

# Naked Creek Stream Restoration

Wilkes County, North Carolina

2012 Year 5 Monitoring Report - Final

EEP Project Number: 261

USGS HUC 03040101010100

EcoEngineering Project Number: EEP-08000

Prepared for:

NCDENR Ecosystem Enhancement Program

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Raleigh, NC 27603



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- Morphology and Hydraulic Monitoring Summary [Exhibit Table IX] (Cross Section and Reach Parameters submitted electronically)
- Stream Problem Area Photos (submitted electronically)
- Stream Problem Area Inventory Table (submitted electronically)

## Appendix E – Wetland Assessment

Table 10. Wetland Criteria Attainment (omitted, not applicable)  
– Precipitation and Water Level Plots (omitted, not applicable)

## **1.0 Executive Summary/Project Abstract**

### ***1.1 Project Goals and Objectives***

The goal of the restoration project is to improve the water quality and biological habitat of the site's streams, wetlands, and riparian buffers through the following:

- Restore (pattern, dimension, and profile) unstable streams using natural channel design techniques
- Re-establish riparian buffers (Kimley-Horn, 2007)

### ***1.2 Vegetation Condition and Comparison***

Original baseline vegetation monitoring data was not provided prior to the 2008 Monitoring Year 1 and 2008 is considered a drought year. The 2009 Monitoring Year 2 is considered the baseline datum because after two years of monitoring it is assumed all planted stems within a vegetation monitoring plot have been surveyed and accounted for. Therefore, any additional species observed in proceeding monitoring years are considered volunteer species. The 2012 Monitoring Year 5 data was provided by Carolina Vegetation Survey and was not manipulated for presentation within Table 7 - Stem Count Total and Planted by Plot Species **Appendix C**.

Current stem counts were calculated using vegetation plot monitoring data. Interim density targets (stems/acre) are 320 at year 3 and 288 at year 4. Final stem count criteria are 260 trees per acre at the end of the five (5) year monitoring. As for Monitoring Year 5, Naked Creek had 5 vegetation plots encompassing 0.12 acres, containing a total of 50 planted stems excluding live stakes. In total, the 5 vegetation plots yielded a density of 405 planted trees per acre excluding live stakes. These density totals exceed the requirements by 10% for planted trees per acre excluding live stakes. With regard to each individual vegetation plot, Vegetation Plot 5 failed to meet the requirements by less than 10% while Vegetation Plots 1, 2, 3 and 4 exceed the requirements by 10% when examining planted stems excluding live stakes.

Exotic/invasive species were observed at the site. Exotic species observed at the site include Chinese privet (*Ligustrum sinense*) and cattail (*Typha latifolia*). There are nine (9) areas in which exotic/invasive species were observed totaling approximately 0.04 acres in size and are approximately 1.03% of the easement acreage. The extent of exotic/invasive species is depicted in the Consolidated Current Condition Plan View **Appendix A**.

Bare areas which exhibit limited cover of both woody and herbaceous material were observed at the site. There were two areas considered bare areas which total approximately 0.23 acres in size and are approximately 9.06% of the planted area at the site. The extent of the bare areas is depicted in the Consolidated Current Condition Plan View **Appendix A**.

The restoration project includes within the conservation easement areas designated as "Allowable Use Area". Allowable Use Areas are areas in which mowing activities have

occurred and are permissible. There are six (6) Allowable Use Areas located between Stations 0+05 and 5+85, 6+15 and 16+40, 17+15 and 18+15, 22+90 and 23+60, 23+65 and 25+00, and 25+55 and 26+5. These Allowable Use Areas are noted within Table 6A – Vegetation Condition Assessment **Appendix C** as Easement Encroach Areas. The Allowable Use Areas total approximately 0.21 acres in size and are approximately 5.38% of the easement acreage. The extent of the Allowable Use Areas is depicted in the Consolidated Current Condition Plan View **Appendix A**.

The conservation easement is shown on the Consolidated Current Condition Plan View **Appendix A** and the acreage is 3.9 acres. The conservation easement is based on information received from EEP on October 11, 2012 and is based on Deed Book 1019 Page 361, Plat 10 Page 486 Wilkes County and Deed Book 1019 Page 417, Plat 10 Page 486 Wilkes County, dated November 20, 2007. EcoEngineering did survey locate one EEP Conservation Monument located at Station 26+70 and is depicted on the Consolidated Current Condition Plan View **Appendix A**. Many of the EEP markers and stakes were noted to be within 10 feet of the restored stream's top of bank. Areas have been mowed immediately adjacent to the east of the stakes and EEP markers. As a result, approximately 60% of Vegetation Plot 5 has been mowed. However, EcoEngineering recreated Vegetation Plot 5 and surveyed the vegetation within the plot. It should be noted that a section of fence has been removed between Stations 16+80 and 19+60.

Based on the survey conducted for the Naked Creek Stream Restoration project, the restoration project is 2,652 linear feet and will provide a total of 2,652 stream mitigation units.

### *1.3 Stream Stability/Condition and Comparison*

Overall, the stream system appears stable and is not migrating toward lateral or vertical instability. Based on the prior year comparison using longitudinal profile data, it appears that minor systemic aggradation has occurred throughout the reach, although this condition does not appear to pose an imminent threat to the overall stability of the system. To document bankfull events a crest gage is located approximately 450 feet upstream of cross section 4 and is depicted in the Consolidated Current Condition Plan View **Appendix A**. Evidence of a bankfull event was observed this monitoring year.

On May 31, 2012, EcoEngineering conducted field investigations for the Fifth Year Initial Assessment. During the Initial Assessment, (4) beaver dams were observed at Stations 19+45, 20+25, 21+10, and 23+95. The beaver dams were constructed after Monitoring Year 4 and before the Fifth Year Initial Assessment. All four (4) beaver dams were removed after the Initial Assessment and prior to field survey activities for Monitoring Year 5 (conducted August 7 and August 10, 2012). The four (4) removed beaver dams are located in the Consolidated Current Condition Plan View **Appendix A**.

Bank erosion predictions utilizing Bank Erosion Hazard Index (BEHI) and Near Bank Stress (NBS) assessment were not conducted for the entire project pre-construction as part of the existing conditions survey. Therefore, BEHI and NBS assessments are not applicable during Monitoring Year 5.

## ***1.4 Wetland Conditions and Performance***

No wetlands are being monitored for mitigation credits at this project site.

## ***1.5 Narrative Background***

Summary information/data related to the occurrence of items such as beaver or encroachment and statistics related to performance of various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting information formerly found in these reports can be found in the mitigation and restoration plan documents available on the EEP website. All raw data supporting the tables and figures in the appendices is available from EEP upon request.

## **2.0 Methodology**

All monitoring methodologies follow the most current templates and guidelines provided by EEP (EEP, 2006; EEP, 2009). Photographs were taken at high resolution using an Olympus FE-115 5.0 megapixel digital camera. GPS location information was collected using a Trimble Geo XT handheld mapping grade GPS unit. Stream and vegetation problem areas were noted in the field on As-Built Plan Sheets.

The methods used to generate the data in this report are standard fluvial geomorphology techniques as described in *Applied River Morphology* (Rosgen, 1996) and related publications from US Forest Service and the interagency Stream Mitigation Guidelines (USACE, 2003).

Vegetation monitoring methods followed the 2008, Version 4.2 CVS-EEP Protocol for Recording Vegetation (Lee et. al., 2008). Vegetation plot photographs were collected for each vegetation plot. Vegetation monitoring plots were re-marked in the field by replacing all old flagging with new orange flagging. Monitoring taxonomy follows *Flora of the Carolinas, Virginia, Georgia, and Surrounding Areas* (Weakley 2007). Stem height was measured with a folding one-meter rule. Diameter at breast height and decimeter height were measured with calipers.

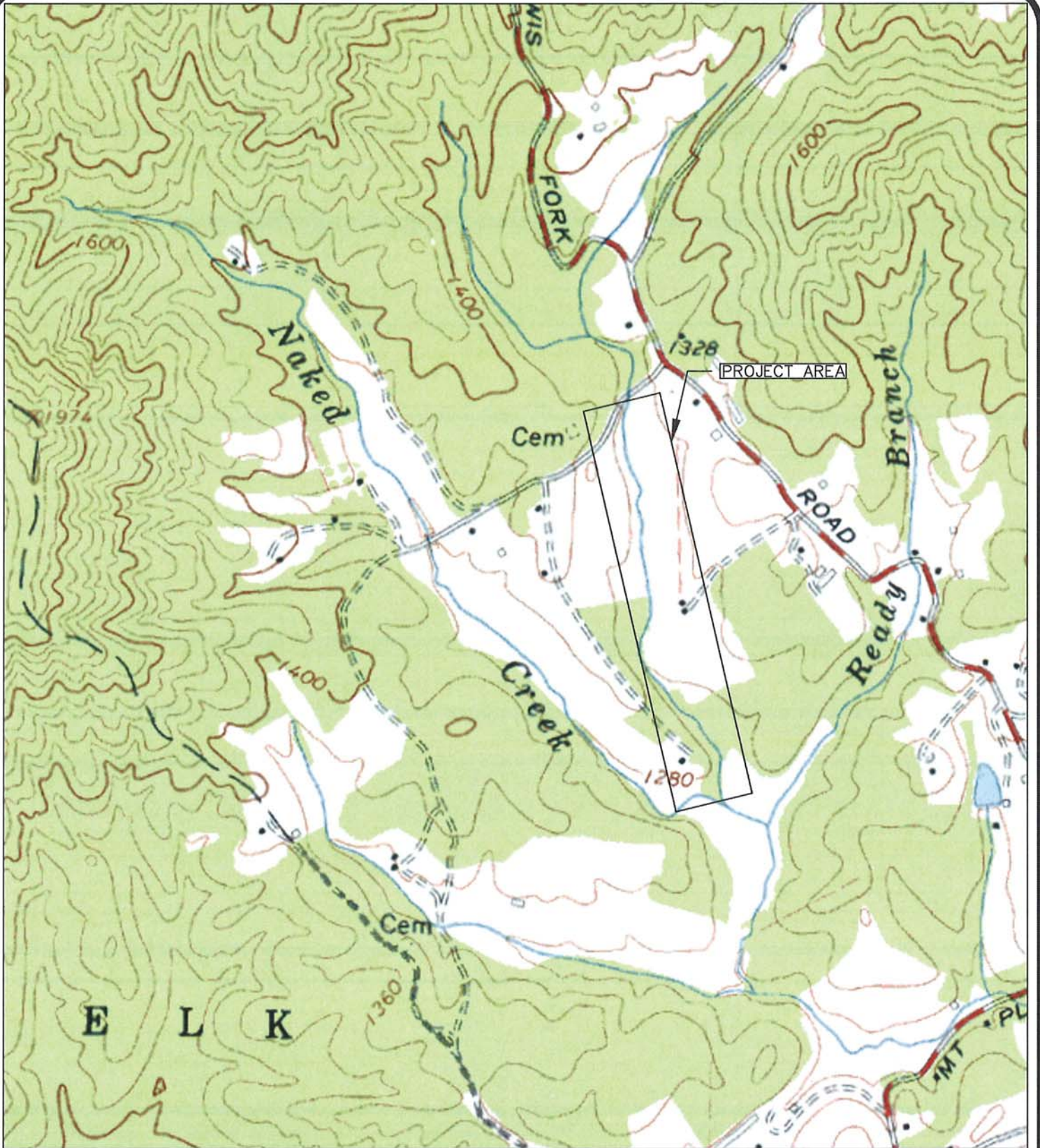
### **3.0 References**

- Ecosystem Enhancement Program (EEP), 2006. Monitoring Report Guidelines, November 16, 2006.
- Ecosystem Enhancement Program (EEP), 2009. Monitoring Report Guidelines, June 1, 2009.
- Kimley-Horn and Associates, Inc., 2007. Naked Creek Stream Final Mitigation Report. Submitted to NCDENR-EEP, August 2007.
- Lee, Michael T., R. K. Peet, S. D. Roberts, and T. R. Wentworth. 2008. CVS-EEP Protocol for Recording Vegetation, Version 4.2 (<http://cvs.bio.unc.edu/methods.htm>)
- Rosgen, D.L. 1996. Applied Morphology. Wildland Hydrology, Pagosa Springs, CO.
- US Army Corps of Engineers (USACE), 2003. April 2003 Stream Mitigation Guidelines.
- US Army Corps of Engineers (USACE), 2005. Information Regarding Stream Restoration In The Outer Coastal Plain of North Carolina. US Army Corps of Engineers, Wilmington District, Regulatory Division and North Carolina Department of Environment and Natural Resources, Division of Water Quality, December 1, 2005.
- Weakley, A. S., 2008. Flora of the Carolinas, Virginia, Georgia, northern Florida, and surrounding areas. University of North Carolina Herbarium (NCU), North Carolina Botanical Garden, University of North Carolina at Chapel Hill, working Draft as of April 7, 2008.

