Elevation:	212.1
Bankfull Cross-Sectional Area:	4.6
Bankfull Width:	6.7
Flood Prone Area Elevation:	213.3
Flood Prone Width:	21.0
Max Depth at Bankfull:	1.2
Mean Depth at Bankfull:	0.7
W / D Ratio:	9.8
Entrenchment Ratio:	3.1
Bank Height Ratio:	1.0

Stream Type	E5

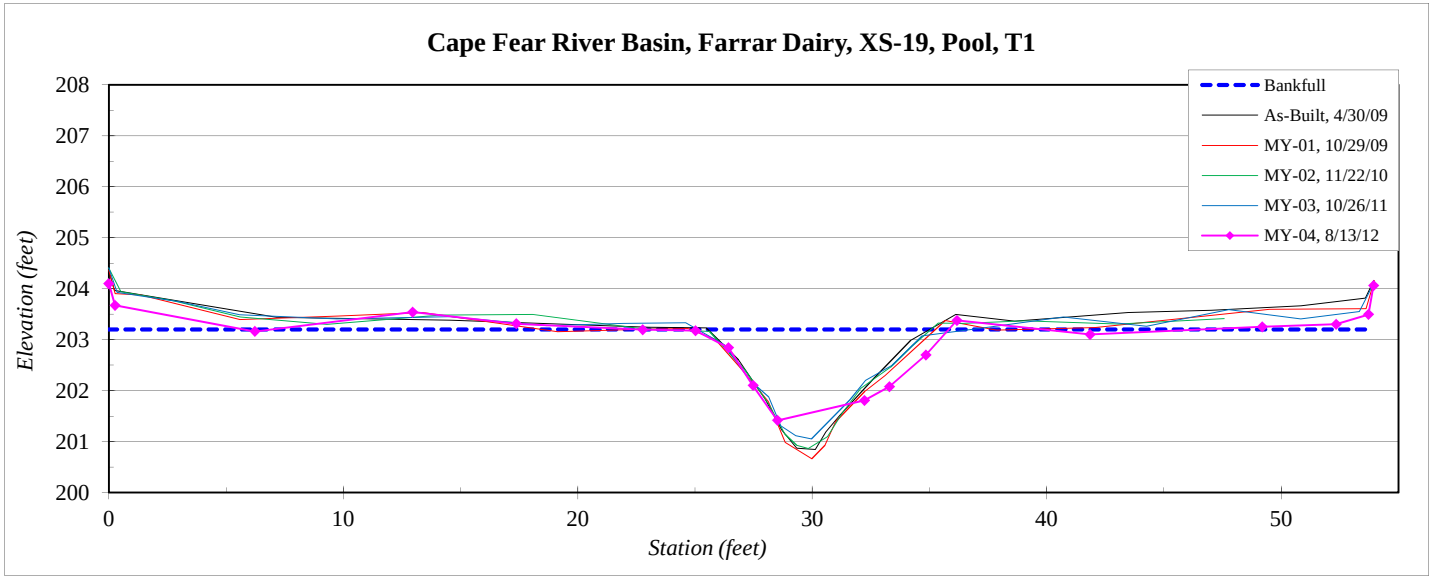


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-19, Pool, T1
Drainage Area (sq mi):	0.18
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	204.10
0.3	203.67
6.2	203.16
13.0	203.54
17.4	203.31
22.8	203.20
25.0	203.18
26.4	202.84
27.5	202.10
28.5	201.42
32.2	201.81
33.3	202.08
34.9	202.70
36.2	203.38
41.8	203.10
49.2	203.25
52.3	203.30
53.7	203.49
53.9	204.06

SUMMARY DATA	
Bankfull Elevation:	203.2
Bankfull Cross-Sectional Area:	10.3
Bankfull Width:	10.6
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	1.8
Mean Depth at Bankfull:	1.0
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	E5

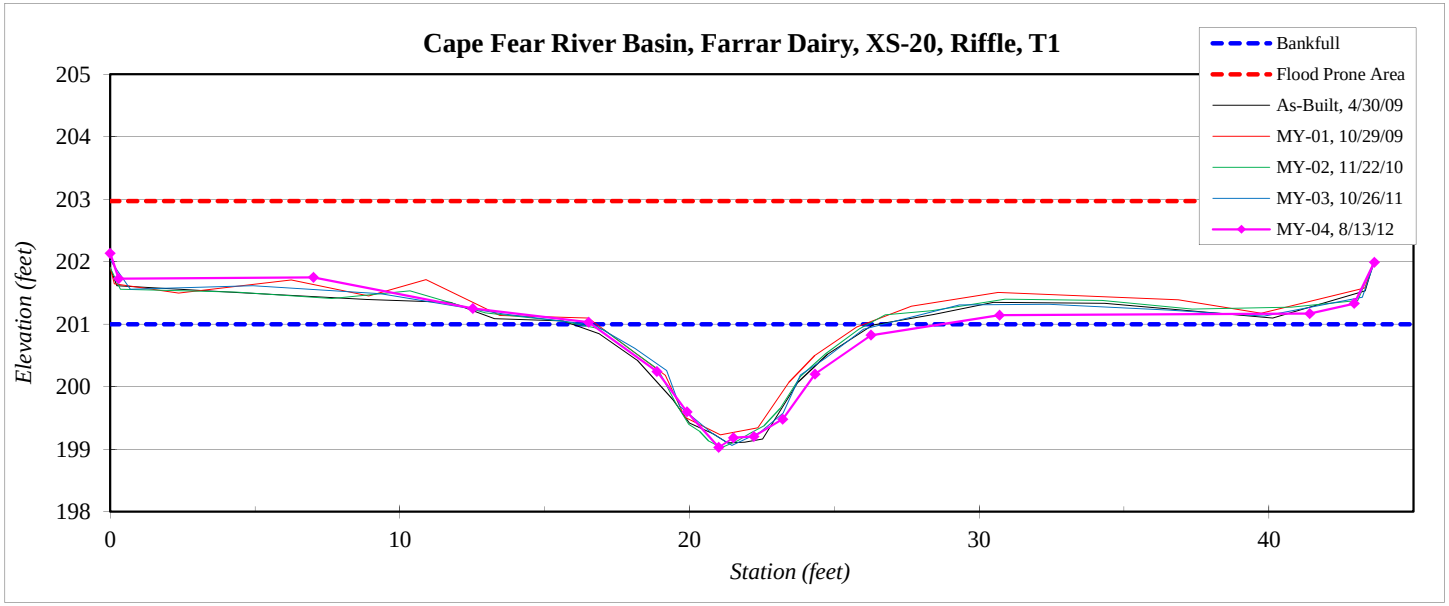


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-20, Riffle, T1
Drainage Area (sq mi):	0.18
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	202.13
0.3	201.73
7.0	201.75
12.5	201.25
16.5	201.03
18.9	200.24
19.9	199.60
21.0	199.03
21.5	199.19
22.2	199.20
23.2	199.48
24.3	200.20
26.3	200.82
30.7	201.15
41.4	201.17
42.9	201.33
43.6	201.99

SUMMARY DATA	
Bankfull Elevation:	201.0
Bankfull Cross-Sectional Area:	10.2
Bankfull Width:	12.1
Flood Prone Area Elevation:	203.0
Flood Prone Width:	>60
Max Depth at Bankfull:	2.0
Mean Depth at Bankfull:	0.8
W / D Ratio:	15.1
Entrenchment Ratio:	>3.0
Bank Height Ratio:	1.0

Stream Type	E5

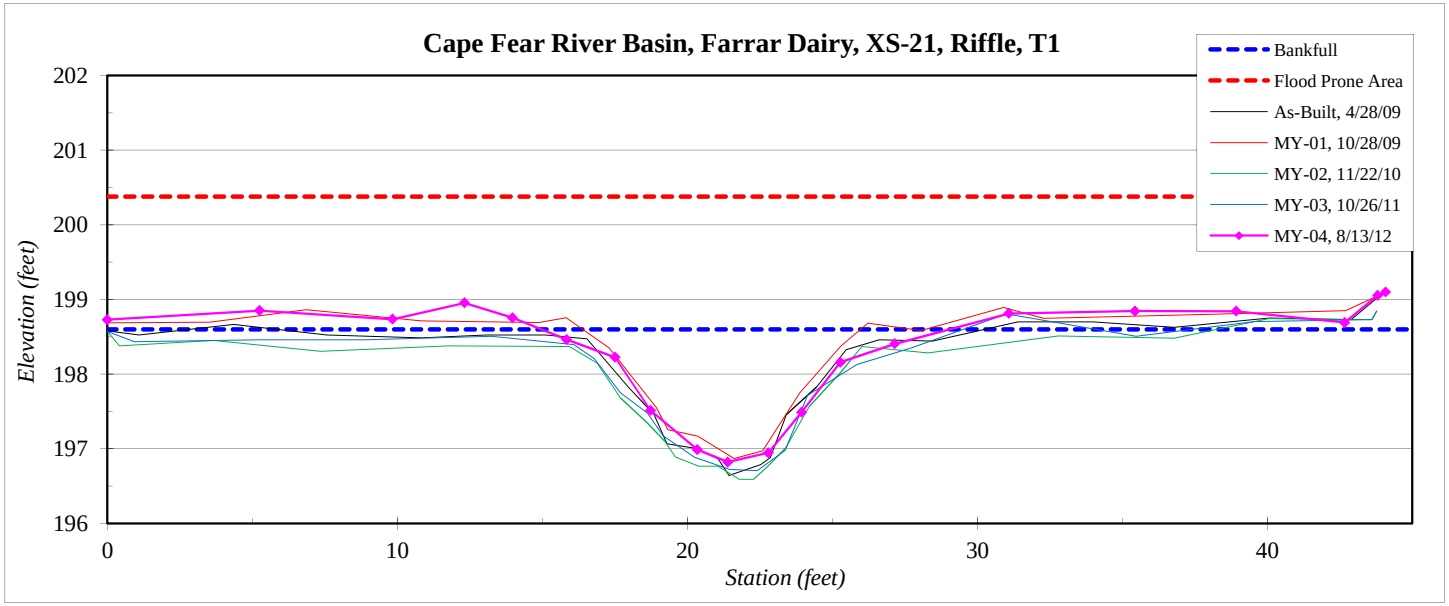


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-21, Riffle, T1
Drainage Area (sq mi):	0.18
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	198.73
5.2	198.85
9.8	198.74
12.3	198.95
14.0	198.76
15.8	198.46
17.5	198.22
18.7	197.51
20.3	196.99
21.4	196.82
22.8	196.95
23.9	197.49
25.3	198.16
27.1	198.40
31.1	198.81
35.4	198.84
38.9	198.84
42.7	198.69
43.8	199.05
44.1	199.10

SUMMARY DATA	
Bankfull Elevation:	198.6
Bankfull Cross-Sectional Area:	11.1
Bankfull Width:	14.1
Flood Prone Area Elevation:	200.4
Flood Prone Width:	>60
Max Depth at Bankfull:	1.8
Mean Depth at Bankfull:	0.8
W / D Ratio:	17.9
Entrenchment Ratio:	>3.0
Bank Height Ratio:	1.0

Stream Type	E5

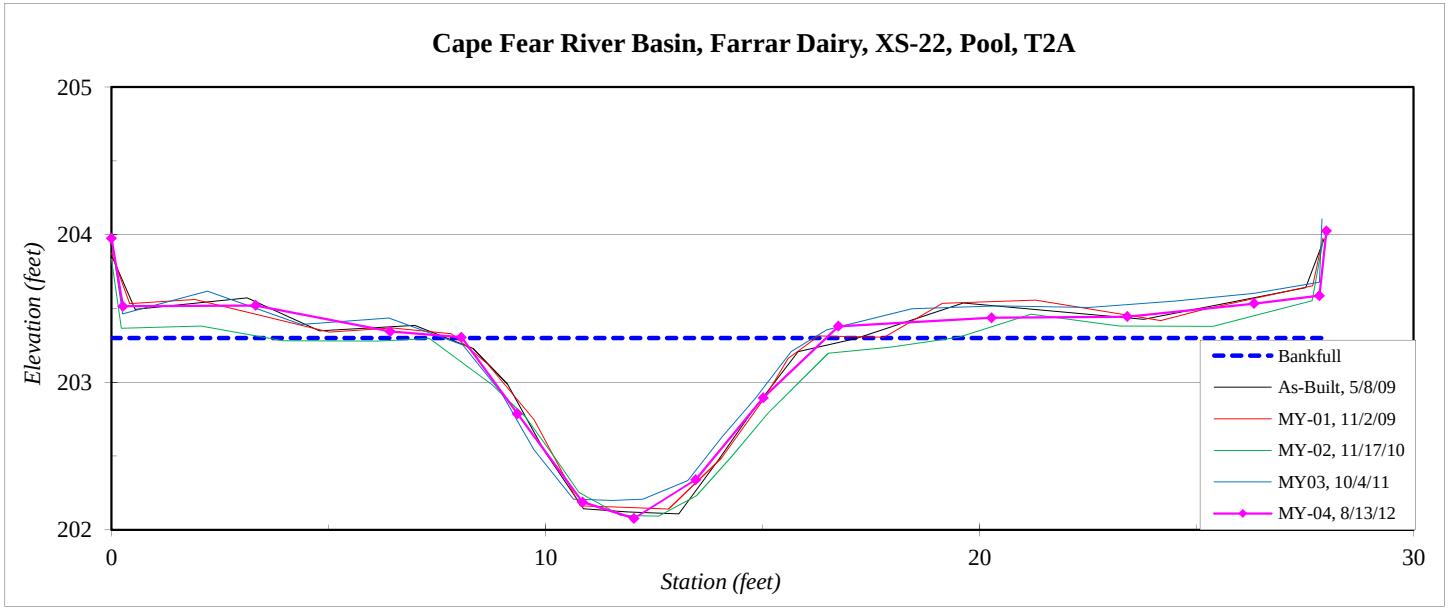


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-22, Pool, T2A
Drainage Area (sq mi):	0.04
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	203.98
0.3	203.52
3.3	203.52
6.4	203.34
8.1	203.30
9.3	202.79
10.8	202.19
12.0	202.08
13.5	202.34
15.0	202.90
16.7	203.38
20.3	203.44
23.4	203.44
26.3	203.53
27.8	203.59
28.0	204.03

SUMMARY DATA	
Bankfull Elevation:	203.3
Bankfull Cross-Sectional Area:	5.8
Bankfull Width:	8.4
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	1.2
Mean Depth at Bankfull:	0.7
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	C5

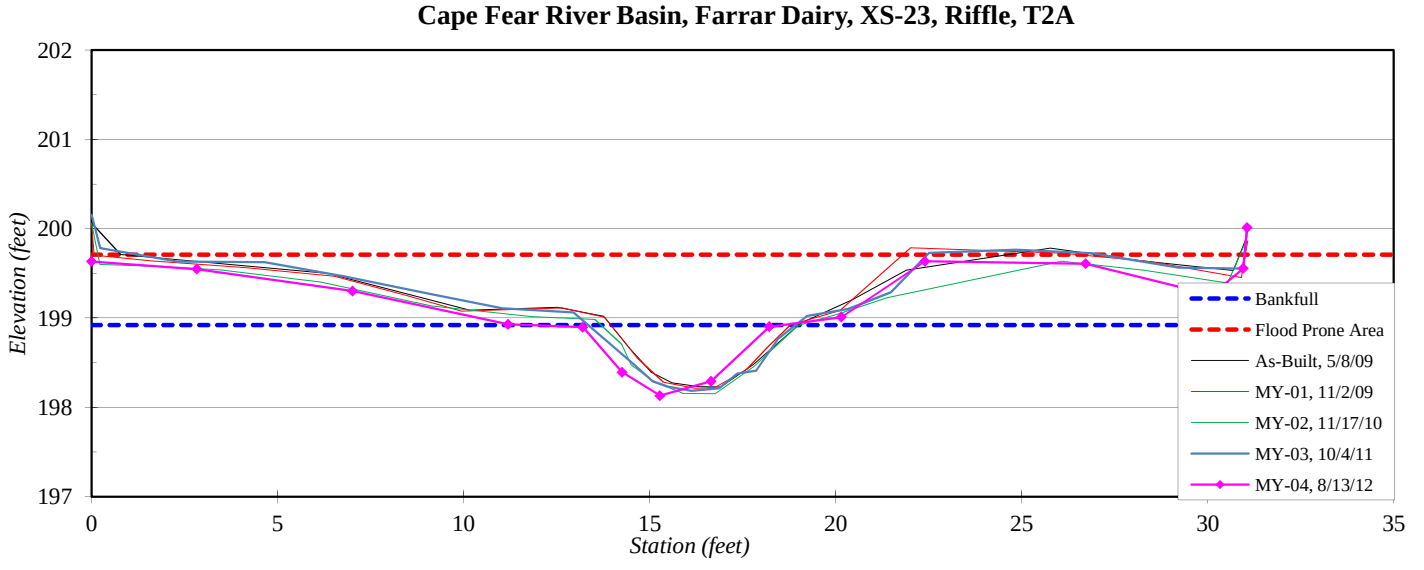


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-23, Riffle, T2A
Drainage Area (sq mi):	0.04
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	199.63
2.8	199.55
7.0	199.30
11.2	198.93
13.2	198.90
14.3	198.39
15.3	198.13
16.7	198.29
18.2	198.90
20.2	199.01
22.4	199.64
26.7	199.61
30.1	199.26
31.1	200.01

SUMMARY DATA	
Bankfull Elevation:	198.9
Bankfull Cross-Sectional Area:	2.5
Bankfull Width:	6.8
Flood Prone Area Elevation:	199.7
Flood Prone Width:	>30
Max Depth at Bankfull:	0.8
Mean Depth at Bankfull:	0.4
W / D Ratio:	18.5
Entrenchment Ratio:	>3.0
Bank Height Ratio:	1.0

Stream Type	C5

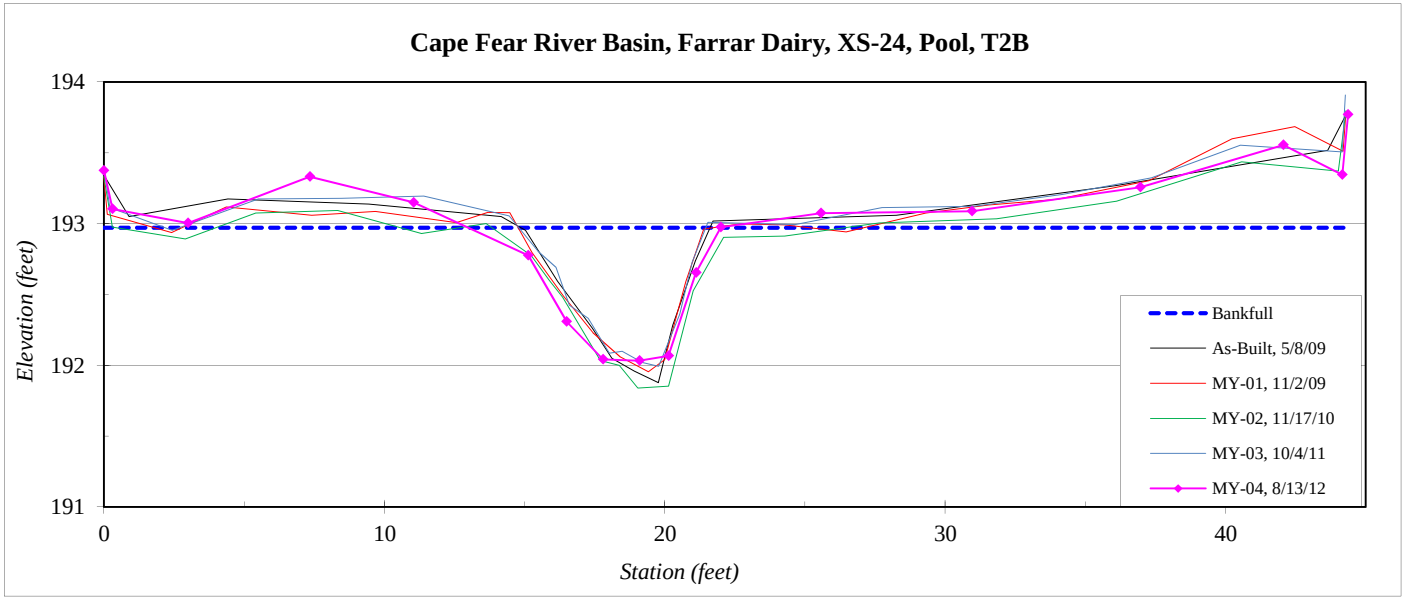


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-24, Pool, T2B
Drainage Area (sq mi):	0.04
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	193.38
0.3	193.10
3.0	193.00
7.3	193.33
11.0	193.15
15.1	192.78
16.5	192.31
17.8	192.04
19.1	192.03
20.1	192.07
21.1	192.65
22.0	192.98
25.6	193.07
30.9	193.09
37.0	193.26
42.1	193.55
44.2	193.35
44.4	193.77

SUMMARY DATA	
Bankfull Elevation:	193.0
Bankfull Cross-Sectional Area:	4.7
Bankfull Width:	9.0
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	0.9
Mean Depth at Bankfull:	0.5
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	C5

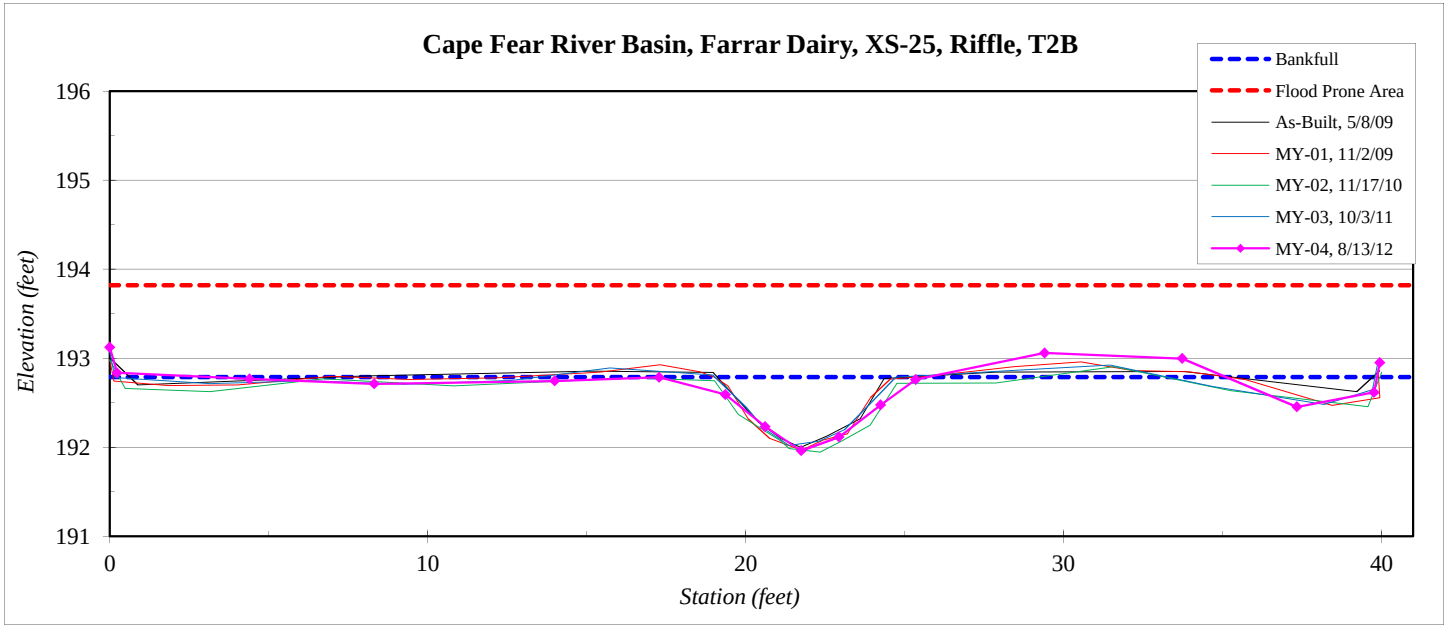


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-25, Riffle, T2B
Drainage Area (sq mi):	0.04
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	192.92
0.2	192.64
4.4	192.57
8.3	192.51
14.0	192.55
17.3	192.59
19.4	192.39
20.6	192.03
21.8	191.76
22.9	191.92
24.2	192.28
25.4	192.56
29.4	192.86
33.7	192.80
37.3	192.25
39.8	192.42
39.9	192.75

SUMMARY DATA	
Bankfull Elevation:	192.8
Bankfull Cross-Sectional Area:	3.2
Bankfull Width:	8.4
Flood Prone Area Elevation:	193.8
Flood Prone Width:	>60
Max Depth at Bankfull:	1.0
Mean Depth at Bankfull:	0.4
W / D Ratio:	22.1
Entrenchment Ratio:	>3.0
Bank Height Ratio:	1.0