APPENDIX A

General Figures and Plan View





USGS, 7.5 MINUTE, TOPOGRAPHIC QUADRANGLE;  
 PURLEAR, N.C.; 1966; LAT: 36.1394315° N  
 LON: 81.3634822° W



McADAMS	PROJECT NO.	EEP-08000
	FILENAME:	EEP-08000
	SCALE:	1" = 1,000
	DATE:	08-20-12



# NAKED CREEK

## VICINITY MAP

WILKES COUNTY, NORTH CAROLINA

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# NAKED CREEK

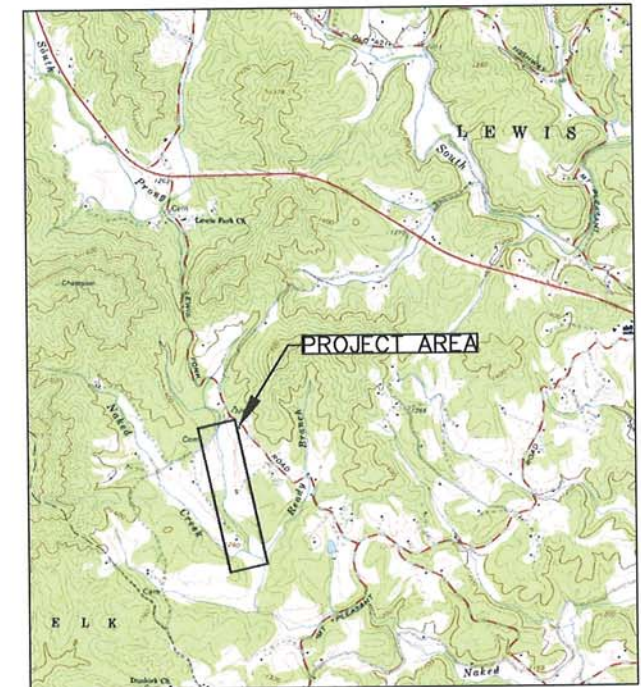
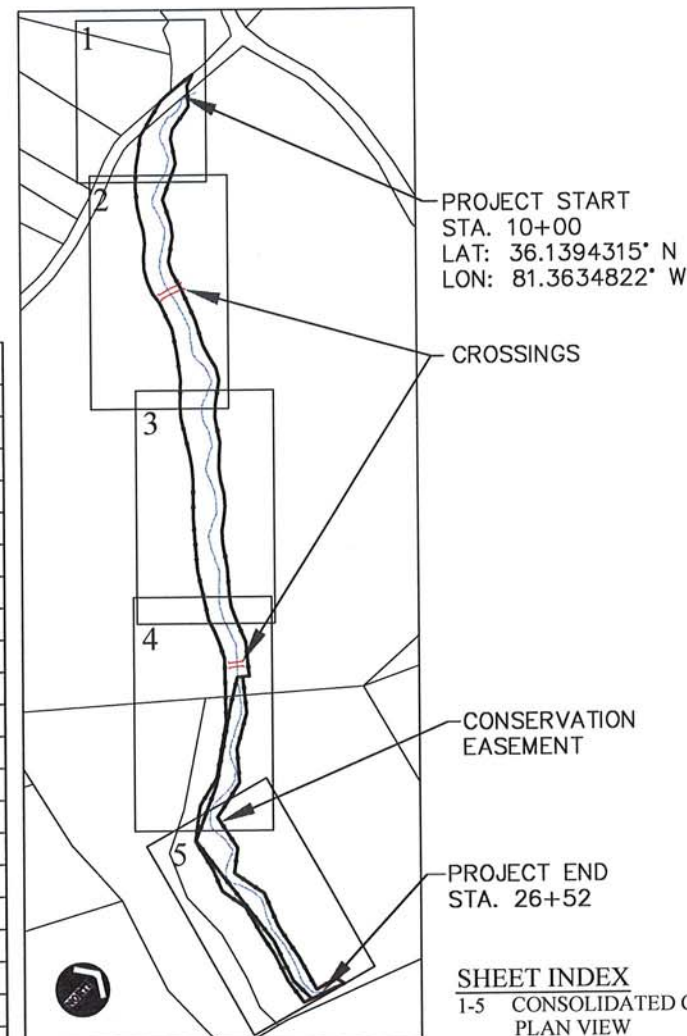
## CONSOLIDATED CURRENT CONDITIONS PLAN VIEW - YEAR FIVE MONITORING

CONTROL TABLE				
POINT NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	1770034.41	2615810.00	1323.68	CP 1
2	1769414.45	2615886.09	1334.03	CP 2
5	1768883.08	2616058.80	1293.99	CP 5
6	1768567.01	2616040.08	1295.62	CP 6
7	1768230.13	2616220.26	1286.57	CP 7
8	1767905.05	2616419.19	1276.62	CP 8
21	1769876.73	2615841.40	1314.65	XSEC
22	1769875.01	2615907.57	1310.10	XSEC
23	1769811.05	2615854.15	1312.41	XSEC
24	1769833.93	2615921.91	1309.27	XSEC
25	1769517.07	2615935.30	1309.93	XSEC
26	1769528.18	2616000.38	1304.25	XSEC
27	1768845.89	2616001.39	1299.91	XSEC
28	1768841.05	2616071.64	1294.02	XSEC
29	1768081.50	2616056.52	1285.76	XSEC
30	1768135.40	2616090.71	1282.76	XSEC
31	1768008.00	2616130.42	1281.06	XSEC
32	1768024.62	2616192.14	1280.54	XSEC
200	1767923.77	2616295.32	1277.98	NS TRV
201	1768021.09	2616272.32	1277.98	NMAG
202	1767750.03	2616140.01	1317.13	NS TRV
203	1768246.83	2616709.45	1326.95	NS TRAV
204	1768660.70	2616461.82	1313.51	NS SPUR
206	1768656.44	2616054.29	1297.16	NS SPUR/10/05RC
207	1767885.75	2616033.96	1320.66	NS TRAV
210	1767586.20	2616220.21	1307.38	NS TRAV
211	1767350.07	2616460.29	1293.22	NS TRAV
300	1767935.38	2616171.69	1279.68	1/2" EIR AT BASE
301	1767797.67	2616275.95	1284.75	1/2" EIR BASE
302	1767806.16	2616267.50	1284.82	27" MARKED BEECH
303	1767724.80	2616119.08	1317.87	3/4" EIP
304	1767910.76	2615956.19	1326.65	PP
305	1768030.62	2616849.25	1318.89	1/2" EIP
306	1768672.92	2616491.75	1313.53	1/2" EIP
307	1768555.88	2616073.60	1287.44	1/2" EIR
308	1768794.01	2615411.25	1362.06	3/4" EIP RAB
309	1768399.81	2615612.93	1340.59	3/4" EIP
310	1768247.44	2615709.89	1335.95	PP
311	1768094.04	2615832.43	1327.39	AXLE
312	1768624.46	2616090.77	1289.05	1/2" EIR
313	1767394.13	2616438.23	1299.30	3/4" EIP
314	1767353.37	2616475.02	1297.61	1.5" EIP
315	1767947.48	2616180.14	1278.67	1/2" EIR
316	1768132.37	2616037.55	1280.22	1/2" EIR
317	1768209.14	2615980.69	1282.38	1/2" EIR
318	1768578.84	2615504.74	1350.98	AXLE
319	1768471.54	2615925.36	1307.83	NS SPUR
320	1768546.42	2616163.77	1289.41	NS TRV
321	1767748.03	2616432.00	1273.34	NS TRAV

WILKES COUNTY, NORTH CAROLINA  
 EEP PROJECT NUMBER: 261  
 DATE: AUGUST 20, 2012

NORTH CAROLINA  
 ECOSYSTEM ENHANCEMENT PROGRAM  
 NC-EEP CONTACT: JULIE CAHILL (828)230-5172

VEGETATION PLOT MONITORING CONTROL POINTS			
POINT NUMBER	POINT TAG	NORTHING	EASTING
1	VC1	878937.6305	1303595.7584
2	VC2	878969.6963	1303599.5650
3	VC3	878967.2706	1303629.8125
4	VC4	878935.1638	1303628.2089
5	VC5	878716.8337	1303595.7108
6	VC6	878781.7716	1303595.5887
7	VC7	878781.7462	1303611.9076
8	VC8	878715.3560	1303616.0404
9	VC9	878238.8832	1303704.1393
10	VC10	878304.3131	1303701.2231
11	VC11	878305.6913	1303712.2540
12	VC12	878240.6355	1303720.0466
13	VC13	877913.0134	1303764.5696
14	VC14	877978.1274	1303757.1446
15	VC15	877977.1997	1303772.6940
16	VC16	877912.3357	1303778.7246
17	VC17	876852.8169	1303975.3137
18	VC18	876908.5974	1303941.6805
19	VC19	876917.5288	1303955.2972
20	VC20	876861.4609	1303990.4754



VICINITY MAP  
 NTS

NOTE: SURVEY DATES OF THALWEG AND TOP-OF-BANK - 8/07/12 TO 8/10/12.



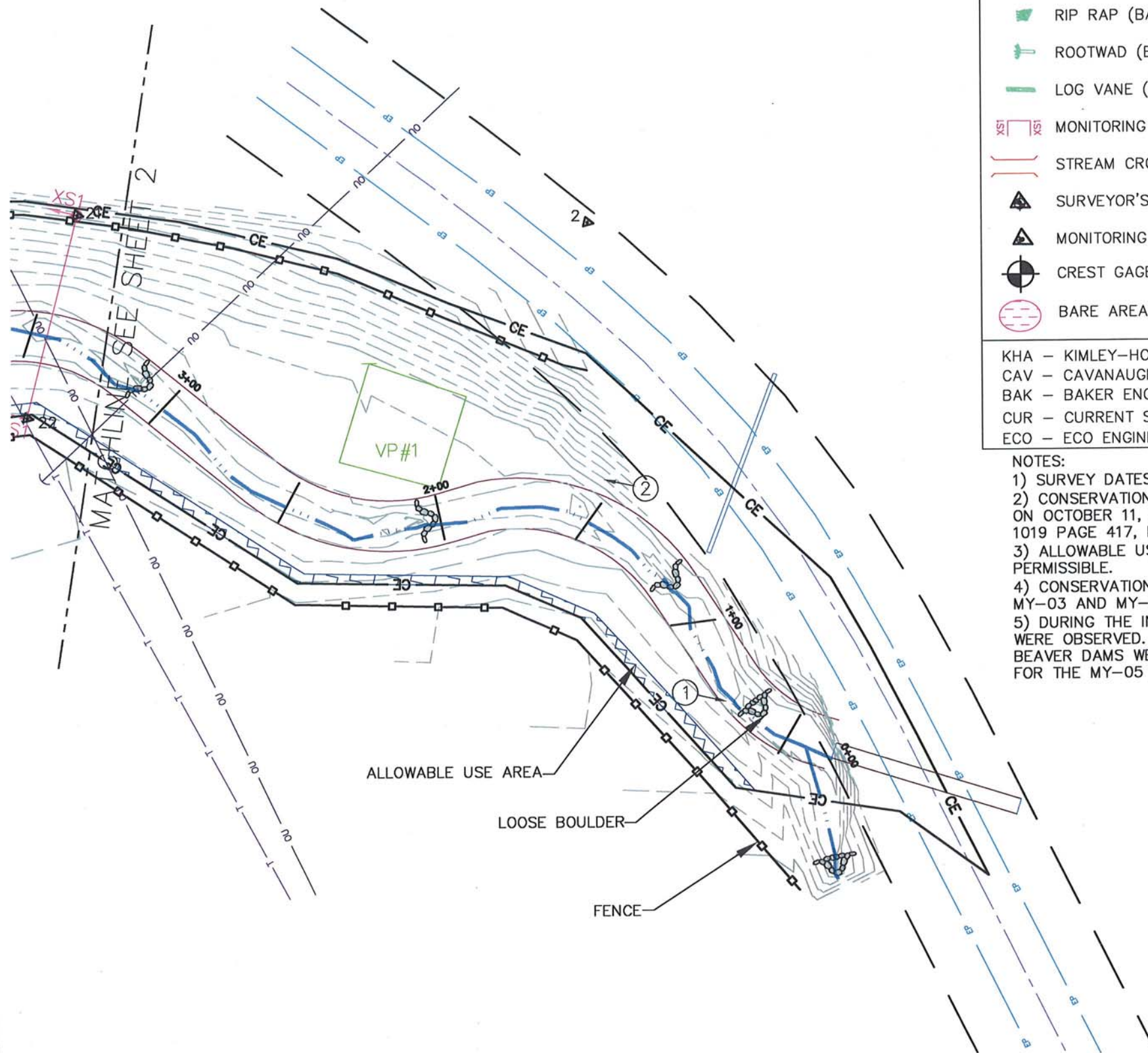
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(ECO)

(KHA)

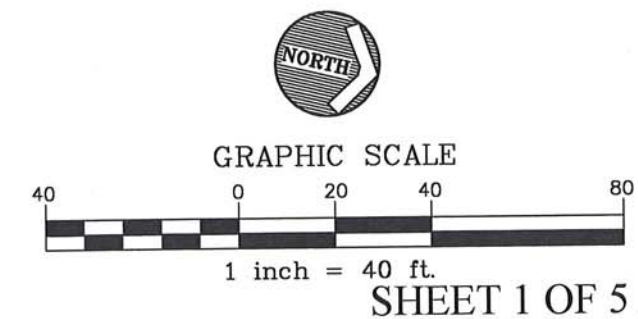


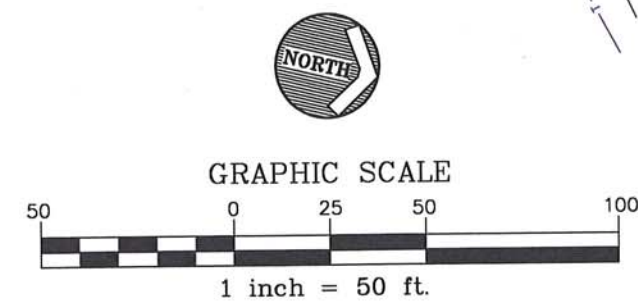
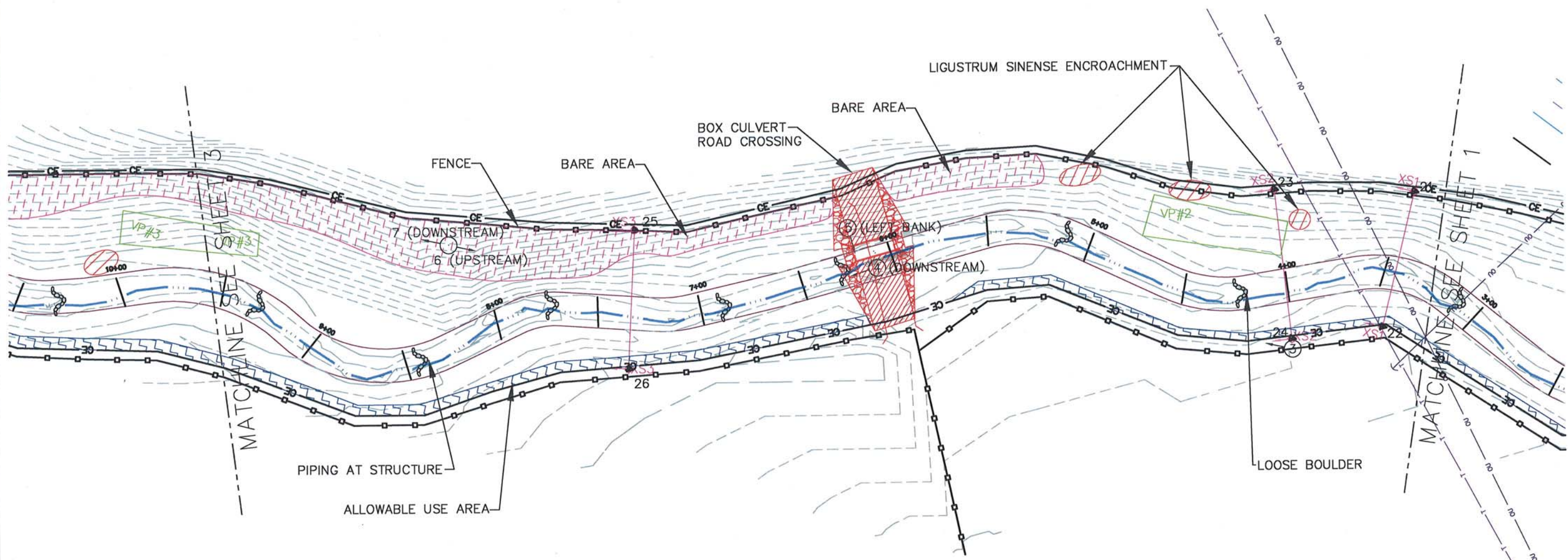
**LEGEND**

	PHOTO POINT (ECO)		FENCE (BAK)
	VEGETATION MONITORING PLOT (KHA)		CONSERVATION EASEMENT <sup>2</sup>
	ROCK CROSS VANE (BAK)		EDGE OF PAVEMENT (CAV)
	ROCK A-VANE (BAK)		TELEPHONE LINE (CAV)
	RIP RAP (BAK)		OVERHEAD POWER LINE (CAV)
	ROOTWAD (BAK)		YEAR FIVE STREAM CENTERLINE (ECO) <sup>1</sup>
	LOG VANE (BAK)		AS-BUILT TOP OF BANK (BAK)
	MONITORING CROSS SECTIONS (ECO)		VEGETATION MONITORING PLOT (KHA)
	STREAM CROSSING/FORD (BAK)		ALLOWABLE USE AREA <sup>3</sup>
	SURVEYOR'S BENCHMARKS (CAV, BAK)		INVASIVE / EXOTIC VEGETATION
	MONITORING BENCHMARKS (KHA)		PHOTO POINT LOCATION AND DIRECTION
	CREST GAGE		CONSERVATION EASEMENT MONUMENT <sup>4</sup>
	BARE AREAS		BEAVER DAM <sup>5</sup>

KHA - KIMLEY-HORN AND ASSOCIATES, INC. (DESIGN BASED ON CAV MAPPING)  
 CAV - CAVANAUGH ASSOCIATES, P.A. (BASE/PRE-CONSTRUCTION MAPPING)  
 BAK - BAKER ENGINEERING NY, INC. (AS-BUILT MAPPING)  
 CUR - CURRENT SURVEYING AND MAPPING, P.A. (STATE PROPERTY EASEMENT SURVEYOR)  
 ECO - ECO ENGINEERING (YEAR FOUR MONITORING)

**NOTES:**  
 1) SURVEY DATES OF THALWEG AND TOP-OF-BANK - 8/07/12 TO 8/10/12.  
 2) CONSERVATION EASEMENT ACREAGE IS 3.9 ACRES AND IS BASED ON INFORMATION RECEIVED FROM EEP ON OCTOBER 11, 2012 AND IS BASED ON DB 1019 PAGE 361, PLAT 10 PAGE 486 WILKES COUNTY, AND DB 1019 PAGE 417, PLAT 10 PAGE 486 WILKES COUNTY, DATED NOVEMBER 20, 2007.  
 3) ALLOWABLE USE AREAS ARE AREAS IN WHICH MOWING ACTIVITIES HAVE OCCURRED AND ARE PERMISSIBLE.  
 4) CONSERVATION EASEMENT MONUMENT SURVEY LOCATED BY ECOENGINEERING AND INSTALLED BETWEEN MY-03 AND MY-04 BY OTHERS.  
 5) DURING THE INITIAL ASSESSMENT (CONDUCTED MAY 31, 2012) FOR MY-05 PERIOD, BEAVER DAMS WERE OBSERVED. THE BEAVER DAMS WERE CONSTRUCTED AFTER MY-04 AND BEFORE MY-05 PERIODS. BEAVER DAMS WERE REMOVED AFTER THE INITIAL ASSESSMENT AND PRIOR TO FIELD SURVEY ACTIVITIES FOR THE MY-05 PERIOD.



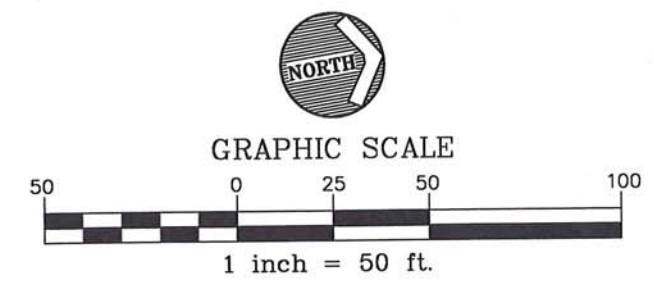
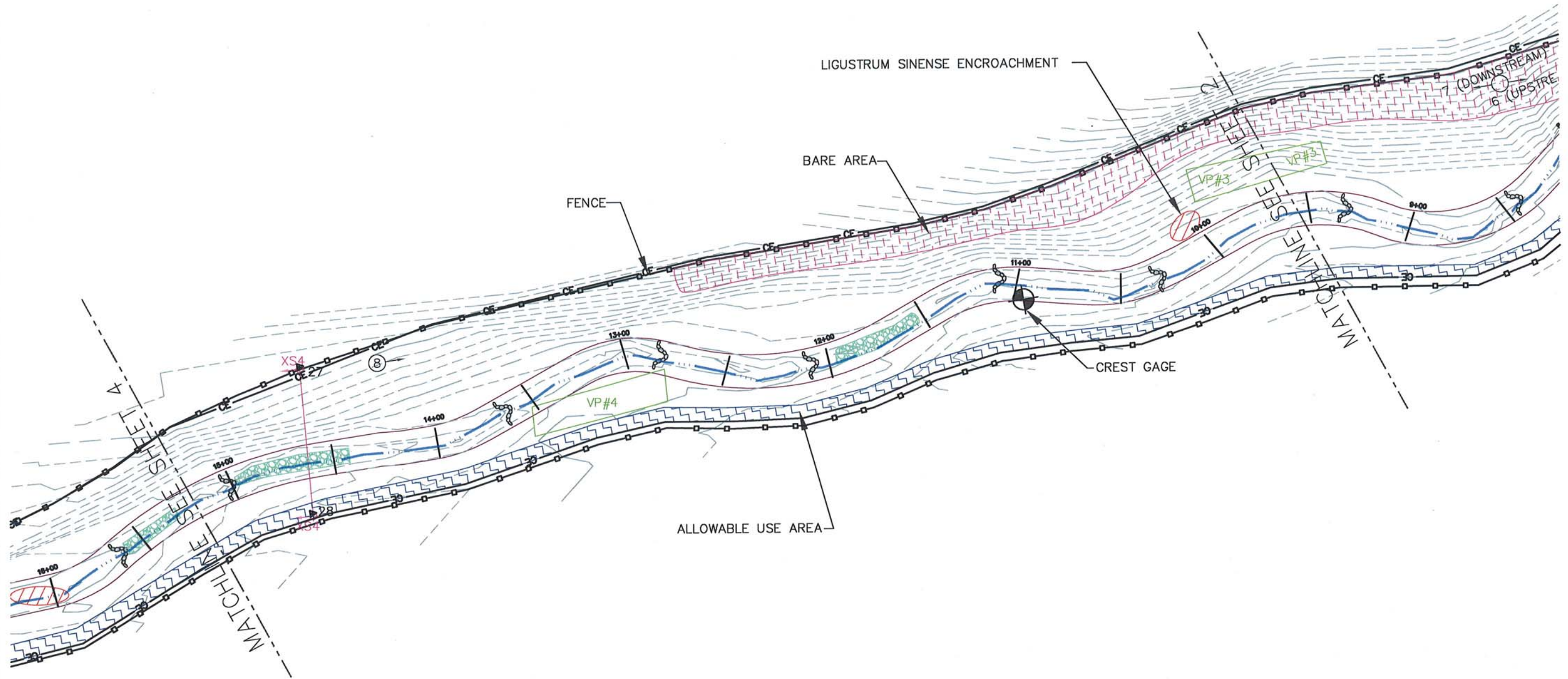