Stream Type	C5

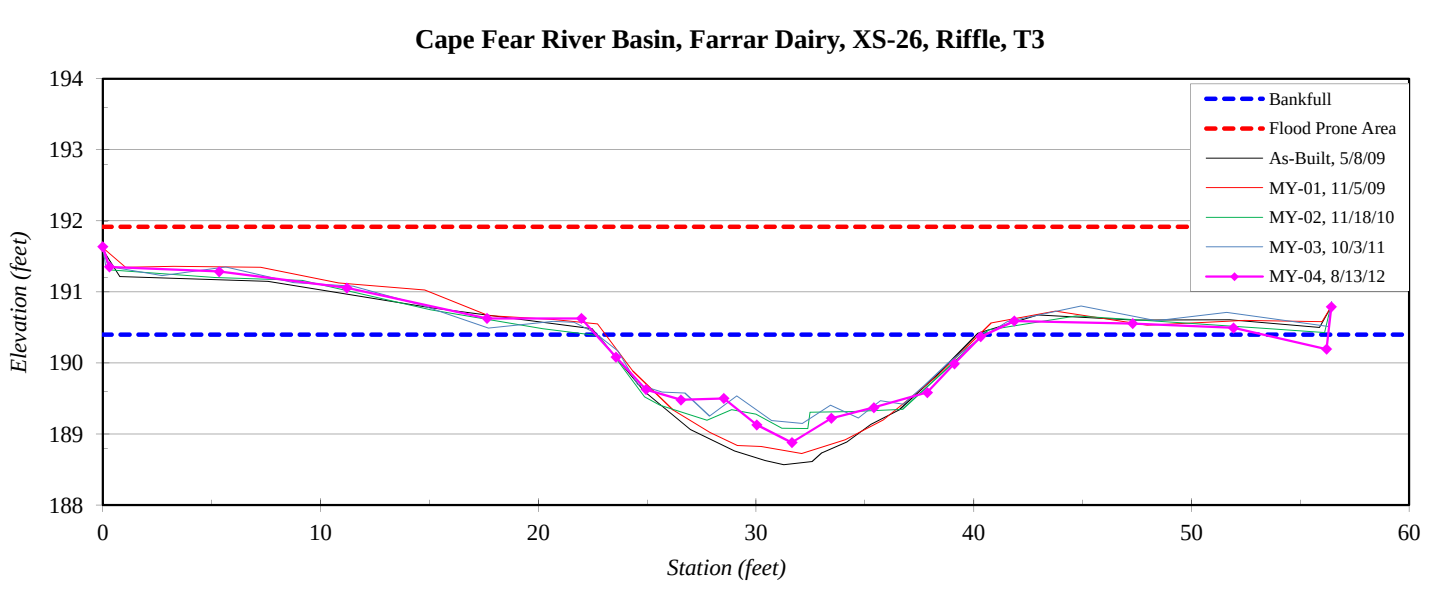


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-26, Riffle, T3
Drainage Area (sq mi):	0.39
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	191.64
0.3	191.35
5.3	191.29
11.2	191.06
17.6	190.63
22.0	190.63
23.6	190.08
24.9	189.63
26.6	189.48
28.5	189.50
30.0	189.13
31.6	188.88
33.5	189.22
35.4	189.37
37.9	189.59
39.1	189.99
40.3	190.37
41.9	190.59
47.3	190.56
51.9	190.50
56.2	190.20
56.4	190.79

SUMMARY DATA	
Bankfull Elevation:	190.4
Bankfull Cross-Sectional Area:	15.8
Bankfull Width:	17.9
Flood Prone Area Elevation:	191.9
Flood Prone Width:	>60
Max Depth at Bankfull:	1.5
Mean Depth at Bankfull:	0.9
W / D Ratio:	20.3
Entrenchment Ratio:	>3.0
Bank Height Ratio:	1.1

Stream Type	C5

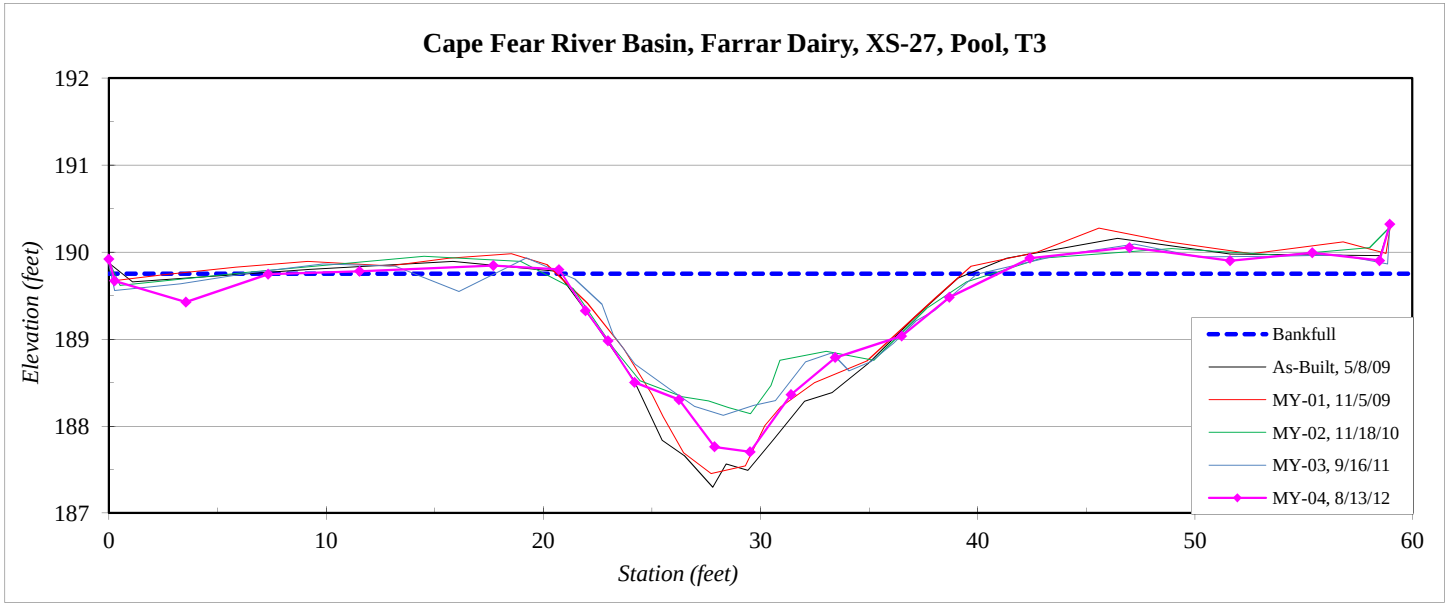


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-27, Pool, T3
Drainage Area (sq mi):	0.39
Date:	8/13/2012
Field Crew:	A. French, M. Koss

Station	Elevation
0.0	189.92
0.3	189.67
3.6	189.43
7.3	189.75
11.6	189.78
17.7	189.85
20.7	189.80
21.9	189.33
23.0	188.98
24.2	188.50
26.3	188.30
27.9	187.76
29.5	187.70
31.4	188.36
33.4	188.79
36.5	189.03
38.7	189.48
42.4	189.93
47.0	190.05
51.6	189.90
55.4	189.99
58.5	189.90
59.0	190.32

SUMMARY DATA	
Bankfull Elevation:	189.8
Bankfull Cross-Sectional Area:	20.5
Bankfull Width:	20.1
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	2.0
Mean Depth at Bankfull:	1.0
W / D Ratio:	-
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	C5

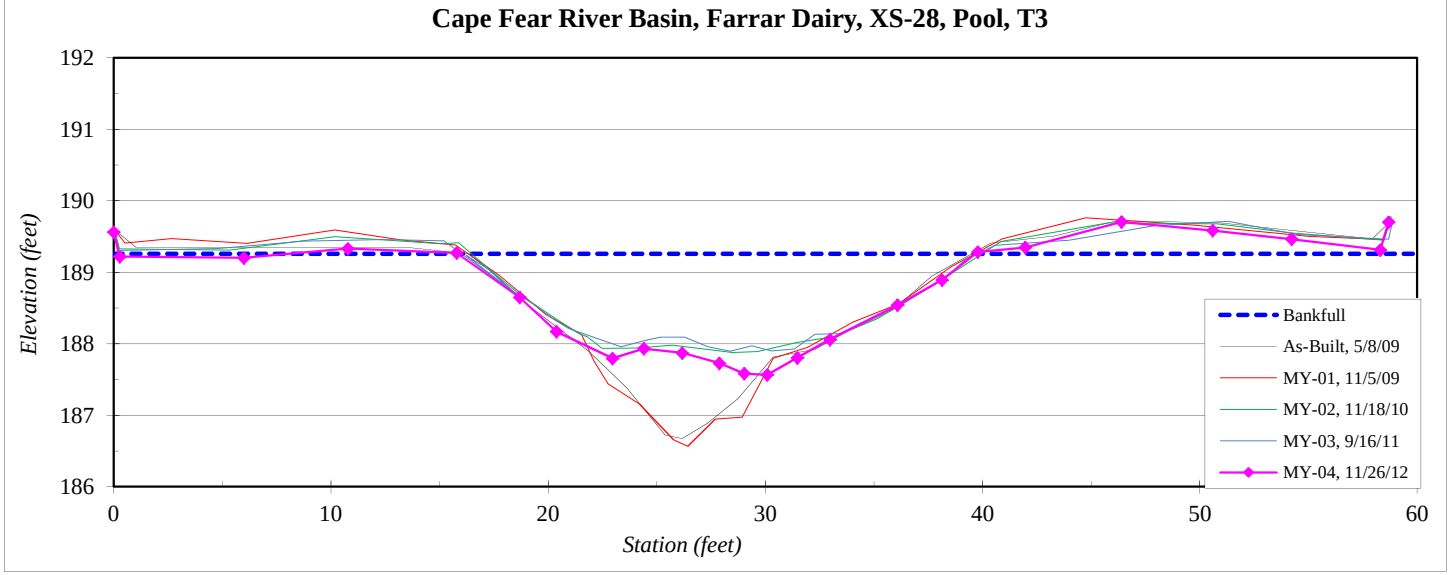


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-28, Pool, T3
Drainage Area (sq mi):	0.39
Date:	11/26/2012
Field Crew:	A. Helms, M. Koss

Station	Elevation
0.0	189.56
0.3	189.22
6.0	189.20
10.8	189.33
15.8	189.27
18.7	188.65
20.4	188.17
23.0	187.80
24.4	187.93
26.2	187.87
27.9	187.73
29.0	187.58
30.1	187.56
31.5	187.80
33.0	188.06
36.1	188.54
38.1	188.89
39.8	189.28
42.0	189.35
46.4	189.71
50.6	189.58
54.2	189.46
58.3	189.31
58.7	189.70

SUMMARY DATA	
Bankfull Elevation:	189.3
Bankfull Cross-Sectional Area:	24.7
Bankfull Width:	23.8
Flood Prone Area Elevation:	-
Flood Prone Width:	-
Max Depth at Bankfull:	1.7
Mean Depth at Bankfull:	1.0
W / D Ratio:	22.9
Entrenchment Ratio:	-
Bank Height Ratio:	-

Stream Type	C5

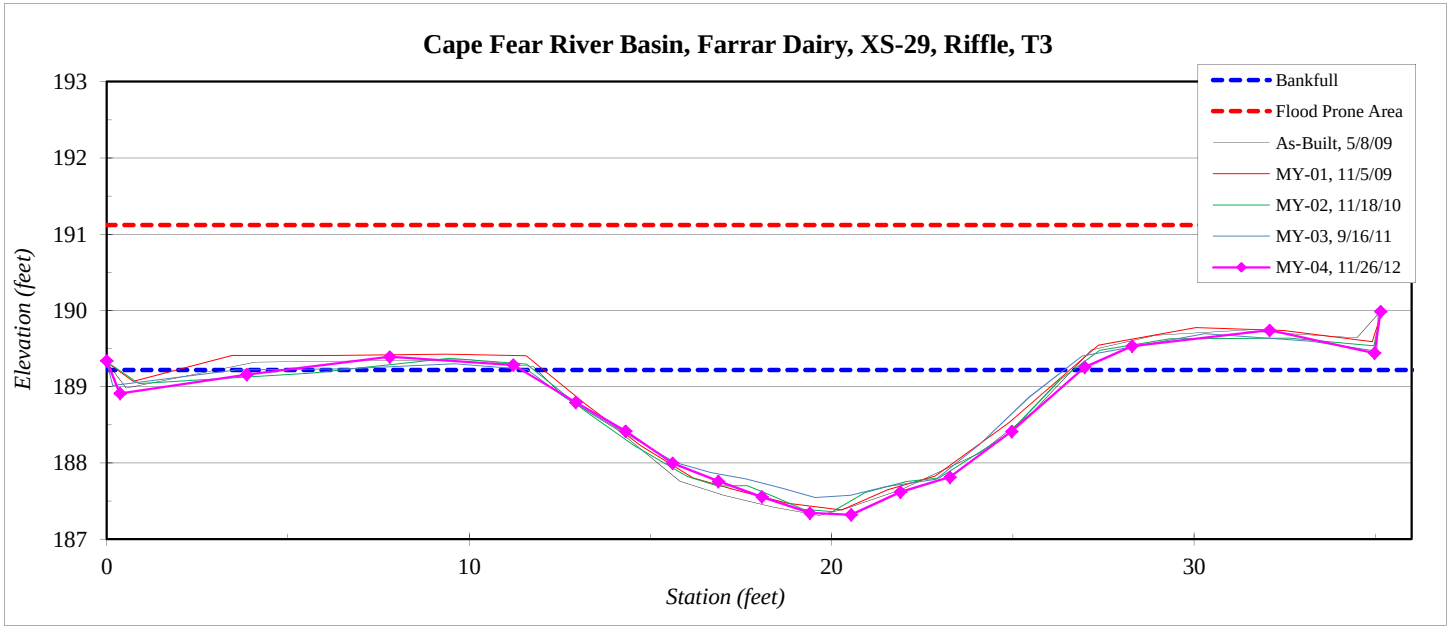


River Basin:	Cape Fear
Watershed:	Farrar Dairy
XS ID	XS-29, Riffle, T3
Drainage Area (sq mi):	0.39
Date:	11/26/2012
Field Crew:	A. Helms, M. Koss

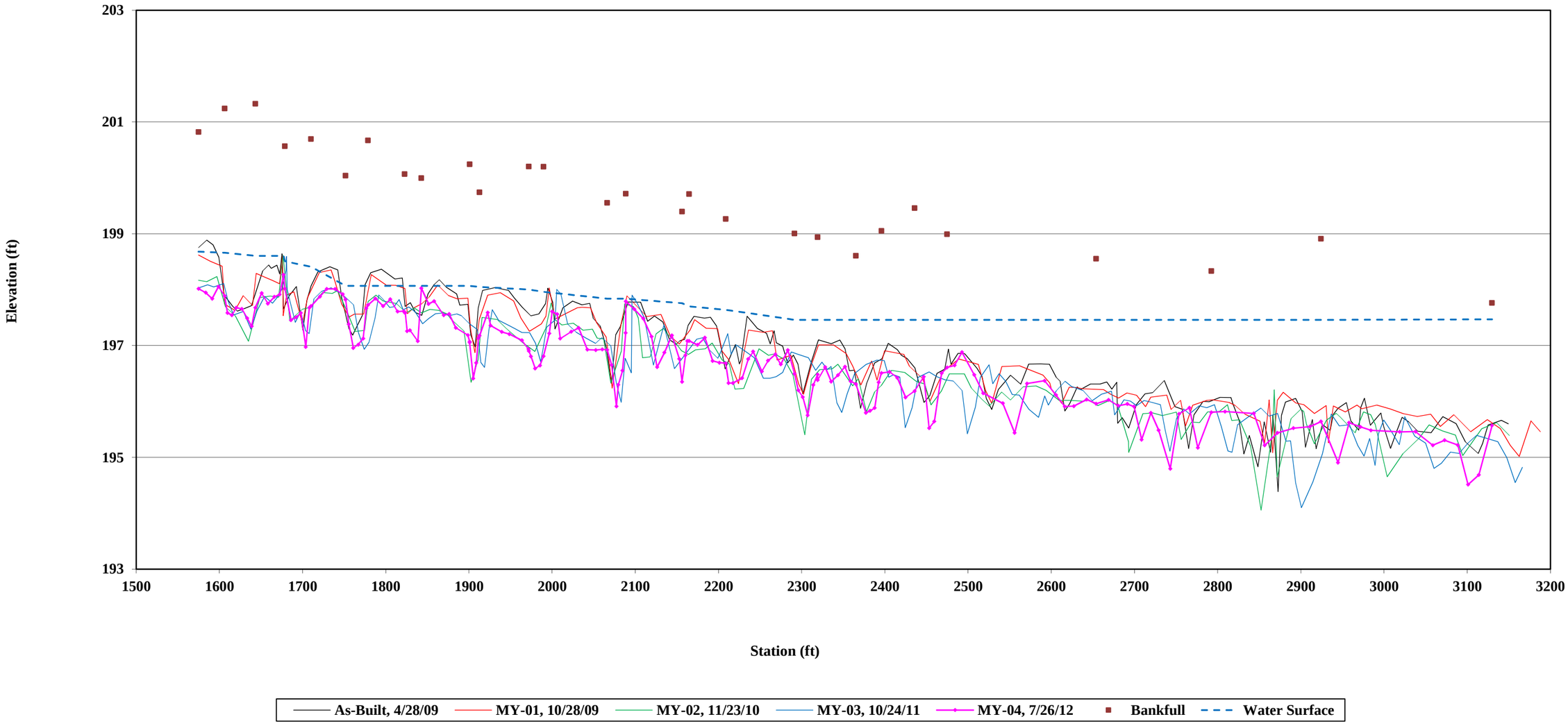
Station	Elevation
0.0	189.34
0.4	188.91
3.9	189.16
7.8	189.39
11.2	189.28
12.9	188.79
14.3	188.42
15.6	188.00
16.9	187.76
18.1	187.56
19.4	187.34
20.5	187.32
21.9	187.62
23.3	187.81
25.0	188.41
27.0	189.26
28.3	189.53
32.1	189.74
35.0	189.44
35.1	189.99

SUMMARY DATA	
Bankfull Elevation:	189.2
Bankfull Cross-Sectional Area:	17.6
Bankfull Width:	15.5
Flood Prone Area Elevation:	191.1
Flood Prone Width:	>35
Max Depth at Bankfull:	1.9
Mean Depth at Bankfull:	1.1
W / D Ratio:	13.7
Entrenchment Ratio:	2.3
Bank Height Ratio:	1.0

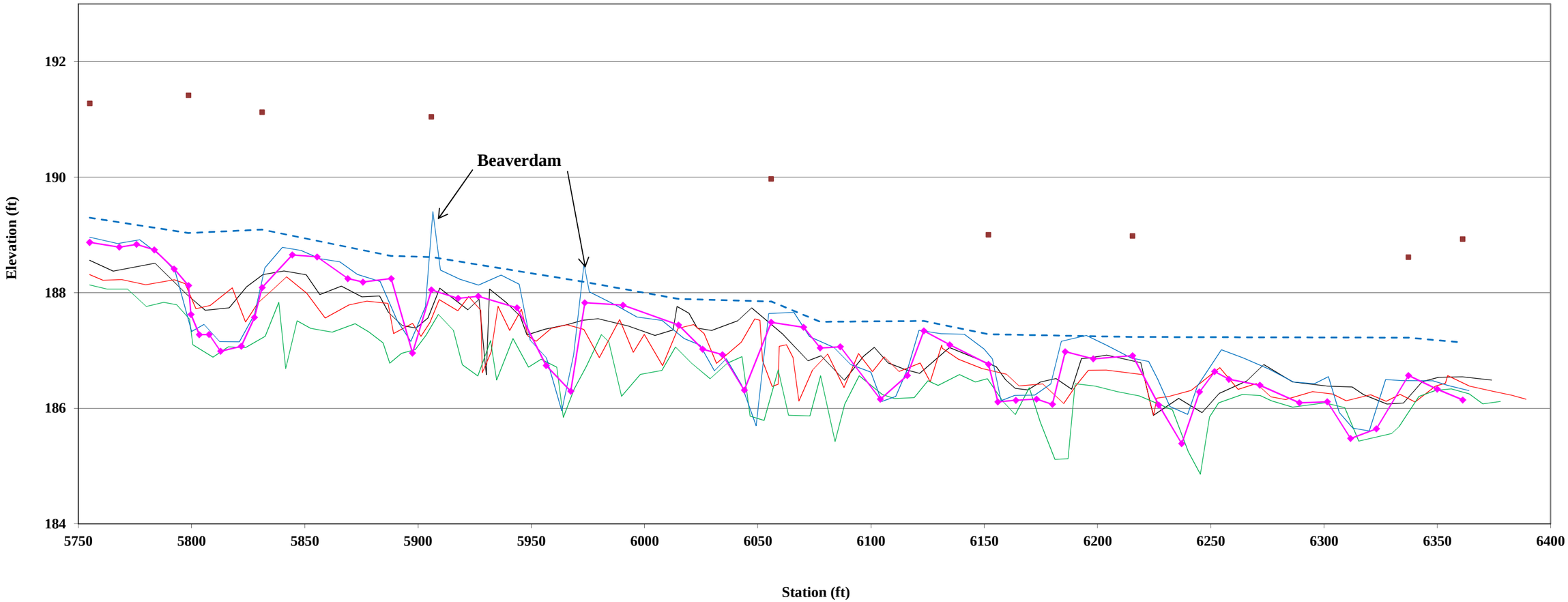
Stream Type	C5



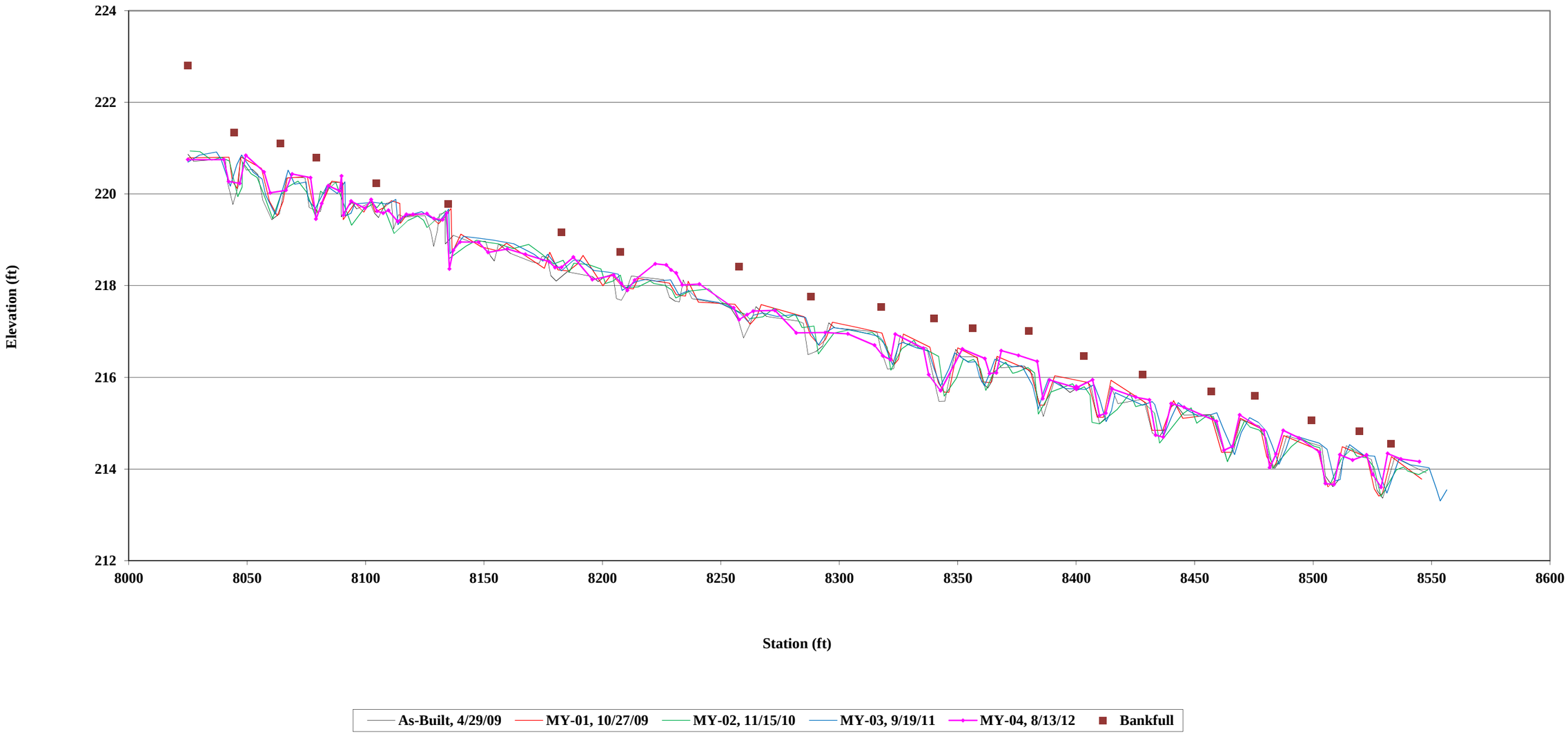
Farrar Dairy Longitudinal Profile
NPAC-1 MY-04
Stations 15+75 - 31+75



Farrar Dairy Longitudinal Profile
NPAC-2 MY-04
Stations 57+55 - 63+77

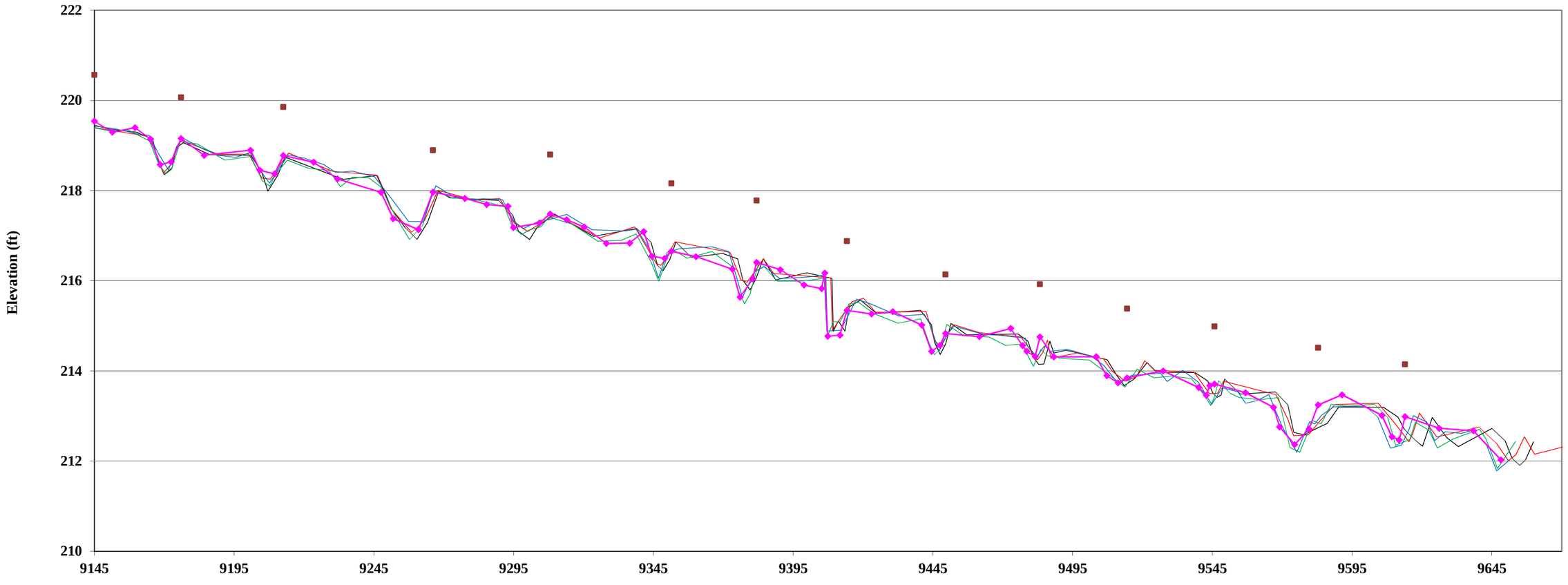


Farrar Dairy Longitudinal Profile
Tributary 1.1 MY-04
Stations 80+25 - 85+75



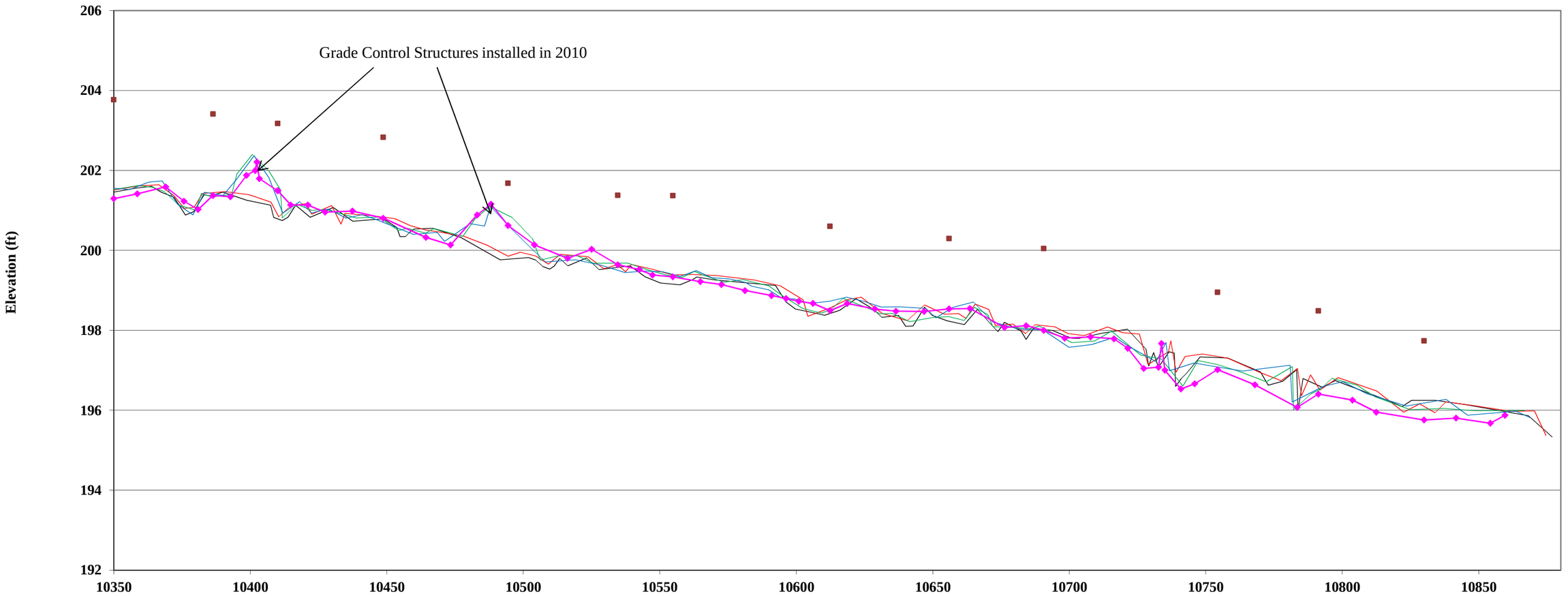
*No WS due to no flow in channel during survey.