SHEET 2 OF 5



**NAKED CREEK**  
 CONSOLIDATED CURRENT CONDITIONS PLAN VIEW - YEAR FOUR MONITORING  
 WILKES COUNTY, NORTH CAROLINA

PROJECT NO.	EEP-08000
FILENAME:	EEP-08000
SCALE:	1" = 50'
DATE:	08-20-12

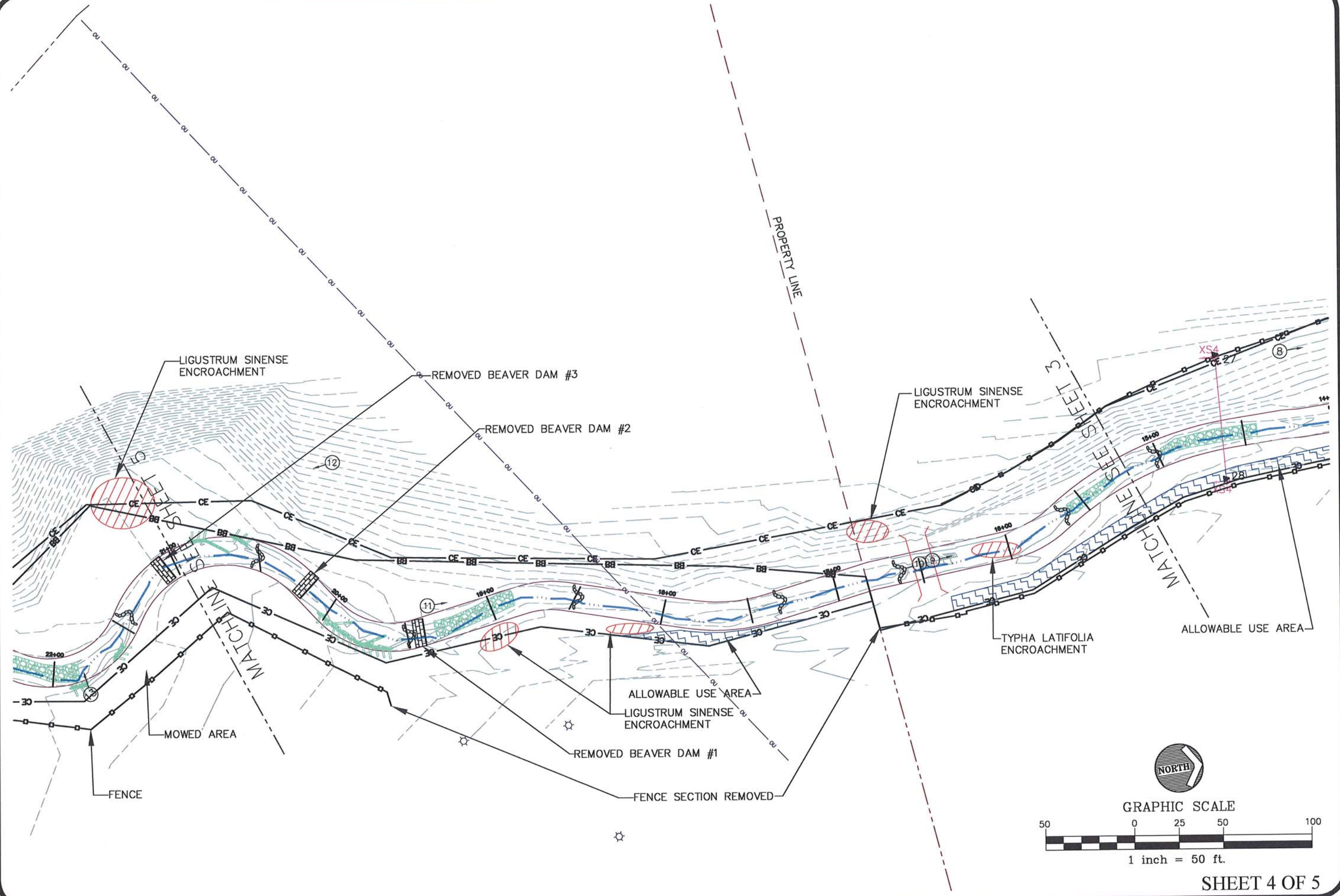


SHEET 3 OF 5



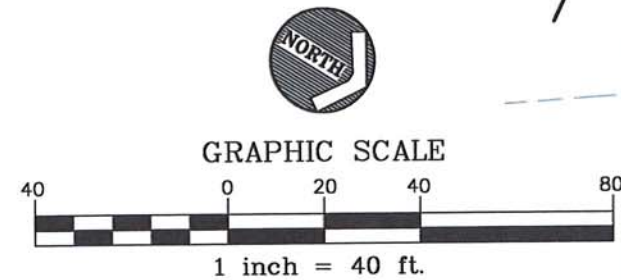
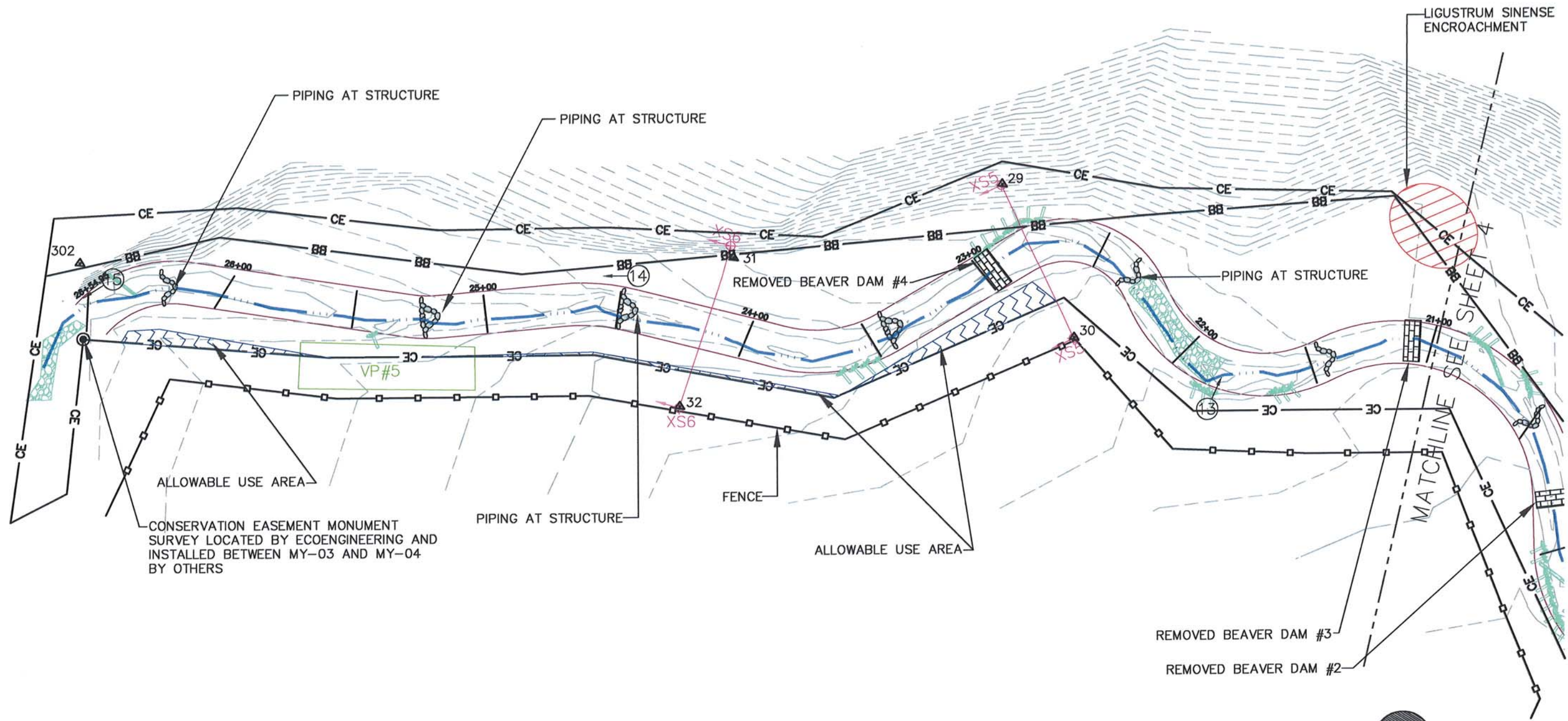
**NAKED CREEK**  
 CONSOLIDATED CURRENT CONDITIONS PLAN VIEW - YEAR FOUR MONITORING  
 WILKES COUNTY, NORTH CAROLINA

PROJECT NO.:	EEP-08000
FILENAME:	EEP-08000
SCALE:	1" = 50'
DATE:	08-20-12



**NAKED CREEK**  
 CONSOLIDATED CURRENT CONDITIONS PLAN VIEW - YEAR FOUR MONITORING  
 WILKES COUNTY, NORTH CAROLINA

PROJECT NO:	EEP - 08000
FILENAME:	EEP-08000
SCALE:	1" = 50'
DATE:	08-20-12



SHEET 5 OF 5



PROJECT NO.	EEP-08000
FILENAME:	EEP-08000
SCALE:	1" = 40'
DATE:	08-20-12

APPENDIX B

General Project Tables



**Table 1. Project Restoration Components  
Naked Creek Stream Restoration Project/EEP Project Number: 261**

Project Segment or Reach ID	Existing Feet/Acres	Type	Approach	Footage or Acreage	Mitigation Ratio	Mitigation Units	Stationing	Comment
UtNkd	2,652 lf	R	P2	2,652 lf	1	2,652	10+00 - 26+52	
<b>Mitigation Unit Summations</b>								
Stream	Riparian Wetland		Nonriparian Wetland		Total Wetland		Buffer	Comment
2,652		0		0		0		0

R= Restoration

EI= Enhancement

EH= Enhancement II

S= Stabilization

P1= Priority I

P2= Priority II

P3= Priority III

SS=Stream Bank Stabilization

**Table 2. Project Activity and Reporting  
Naked Creek Stream Restoration Project/EEP Project Number: 261**

<b>Activity or Report</b>	<b>Data Collection Complete</b>	<b>Actual Completion or Delivery</b>
Restoration Plan	Summer 05	Nov-05
Final Design – 90%	Spring 06	Summer 06
Construction	Fall 06	Winter 06
Temporary S&E mix applied to entire project area	Winter 06	Winter 06
Permanent seed mix applied to reach/segments 1 & 2	Winter 06	Winter 06
Containerized and B&B plantings for reach/segments 1 & 2	Winter 06	Winter 06
Mitigation Plan / As-built (Year 0 Monitoring – baseline)	Spring 07	Aug-07
Year 1 Monitoring	Sep-08	Nov-08
Year 2 Monitoring	Sep-09	Nov-09
Year 3 Monitoring	Jul-10	Oct-10
Year 4 Monitoring	Apr-11	Nov-11
Year 5 Monitoring	Oct-12	12-Nov

Note: Timeframe estimated from information provided by EEP.

**Table 3. Project Contacts Table**  
**Naked Creek Stream Restoration Project/EEP Project Number: 261**

<b>Designer</b>	Kimley-Horn and Associates, Inc. P.O Box 33068, Raleigh, North Carolina 27636
Primary project design POC	POC name and phone 919-677-2050
<b>Construction Contractor</b>	Fluvial Solutions, Inc. PO Box 28749, Raleigh, NC 27611-8749
Construction contractor POC	Peter Jelenevsky, 919-605-6134
<b>Planting Contractor</b>	Carolina Silvics 908 Indian Trail Road, Edenton, NC 27932
Planting contractor POC	Mary-Margaret McKinney 252-482-8491
<b>Seeding Contractor</b>	Contact: Fluvial Solutions, Inc PO Box 28749, Raleigh, NC 27611-8749
Planting contractor POC	Peter Jelenevsky, 919-605-6134
Seed Mix Sources	Contact: Fluvial Solutions, Inc Peter Jelenevsky, 919-605-6134
Nursery Stock Suppliers	ArborGen 843-851-4129
<b>Monitoring Performers</b>	EcoEngineering - A Division of The John R. McAdams Co. 2905 Meridian Parkway, Durham, NC 27713
Stream Monitoring POC George Buchholz	919-287-0890
Vegetation Monitoring POC George Buchholz	919-287-0890
Wetland Monitoring POC NA	NA

Note: Information obtained from EEP documents and bid tabulation results. Use contacts in table for additional information or to verify data.

**Table 4. Project Attribute Table**  
**Naked Creek Stream Restoration Project/EEP Project Number: 261**

Project County	Wilkes County
Drainage Area: UTto Naked Creek	0.53 square miles
Drainage impervious cover estimate (%)	Estimated at 0.2%
Stream Order	1st for UT to Naked Creek
Physiographic Region	Blue Ridge
Ecoregion	Appalachian Highlands
Rosgen Classification of As-built	C
Cowardin Classification	R3UBH
Dominant soil types	Chewacla loam, Pacolet sandy loam
Reference site ID	UT Purlear, Upper Big Warrior
USGS HUC for Project	030401010100
NCDWQ Sub-basin for Project	12-31-3-(0.5)
NCDWQ classification for Project and Reference	C
Any portion of any project segment 303d listed?	No
Any portion of any project segment upstream of a 303d listed segment?	No
Reasons for 303d listing or stressor	NA
% of project easement fenced	80%

APPENDIX C

Vegetation Assessment Data

**Table 5. Vegetation Plot Mitigation Success Summary Table**  
**Naked Creek Stream Restoration Project/EEP Project Number: 261**

<b>Vegetation Plot Summary Information</b>							
<b>Plot #</b>	<b>Riparian Buffer Stems<sup>1</sup></b>	<b>Stream/ Wetland Stems<sup>2</sup></b>	<b>Live Stakes</b>	<b>Invasives</b>	<b>Volunteers<sup>3</sup></b>	<b>Total<sup>4</sup></b>	<b>Unknown Growth Form</b>
VP1	n/a	8	0	0	0	8	0
VP2	n/a	15	0	0	0	15	0
VP3	n/a	12	0	0	0	12	0
VP4	n/a	9	0	0	0	9	0
VP5	n/a	6	0	0	0	6	0

<b>Wetland/Stream Vegetation Totals</b>				
<b>(per acre)</b>				
<b>Plot #</b>	<b>Stream/ Wetland Stems<sup>2</sup></b>	<b>Volunteers<sup>3</sup></b>	<b>Total<sup>4</sup></b>	<b>Success Criteria Met?</b>
VP1	324	0	324	Yes
VP2	607	0	607	Yes
VP3	486	0	486	Yes
VP4	364	0	364	Yes
VP5	243	0	243	No
Project Avg	405	0	405	Yes

<b>Notes:</b>	
<b>Stem Class</b>	<b>Characteristics</b>
<sup>1</sup> Buffer Stems	Native planted hardwood trees. Does NOT include shrubs. No pines. No vines.
<sup>2</sup> Stream/ Wetland Stems	Native planted woody stems. Includes shrubs, does NOT include live stakes. No vines
<sup>3</sup> Volunteers	Native woody stems. Not planted. No vines.
<sup>4</sup> Total	Planted + volunteer native woody stems. Includes live stakes. Excl. exotics. Excl. vines.

<b>Table 6. Vegetation Metadata</b>	
<b>Naked Creek Stream Restoration Project/EEP Project Number:261</b>	
<b>Report Prepared By</b>	George Buchholz
<b>Date Prepared</b>	8/21/2012 11:30
<b>database name</b>	cvs-cep-entrytool-v2.3.0.mdb
<b>database location</b>	X:\Projects\EEP\EEP-08000 (Naked Creek)\Storm\Design Files\2012 Naked Creek Final Submittal
<b>computer name</b>	BUCHHOES
<b>file size</b>	70844416
<b>DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT</b>	
<b>Metadata</b>	Description of database file, the report worksheets, and a summary of project(s) and project data.
<b>Proj, planted</b>	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
<b>Proj, total stems</b>	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
<b>Plots</b>	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
<b>Vigor</b>	Frequency distribution of vigor classes for stems for all plots.
<b>Vigor by Spp</b>	Frequency distribution of vigor classes listed by species.
<b>Damage</b>	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
<b>Damage by Spp</b>	Damage values tallied by type for each species.
<b>Damage by Plot</b>	Damage values tallied by type for each plot.
<b>Planted Stems by Plot and Spp</b>	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
<b>PROJECT SUMMARY</b>	
<b>Project Code</b>	261
<b>project Name</b>	Naked Creek
<b>Description</b>	10.6 miles west of Wilkesboro and 18.4 miles east of Boone in Wilkesboro, NC. One Reach (UtNkd) approximately 2,800 linear feet
<b>River Basin</b>	Yadkin-Pee Dee
<b>length(ft)</b>	Yadkin-Pee Dee
<b>stream-to-edge width (ft)</b>	2,652
<b>area (sq m)</b>	25
<b>Required Plots (calculated)</b>	0.01 sq miles (2.92 acres)
<b>Sampled Plots</b>	5

**Table 6A. Vegetation Condition Assessment**  
**Naked Creek Stream Restoration Project/EEP Project Number:261**

Planted Acreage **2.54**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres	dash, pink	2	0.23	9.06%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acres	----	0	0	0.0%
Total						
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 acres	----	0	0	0.0%
Cumulative Total						
						9.06%

Easement Acreage **3.9\***

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Easement Acreage
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	1000 SF	diagonal, red	9	0.04	1.03%
5. Easement Encroachment Areas**	Areas or points (if too small to render as polygons at map scale).	none	zig zag, blue & double hatch, green	6	0.21	5.38%

**Notes:**

\* Easement Acreage is based on information received from EEP on January 24, 2011 and is based on DB 1019 Page 361, Plat 10 Page 486 Wilkes County, and DB 1019 Page 417, Plat 10 Page 486 Wilkes County, Dated November 20, 2007.

\*\* Easement Encroachment Areas are "Allowable Use Areas" and are areas in which Mowing Activities have occurred.



Table 7. Stem Count Total and Planted by Plot Species  
 Naked Creek Stream Restoration Project/EEP Project Number: 261  
 Page 1

Scientific Name	Common Name	Species Type	Current Plot Data (MY5 2012)											
			E261-01-VP1		E261-01-VP2		E261-01-VP3		E261-01-VP4		E261-01-VP5			
			P-noLS	T	P-noLS	T	P-noLS	T	P-noLS	T	P-noLS	T		
<i>Alnus serrulata</i>	hazel alder	Shrub	2	2			1	1						
<i>Betula nigra</i>	river birch	Tree	1	1	3	3								
<i>Cephalanthus occidentalis</i>	common buttonbush	Shrub							1	1				
<i>Fraxinus pennsylvanica</i>	green ash	Tree	4	4	8	8	6	6			4	4		
<i>Nyssa sylvatica</i>	blackgum	Tree			1	1								
<i>Persea borbonia</i>	redbay	tree					1	1	2	2				
<i>Prunus serotina</i>	black cherry	Tree					2	2						
<i>Quercus falcata</i>	southern red oak	Tree												
<i>Quercus phellos</i>	willow oak	Tree			3	3	2	2	6	6	2	2		
<i>Quercus rubra</i>	northern red oak	Tree	1	1										
<i>Robinia pseudoacacia</i>	black locust	Tree												
		Stem count	8	8	15	15	12	12	9	9	6	6		
		size (ares)	1						1					
		size (ACRES)	0.02		0.02		0.02		0.02		0.02			
		Species count	4	4	4	4	5	5	3	3	2	2		
		Stems per ACRE	323.75	323.75	607.03	607.03	485.62	485.62	364.22	364.22	242.81	242.81		

**Notes:**

- a) Data presented in table was provided to EcoEngineering from the Carolina Vegetation Survey. Data was not manipulated by EcoEngineering. Formatting of table was performed by EcoEngineering.
- b) Original baseline vegetation monitoring data was not provided prior to the 2008 Monitoring Year 1 and 2008 is considered a drought year. The 2009 Monitoring Year 2 is considered the baseline datum because after two years of monitoring it is assumed all planted stems within a vegetation monitoring plot have been surveyed and accounted for. Therefore, any additional species observed in proceeding monitoring years are considered volunteer species.
- c) P-noLS = Planted Excluding Live Stakes; P-all = All Planted Stems; T = Total Planted and Volunteer Stems
- d) Cells highlighted in VIOLET indicate the presence of volunteers.

**Color for Density**

- Exceeds requirements by 10%
- Exceeds requirements, but by less than 10%
- Falls to meet requirements, by less than 10%

**Table 7. Stem Count Total and Planted by Plot Species**  
**Naked Creek Stream Restoration Project/EEP Project Number: 261**  
 Page 2

Annual Means												
MY5 (2012)		MY4 (2011)			MY3 (2010)			MY2 (2009)			MY1 (2008)	
PnOLS	T	PnOLS	P-all	T	PnOLS	P-all	T	PnOLS	P-all	T	PnOLS	T
3	3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4	4
1	1	2	2	2	1	1	1	1	1	1	1	1
22	22	20	20	23	22	22	26	22	22	22	15	15
1	1	1	1	1	3	3	3	3	3	3	4	4
3	3	3	3	3	2	2	2	3	3	3	2	2
2	2	2	2	4	2	2	5	2	2	2	3	3
					1	1	1	1	1	1	2	2
13	13	9	9	15	9	9	12	11	11	11	9	9
1	1	1	1	1	1	1	1	2	2	2	1	1
50	50	42	42	53	47	47	59	51	51	51	39	39
5	5	5	5	5	5	5	5	5	5	5	5	5
0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
9	9	9	8	8	9	9	11	9	9	9	8	8
404.69	404.69	339.94	339.94	428.97	380.4	380.4	477.53	412.78	412.78	428.97	315.65	315.65

**Notes:**

- a) Data presented in table was provided to EcoEngineering from the Carolina Vegetation Survey. Data was not manipulated by EcoEngineering. Formatting of table was performed by EcoEngineering.
- b) Original baseline vegetation monitoring data was not provided prior to the 2008 Monitoring Year 1 and 2008 is considered a drought year. The 2009 Monitoring Year 2 is considered the baseline datum because after two years of monitoring it is assumed all planted stems within a vegetation monitoring plot have been surveyed and accounted for. Therefore, any additional species observed in proceeding monitoring years are considered volunteer species.
- c) PnOLS = Planted Excluding Live Stakes; P-all = All Planted Stems; T = Total Planted and Volunteer Stems
- d) Cells highlighted in VIOLET indicate the presence of volunteers.

Color for Density
Exceeds requirements by 10%
Exceeds requirements, but by less than 10%
Fails to meet requirements, by less than 10%



PHOTO VP1: LOOKING NORTH AT VEGETATION PLOT VP1.



PHOTO VP2: LOOKING NORTH AT VEGETATION PLOT VP2.

McADAMS

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 FILENAME: EEP-08000  
 SCALE: NTS  
 DATE: 08-20-12



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PHOTO VP 3: LOOKING NORTHEAST OF VEGETATION PLOT VP3.



PHOTO VP 4: LOOKING NORTHWEST AT VEGETATION PLOT VP4.

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PHOTO VP 5: LOOKING SOUTHEAST AT VEGETATION PLOT VP5.

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APPENDIX D

Stream Assessment Data

**Table 8. Visual Morphological Stability Assessment  
Naked Creek Stream Restoration Project/EEP Project Number: 261  
Unnamed Tributary to Naked Creek: 2,655 Linear Feet**

Feature Category	Metric (per As-built and reference baselines)	(# Stable) Number Performing as Intended	Total number per As-built	Total Number / feet in unstable state	% Perform in Stable Condition	Feature Perform. Mean or Total
A. Riffles	1. Present ?	28	28	NA	100	
	2. Armor stable (e.g. n o displacement)?	28	28	NA	100	
	3. Facet grade appears stable? (slope ≤ design range)	22	28	NA	79	
	4. Minimal evidence of embedding/fining?	28	28	NA	100	
	5. Length appropriate?	NA	NA	NA	NA	95
B. Pools	1. Present? (e.g. not subject to severe aggrad. or migrat.?)	17	17	NA	100	
	2. Sufficiently deep (Max Pool D:Mean Bkt>1.6?)	Design = 2.4 / 0.8 = 3 17	Max Pool / 0.8 > 1.6, 10 of 17	NA	59	
	3. Length appropriate? (pool-to-pool speng)	15	17	NA	88	82
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?	25	28	NA	89	
	2. Downstream of meander (glide/inflection) centering?	26	28	NA	93	91
D. Meander	1. Outer bend in state of limited/controlled erosion?	27	27	NA	100	
	2. Of those eroding, # w/concomitant point bar formation	27	27	NA	100	
	3. Apparent Rc within spec?	21	27	NA	78	
	4. Sufficient floodplain access and relief?	27	27	NA	100	95
E. Bed General	1. General channel bed aggradation areas (bar formation)	NA	NA	3/700	72	
	2. Channel bed degradation – areas of increasing down-cutting or head cutting?	NA	NA	NA	100	86
F. Bank	1. Actively eroding, wasting, or slumping bank	NA	NA	NA	100	100
	1. Free of bank or arm scour?	34	34	NA	100	
	2. Height appropriate?	34	34	NA	100	
	3. Angle and geometry appear appropriate?	34	34	NA	100	
G. Vanes	4. Free of piping or other structural failures?	29	34	NA	85	96
	1. Free of scour?	36	36	NA	100	
H. Wads/ Boulders	2. Footing stable?	36	36	NA	100	100

**Table 9. Verification of Bankfull Events  
Naked Creek Stream Restoration Project/EEP Project Number: 261**

<b>Date of Data Collection</b>	<b>Date of Occurrence</b>	<b>Method</b>	<b>Photo # (if available)</b>
07/15/10	Between 09/16/09 and 07/15/10	On-Site Crest Gage located at Station 10+97. Observed elevation on gage at elevation 1297.81	Not Available
04/06/11	Between 07/15/10 and 04/06/11	On-Site Crest Gage located at Station 10+97. Observed elevation on gage at elevation 1297.93	Not Available
08/08/12	Between 04/06/11 and 08/08/12	On-Site Crest Gage located at Station 10+97. Observed elevation on gage at elevation 1297.95	Not Available

Note: A crest gage was installed during the 2009 Monitoring Year 2 field investigations so that bankfull events can be documented during subsequent monitoring years. The crest gage is located at Station 10+97 and is depicted in the Consolidated Current Condition Plan View located in Appendix A.





PHOTO 1: LOOKING UPSTREAM AT THE CULVERT AT TOP OF PROJECT.



PHOTO 2: LOOKING DOWNSTREAM AT CHANNEL AND WET AREA NEAR RIGHT BANK.

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PHOTO 3: LOOKING DOWNSTREAM AT CHANNEL.



PHOTO 4: LOOKING DOWNSTREAM FROM UPPER CROSSING AT CHANNEL.

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PHOTO 9: LOOKING UPSTREAM AT CHANNEL FROM LOWER CROSSING.



PHOTO 10: LOOKING DOWNSTREAM AT CHANNEL FROM LOWER CROSSING.

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PHOTO 11: LOOKING UPSTREAM FROM RIGHT BANK.



PHOTO 12: LOOKING DOWNSTREAM FROM HILLSIDE.

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PHOTO 13: LOOKING FROM LEFT BANK TOWARD RIGHT BANK AT WET AREA DRAINING INTO RIGHT SIDE OF CHANNEL.



PHOTO 14: LOOKING DOWNSTREAM FROM RIGHT BANK AT CHANNEL AND RIPARIAN AREA.

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PROJECT NO. EEP-08000  
 FILENAME: EEP-08000  
 SCALE: NTS  
 DATE: 08-20-12



**NAKED CREEK RESTORATION**  
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PHOTO 15: LOOKING DOWNSTREAM FROM RIGHT BANK AT RIP-RAP TOE PROTECTION.

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FILENAME: EEP-08000  
SCALE: NTS  
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**NAKED CREEK RESTORATION**  
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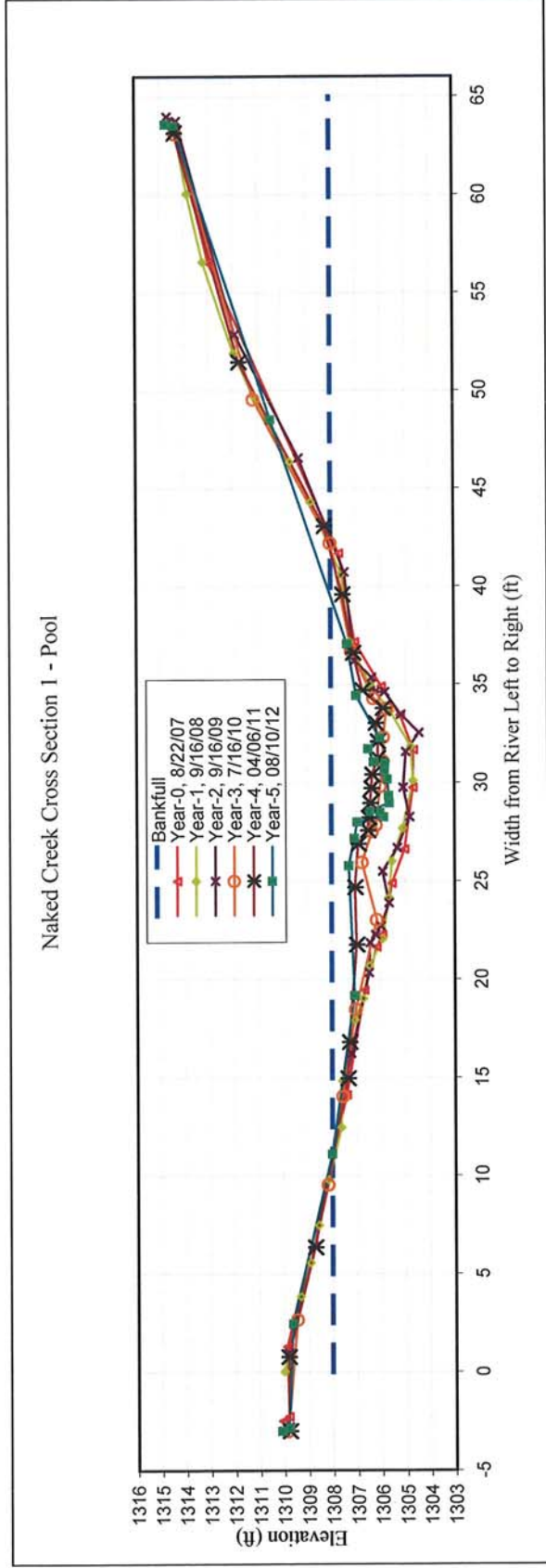