Farrar Dairy Longitudinal Profile
Tributary 1.2 MY-04
Stations 91+45 - 96+70



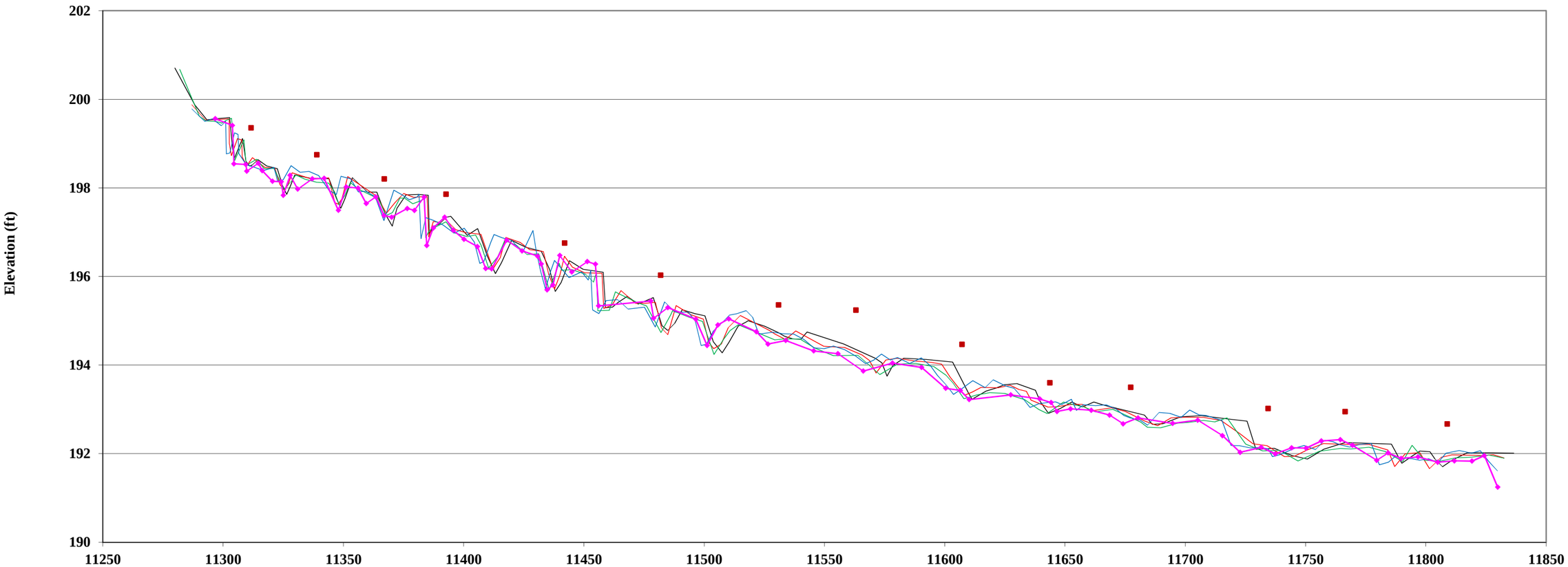
*No WS due to no flow in channel during survey.

Farrar Dairy Longitudinal Profile
Tributary 1 MY-04
Stations 103+50 - 108+77



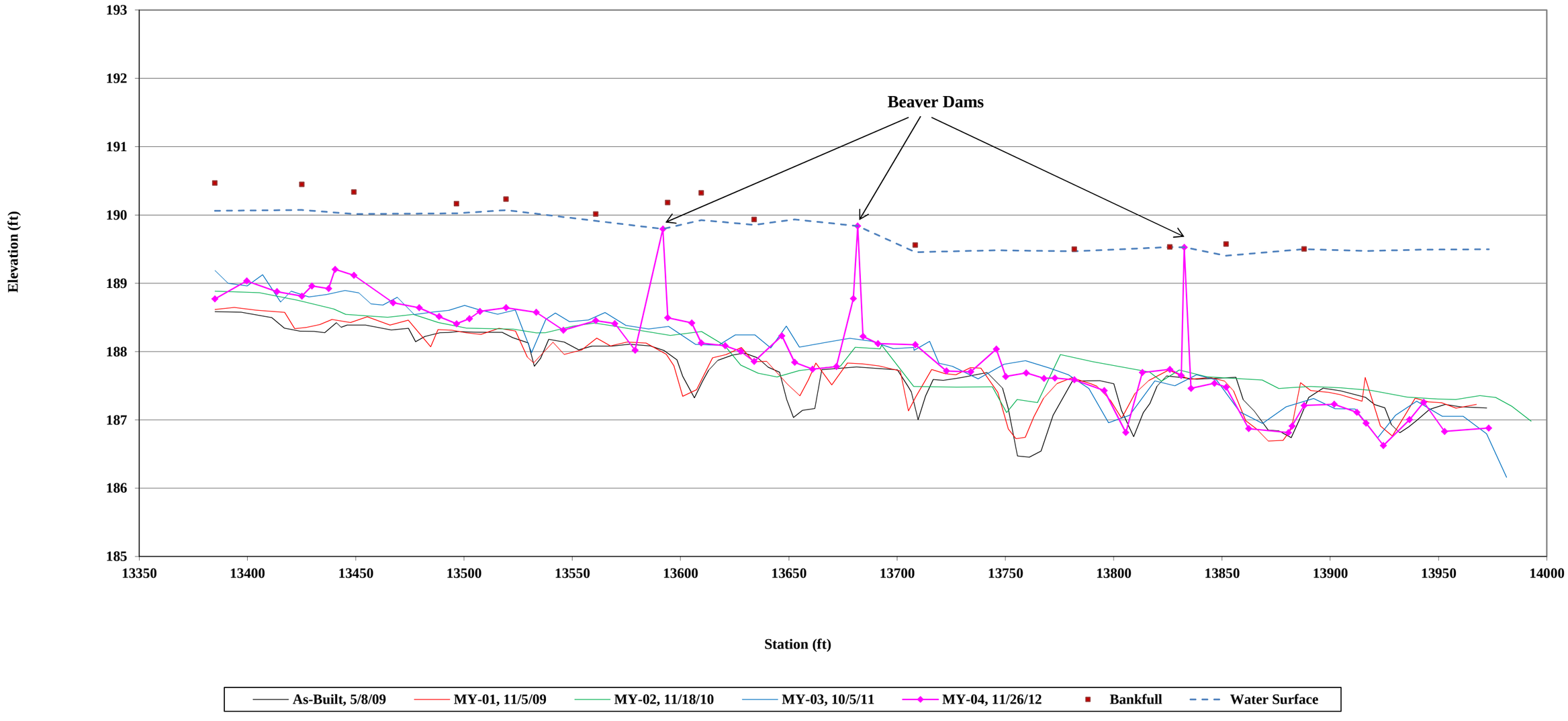
*No WS due to no flow in channel during survey.

Farrar Dairy Longitudinal Profile
Tributary 2 MY-04
Stations 112+80 - 118+37



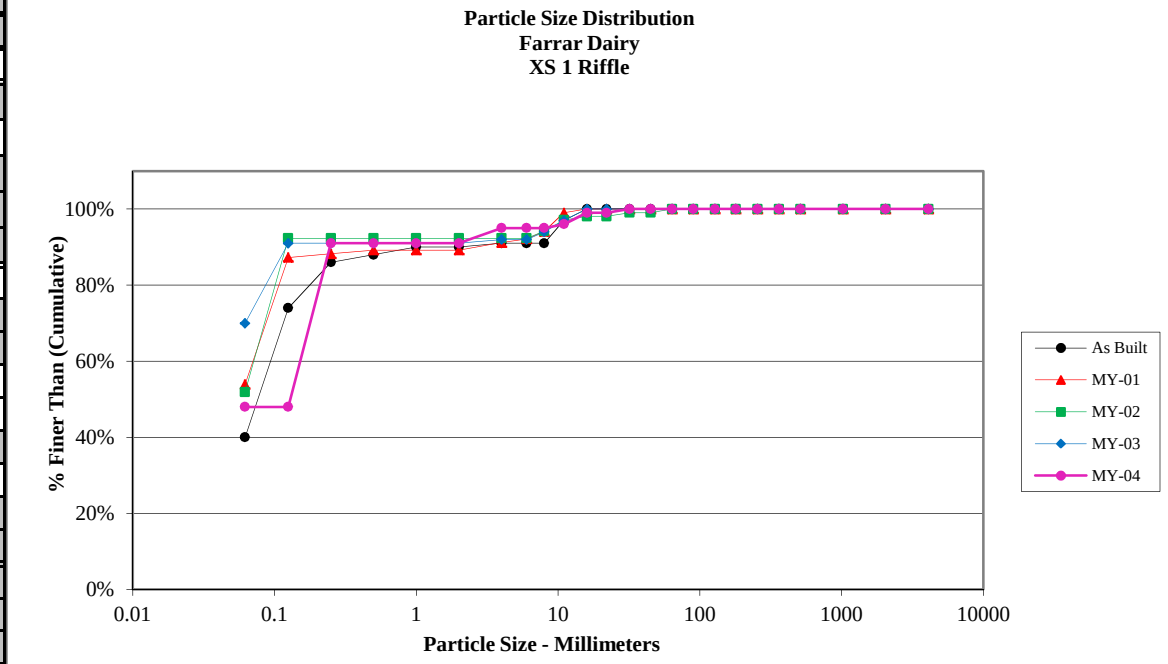
*No WS due to no flow in channel during survey.

Farrar Dairy Longitudinal Profile
Tributary 3 MY-04
Stations 133+85 - 139+73



Cross-Section 1 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	48
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	43
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		4
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	1
Medium	11.3 - 16	V	3
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	1
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



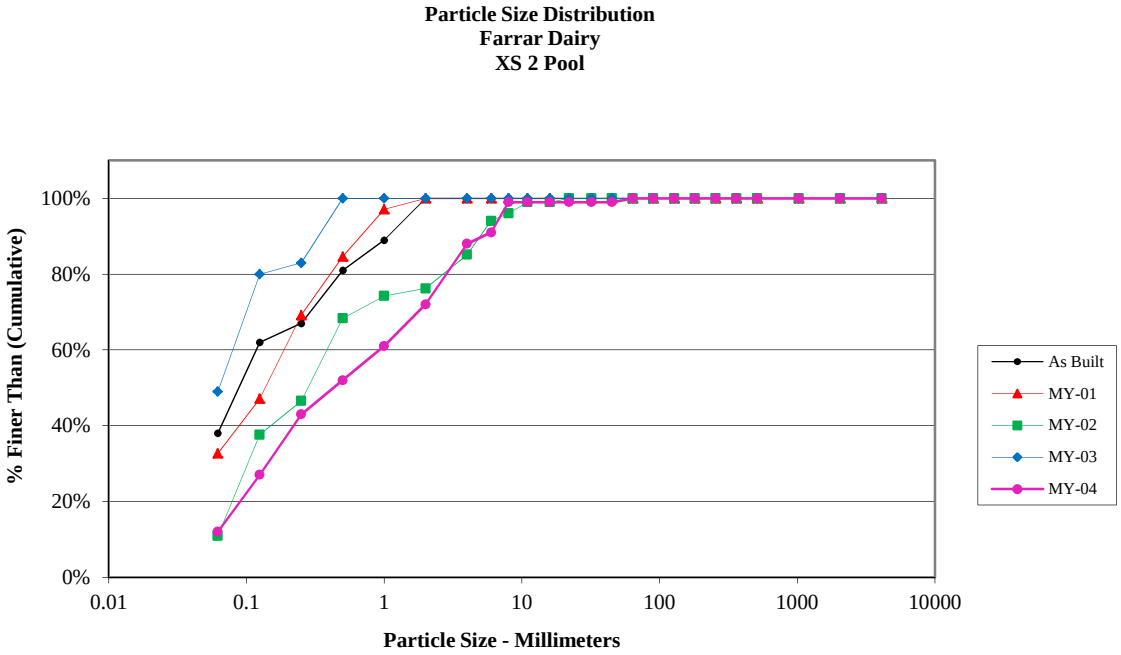
Size (mm)	
D16	0.062
D35	0.062
D50	0.13
D65	0.16
D84	0.22
D95	4

Size Distribution	
mean	0.1
dispersion	1.9
skewness	-0.06

Type	
silt/clay	48%
sand	43%
gravel	9%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 2 Pool - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	12
Very Fine	.062 - .125	S	15
Fine	.125 - .25	A	16
Medium	.25 - .50	N	9
Coarse	.50 - 1	D	9
Very Coarse	1 - 2	S	11
Very Fine	2 - 4		16
Fine	4 - 5.7	G	3
Fine	5.7 - 8	R	8
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		1
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



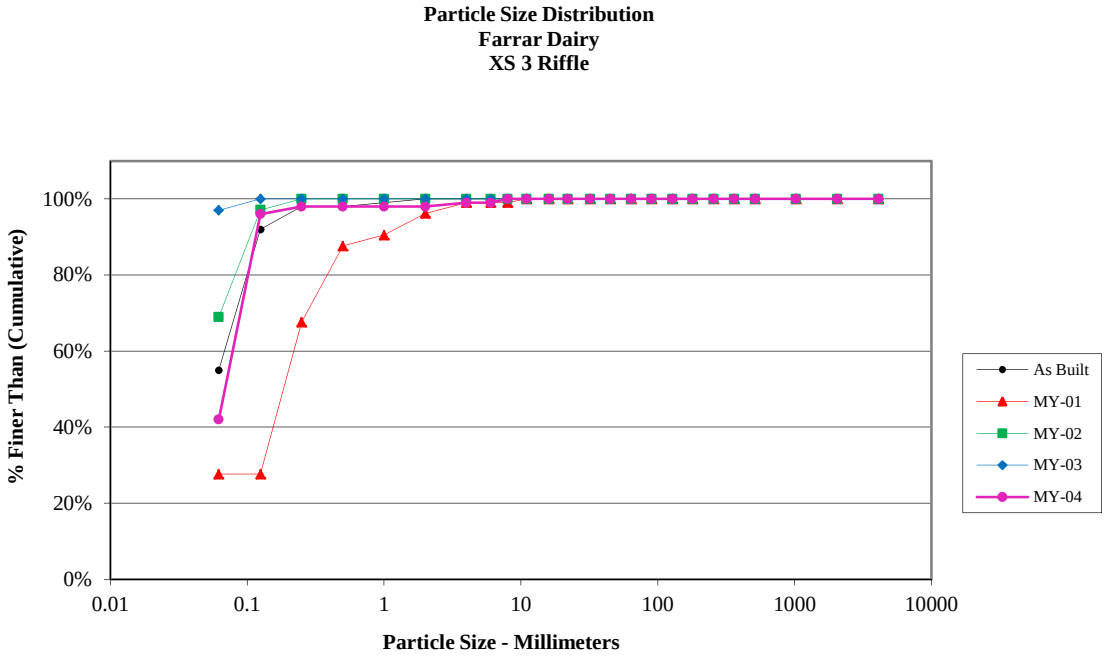
Size (mm)	
D16	0.075
D35	0.18
D50	0.43
D65	1.3
D84	3.4
D95	6.9

Size Distribution	
mean	0.5
dispersion	6.8
skewness	0.05

Type	
silt/clay	12%
sand	60%
gravel	28%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 3 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	42
Very Fine	.062 - .125	S	54
Fine	.125 - .25	A	2
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		1
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	1
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



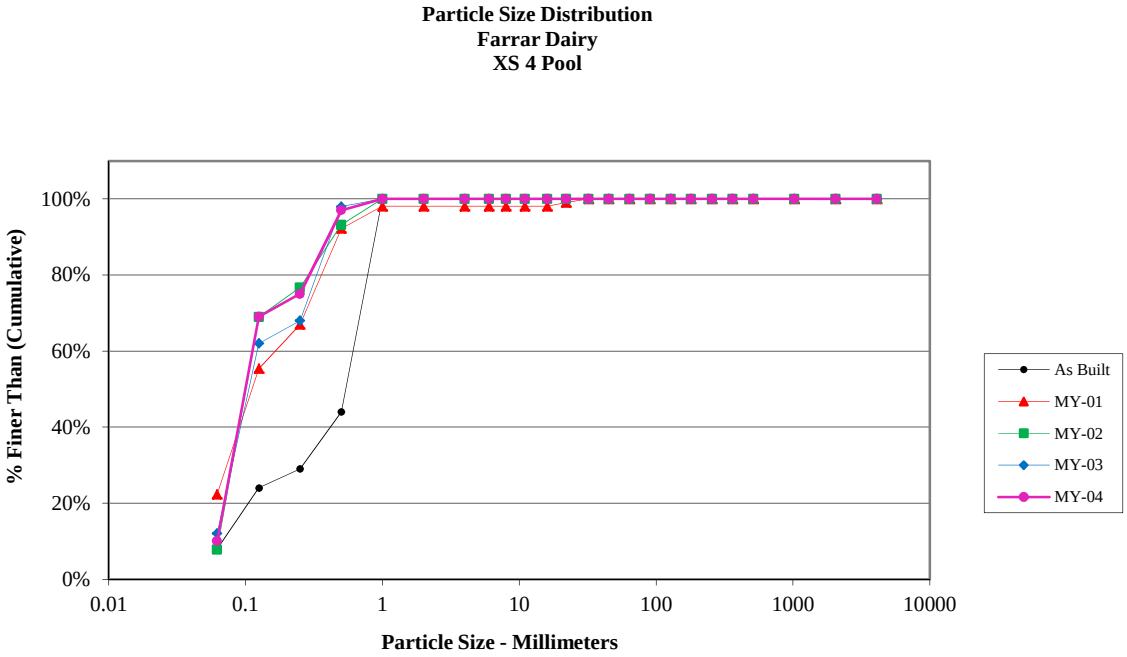
Size (mm)	
D16	0.062
D35	0.062
D50	0.069
D65	0.084
D84	0.11
D95	0.12

Size Distribution	
mean	0.1
dispersion	1.4
skewness	0.16

Type	
silt/clay	42%
sand	56%
gravel	2%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 4 Pool -MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	10
Very Fine	.062 - .125	S	59
Fine	.125 - .25	A	6
Medium	.25 - .50	N	22
Coarse	.50 - 1	D	3
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



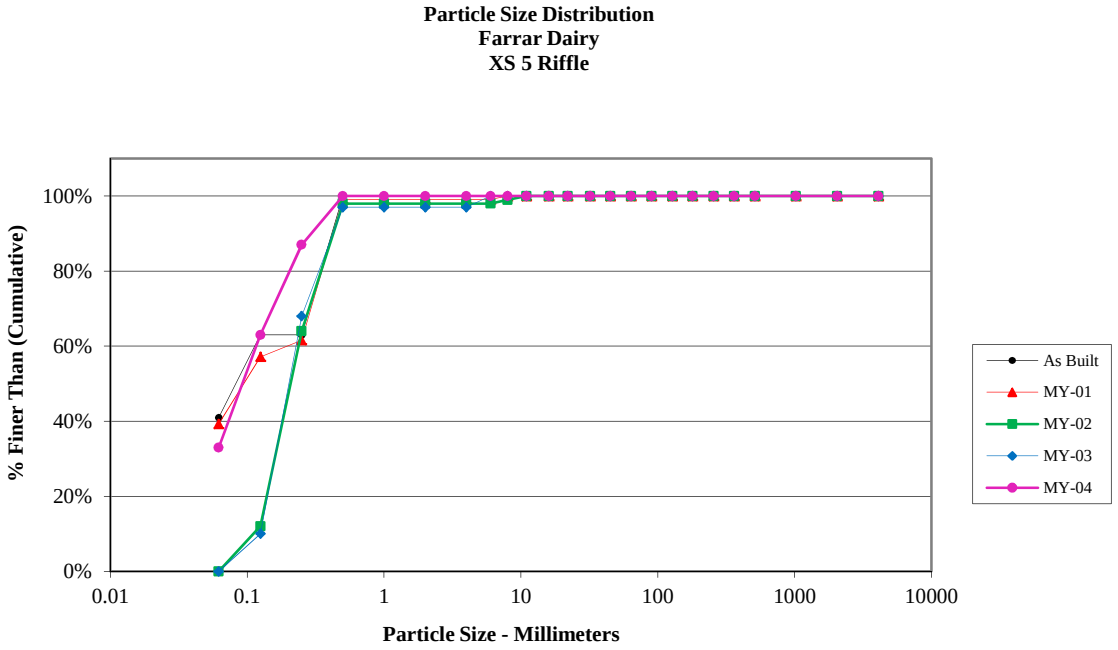
Size (mm)	
D16	0.067
D35	0.083
D50	0.1
D65	0.12
D84	0.33
D95	0.47

Size Distribution	
mean	0.1
dispersion	2.4
skewness	0.21

Type	
silt/clay	10%
sand	90%
gravel	0%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 5 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	33
Very Fine	.062 - .125	S	30
Fine	.125 - .25	A	24
Medium	.25 - .50	N	13
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



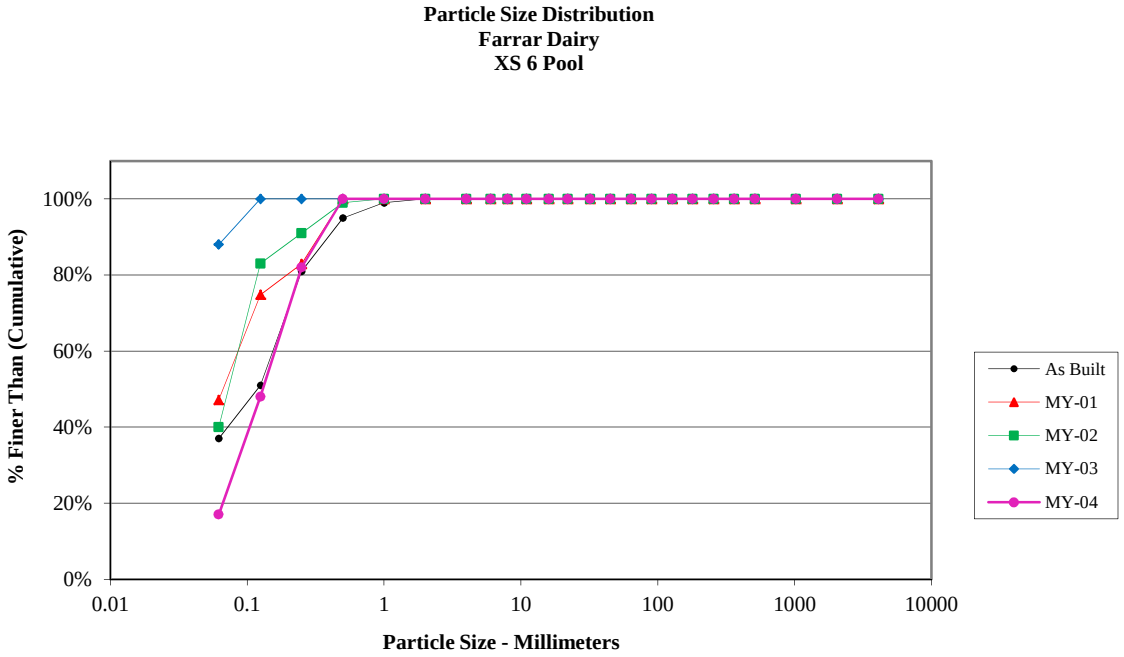
Size (mm)	
D16	0.062
D35	0.065
D50	0.092
D65	0.13
D84	0.23
D95	0.38

Size Distribution	
mean	---
dispersion	---
skewness	---

Type	
silt/clay	33%
sand	67%
gravel	0%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 6 Pool -MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	17
Very Fine	.062 - .125	S	31
Fine	.125 - .25	A	34
Medium	.25 - .50	N	18
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



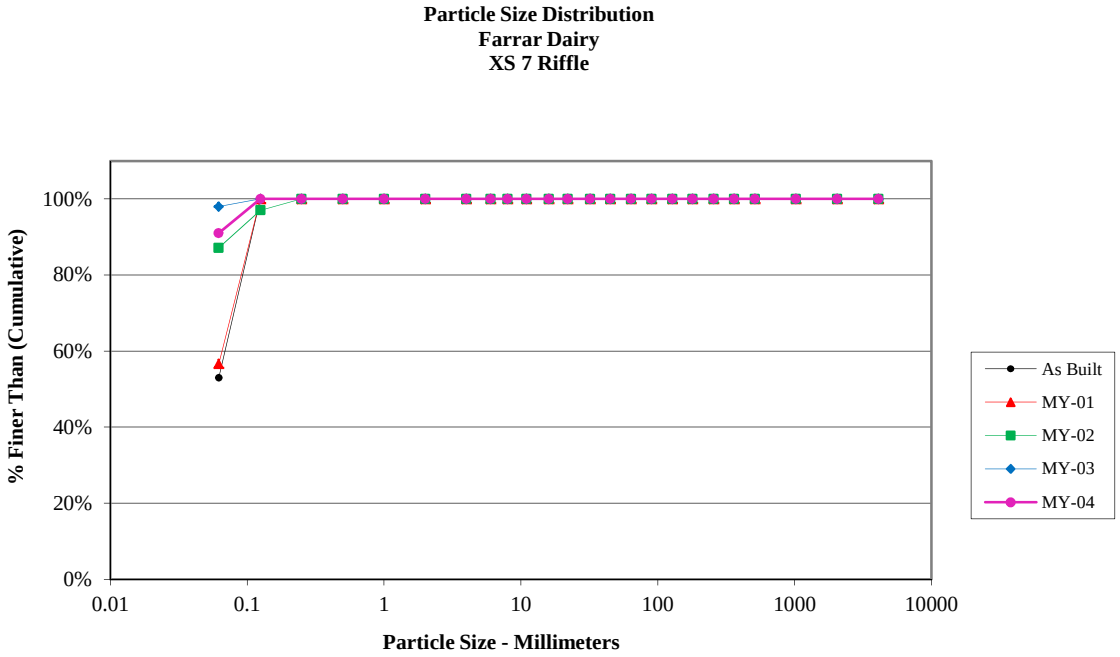
Size (mm)	
D16	0.062
D35	0.093
D50	0.13
D65	0.18
D84	0.27
D95	0.41

Size Distribution	
mean	0.1
dispersion	2.1
skewness	0.00

Type	
silt/clay	17%
sand	83%
gravel	0%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 7 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	91
Very Fine	.062 - .125	S	9
Fine	.125 - .25	A	
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



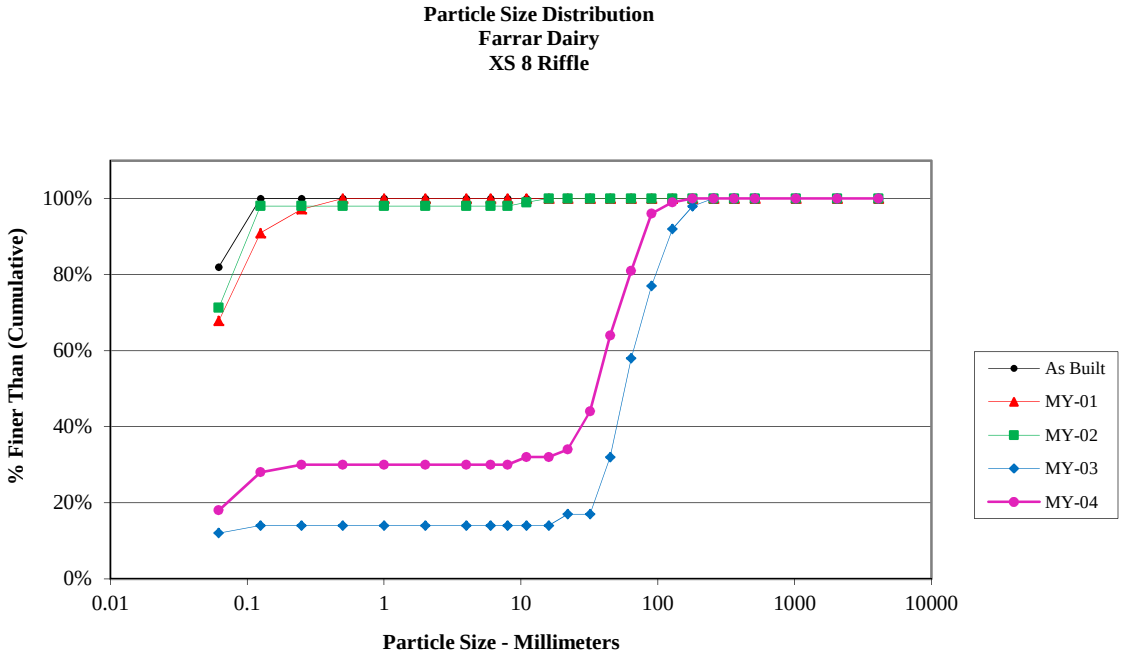
Size (mm)	
D16	0.062
D35	0.062
D50	0.062
D65	0.062
D84	0.062
D95	0.085

Size Distribution	
mean	0.1
dispersion	1.0
skewness	---

Type	
silt/clay	91%
sand	9%
gravel	0%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 8 Riffle -MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	18
Very Fine	.062 - .125	S	10
Fine	.125 - .25	A	2
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	2
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	2
Coarse	22.6 - 32	L	10
Very Coarse	32 - 45	S	20
Very Coarse	45 - 64		17
Small	64 - 90	C	15
Small	90 - 128	O	3
Large	128 - 180	B	1
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



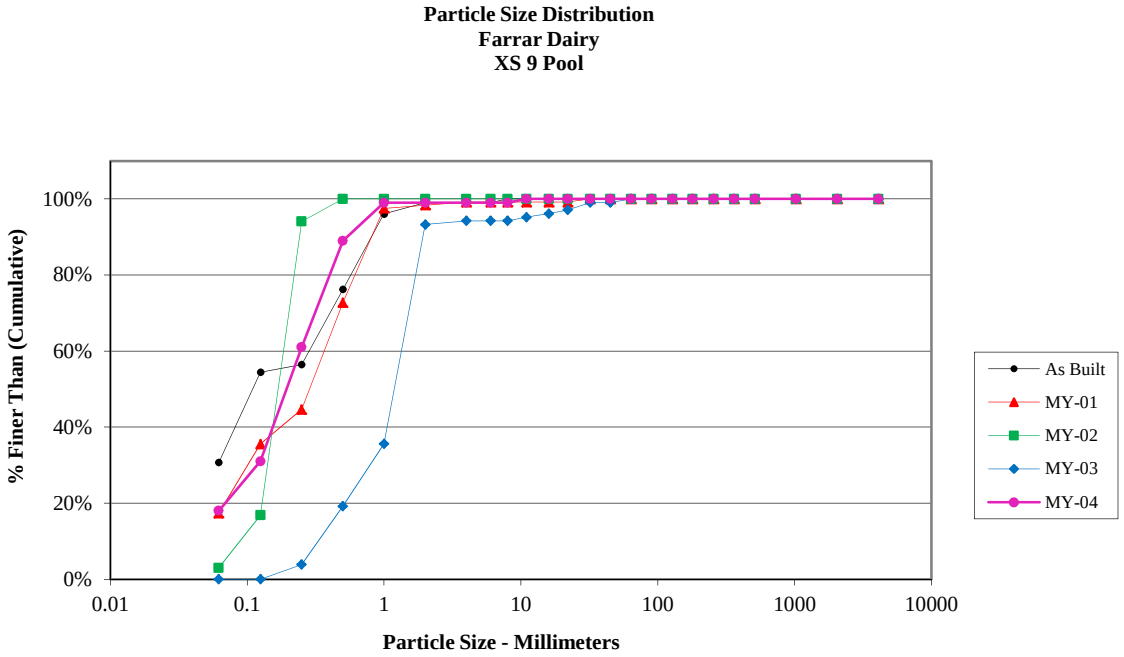
Size (mm)	
D16	0.062
D35	23
D50	35
D65	46
D84	69
D95	88

Size Distribution	
mean	2.1
dispersion	283.2
skewness	-0.70

Type	
silt/clay	18%
sand	12%
gravel	51%
cobble	19%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 9 Pool - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	18
Very Fine	.062 - .125	S	13
Fine	.125 - .25	A	30
Medium	.25 - .50	N	28
Coarse	.50 - 1	D	10
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	1
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



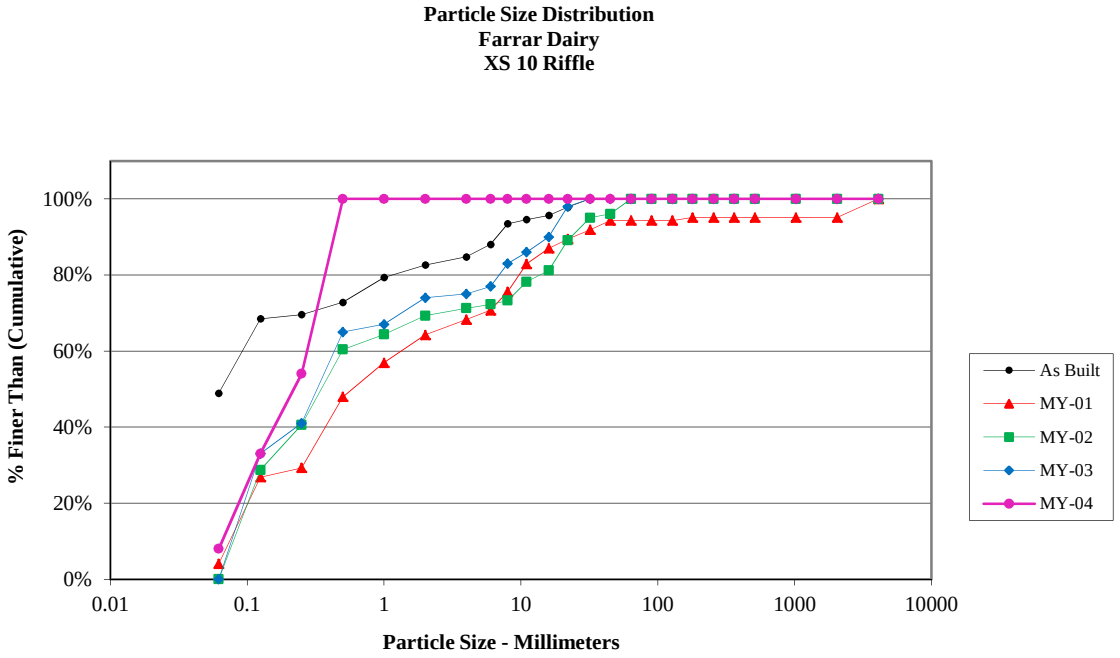
Size (mm)	
D16	0.062
D35	0.14
D50	0.19
D65	0.28
D84	0.44
D95	0.76

Size Distribution	
mean	0.2
dispersion	2.7
skewness	-0.07

Type	
silt/clay	18%
sand	81%
gravel	1%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 10 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	8
Very Fine	.062 - .125	S	25
Fine	.125 - .25	A	21
Medium	.25 - .50	N	46
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



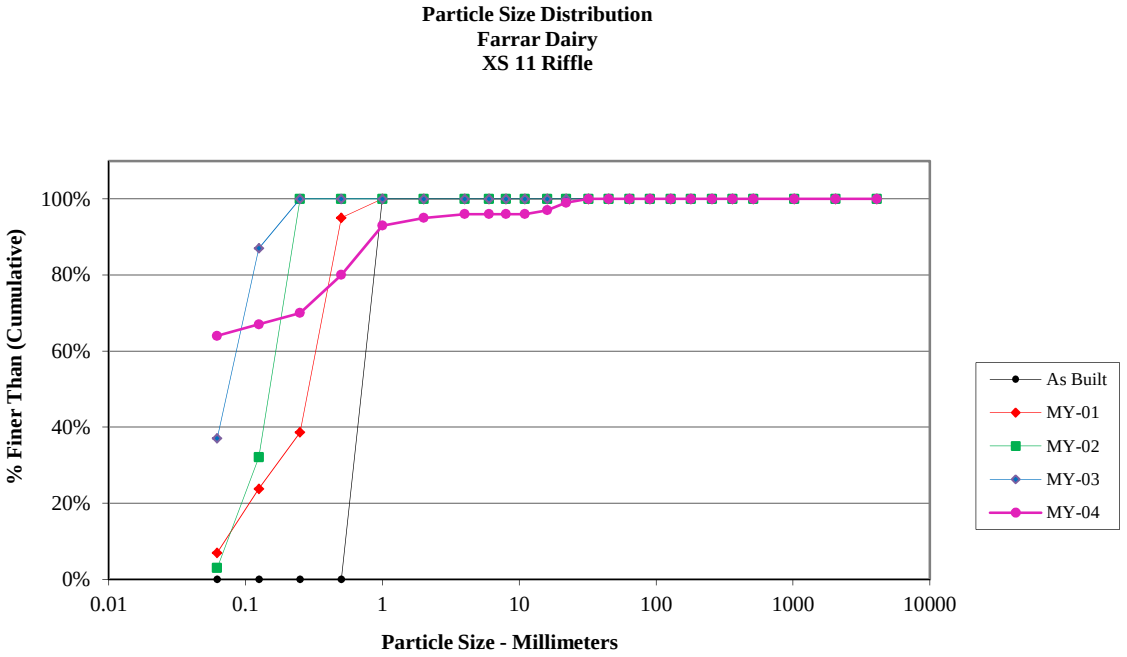
Size (mm)	
D16	0.078
D35	0.13
D50	0.22
D65	0.3
D84	0.39
D95	0.46

Size Distribution	
mean	0.2
dispersion	2.3
skewness	-0.12

Type	
silt/clay	8%
sand	92%
gravel	0%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 11 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	64
Very Fine	.062 - .125	S	3
Fine	.125 - .25	A	3
Medium	.25 - .50	N	10
Coarse	.50 - 1	D	13
Very Coarse	1 - 2	S	2
Very Fine	2 - 4		1
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	1
Coarse	16 - 22.6	E	2
Coarse	22.6 - 32	L	1
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



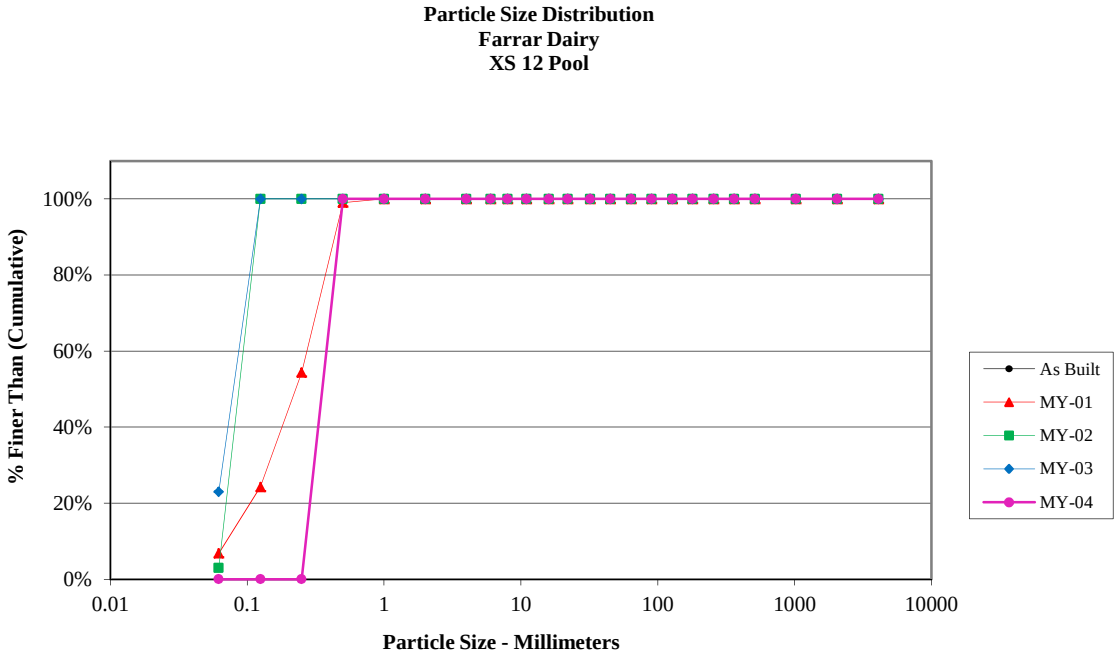
Size (mm)	
D16	0.062
D35	0.062
D50	0.062
D65	0.078
D84	0.62
D95	2

Size Distribution	
mean	0.2
dispersion	5.5
skewness	0.50

Type	
silt/clay	64%
sand	31%
gravel	5%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 12 Pool - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	
Medium	.25 - .50	N	100
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



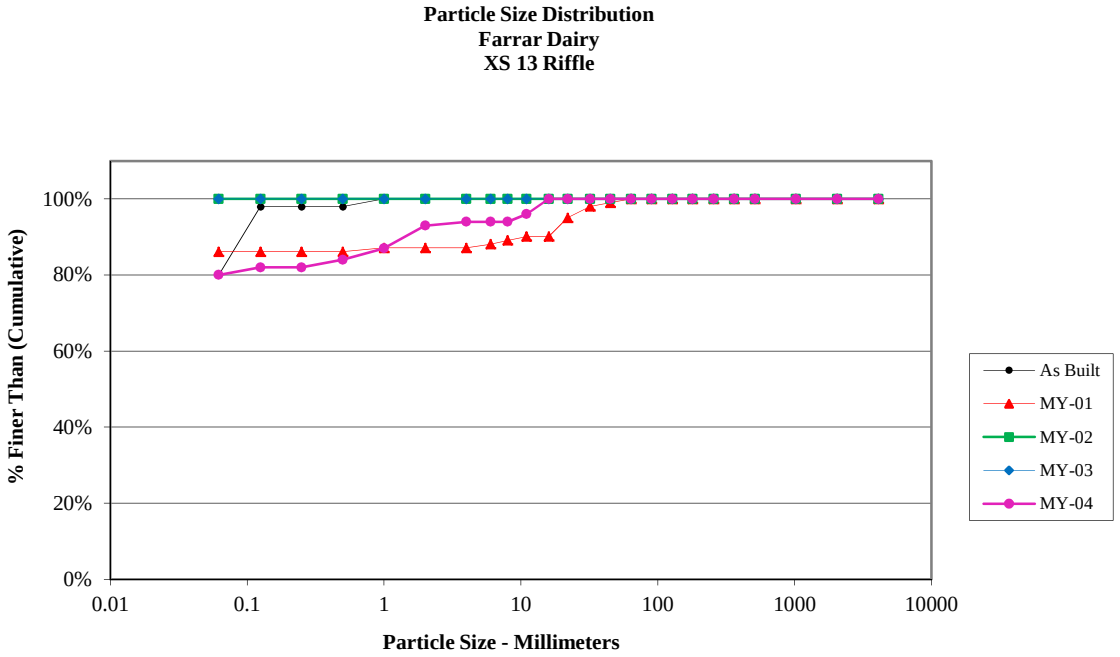
Size (mm)	
D16	0.28
D35	0.32
D50	0.35
D65	0.39
D84	0.45
D95	0.48

Size Distribution	
mean	0.4
dispersion	1.3
skewness	0.01

Type	
silt/clay	0%
sand	100%
gravel	0%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 13 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	80
Very Fine	.062 - .125	S	2
Fine	.125 - .25	A	
Medium	.25 - .50	N	2
Coarse	.50 - 1	D	3
Very Coarse	1 - 2	S	6
Very Fine	2 - 4		1
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	2
Medium	11.3 - 16	V	4
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



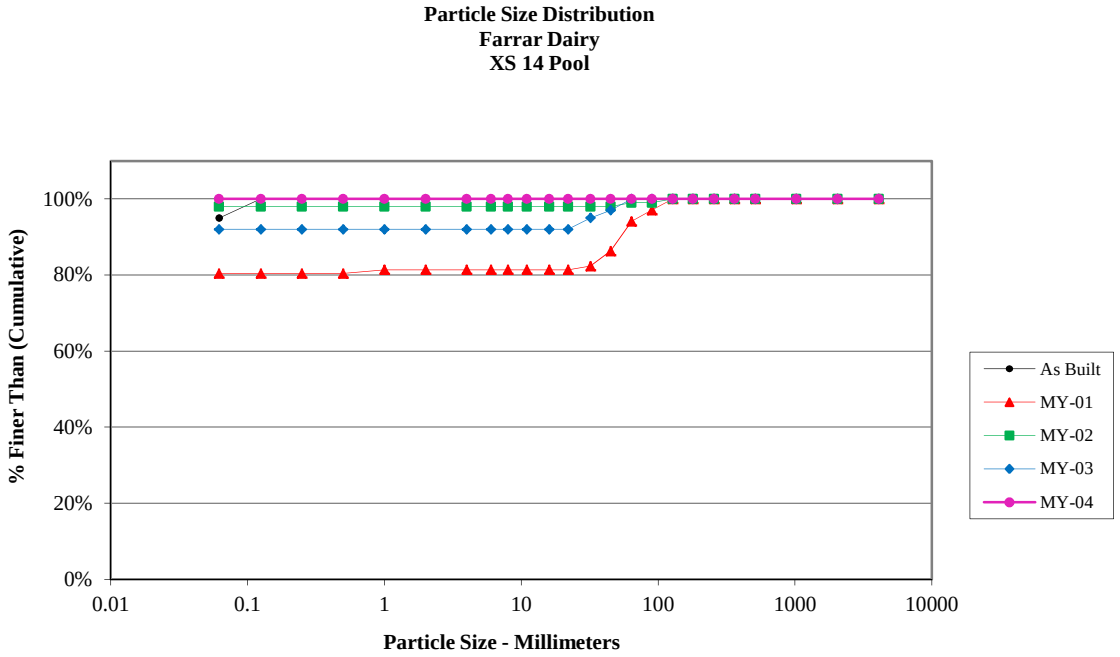
Size (mm)	
D16	0.062
D35	0.062
D50	0.062
D65	0.062
D84	0.5
D95	9.4

Size Distribution	
mean	0.2
dispersion	4.5
skewness	0.48

Type	
silt/clay	80%
sand	13%
gravel	7%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 14 Pool - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	100
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



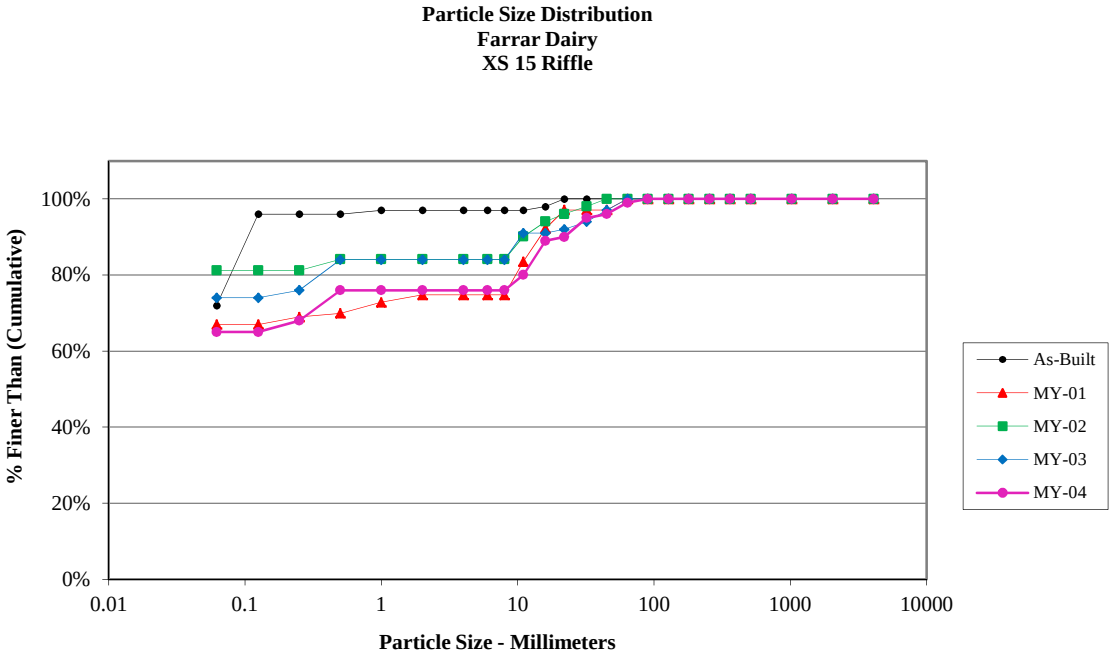
Size (mm)	
D16	0.062
D35	0.062
D50	0.062
D65	0.062
D84	0.062
D95	0.062

Size Distribution	
mean	0.1
dispersion	1.0
skewness	---

Type	
silt/clay	100%
sand	0%
gravel	0%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 15 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	65
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	3
Medium	.25 - .50	N	8
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	4
Medium	11.3 - 16	V	9
Coarse	16 - 22.6	E	1
Coarse	22.6 - 32	L	5
Very Coarse	32 - 45	S	1
Very Coarse	45 - 64		3
Small	64 - 90	C	1
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