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NAKED CREEK		EEP PROJECT # 261										CROSS SECTION 1					
		Year-0		Year-1		Year-2		Year-3		Year-4				Year-5		Year-6	
Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)
-2.50	1310.07	0.00	1309.99	-3.00	1310.02	-3.00	1309.84	-3.00	1309.8	-3	1309.8	-3	1310.1	-3	1310.1	-3	1310.1
-2.27	1309.80	3.84	1309.31	-2.79	1309.79	2.65	1309.45	2.65	1309.83	0.76	1309.83	0.76	1309.81	-2.84	1309.81	-2.84	1309.81
1.27	1309.87	5.55	1308.91	0.96	1309.82	9.53	1308.18	9.53	1308.73	6.34	1308.73	6.34	1309.64	2.45	1309.64	2.45	1309.64
14.11	1307.42	7.47	1308.57	6.40	1308.75	14.04	1307.56	14.04	1307.38	14.95	1307.38	14.95	1308.01	11.11	1308.01	11.11	1308.01
19.44	1306.68	9.77	1308.17	16.22	1307.24	18.47	1307.04	18.47	1307.3	16.8	1307.3	16.8	1307.08	19.19	1307.08	19.19	1307.08
21.63	1306.18	12.46	1307.64	20.34	1306.50	23.03	1306.16	23.03	1307.06	21.76	1307.06	21.76	1307.3	25.8	1307.3	25.8	1307.3
22.26	1305.94	14.84	1307.58	21.87	1306.44	25.95	1306.76	25.95	1306.76	24.68	1306.76	24.68	1307.07	27.19	1307.07	27.19	1307.07
24.87	1305.55	17.94	1307.07	22.28	1306.22	27.52	1306.35	27.52	1306.35	26.89	1306.92	26.89	1306.96	28.02	1306.96	28.02	1306.96
26.61	1305.03	19.02	1306.73	22.70	1306.01	27.85	1306.19	27.85	1306.19	27.57	1306.53	27.57	1305.88	28.27	1305.88	28.27	1305.88
29.75	1304.70	20.68	1306.47	23.89	1305.68	29.81	1306.02	29.81	1306.02	28.21	1306.5	28.21	1306.03	28.51	1306.03	28.51	1306.03
31.66	1304.67	22.07	1305.93	25.50	1305.93	31.09	1305.89	31.09	1305.89	28.96	1306.43	28.96	1306.46	28.53	1306.46	28.53	1306.46
33.44	1305.20	24.14	1305.68	26.69	1305.34	32.32	1305.88	32.32	1305.88	29.72	1306.39	29.72	1305.65	28.98	1305.65	28.98	1305.65
34.89	1305.96	26.01	1305.55	28.26	1304.83	33.76	1305.75	33.76	1305.75	30.41	1306.35	30.41	1305.67	29.37	1305.67	29.37	1305.67
37.15	1307.04	27.68	1305.11	29.75	1305.08	34.29	1306.27	34.29	1306.27	31.24	1306.12	31.24	1305.73	30.19	1305.73	30.19	1305.73
41.68	1307.67	30.11	1304.68	31.57	1304.97	36.71	1307.17	36.71	1307.17	32.09	1306.12	32.09	1305.84	30.6	1305.84	30.6	1305.84
56.53	1312.96	31.83	1304.77	32.55	1304.43	42.20	1308.02	42.20	1308.02	33.02	1306.2	33.02	1305.83	31.02	1305.83	31.02	1305.83
63.35	1314.26	33.64	1305.59	33.47	1305.17	49.56	1311.16	49.56	1311.16	33.78	1305.91	33.78	1306.29	31.07	1306.29	31.07	1306.29
		34.98	1306.43	34.61	1305.82	63.11	1314.30	63.11	1314.30	34.69	1306.73	34.69	1306.51	31.74	1306.51	31.74	1306.51
		37.17	1307.25	34.61	1306.21					36.6	1307.11	36.6	1306.04	32.29	1306.04	32.29	1306.04
		40.61	1307.57	35.35	1306.35					39.58	1307.54	39.58	1306.99	34.45	1306.99	34.45	1306.99
		44.29	1308.81	36.20	1307.05					43.06	1308.27	43.06	1307.35	37.08	1307.35	37.08	1307.35
		46.35	1309.66	40.72	1307.45					51.45	1311.74	51.45	1310.46	48.53	1310.46	48.53	1310.46
		49.73	1311.14	46.54	1309.30					63.14	1314.34	63.14	1314.37	63.52	1314.37	63.52	1314.37
		51.91	1311.94	52.87	1311.90												
		56.58	1313.19	63.76	1314.26												
		60.05	1313.83	63.99	1314.64												
		63.29	1314.30														





**CROSS SECTION PLOT - LOOKING DOWNSTREAM**

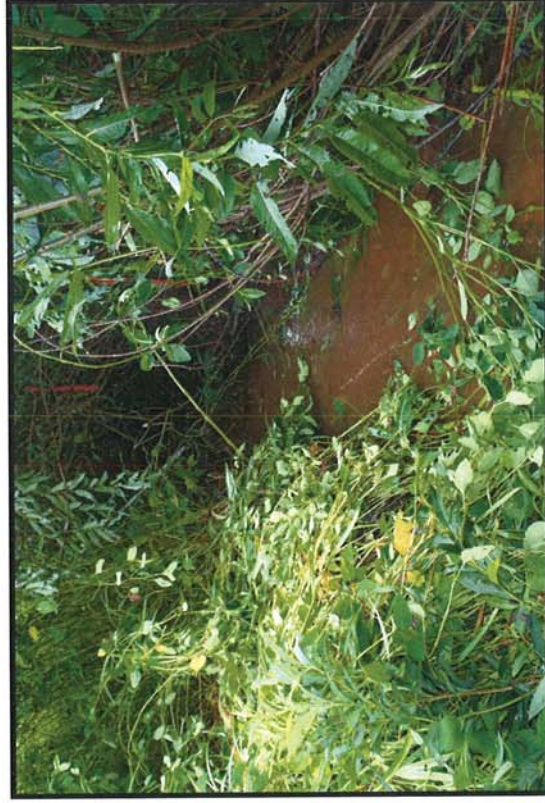
**YEAR-5, 2012 SURVEY DATA**      **CROSS-SECTION:**      1      Pool  
**PROJECT**      NAKED CREEK      **FEATURE:**  
**TASK**      CROSS SECTION  
**REACH**      NAKED CREEK  
**DATE**      8/07/2012 to 8/10/2012  
**CREW**      BUCHHOLZ/PARRISH

**Summary Data**

All dimensions in feet.

Bankfull X-sec area	25.2	sq. ft.
Bankfull Width	26.0	ft.
Bankfull Mean Depth	1.0	ft.
Bankfull Max Depth	2.4	ft.
Width/Depth Ratio	26.8	ft.
Entrenchment Ratio	n/a	ft.
Classification	n/a	

Bankfull Elevation:      1308.01      ft.

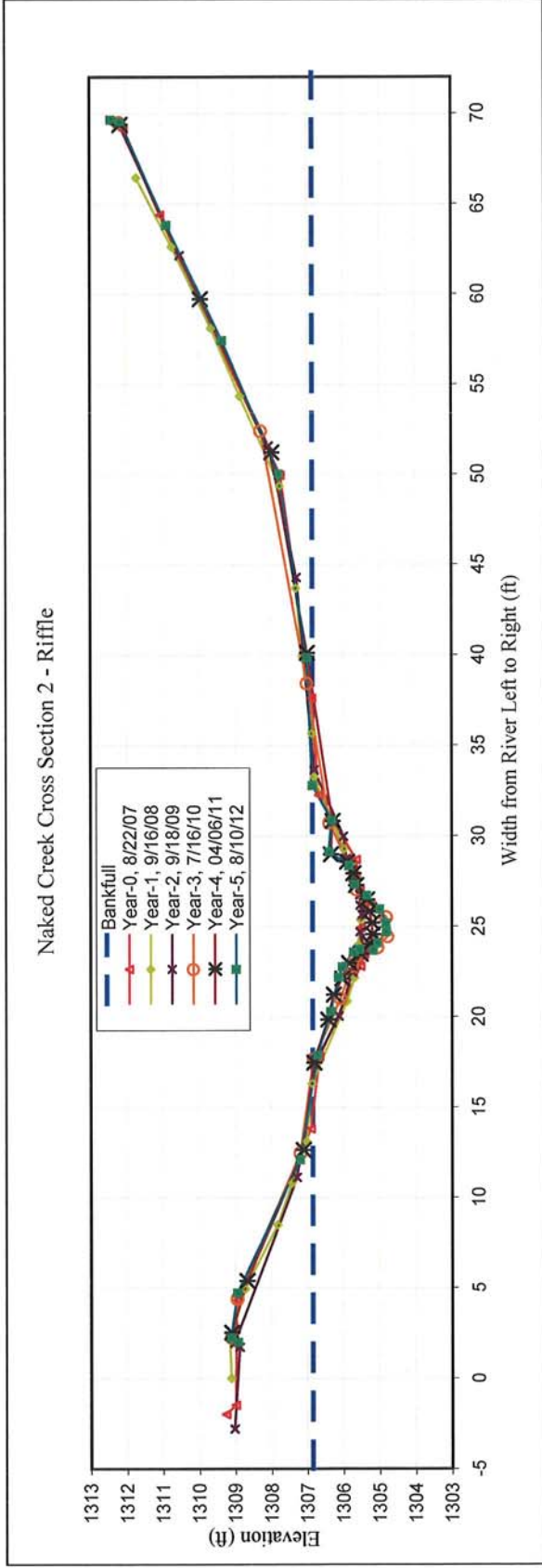


**CROSS SECTION PHOTO - LOOKING DOWNSTREAM**



NAKED CREEK		EEP PROJECT # 261										CROSS SECTION 2	
Year-0		Year-1		Year-2		Year-3		Year-4		Year-5		Year-6	
Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)
-2.00	1309.25	0.00	1309.10	-2.80	1309.01	2.00	1308.94	2.53	1309.1	2	1308.92		
-1.48	1308.98	2.10	1309.14	1.72	1308.88	2.28	1309.09	5.39	1308.68	2.23	1309.12		
4.32	1308.96	4.94	1308.72	1.94	1309.02	4.39	1308.93	12.62	1307.11	4.72	1308.93		
13.81	1306.89	8.49	1307.82	11.12	1307.28	12.48	1307.18	17.46	1306.81	12.1	1307.19		
17.81	1306.65	10.81	1307.41	17.38	1306.80	17.67	1306.82	19.84	1306.42	17.89	1306.7		
22.79	1305.52	13.10	1307.01	20.04	1306.12	21.02	1306.06	21.22	1306.26	20.3	1306.34		
23.48	1305.41	16.30	1306.86	22.47	1305.73	22.82	1305.74	22.1	1306.03	22.19	1306.12		
24.93	1305.51	20.85	1305.88	22.89	1305.63	23.33	1305.65	22.96	1305.84	22.77	1306.01		
26.27	1305.42	22.15	1305.67	23.72	1305.46	23.85	1305.04	23.47	1305.52	23.59	1305.7		
27.00	1305.53	23.96	1305.57	24.70	1305.53	24.46	1304.77	24.01	1305.26	23.68	1305.16		
28.69	1305.63	25.38	1305.51	25.65	1305.46	25.53	1304.80	24.56	1305.18	23.73	1305.55		
32.26	1306.67	26.58	1305.47	26.17	1305.52	26.20	1305.23	25.2	1305.2	24.1	1305.05		
37.62	1306.86	28.38	1305.74	26.75	1305.53	27.05	1305.61	25.82	1305.27	24.7	1304.79		
49.96	1307.73	29.29	1305.97	27.38	1305.59	27.68	1305.66	26.48	1305.34	25.19	1304.81		
64.39	1311.04	33.26	1306.79	27.98	1305.68	30.74	1306.37	27.26	1305.64	25.96	1304.98		
69.12	1312.05	35.66	1306.85	28.13	1305.75	38.44	1306.99	27.92	1305.71	26.72	1305.34		
69.52	1312.36	39.93	1307.12	28.74	1305.91	52.41	1308.27	28.56	1305.89	27.33	1305.68		
		43.70	1307.30	29.98	1305.98	69.52	1312.17	28.98	1306.34	28.37	1305.83		
		49.37	1307.75	33.65	1306.79	69.64	1312.38	30.82	1306.29	29.14	1306.39		
		54.34	1308.84	44.29	1307.29			40.09	1306.99	30.88	1306.31		
		58.12	1309.64	51.58	1308.06			51.2	1307.97	32.81	1306.84		
		62.63	1310.72	62.15	1310.51			59.71	1309.94	39.83	1307		
		66.47	1311.70	69.48	1312.12			69.37	1312.15	50.04	1307.78		
										57.45	1309.33		
										63.85	1310.87		
										69.56	1312.15		
										69.68	1312.4		





**CROSS SECTION PLOT - LOOKING DOWNSTREAM**

**YEAR-5, 2012 SURVEY DATA**      **CROSS-SECTION:** 2  
**PROJECT** NAKED CREEK      **FEATURE:** Riffle  
**TASK** CROSS SECTION  
**REACH** NAKED CREEK  
**DATE** 8/07/2012 to 8/10/2012  
**CREW** BUCHHOLZ/PARRISH

**Summary Data**  
 All dimensions in feet.

Bankfull X-sec area	12.35	sq. ft.
Bankfull Width	14.64	ft.
Bankfull Mean Depth	0.84	ft.
Bankfull Max Depth	2.05	ft.
Width/Depth Ratio	17.37	ft.
Entrenchment Ratio	6.83	ft.
Classification	C	
Bankfull Elevation:	1306.84	ft.