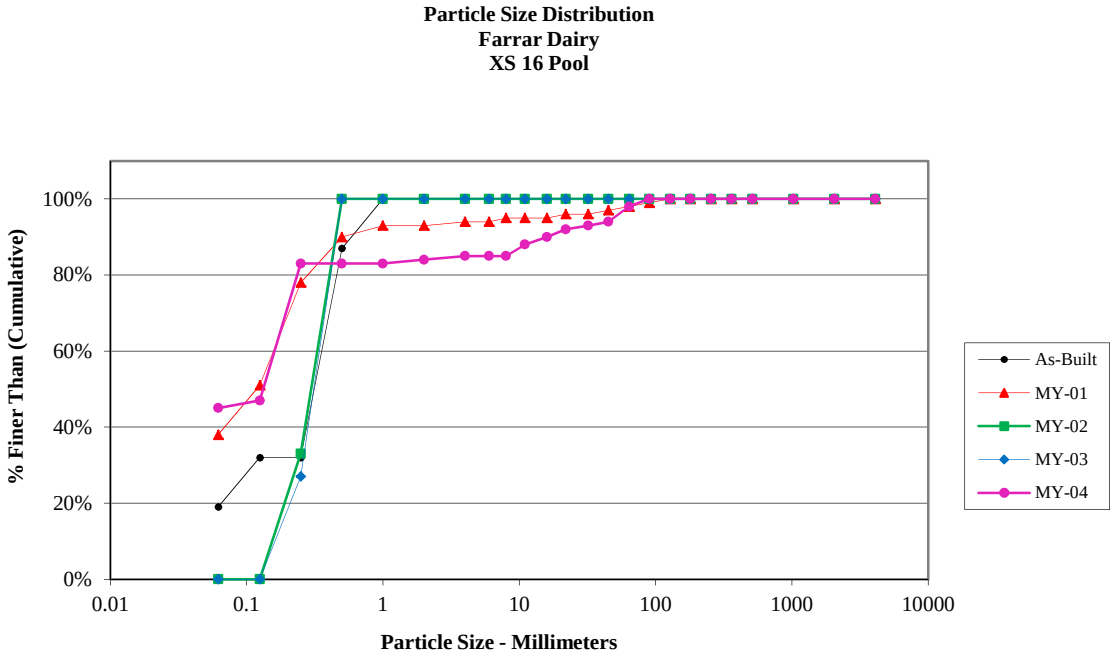
Size (mm)	
D16	0.062
D35	0.062
D50	0.062
D65	0.062
D84	13
D95	32

Size Distribution	
mean	0.9
dispersion	105.3
skewness	0.76

Type	
silt/clay	65%
sand	11%
gravel	23%
cobble	1%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 16 Pool -MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	45
Very Fine	.062 - .125	S	2
Fine	.125 - .25	A	36
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	1
Very Fine	2 - 4		1
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	3
Medium	11.3 - 16	V	2
Coarse	16 - 22.6	E	2
Coarse	22.6 - 32	L	1
Very Coarse	32 - 45	S	1
Very Coarse	45 - 64		4
Small	64 - 90	C	2
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



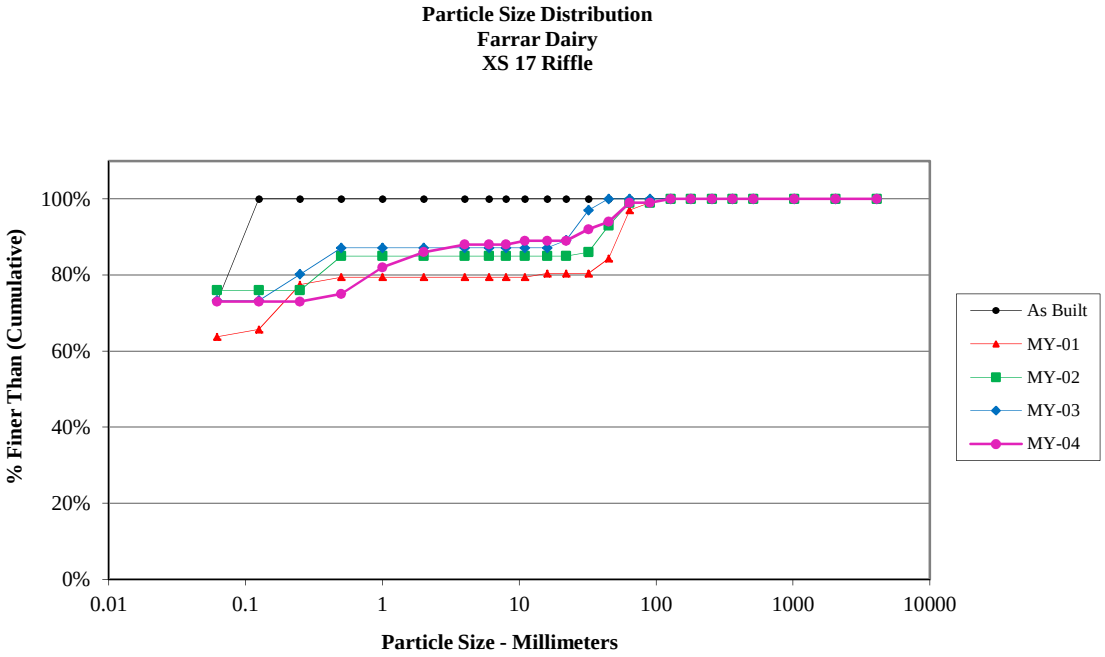
Size (mm)	
D16	0.062
D35	0.062
D50	0.13
D65	0.18
D84	2
D95	49

Size Distribution	
mean	0.4
dispersion	8.7
skewness	0.35

Type	
silt/clay	45%
sand	39%
gravel	14%
cobble	2%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 17 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	73
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	
Medium	.25 - .50	N	2
Coarse	.50 - 1	D	7
Very Coarse	1 - 2	S	4
Very Fine	2 - 4		2
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	1
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	3
Very Coarse	32 - 45	S	2
Very Coarse	45 - 64		5
Small	64 - 90	C	
Small	90 - 128	O	1
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



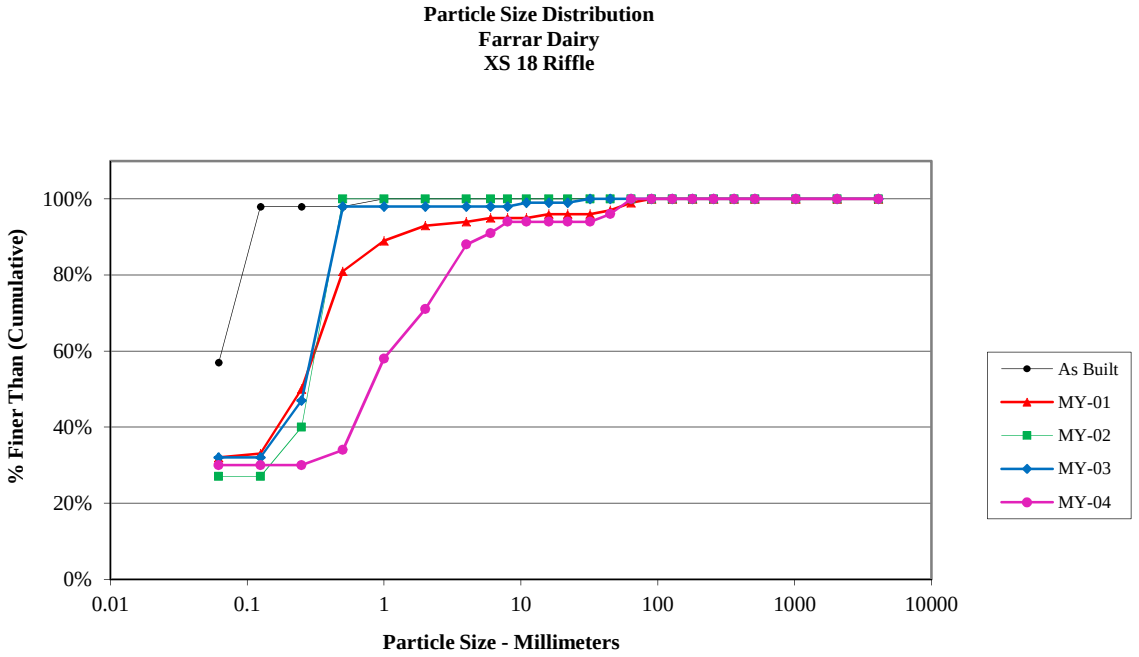
Size (mm)	
D16	0.062
D35	0.062
D50	0.062
D65	0.062
D84	1.4
D95	48

Size Distribution	
mean	0.3
dispersion	11.8
skewness	0.58

Type	
silt/clay	73%
sand	13%
gravel	13%
cobble	1%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 18 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	30
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	
Medium	.25 - .50	N	4
Coarse	.50 - 1	D	24
Very Coarse	1 - 2	S	13
Very Fine	2 - 4		17
Fine	4 - 5.7	G	3
Fine	5.7 - 8	R	3
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	2
Very Coarse	45 - 64		4
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



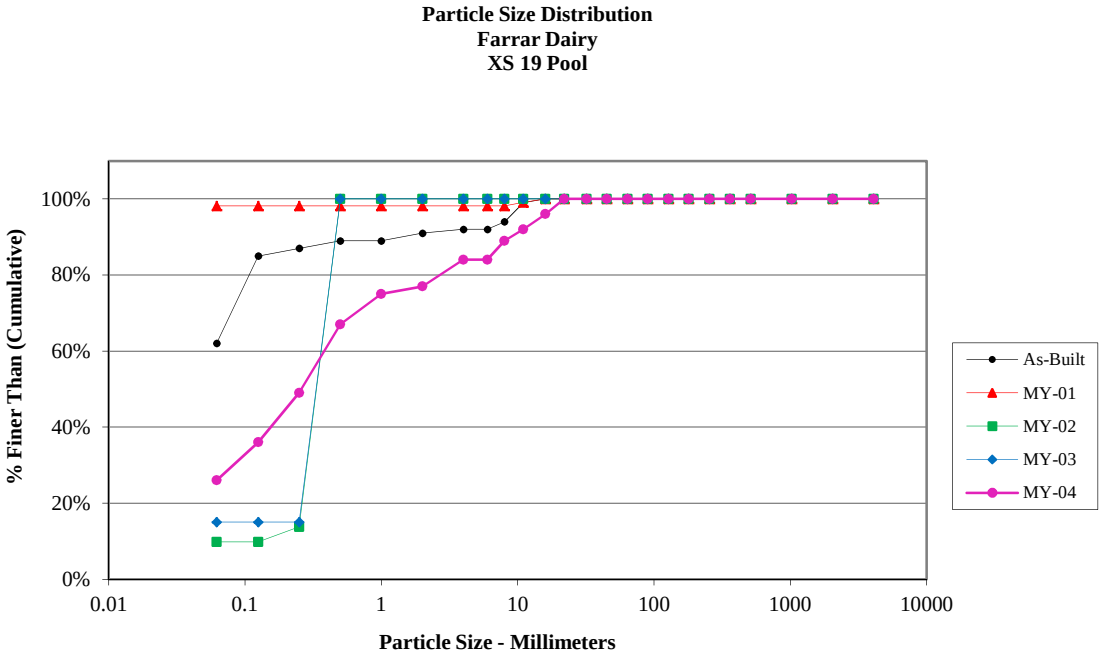
Size (mm)	
D16	0.062
D35	0.51
D50	0.79
D65	1.5
D84	3.4
D95	38

Size Distribution	
mean	0.5
dispersion	8.5
skewness	-0.18

Type	
silt/clay	30%
sand	41%
gravel	29%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 19 Pool - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	26
Very Fine	.062 - .125	S	10
Fine	.125 - .25	A	13
Medium	.25 - .50	N	18
Coarse	.50 - 1	D	8
Very Coarse	1 - 2	S	2
Very Fine	2 - 4		7
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	5
Medium	8 - 11.3	A	3
Medium	11.3 - 16	V	4
Coarse	16 - 22.6	E	4
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



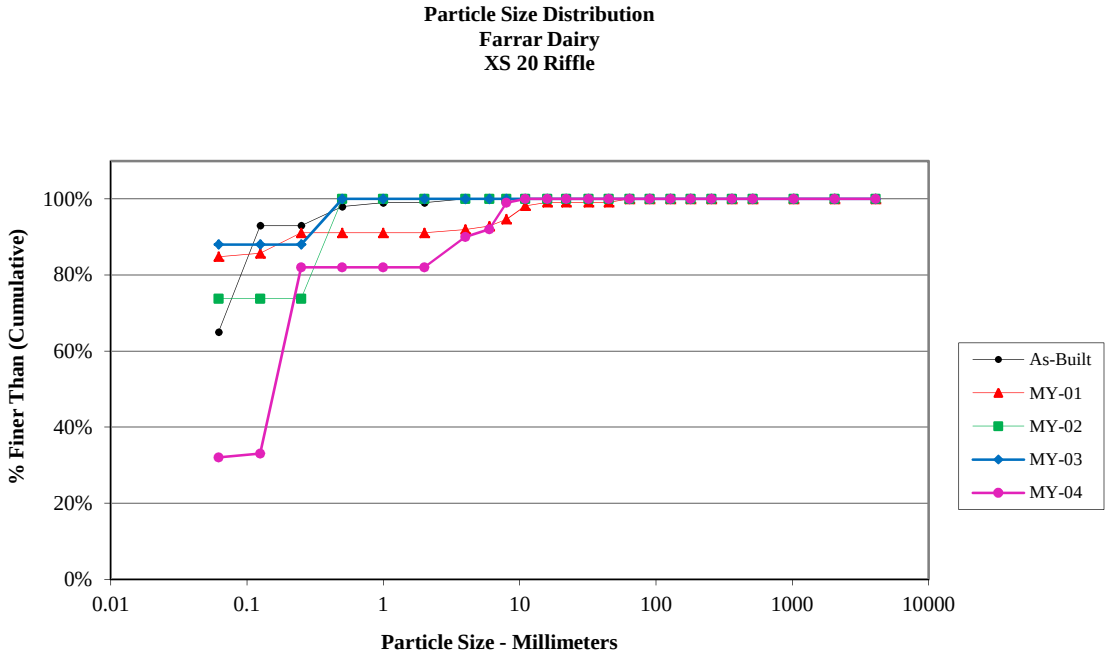
Size (mm)	
D16	0.062
D35	0.12
D50	0.26
D65	0.46
D84	-
D95	15

Size Distribution	
mean	---
dispersion	---
skewness	---

Type	
silt/clay	26%
sand	51%
gravel	23%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 20 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	32
Very Fine	.062 - .125	S	1
Fine	.125 - .25	A	49
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		8
Fine	4 - 5.7	G	2
Fine	5.7 - 8	R	7
Medium	8 - 11.3	A	1
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



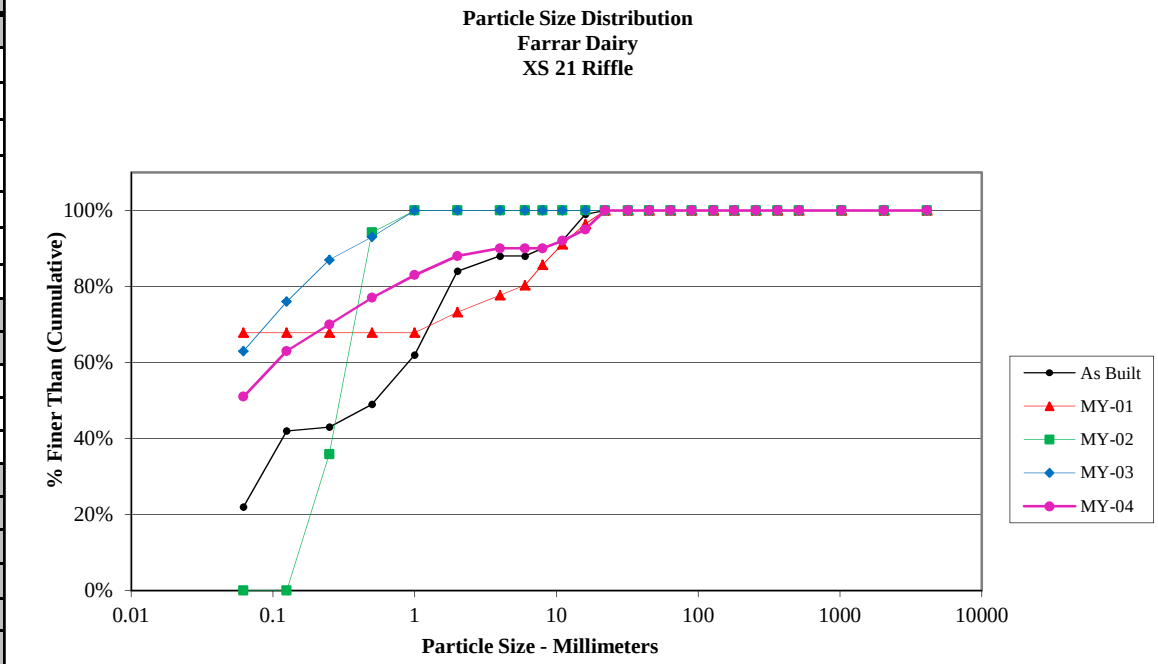
Size (mm)	
D16	0.062
D35	0.13
D50	0.16
D65	0.2
D84	2.4
D95	6.8

Size Distribution	
mean	0.4
dispersion	8.8
skewness	0.30

Type	
silt/clay	32%
sand	50%
gravel	18%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 21 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	51
Very Fine	.062 - .125	S	12
Fine	.125 - .25	A	7
Medium	.25 - .50	N	7
Coarse	.50 - 1	D	6
Very Coarse	1 - 2	S	5
Very Fine	2 - 4		2
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	2
Medium	11.3 - 16	V	3
Coarse	16 - 22.6	E	5
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



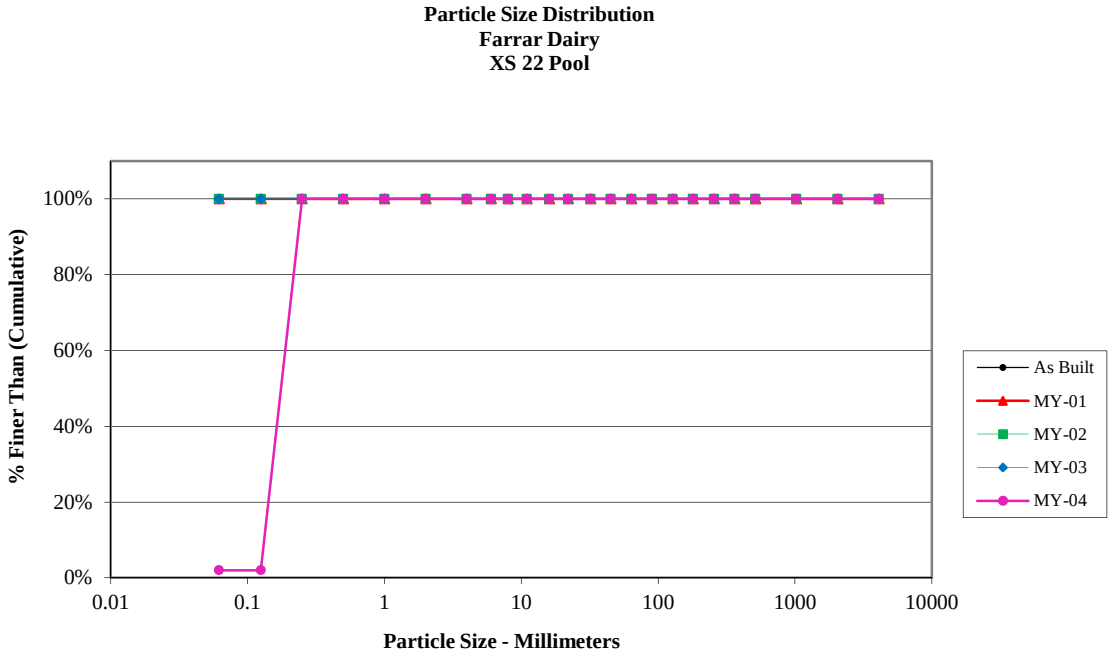
Size (mm)	
D16	0.062
D35	0.062
D50	0.062
D65	0.15
D84	1.1
D95	16

Size Distribution	
mean	0.3
dispersion	9.4
skewness	0.56

Type	
silt/clay	51%
sand	37%
gravel	12%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 22 Pool - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	2
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	98
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



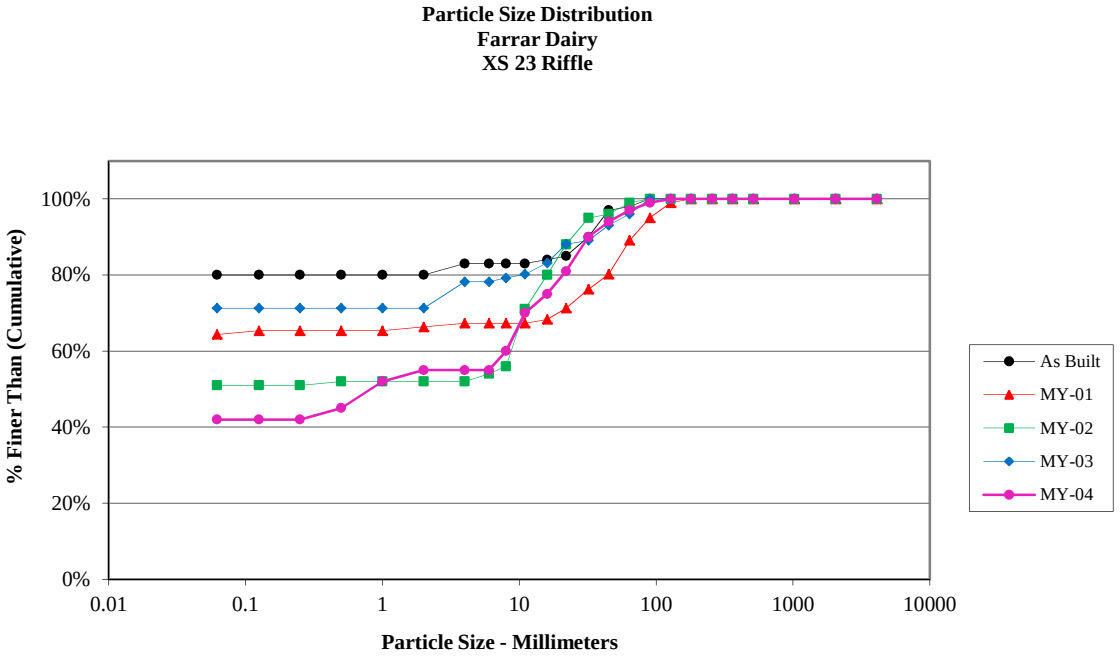
Size (mm)	
D16	0.14
D35	0.16
D50	0.18
D65	0.2
D84	0.22
D95	0.24

Size Distribution	
mean	0.2
dispersion	1.3
skewness	-0.02

Type	
silt/clay	2%
sand	98%
gravel	0%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 23 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	42
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	
Medium	.25 - .50	N	3
Coarse	.50 - 1	D	7
Very Coarse	1 - 2	S	3
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	5
Medium	8 - 11.3	A	10
Medium	11.3 - 16	V	5
Coarse	16 - 22.6	E	6
Coarse	22.6 - 32	L	9
Very Coarse	32 - 45	S	4
Very Coarse	45 - 64		3
Small	64 - 90	C	2
Small	90 - 128	O	1
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



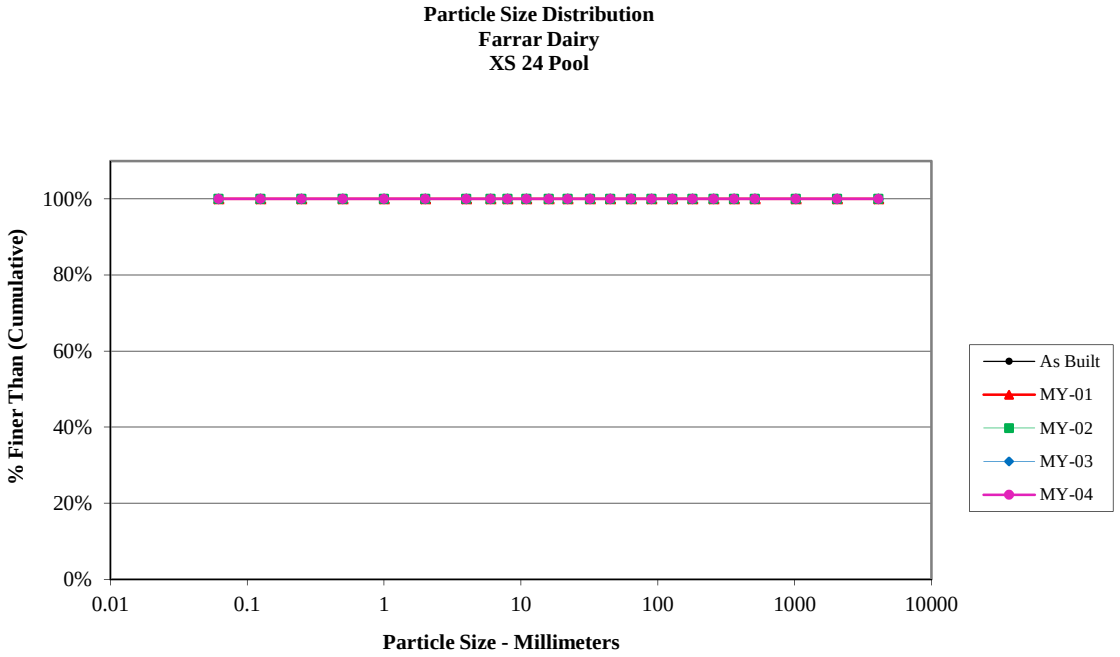
Size (mm)	
D16	0.062
D35	0.062
D50	0.82
D65	9.4
D84	25
D95	51

Size Distribution	
mean	1.2
dispersion	21.9
skewness	0.11

Type	
silt/clay	42%
sand	13%
gravel	42%
cobble	3%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 24 Pool - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	100
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



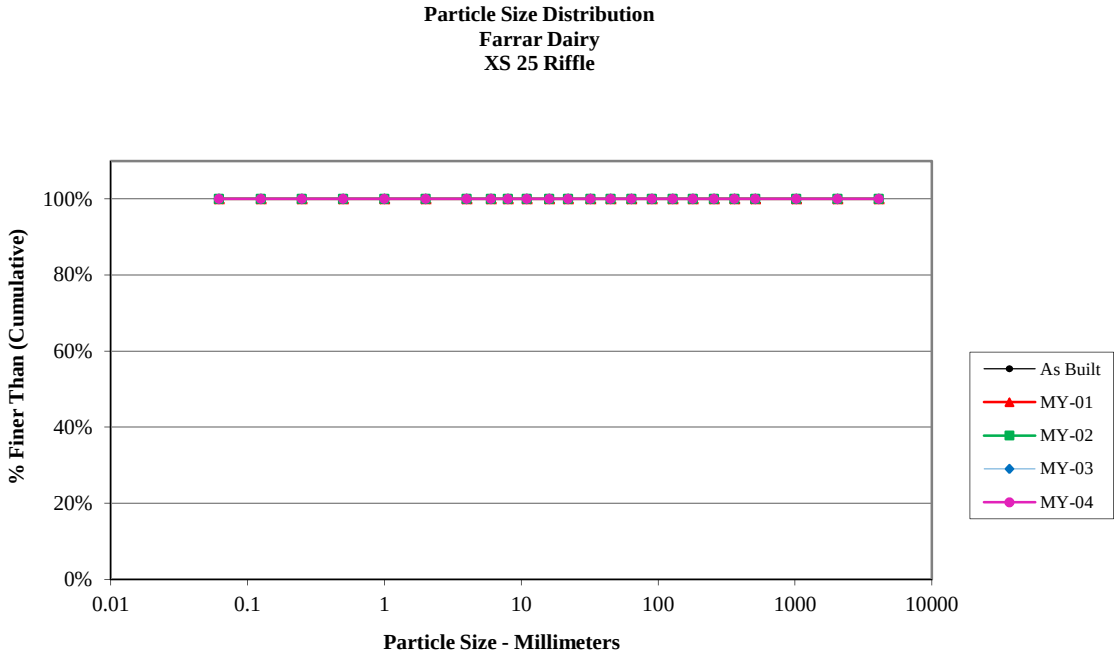
Size (mm)	
D16	0.062
D35	0.062
D50	0.062
D65	0.062
D84	0.062
D95	0.062

Size Distribution	
mean	0.1
dispersion	1.0
skewness	---

Type	
silt/clay	100%
sand	0%
gravel	0%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 25 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	100
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



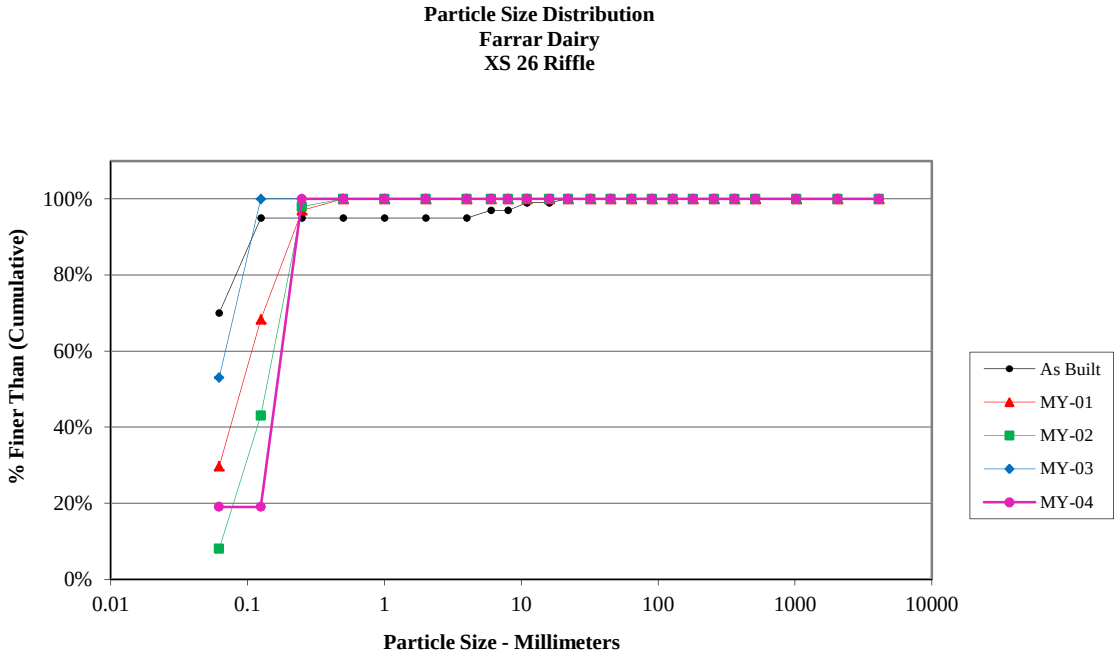
Size (mm)	
D16	0.062
D35	0.062
D50	0.062
D65	0.062
D84	0.062
D95	0.062

Size Distribution	
mean	0.1
dispersion	1.0
skewness	---

Type	
silt/clay	100%
sand	0%
gravel	0%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 26 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	19
Very Fine	.062 - .125	S	
Fine	.125 - .25	A	81
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



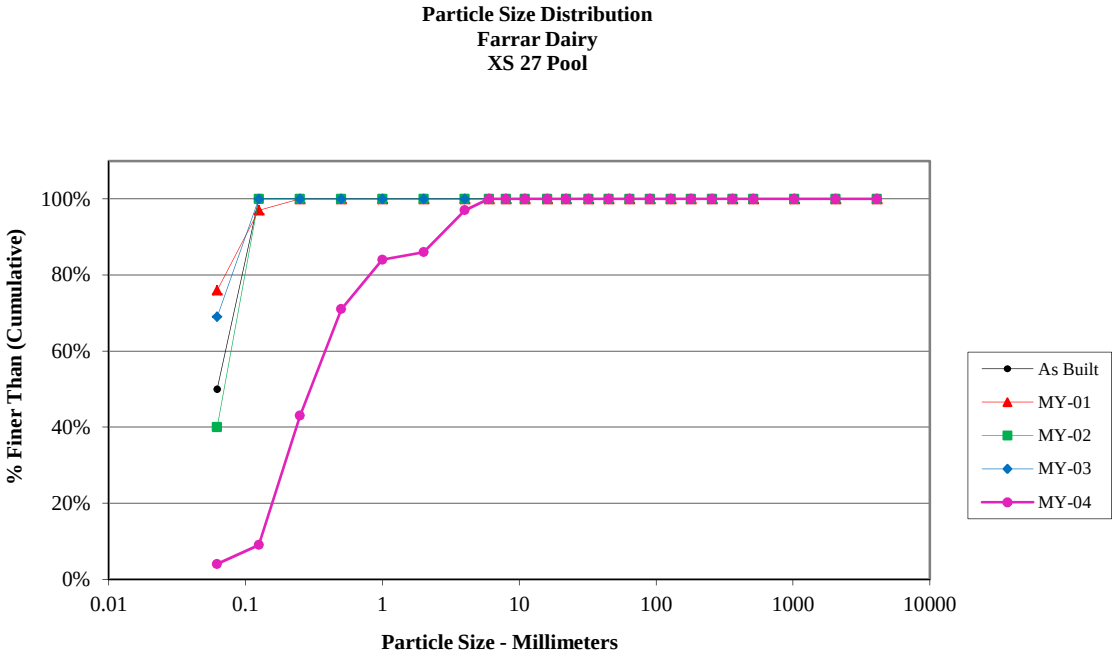
Size (mm)	
D16	0.062
D35	0.14
D50	0.16
D65	0.19
D84	0.22
D95	0.24

Size Distribution	
mean	0.1
dispersion	2.0
skewness	-0.18

Type	
silt/clay	19%
sand	81%
gravel	0%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 27 Pool - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	4
Very Fine	.062 - .125	S	5
Fine	.125 - .25	A	34
Medium	.25 - .50	N	28
Coarse	.50 - 1	D	13
Very Coarse	1 - 2	S	2
Very Fine	2 - 4		11
Fine	4 - 5.7	G	3
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



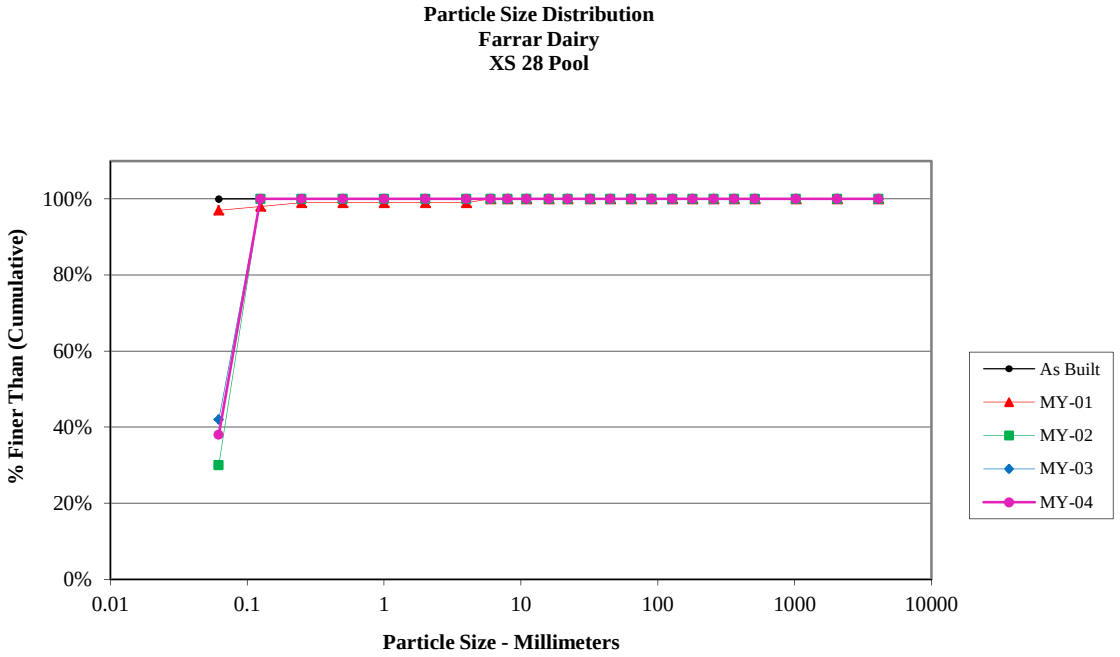
Size (mm)	
D16	0.14
D35	0.21
D50	0.3
D65	0.43
D84	1
D95	3.5

Size Distribution	
mean	0.4
dispersion	2.7
skewness	0.10

Type	
silt/clay	4%
sand	82%
gravel	14%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 28 Pool - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	38
Very Fine	.062 - .125	S	62
Fine	.125 - .25	A	
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:



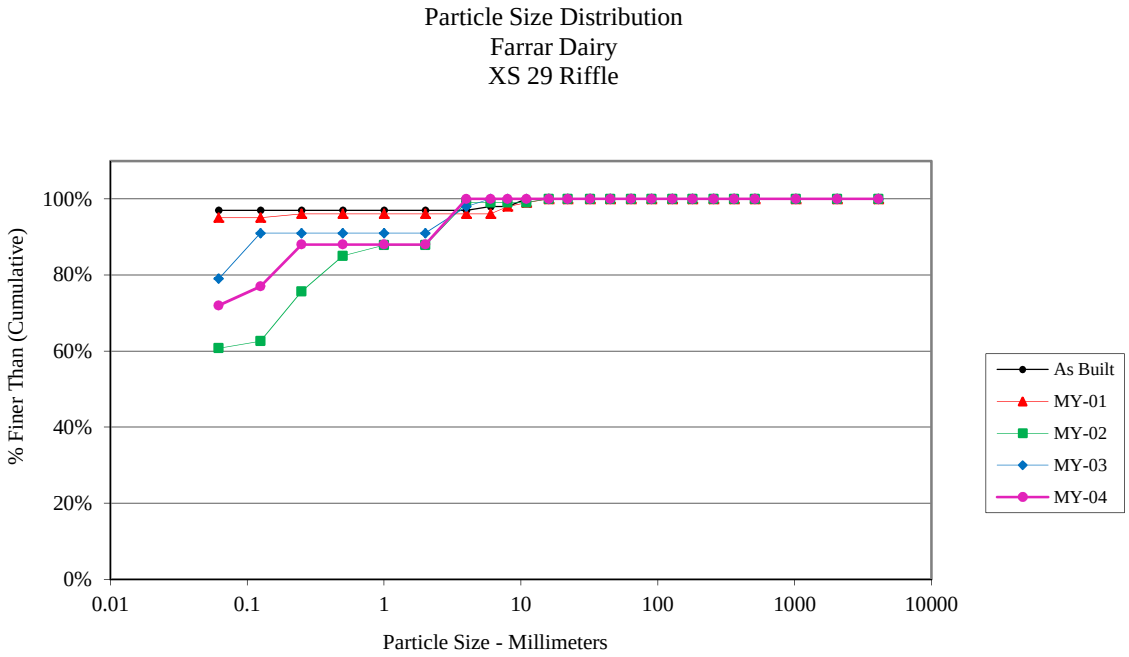
Size (mm)	
D16	0.062
D35	0.062
D50	0.071
D65	0.084
D84	0.1
D95	0.12

Size Distribution	
mean	0.1
dispersion	1.3
skewness	0.10

Type	
silt/clay	38%
sand	62%
gravel	0%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

Cross-Section 29 Riffle - MY-04			
Particle	Millimeter		Count
Silt/Clay	< 0.062	S/C	72
Very Fine	.062 - .125	S	5
Fine	.125 - .25	A	11
Medium	.25 - .50	N	
Coarse	.50 - 1	D	
Very Coarse	1 - 2	S	
Very Fine	2 - 4		12
Fine	4 - 5.7	G	
Fine	5.7 - 8	R	
Medium	8 - 11.3	A	
Medium	11.3 - 16	V	
Coarse	16 - 22.6	E	
Coarse	22.6 - 32	L	
Very Coarse	32 - 45	S	
Very Coarse	45 - 64		
Small	64 - 90	C	
Small	90 - 128	O	
Large	128 - 180	B	
Large	180 - 256	L	
Small	256 - 362	B	
Small	362 - 512	L	
Medium	512 - 1024	D	
Lrg- Very Lrg	1024 - 2048	R	
Bedrock	>2048	BDRK	
		Total	100

Note:

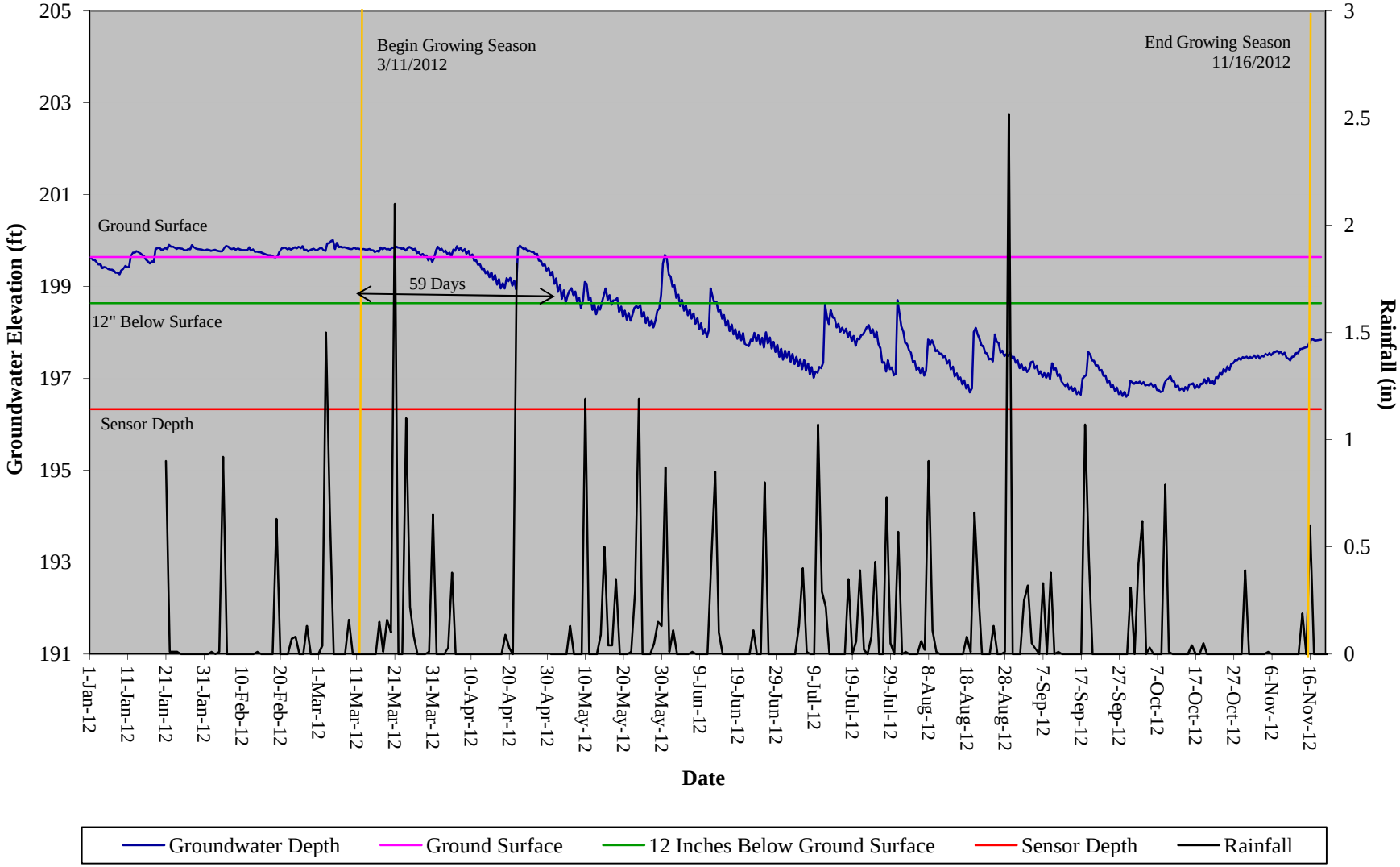


Size (mm)	
D16	0.062
D35	0.062
D50	0.062
D65	0.062
D84	0.19
D95	3

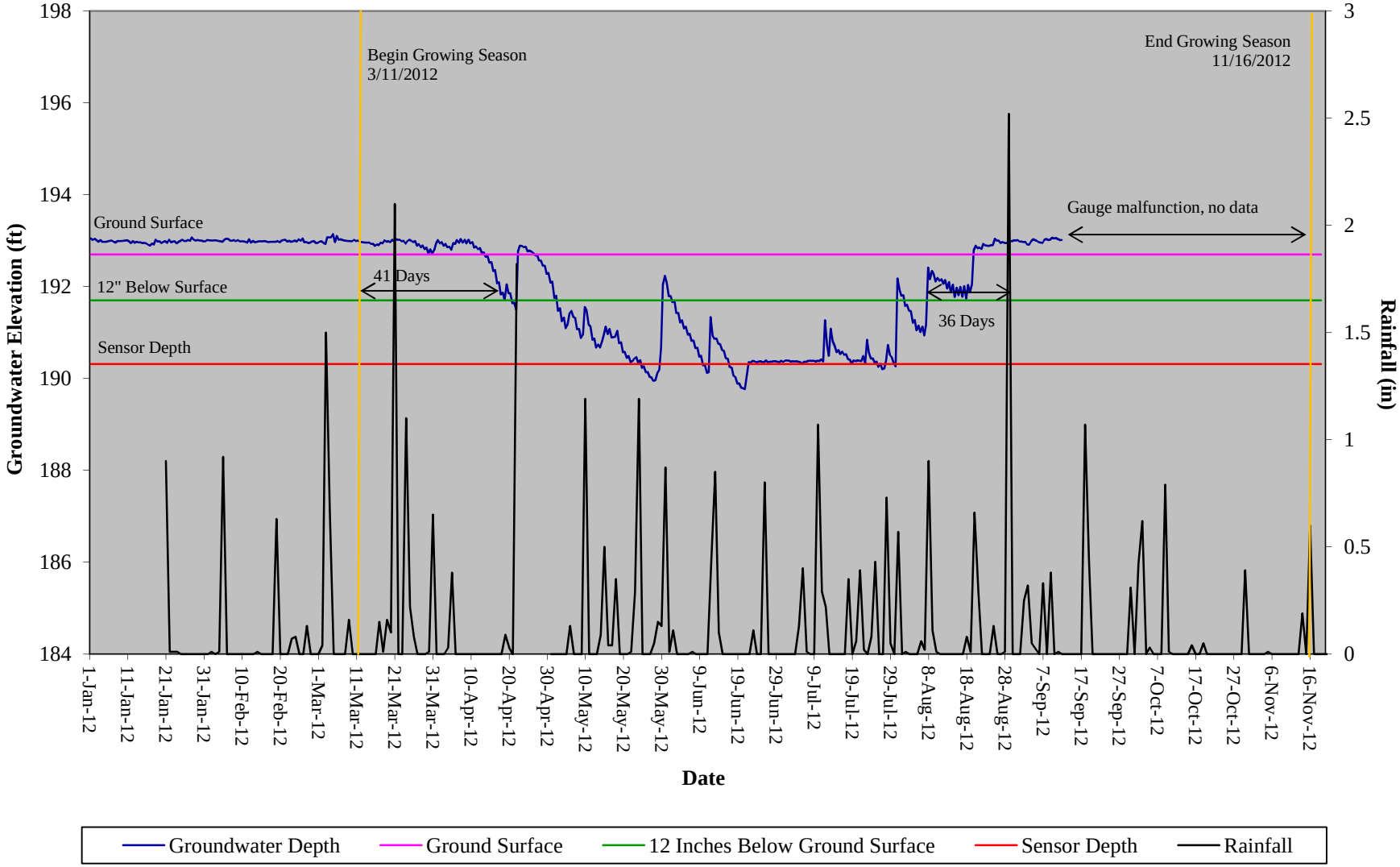
Size Distribution	
mean	0.1
dispersion	2.0
skewness	0.35

Type	
silt/clay	72%
sand	16%
gravel	12%
cobble	0%
boulder	0%
bedrock	0%
hardpan	0%
wood/det	0%
artificial	0%

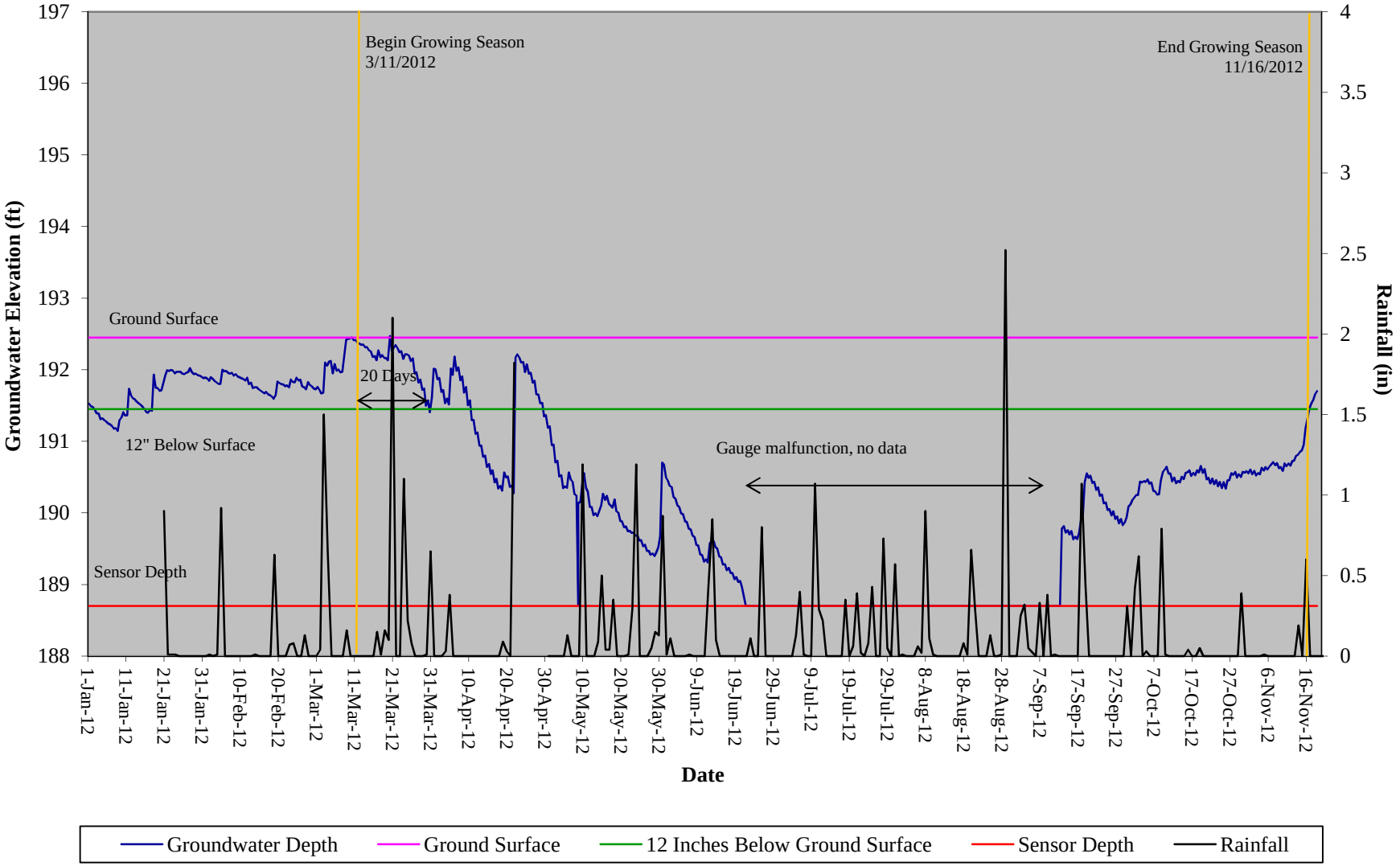
Farrar Dairy Restoration Site
Hydrograph
Wetland Gauge 1