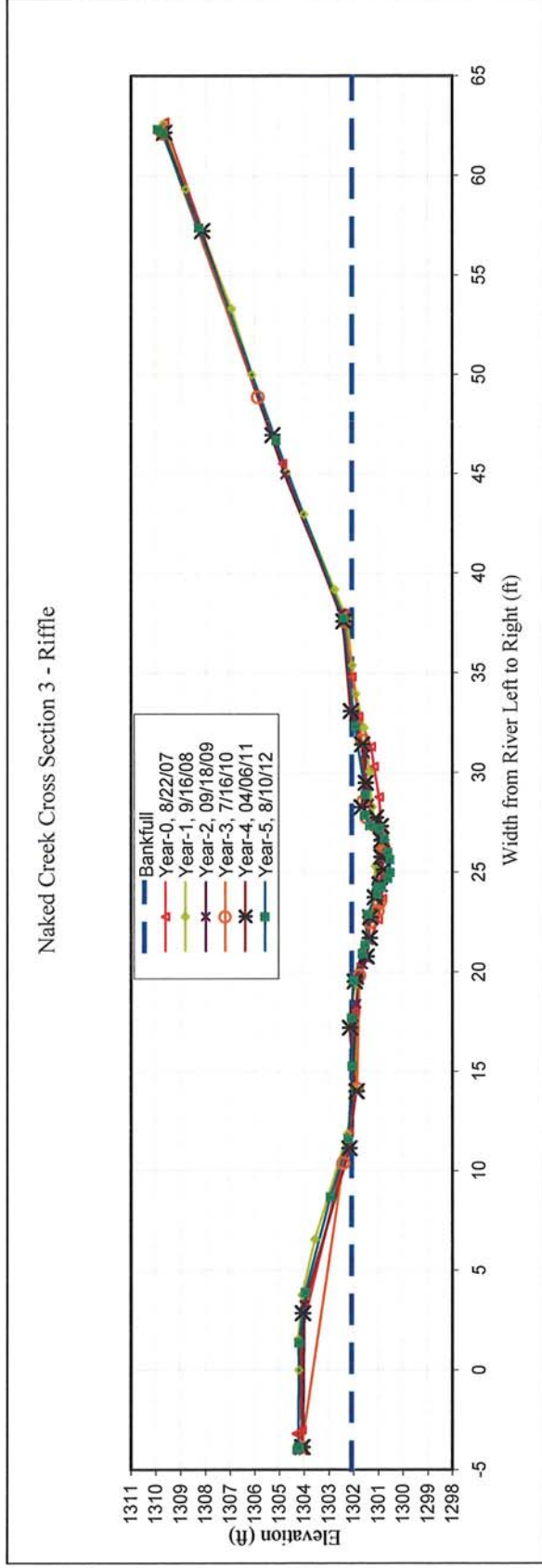


**CROSS SECTION PHOTO - LOOKING DOWNSTREAM**



NAKED CREEK		EEP PROJECT # 261		CROSS SECTION 3		Year-0		Year-1		Year-2		Year-3		Year-4		Year-5		Year-6	
Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)
-3.20	1304.09	0.00	1304.18	-4.03	1304.01	-4.00	1304.19	-3.87	1304.07	-3.87	1304.01	-3.87	1304.07	-3.87	1304.07	-4	1304.25		
-3.00	1303.86	1.53	1304.20	3.27	1303.98	-3.87	1304.06	2.85	1304.05	2.85	1304.06	-3.87	1304.06	2.85	1304.05	-3.86	1304.2		
1.35	1303.96	3.77	1304.04	11.12	1302.14	11.12	1304.06	11.14	1302.17	11.14	1304.06	11.12	1304.06	11.14	1302.17	1.37	1304.18		
11.93	1301.96	6.55	1303.54	18.40	1301.87	10.41	1302.39	14	1301.89	14	1301.87	10.41	1302.39	14	1301.89	3.91	1303.92		
18.06	1301.71	11.86	1302.24	19.57	1301.75	14.15	1301.84	17.19	1302.15	17.19	1301.84	14.15	1301.84	17.19	1302.15	8.71	1302.91		
20.40	1301.49	14.12	1301.91	20.37	1301.59	19.83	1301.74	19.51	1301.96	19.51	1301.74	19.83	1301.74	19.51	1301.96	11.62	1302.2		
22.63	1300.78	19.40	1301.86	20.70	1301.46	22.50	1301.31	20.77	1301.47	20.77	1301.31	22.50	1301.31	20.77	1301.47	15.28	1302.04		
23.67	1300.61	21.34	1301.53	21.59	1301.37	23.08	1301.00	21.69	1301.35	21.69	1301.00	23.08	1301.00	21.69	1301.35	17.69	1302.07		
26.92	1300.63	22.85	1301.18	22.70	1301.36	23.49	1300.93	22.74	1301.33	22.74	1301.36	23.49	1300.93	22.74	1301.33	19.57	1302		
28.78	1300.76	23.95	1301.18	23.46	1300.95	24.64	1300.85	23.73	1301.14	23.73	1300.85	24.64	1300.85	23.73	1301.14	20.92	1301.63		
30.30	1300.96	25.32	1301.10	24.34	1301.05	25.54	1300.77	24.4	1300.95	24.4	1300.77	25.54	1300.77	24.4	1300.95	21.37	1301.51		
31.29	1301.07	26.24	1300.99	25.60	1300.96	26.02	1300.80	25.12	1300.79	25.12	1300.80	26.02	1300.80	25.12	1300.79	22.9	1301.42		
32.81	1301.58	28.29	1301.23	26.77	1300.98	26.31	1300.77	25.76	1300.88	25.76	1300.77	26.31	1300.77	25.76	1300.88	23.9	1301.03		
34.80	1301.86	30.05	1301.34	28.46	1301.35	27.07	1300.87	26.6	1300.88	26.6	1300.87	27.07	1300.87	26.6	1300.88	24.24	1301.04		
38.00	1302.16	32.25	1301.55	29.33	1301.45	27.37	1301.12	27.3	1300.9	27.3	1301.12	27.37	1301.12	27.3	1300.9	24.26	1300.87		
45.53	1304.65	33.95	1301.89	30.93	1301.51	27.77	1301.45	27.73	1301.1	27.73	1301.45	27.77	1301.45	27.73	1301.1	24.71	1300.61		
62.71	1309.43	35.38	1302.04	32.82	1301.98	28.57	1301.58	28.26	1301.68	28.26	1301.58	28.57	1301.58	28.26	1301.68	25	1300.51		
63.02	1309.72	37.72	1302.24	38.00	1302.49	31.63	1301.64	29.48	1301.51	29.48	1301.64	31.63	1301.64	29.48	1301.51	25.65	1300.53		
		39.19	1302.76	44.96	1304.76	37.59	1302.36	31.4	1301.65	31.4	1302.36	37.59	1302.36	31.4	1301.65	26.02	1300.61		
		42.97	1304.00	62.29	1309.69	48.88	1305.85	33.07	1302.11	33.07	1305.85	48.88	1305.85	33.07	1302.11	26.69	1300.76		
		45.07	1304.70			62.14	1309.69	37.58	1302.42	37.58	1309.69	62.14	1309.69	37.58	1302.42	27.19	1300.96		
		50.00	1306.11			62.31	1309.91	46.94	1305.28	46.94	1309.91	62.31	1309.91	46.94	1305.28	27.34	1301.33		
		53.33	1306.93					57.21	1308.13	57.21	1306.93			57.21	1308.13	27.87	1301.54		
		59.33	1308.78					62.15	1309.67	62.15	1308.78			62.15	1309.67	28.9	1301.51		
		62.61	1309.67								1309.67					32.33	1301.93		
																37.76	1302.42		
																46.69	1305.12		
																57.39	1308.26		
																62.14	1309.71		
																62.35	1309.91		





**CROSS SECTION PLOT - LOOKING DOWNSTREAM**

**YEAR-5, 2012 SURVEY DATA**      **CROSS-SECTION:**      3  
**PROJECT** NAKED CREEK      **FEATURE:**      Riffle  
**TASK** CROSS SECTION  
**REACH** NAKED CREEK  
**DATE** 8/07/2012 to 8/10/2012  
**CREW** BUCHHOLZ/PARRISH

**Summary Data**

All dimensions in feet.

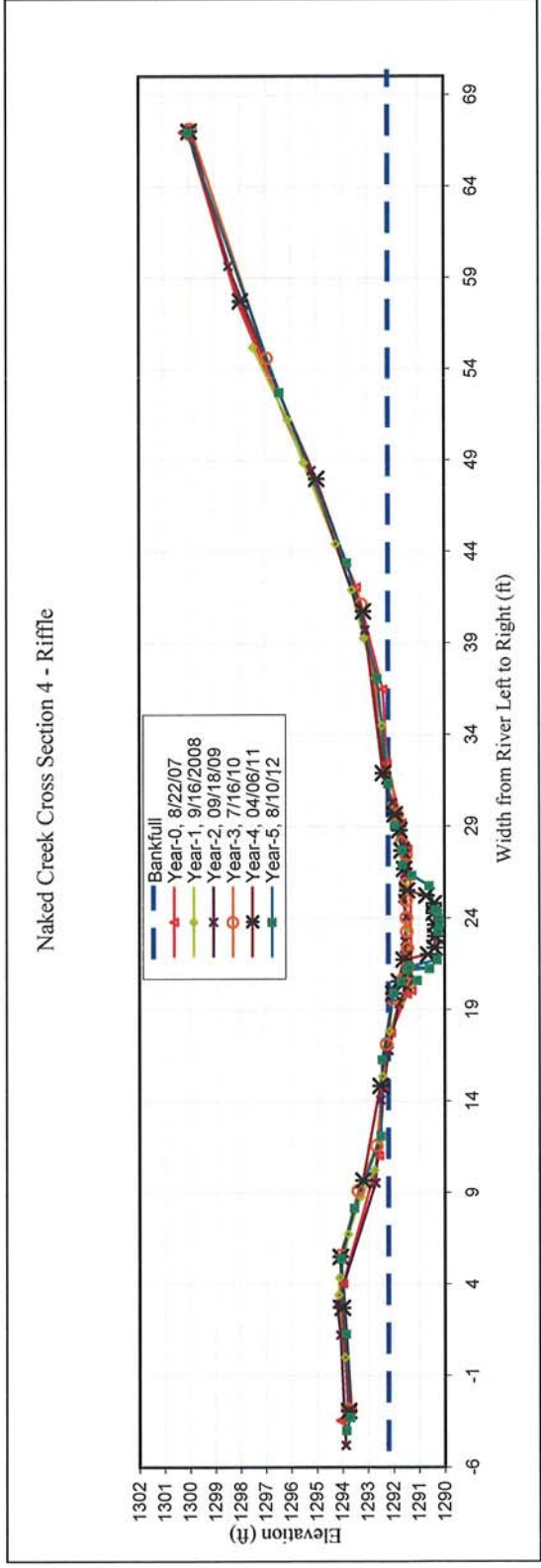
Bankfull X-sec area	7.21	sq. ft.
Bankfull Width	14.30	ft.
Bankfull Mean Depth	0.50	ft.
Bankfull Max Depth	1.56	ft.
Width/Depth Ratio	28.37	ft.
Entrenchment Ratio	2.10	ft.
Classification	C	
Bankfull Elevation:	1302.07	ft.