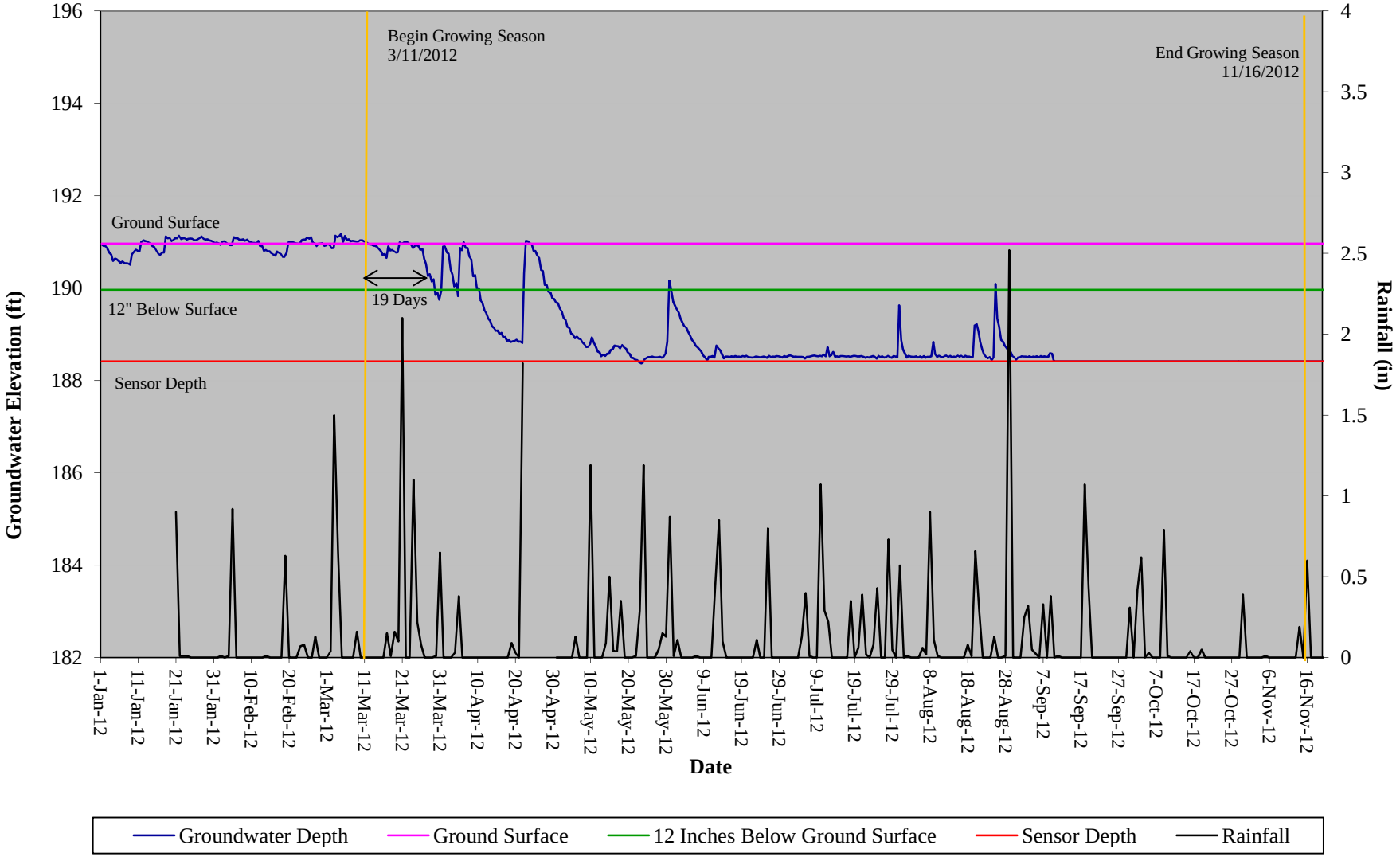
Farrar Dairy Restoration Site
Hydrograph
Wetland Gauge 2



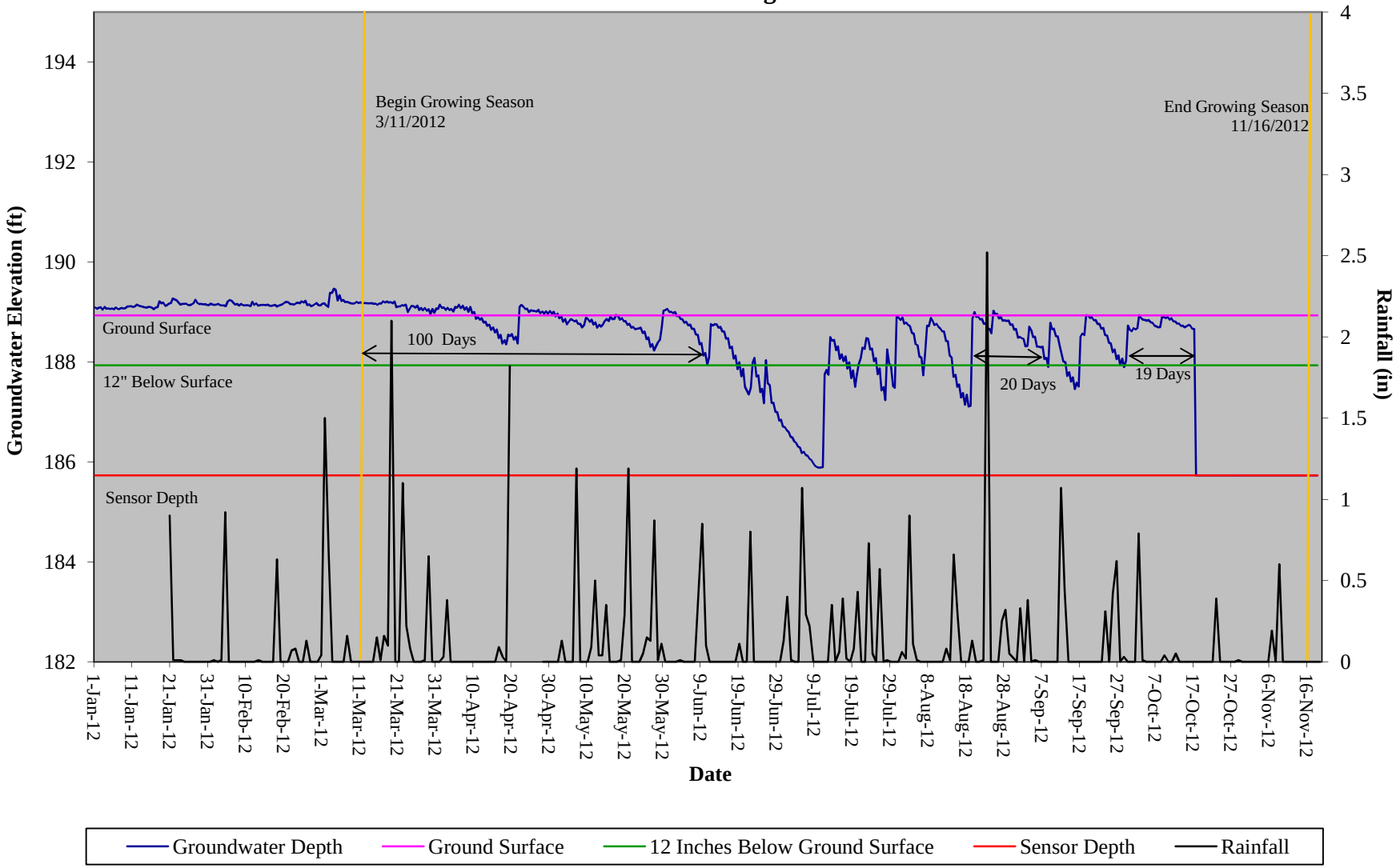
Farrar Dairy Restoration Site
Hydrograph
Wetland Gauge 3



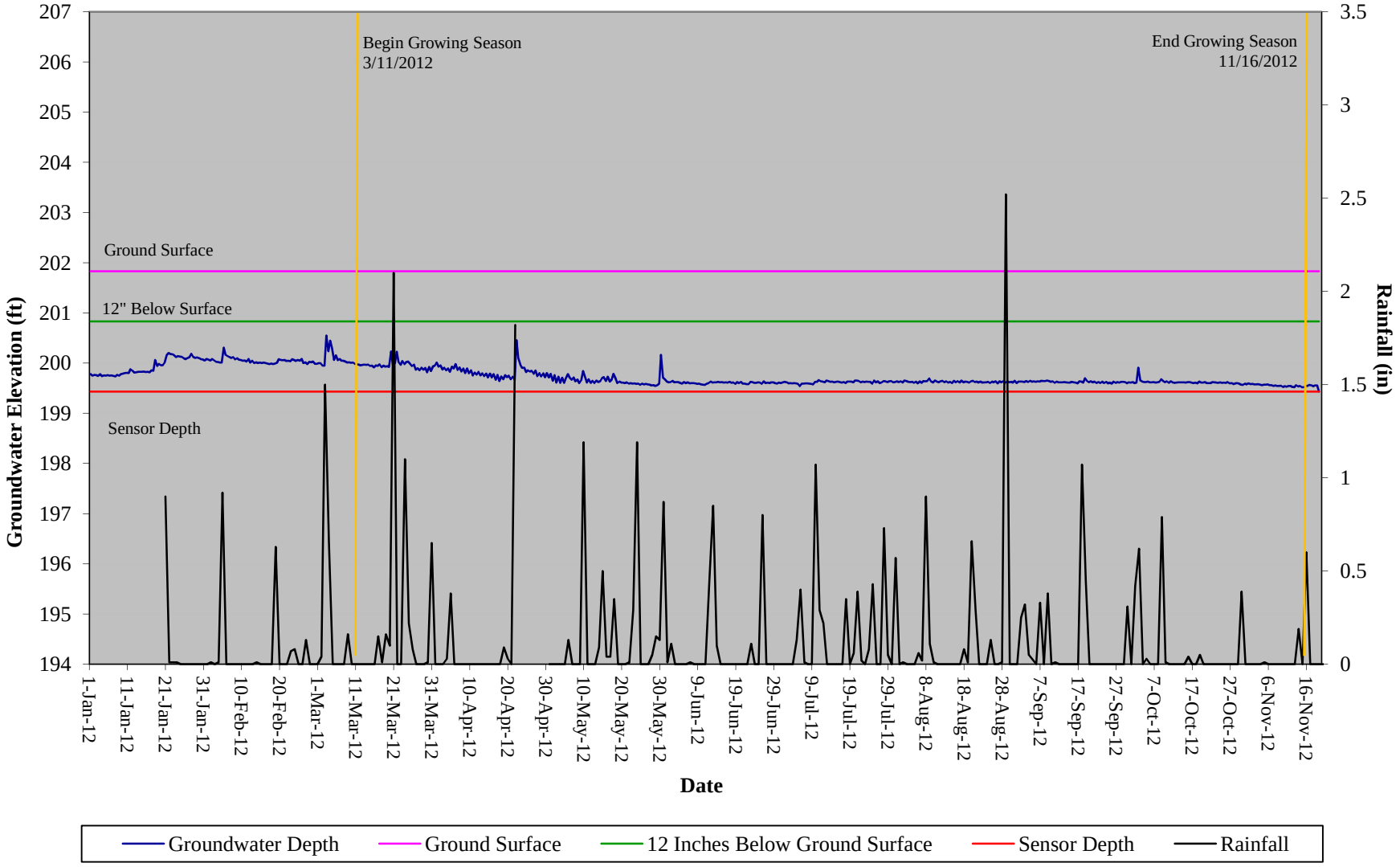
Farrar Dairy Restoration Site
Hydrograph
Wetland Gauge 4



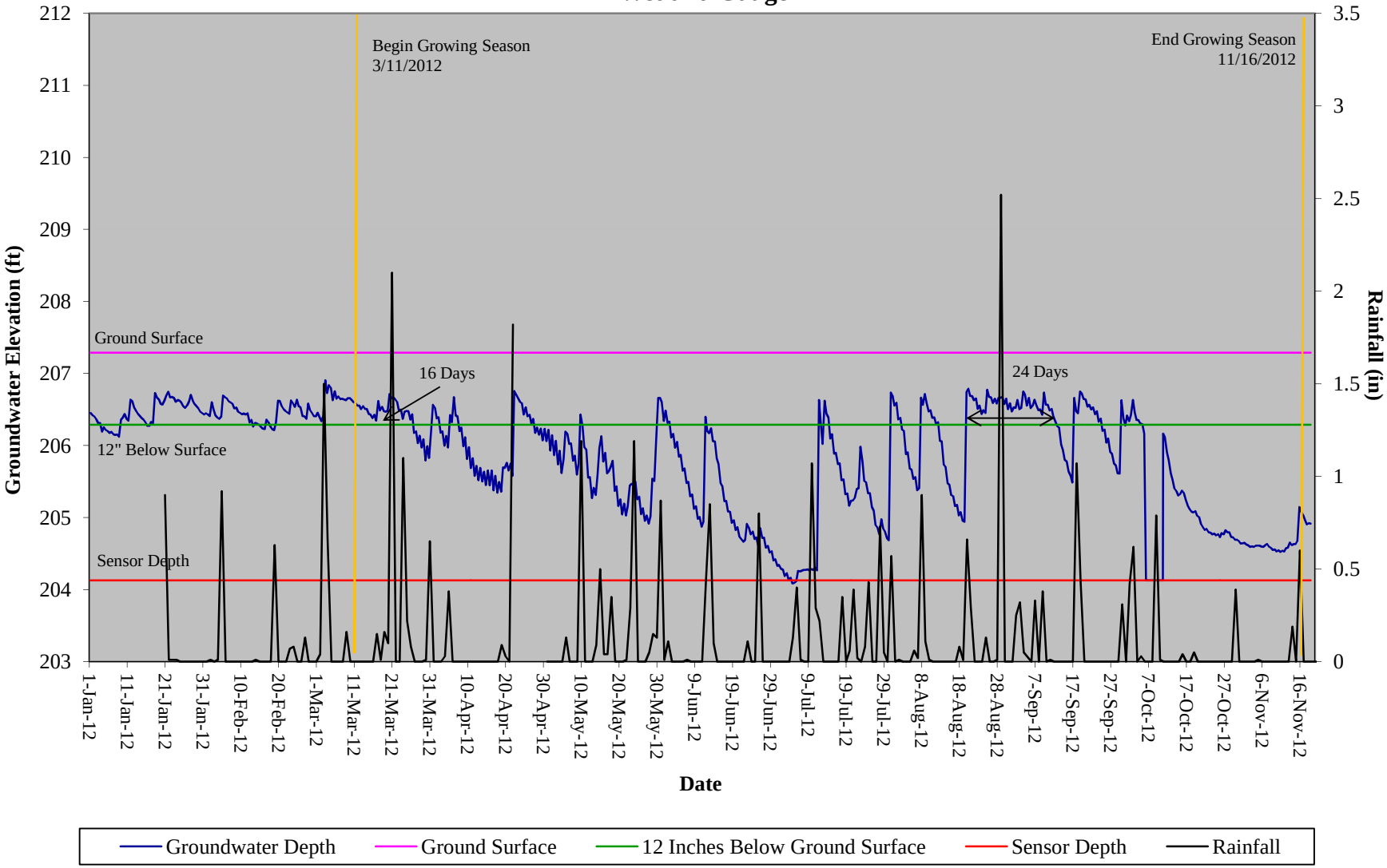
Farrar Dairy Restoration Site
Hydrograph
Wetland Gauge 5

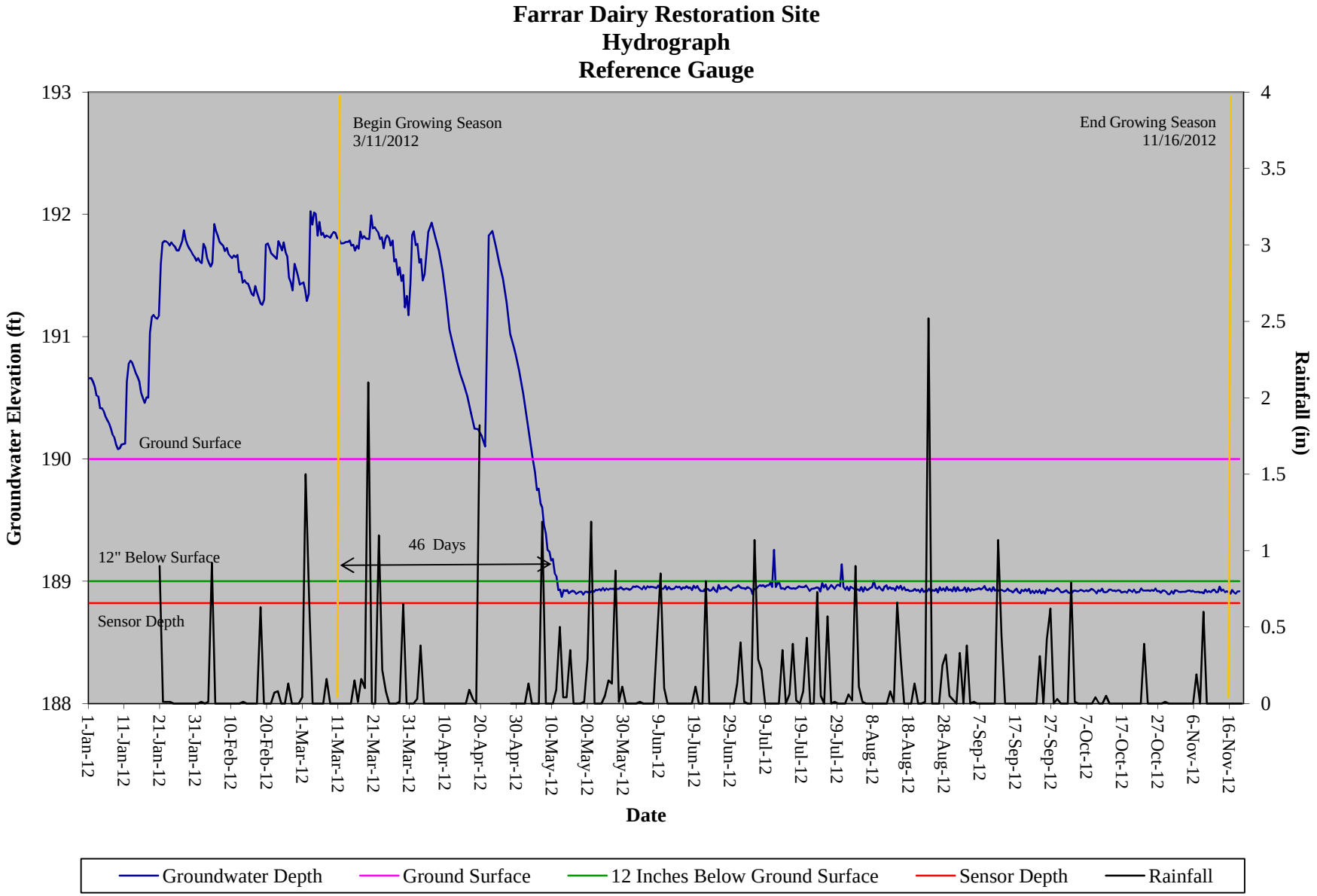


Farrar Dairy Restoration Site
Hydrograph
Wetland Gauge 6

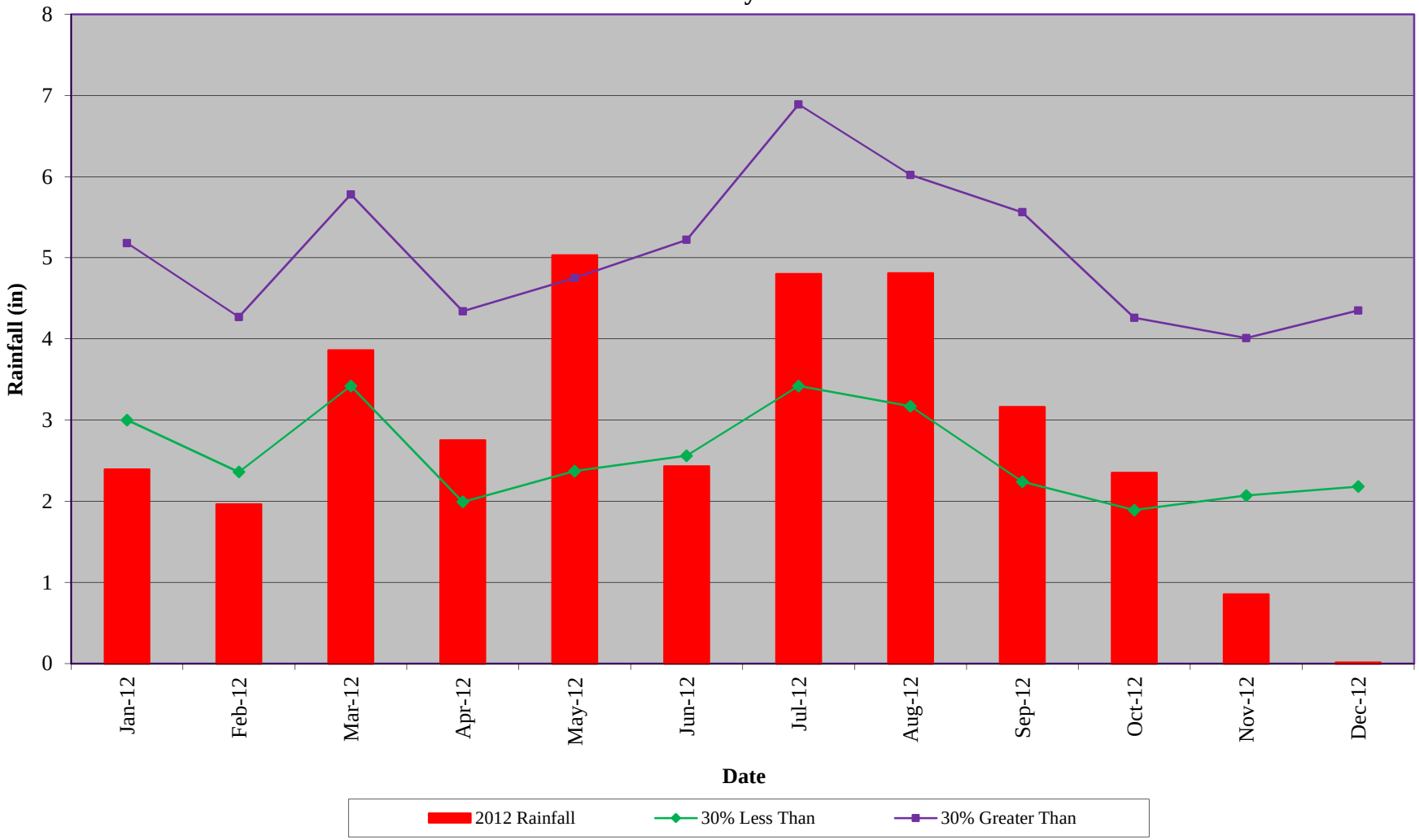


Farrar Dairy Restoration Site
Hydrograph
Wetland Gauge 7

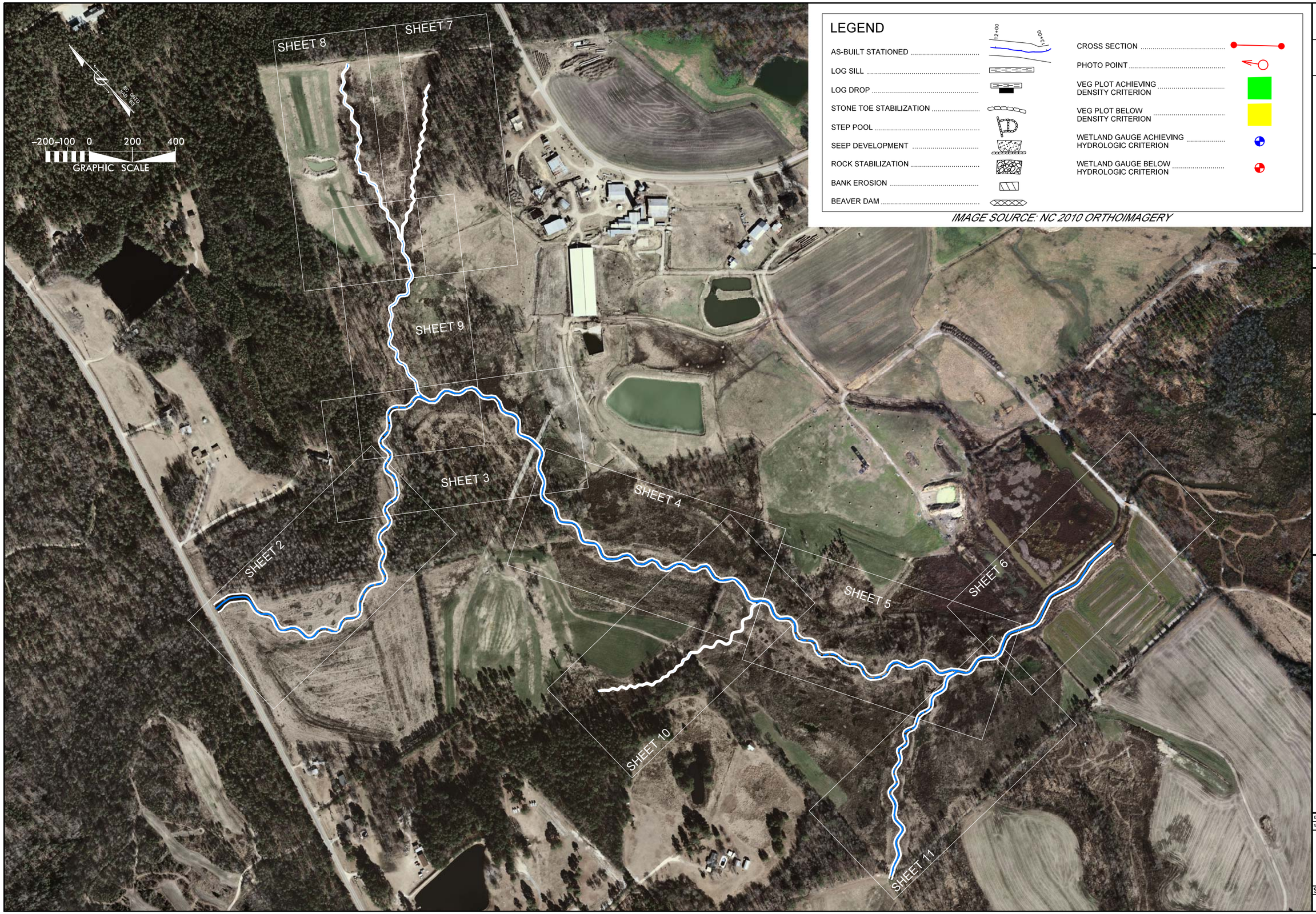



Farrar Dairy Restoration Site
Hydrograph
Reference Gauge
Begin Growing Season
3/11/2012
End Growing Season
11/16/2012
Ground Surface
12" Below Surface
Sensor Depth
46 Days
Groundwater Elevation (ft)
Rainfall (in)
Date
193
192
191
190
189
188
4
3.5
3
2.5
2
1.5
1
0.5
0
1-Jan-12
11-Jan-12
21-Jan-12
31-Jan-12
10-Feb-12
20-Feb-12
1-Mar-12
11-Mar-12
21-Mar-12
31-Mar-12
10-Apr-12
20-Apr-12
30-Apr-12
10-May-12
20-May-12
30-May-12
9-Jun-12
19-Jun-12
29-Jun-12
9-Jul-12
19-Jul-12
29-Jul-12
8-Aug-12
18-Aug-12
28-Aug-12
7-Sep-12
17-Sep-12
27-Sep-12
7-Oct-12
17-Oct-12
27-Oct-12
6-Nov-12
16-Nov-12
Groundwater Depth
Ground Surface
12 Inches Below Ground Surface
Sensor Depth
Rainfall

Farrar Dairy Site
30-70 Percentile Graph
Lillington, NC
2012 Monthly Rainfall



Appendix D
Current Condition Plan View



REVISIONS			
DESCRIPTION	DATE	APPROVED	

Ecosystem Enhancement Program

KCI TECHNOLOGIES
ENGINEERS • PLANNERS • SCIENTISTS
460 SIX FORKS ROAD
RALEIGH, NORTH CAROLINA 27609

FARRAR DAIRY
STREAM AND WETLAND RESTORATION
LILLINGTON, HARNETT COUNTY, NORTH CAROLINA

DATE: DEC 2012
SCALE: 1"=400'

CURRENT CONDITION PLAN VIEW

SHEET 1 OF 11

LEGEND

- AS-BUILT STATIONED
- LOG SILL
- LOG DROP
- STONE TOE STABILIZATION
- STEP POOL
- SEEP DEVELOPMENT
- ROCK STABILIZATION
- BANK EROSION
- BEAVER DAM
- CROSS SECTION
- PHOTO POINT
- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- WETLAND GAUGE ACHIEVING HYDROLOGIC CRITERION
- WETLAND GAUGE BELOW HYDROLOGIC CRITERION

IMAGE SOURCE: NC 2010 ORTHOIMAGERY

BEGIN NPAC
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
25+00
26+00
27+00
POWELL FARM ROAD
CONSERVATION EASEMENT
PP#1
VEG PLOT 1
VEG PLOT 16
WETLAND GAUGE #6
VEG PLOT 17
VEG PLOT 18
RAIN GAUGE
PP#2
START OF PROFILE NPAC-1
X-SECTION #1
X-SECTION #2
PP#3
PP#4
PP#5
VEG PLOT 2
VEG PLOT 3
WETLAND GAUGE #1
VEG PLOT 19
VEG PLOT 20
CONSERVATION EASEMENT
MATCHLINE - SEE SHEET 3
GRAPHIC SCALE
-40 -20 0 40 80

REVISIONS

NO.	DESCRIPTION	DATE	APPROVED

Ecosystem Enhancement Program

KCI TECHNOLOGIES
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460 SIX FORKS ROAD
RALEIGH, NORTH CAROLINA 27609

FARRAR DAIRY
STREAM AND WETLAND RESTORATION
LILLINGTON, HARNETT COUNTY, NORTH CAROLINA
NPAC - STATION 10+00 TO STATION 27+17

DATE: DEC 2012
SCALE: 1"=80'

CURRENT CONDITION PLAN VIEW

SHEET 2 OF 11

SEE SHEETS 7 - 9 FOR T1.1, T1.2, AND T1

CONSERVATION EASEMENT

X-SECTION #21

108+00

PP#26

VEG PLOT 4

END OF PROFILE NPAC-1

32+00

34+00

35+00

36+00

PP#6

31+00

33+00

PP#7

END OF PROFILE T1

30+00

X-SECTION #3

VEG PLOT 21

29+00

37+00

X-SECTION #4

VEG PLOT 22

38+00

VEG PLOT 23

PP#8

39+00

ROCK FORD CROSSING

CONSERVATION EASEMENT

MATCHLINE - SEE SHEET 2

MATCHLINE - SEE SHEET 4

VEG PLOT 5

LEGEND

- AS-BUILT STATIONED (12+00 / 13+00)
- LOG SILL
- LOG DROP
- STONE TOE STABILIZATION
- STEP POOL
- SEEP DEVELOPMENT
- ROCK STABILIZATION
- BANK EROSION
- BEAVER DAM
- CROSS SECTION
- PHOTO POINT
- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- WETLAND GAUGE ACHIEVING HYDROLOGIC CRITERION
- WETLAND GAUGE BELOW HYDROLOGIC CRITERION

IMAGE SOURCE: NC 2010 ORTHOIMAGERY

SYM.	DESCRIPTION	DATE	APPROVED
	REVISIONS		

Ecosystem Enhancement Program

KCI TECHNOLOGIES
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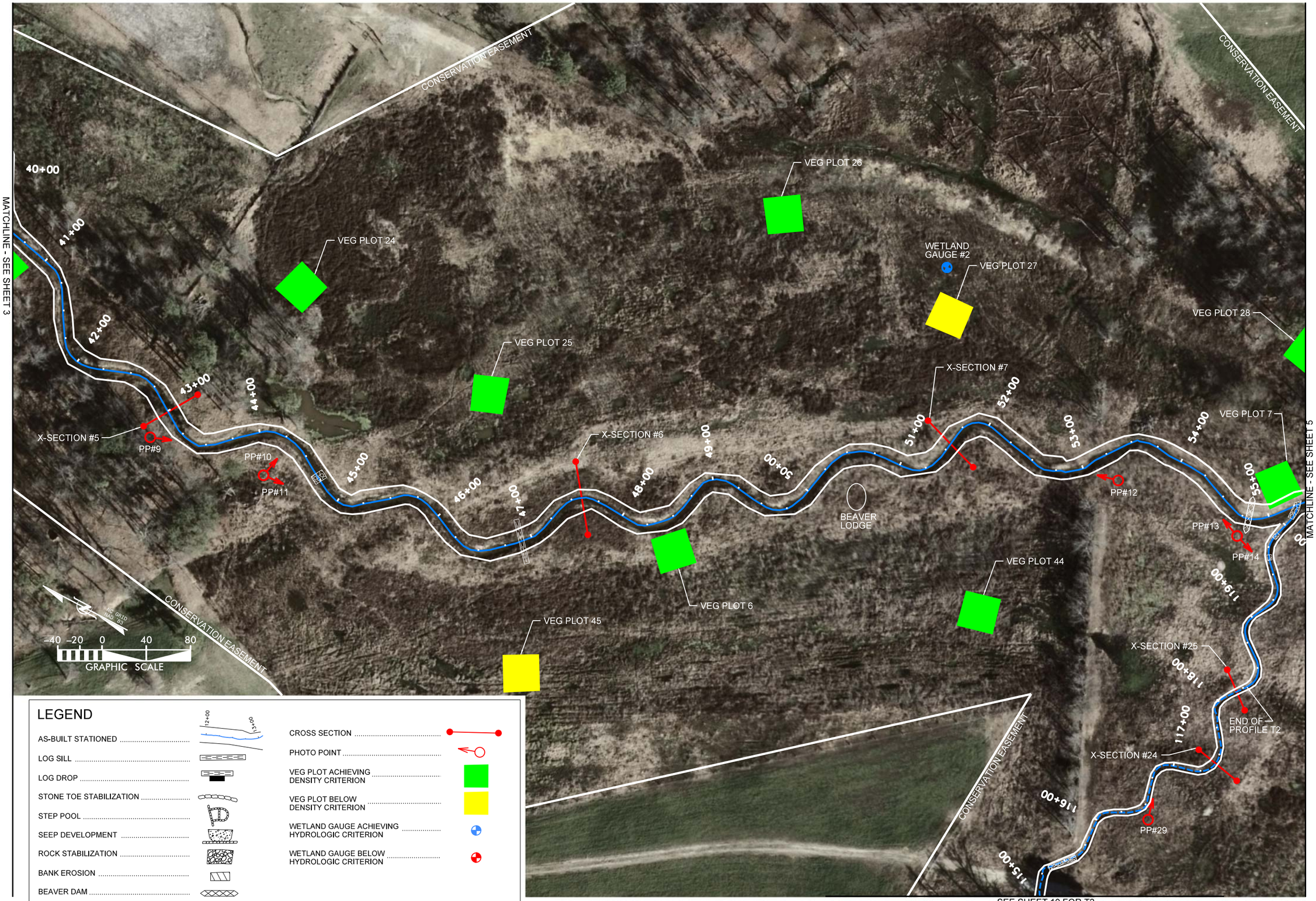
460I SIX FORKS ROAD
RALEIGH, NORTH CAROLINA 27609

FARRAR DAIRY
STREAM AND WETLAND RESTORATION
LILLINGTON, HARNETT COUNTY, NORTH CAROLINA
NPAC - STATION 27+17 TO STATION 40+51

DATE: DEC 2012
SCALE: 1"=80'

CURRENT CONDITION PLAN VIEW



LEGEND

- AS-BUILT STATIONED (12+00 … 13+00)
- LOG SILL
- LOG DROP
- STONE TOE STABILIZATION
- STEP POOL
- SEEP DEVELOPMENT
- ROCK STABILIZATION
- BANK EROSION
- BEAVER DAM
- CROSS SECTION
- PHOTO POINT
- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- WETLAND GAUGE ACHIEVING HYDROLOGIC CRITERION
- WETLAND GAUGE BELOW HYDROLOGIC CRITERION

IMAGE SOURCE: NC 2010 ORTHOIMAGERY

REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVED

Ecosystem Enhancement Program

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RALEIGH, NORTH CAROLINA 27609

FARRAR DAIRY
STREAM AND WETLAND RESTORATION

LILLINGTON, HARNETT COUNTY, NORTH CAROLINA

NPAC - STATION 40+51 TO STATION 55+39

DATE: DEC 2012
SCALE: 1"=80'

CURRENT CONDITION PLAN VIEW

LEGEND

- AS-BUILT STATIONED
- LOG SILL
- LOG DROP
- STONE TOE STABILIZATION
- STEP POOL
- SEEP DEVELOPMENT
- ROCK STABILIZATION
- BANK EROSION
- BEAVER DAM
- CROSS SECTION
- PHOTO POINT
- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- WETLAND GAUGE ACHIEVING HYDROLOGIC CRITERION
- WETLAND GAUGE BELOW HYDROLOGIC CRITERION

IMAGE SOURCE: NC 2010 ORTHOIMAGERY

CONSERVATION EASEMENT
CONSERVATION EASEMENT
VEG PLOT 28
VEG PLOT 30
VEG PLOT 29
WETLAND GAUGE #4
MATCHLINE - SEE SHEET 4
56+00
57+00
START OF PROFILE NPAC-2
X-SECTION #8
58+00
59+00
PP#15
60+00
61+00
62+00
63+00
X-SECTION #9
VEG PLOT 43
VEG PLOT 41
WETLAND GAUGE #3
VEG PLOT 42
VEG PLOT 40
CONSERVATION EASEMENT
64+00
PP#17
PP#16
65+00
END OF PROFILE NPAC-2
X-SECTION #10
STREAM GAUGE #2
VEG PLOT 8
MATCHLINE - SEE SHEET 6
VEG PLOT 32
VEG PLOT 9
66+00
67+00
PP#18
68+00
69+00
141+00
140+00
END OF PROFILE T3
139+00
PP#32
X-SECTION #29
VEG PLOT 35
WETLAND GAUGE #5
VEG PLOT 15
138+00
X-SECTION #28
137+00
X-SECTION #27
PP#31
136+00
VEG PLOT 39
VEG PLOT 36
SEE SHEET 11 FOR T3

NC GRID NAD 83

–40 –20 0 40 80
GRAPHIC SCALE

REVISIONS

SYM.	DESCRIPTION	DATE	APPROVED

Ecosystem Enhancement Program

KCI TECHNOLOGIES
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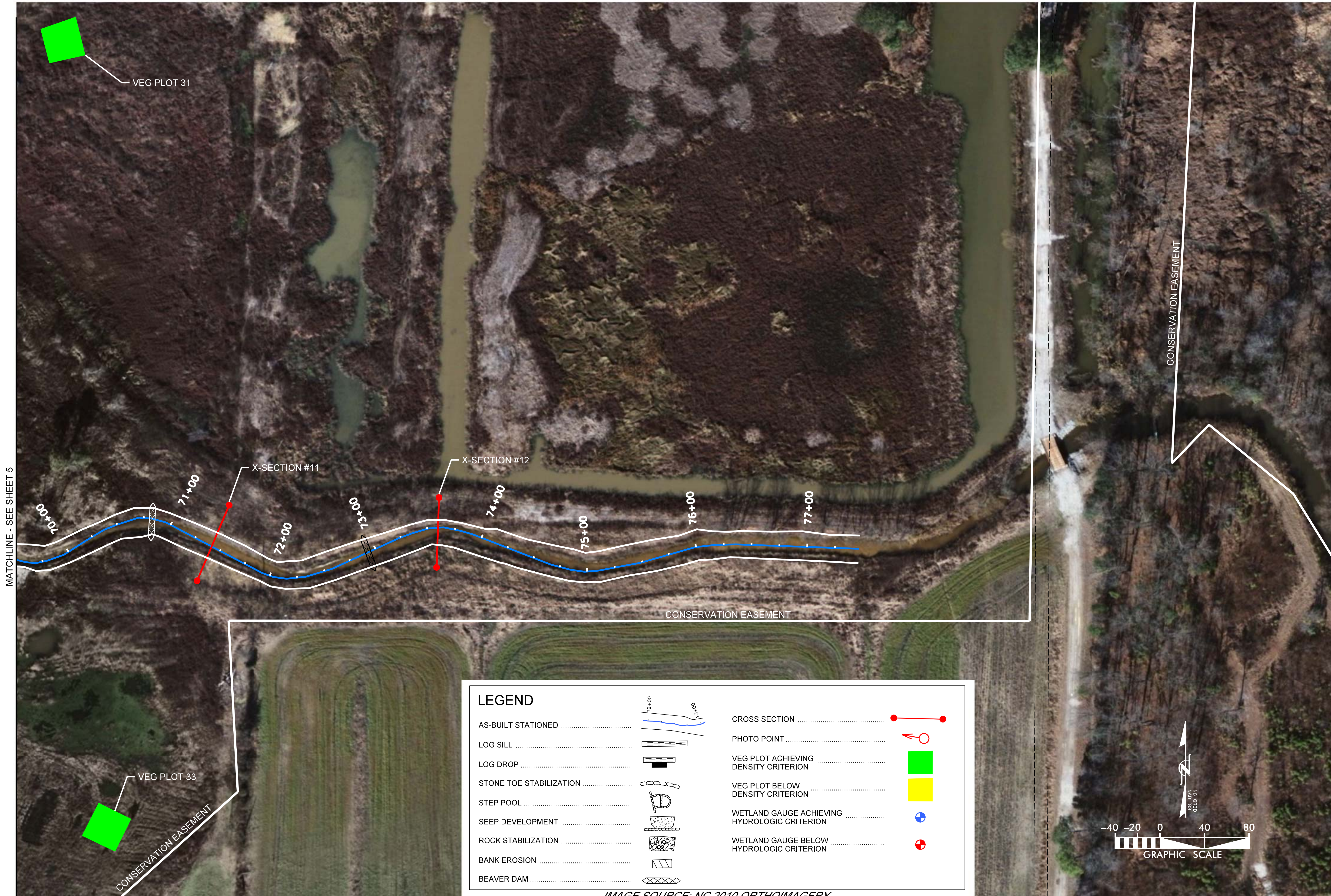
RALEIGH, NORTH CAROLINA 27609

FARRAR DAIRY
STREAM AND WETLAND RESTORATION
LILLINGTON, HARNETT COUNTY, NORTH CAROLINA
NPAC - STATION 55+39 TO STATION 69+51

DATE: DEC 2012
SCALE: 1"=80'

CURRENT CONDITION PLAN VIEW


VEG PLOT 31
VEG PLOT 33
MATCHLINE - SEE SHEET 5
X-SECTION #11
X-SECTION #12
70+00
71+00
72+00
73+00
74+00
75+00
76+00
77+00
CONSERVATION EASEMENT
CONSERVATION EASEMENT
CONSERVATION EASEMENT
LEGEND
AS-BUILT STATIONED
LOG SILL
LOG DROP
STONE TOE STABILIZATION
STEP POOL
SEEP DEVELOPMENT
ROCK STABILIZATION
BANK EROSION
BEAVER DAM
CROSS SECTION
PHOTO POINT
VEG PLOT ACHIEVING DENSITY CRITERION
VEG PLOT BELOW DENSITY CRITERION
WETLAND GAUGE ACHIEVING HYDROLOGIC CRITERION
WETLAND GAUGE BELOW HYDROLOGIC CRITERION
NC GRID NAD 83
-40 -20 0 40 80
GRAPHIC SCALE
IMAGE SOURCE: NC 2010 ORTHOIMAGERY

REVISIONS

SYM.	DESCRIPTION	DATE	APPROVED

Ecosystem Enhancement PROGRAM

KCI TECHNOLOGIES

ENGINEERS • PLANNERS • SCIENTISTS

4601 SIX FORKS ROAD
RALEIGH, NORTH CAROLINA 27609

FARRAR DAIRY
STREAM AND WETLAND RESTORATION
LILLINGTON, HARNETT COUNTY, NORTH CAROLINA

DATE: DEC 2012
SCALE: 1"=80'

SHEET OF 11

LEGEND

- AS-BUILT STATIONED
- LOG SILL
- LOG DROP
- STONE TOE STABILIZATION
- STEP POOL
- SEEP DEVELOPMENT
- ROCK STABILIZATION
- BANK EROSION
- BEAVER DAM
- CROSS SECTION
- PHOTO POINT
- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- WETLAND GAUGE ACHIEVING HYDROLOGIC CRITERION
- WETLAND GAUGE BELOW HYDROLOGIC CRITERION

IMAGE SOURCE: NC 2010 ORTHOIMAGERY

CONSERVATION EASEMENT

CONSERVATION EASEMENT

CONSERVATION EASEMENT

80+00

81+00

82+00

83+00

84+00

85+00

86+00

87+00

88+00

100+00

101+00

102+00

PP#19

PP#20

PP#21

START OF PROFILE T1.1

VEG PLOT 10

X-SECTION #13

X-SECTION #14

END OF PROFILE T1.1

X-SECTION #15

ROCK FORD CROSSING

SEE SHEET 9 FOR T1

SEE SHEET 8 FOR T1.2

REVISIONS

SYM.	DESCRIPTION	DATE	APPROVED

Ecosystem Enhancement Program

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RALEIGH, NORTH CAROLINA 27609

FARRAR DAIRY
STREAM AND WETLAND RESTORATION

LILLINGTON, HARNETT COUNTY, NORTH CAROLINA

T1.1 - STATION 80+00 TO STATION 88+25

DATE: DEC 2012
SCALE: 1"=80'

CURRENT CONDITION PLAN VIEW

SHEET 7 OF 11

LEGEND

- AS-BUILT STATIONED (12+00 / 13+00)
- LOG SILL
- LOG DROP
- STONE TOE STABILIZATION
- STEP POOL
- SEEP DEVELOPMENT
- ROCK STABILIZATION
- BANK EROSION
- BEAVER DAM
- CROSS SECTION
- PHOTO POINT
- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- WETLAND GAUGE ACHIEVING HYDROLOGIC CRITERION
- WETLAND GAUGE BELOW HYDROLOGIC CRITERION

NC GRID NAD 83

−40 −20 0 40 80

GRAPHIC SCALE

IMAGE SOURCE: NC 2010 ORTHOIMAGERY

SYM.	DESCRIPTION	DATE	APPROVED

REVISIONS

Ecosystem Enhancement Program

KCI TECHNOLOGIES
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RALEIGH, NORTH CAROLINA 27609

FARRAR DAIRY
STREAM AND WETLAND RESTORATION

LILLINGTON, HARNETT COUNTY, NORTH CAROLINA

T1.2 - STATION 90+00 TO STATION 99+80

DATE: DEC 2012
SCALE: 1"=80'

CURRENT CONDITION PLAN VIEW

LEGEND

- AS-BUILT STATIONED
- LOG SILL
- LOG DROP
- STONE TOE STABILIZATION
- STEP POOL
- SEEP DEVELOPMENT
- ROCK STABILIZATION
- BANK EROSION
- BEAVER DAM
- CROSS SECTION
- PHOTO POINT
- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- WETLAND GAUGE ACHIEVING HYDROLOGIC CRITERION
- WETLAND GAUGE BELOW HYDROLOGIC CRITERION

NC GRID NAD 83

−40 −20 0 40 80

GRAPHIC SCALE

IMAGE SOURCE: NC 2010 ORTHOIMAGERY

SEE SHEET 3 FOR NPAC

SEE SHEETS 7 AND 8 FOR T1.1 AND T1.2

SEE SHEET 3 FOR NPAC

CONSERVATION EASEMENT

BEGIN T1

VEG PLOT 12

VEG PLOT 22

VEG PLOT 4

VEG PLOT 21

PP#21

PP#7

PP#26

PP#24

PP#25

PP#6

ROCK FORD CROSSING

START OF PROFILE T1

END OF PROFILE T1

END OF PROFILE NPAC-1

X-SECTION #19

X-SECTION #21

X-SECTION #20

X-SECTION #3

STREAM GAUGE #1

98+00 99+00 100+00 101+00 102+00 103+00 104+00 105+00 106+00 107+00 108+00 31+00 32+00 33+00 34+00 30+00 29+00 28+00

CONSERVATION EASEMENT

CONSERVATION EASEMENT

REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVED

Ecosystem Enhancement Program

KCI TECHNOLOGIES
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4601 SIX FORKS ROAD
RALEIGH, NORTH CAROLINA 27609

FARRAR DAIRY
STREAM AND WETLAND RESTORATION
LILLINGTON, HARNETT COUNTY, NORTH CAROLINA
T1 - STATION 100+00 TO STATION 108+84

DATE: DEC 2012
SCALE: 1"=80'

CURRENT CONDITION PLAN VIEW

SHEET 9 OF 11

SEE SHEET 4 FOR NPAC

CONSERVATION EASEMENT

WETLAND GAUGE #7

110+00

111+00

BEGIN T2

X-SECTION #22

112+00

PP#27

VEG PLOT 13

113+00

X-SECTION #23

START OF PROFILE T2

CONSERVATION EASEMENT

114+00

115+00

116+00

PP#28

PP#29

117+00

118+00

119+00

END OF PROFILE T2

X-SECTION #25

X-SECTION #24

120+00

50+00

BEAVER LODGE

WETLAND GAUGE #2

51+00

VEG PLOT 27

X-SECTION #7

52+00

53+00

VEG PLOT 44

PP#12

54+00

PP#13

PP#14

55+00

VEG PLOT 7

VEG PLOT 28

VEG PLOT 43

56+00

57+00

SEE SHEET 5 FOR NPAC

LEGEND

- AS-BUILT STATIONED (12+00 / 13+00)
- LOG SILL
- LOG DROP
- STONE TOE STABILIZATION
- STEP POOL
- SEEP DEVELOPMENT
- ROCK STABILIZATION
- BANK EROSION
- BEAVER DAM
- CROSS SECTION
- PHOTO POINT
- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- WETLAND GAUGE ACHIEVING HYDROLOGIC CRITERION
- WETLAND GAUGE BELOW HYDROLOGIC CRITERION

NC GRID NAD 83

–40 –20 0 40 80

GRAPHIC SCALE

IMAGE SOURCE: NC 2010 ORTHOIMAGERY

REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVED

Ecosystem Enhancement Program

KCI TECHNOLOGIES
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460 SIX FORKS ROAD
RALEIGH, NORTH CAROLINA 27609

FARRAR DAIRY
STREAM AND WETLAND RESTORATION
LILLINGTON, HARNETT COUNTY, NORTH CAROLINA
T2 - STATION 110+00 TO STATION 120+22

DATE: DEC 2012
SCALE: 1"=80'

CURRENT CONDITION PLAN VIEW

LEGEND

- AS-BUILT STATIONED
- LOG SILL
- LOG DROP
- STONE TOE STABILIZATION
- STEP POOL
- SEEP DEVELOPMENT
- ROCK STABILIZATION
- BANK EROSION
- BEAVER DAM
- CROSS SECTION
- PHOTO POINT
- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- WETLAND GAUGE ACHIEVING HYDROLOGIC CRITERION
- WETLAND GAUGE BELOW HYDROLOGIC CRITERION

IMAGE SOURCE: NC 2010 ORTHOIMAGERY

SEE SHEET 5 FOR NPAC

VEG PLOT 15
PP#31
PP#32
PP#18
VEG PLOT 12
X-SECTION #27
X-SECTION #28
X-SECTION #29
END OF PROFILE T3
VEG PLOT 38
VEG PLOT 35
PP#30
START OF PROFILE T3
X-SECTION #26
VEG PLOT 37
WETLAND GAUGE #5
VEG PLOT 36
VEG PLOT 34
VEG PLOT 14
CONSERVATION EASEMENT
BEGIN T3
CONSERVATION EASEMENT

SEE SHEET 6 FOR NPAC

-40 -20 0 40 80
GRAPHIC SCALE

REVISIONS

SYM.	DESCRIPTION	DATE	APPROVED

Ecosystem Enhancement Program

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RALEIGH, NORTH CAROLINA 27609

FARRAR DAIRY
STREAM AND WETLAND RESTORATION
LILLINGTON, HARNETT COUNTY, NORTH CAROLINA
T3 - STATION 130+00 TO STATION 141+67

DATE: DEC 2012
SCALE: 1"=80'

CURRENT CONDITION PLAN VIEW

SHEET 11 OF 11