**CROSS SECTION PHOTO - LOOKING DOWNSTREAM**

NAKED CREEK		EEP PROJECT # 261										CROSS SECTION 4			
Year-0		Year-1		Year-2		Year-3		Year-4		Year-5		Year-6			
Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)		
-3.45	1294.08	0.00	1293.89	-4.80	1293.87	-3.00	1293.94	-2.93	1293.76	-4	1293.84				
-2.86	1293.64	3.40	1294.15	1.22	1294.06	-2.82	1293.79	2.7	1294.01	-3.28	1293.69				
4.04	1293.97	4.36	1294.11	2.91	1294.21	5.58	1294.04	5.49	1294.08	1.28	1293.85				
11.02	1292.54	6.74	1293.76	9.52	1292.69	9.11	1293.37	9.66	1293.19	5.4	1294.05				
14.67	1292.38	8.77	1293.28	14.07	1292.49	11.57	1292.64	14.82	1292.5	8.16	1293.53				
17.74	1292.08	10.25	1292.73	16.77	1292.17	17.13	1292.25	19.87	1292	12.11	1292.47				
19.86	1291.46	11.87	1292.54	19.32	1291.78	19.60	1292.02	20.54	1291.78	16.28	1292.42				
20.04	1291.29	15.36	1292.41	20.24	1291.47	20.55	1291.62	21.73	1291.59	19.91	1291.98				
26.31	1291.33	17.81	1292.14	21.01	1291.48	20.65	1291.63	22	1290.64	20.53	1291.69				
27.76	1291.43	19.39	1291.73	21.97	1291.56	21.32	1291.42	22.36	1290.39	20.61	1291.05				
29.18	1291.66	20.24	1291.40	22.72	1291.53	22.36	1291.43	23.01	1290.37	21.16	1291.49				
32.45	1292.24	20.69	1291.48	24.08	1291.48	23.28	1291.46	23.62	1290.37	21.26	1290.58				
36.48	1292.38	21.74	1291.57	25.07	1291.62	24.02	1291.47	24.27	1290.41	21.37	1291.37				
42.05	1293.42	23.44	1291.46	26.42	1291.55	24.97	1291.48	24.78	1290.41	21.73	1290.27				
57.67	1298.07	25.73	1291.54	27.94	1291.55	25.88	1291.51	25.22	1290.7	23.27	1290.25				
66.66	1299.97	27.62	1291.63	29.03	1291.81	27.47	1291.48	25.5	1291.45	23.77	1290.19				
66.97	1300.23	29.10	1291.86	29.51	1291.87	28.15	1291.66	26.67	1291.57	24.28	1290.25				
		30.18	1292.07	30.31	1292.02	29.13	1291.82	27.67	1291.67	24.43	1290.36				
		31.82	1292.34	31.54	1292.28	29.64	1291.83	28.79	1291.76	25.78	1290.59				
		34.52	1292.42	39.72	1293.09	41.14	1293.23	29.65	1291.93	26.35	1291.27				
		37.08	1292.69	48.44	1295.18	54.60	1296.93	31.89	1292.38	26.9	1291.64				
		39.29	1293.14	59.63	1298.45	67.14	1299.92	40.72	1293.16	27.71	1291.65				
		41.90	1293.60	67.20	1299.97	67.32	1299.92	47.96	1294.98	29.07	1291.93				
		44.43	1294.23					57.7	1297.98	31.34	1292.18				
		48.88	1295.48					66.99	1300.01	37.09	1292.61				
		51.23	1296.11							43.4	1293.8				
		55.20	1297.48							52.73	1296.44				
		58.52	1298.34							66.94	1300.06				
		61.31	1298.85												
		64.99	1299.68												





CROSS SECTION PLOT - LOOKING DOWNSTREAM

YEAR-5, 2012 SURVEY DATA  
 PROJECT NAKED CREEK CROSS-SECTION: 4 Riffle  
 TASK CROSS SECTION  
 REACH NAKED CREEK  
 DATE 8/07/2012 to 8/10/2012  
 CREW BUCHHOLZ/PARRISH

**Summary Data**  
 All dimensions in feet.

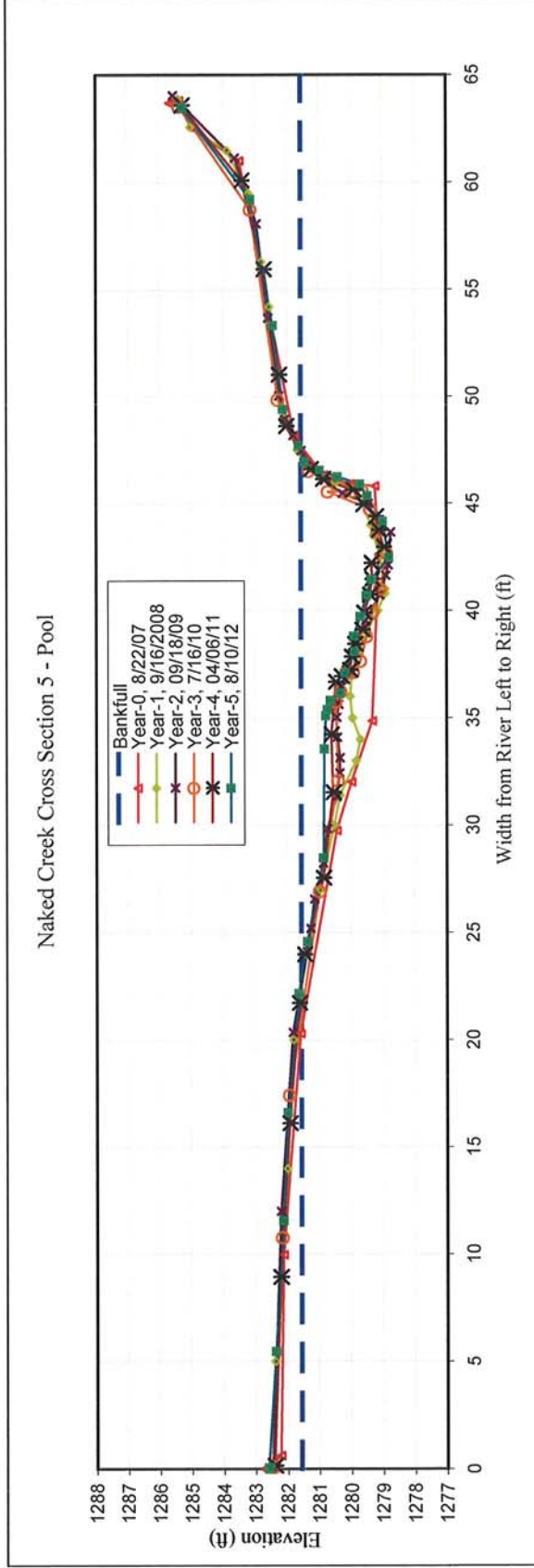
Bankfull X-sec area	10.31	sq. ft.
Bankfull Width	8.64	ft.
Bankfull Mean Depth	1.19	ft.
Bankfull Max Depth	1.99	ft.
Width/Depth Ratio	7.24	ft.
Entrenchment Ratio	11.57	ft.
Classification	C	
Bankfull Elevation:	1292.18	ft.



CROSS SECTION PHOTO - LOOKING DOWNSTREAM

NAKED CREEK		EEP PROJECT # 261		CROSS SECTION 5		Year-0		Year-1		Year-2		Year-3		Year-4		Year-5		Year-6			
Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)		
-2.50	1282.92	0.00	1282.46	0.04	1282.46	0.00	1282.74	0.15	1282.4	0	1282.57	0.15	1282.74	0.15	1282.4	0	1282.57	0.15	1282.4	0	1282.57
-1.88	1282.41	5.00	1282.37	12.00	1282.19	0.10	1282.41	8.94	1282.21	12.00	1282.19	0.10	1282.41	8.94	1282.21	12.00	1282.19	0.10	1282.41	8.94	1282.21
7.47	1282.32	14.00	1281.99	20.35	1281.82	10.77	1282.15	16.11	1281.92	20.35	1281.82	10.77	1282.15	16.11	1281.92	20.35	1281.82	10.77	1282.15	16.11	1281.92
17.80	1281.78	20.00	1281.80	24.12	1281.38	17.42	1281.92	21.72	1281.62	24.12	1281.38	17.42	1281.92	21.72	1281.62	24.12	1281.38	17.42	1281.92	21.72	1281.62
27.26	1280.63	24.00	1281.39	25.20	1281.26	26.92	1280.96	23.98	1281.45	25.20	1281.26	26.92	1280.96	23.98	1281.45	25.20	1281.26	26.92	1280.96	23.98	1281.45
29.53	1280.17	27.00	1280.95	26.56	1281.13	32.08	1280.38	27.55	1280.85	26.56	1281.13	32.08	1280.38	27.55	1280.85	26.56	1281.13	32.08	1280.38	27.55	1280.85
32.35	1279.52	30.00	1280.50	28.23	1280.85	35.75	1280.45	31.53	1280.54	28.23	1280.85	35.75	1280.45	31.53	1280.54	28.23	1280.85	35.75	1280.45	31.53	1280.54
40.12	1279.30	31.40	1280.33	29.85	1280.72	36.22	1280.30	34.22	1280.6	29.85	1280.72	36.22	1280.30	34.22	1280.6	29.85	1280.72	36.22	1280.30	34.22	1280.6
43.31	1279.43	33.00	1279.82	31.33	1280.43	37.08	1280.11	36.66	1280.46	31.33	1280.43	37.08	1280.11	36.66	1280.46	31.33	1280.43	37.08	1280.11	36.66	1280.46
43.41	1280.20	34.00	1279.69	32.44	1280.33	37.12	1279.91	36.93	1280.28	32.44	1280.33	37.12	1279.91	36.93	1280.28	32.44	1280.33	37.12	1279.91	36.93	1280.28
43.82	1281.02	35.00	1279.93	33.14	1280.33	37.64	1279.69	37.22	1280.02	33.14	1280.33	37.64	1279.69	37.22	1280.02	33.14	1280.33	37.64	1279.69	37.22	1280.02
45.56	1281.95	36.00	1280.01	34.10	1280.41	38.79	1279.49	37.84	1279.96	34.10	1280.41	38.79	1279.49	37.84	1279.96	34.10	1280.41	38.79	1279.49	37.84	1279.96
58.52	1283.68	37.00	1279.96	35.03	1280.43	39.90	1279.30	38.43	1279.86	35.03	1280.43	39.90	1279.30	38.43	1279.86	35.03	1280.43	39.90	1279.30	38.43	1279.86
60.09	1285.21	38.00	1279.76	35.63	1280.37	41.00	1279.07	39.09	1279.63	35.63	1280.37	41.00	1279.07	39.09	1279.63	35.63	1280.37	41.00	1279.07	39.09	1279.63
61.33	1285.56	39.00	1279.48	36.46	1280.27	42.68	1278.86	39.88	1279.57	36.46	1280.27	42.68	1278.86	39.88	1279.57	36.46	1280.27	42.68	1278.86	39.88	1279.57
61.22	1285.86	40.00	1279.14	37.23	1280.12	43.68	1279.14	40.72	1279.4	37.23	1280.12	43.68	1279.14	40.72	1279.4	37.23	1280.12	43.68	1279.14	40.72	1279.4
		40.80	1278.91	38.58	1279.81	44.73	1279.38	41.46	1279.32	40.80	1278.91	38.58	1279.81	44.73	1279.38	41.46	1279.32	40.80	1278.91	38.58	1279.81
		41.00	1278.91	39.53	1279.53	45.55	1280.69	42.2	1279.34	41.00	1278.91	39.53	1279.53	45.55	1280.69	42.2	1279.34	41.00	1278.91	39.53	1279.53
		42.60	1279.07	40.71	1279.08	45.58	1279.90	42.95	1278.95	42.60	1279.07	40.71	1279.08	45.58	1279.90	42.95	1278.95	42.60	1279.07	40.71	1279.08
		43.50	1279.27	41.63	1278.89	45.62	1279.63	43.74	1279.11	43.50	1279.27	41.63	1278.89	45.62	1279.63	43.74	1279.11	43.50	1279.27	41.63	1278.89
		44.00	1279.36	42.12	1278.81	46.51	1281.29	44.38	1279.2	44.00	1279.36	42.12	1278.81	46.51	1281.29	44.38	1279.2	44.00	1279.36	42.12	1278.81
		45.70	1279.81	43.66	1278.73	49.85	1282.26	44.94	1279.59	45.70	1279.81	43.66	1278.73	49.85	1282.26	44.94	1279.59	45.70	1279.81	43.66	1278.73
		46.00	1280.46	44.33	1279.23	58.74	1283.12	45.62	1279.9	46.00	1280.46	44.33	1279.23	58.74	1283.12	45.62	1279.9	46.00	1280.46	44.33	1279.23
		46.30	1280.90	45.00	1279.44	63.56	1285.36	46.13	1280.85	46.30	1280.90	45.00	1279.44	63.56	1285.36	46.13	1280.85	46.30	1280.90	45.00	1279.44
		46.80	1281.42	45.46	1280.24	63.74	1285.74	46.58	1281.24	46.80	1281.42	45.46	1280.24	63.74	1285.74	46.58	1281.24	46.80	1281.42	45.46	1280.24
		47.50	1281.65	46.07	1280.80			48.6	1282.01	47.50	1281.65	46.07	1280.80			48.6	1282.01	47.50	1281.65	46.07	1280.80
		49.00	1282.08	47.47	1281.54			51	1282.23	49.00	1282.08	47.47	1281.54			51	1282.23	49.00	1282.08	47.47	1281.54
		54.20	1282.53	48.17	1281.79			55.94	1282.7	54.20	1282.53	48.17	1281.79			55.94	1282.7	54.20	1282.53	48.17	1281.79
		56.30	1282.78	48.93	1282.05			60.08	1283.4	56.30	1282.78	48.93	1282.05			60.08	1283.4	56.30	1282.78	48.93	1282.05
		59.50	1283.18	50.03	1282.24			63.59	1285.28	59.50	1283.18	50.03	1282.24			63.59	1285.28	59.50	1283.18	50.03	1282.24
		61.50	1283.86	53.67	1282.57					61.50	1283.86	53.67	1282.57					61.50	1283.86	53.67	1282.57
		62.60	1285	58.07	1282.93					62.60	1285	58.07	1282.93					62.60	1285	58.07	1282.93
		63.90	1285.39	61.15	1283.61					63.90	1285.39	61.15	1283.61					63.90	1285.39	61.15	1283.61
				64.06	1285.55							64.06	1285.55							64.06	1285.55





**CROSS SECTION PLOT - LOOKING DOWNSTREAM**

**YEAR-5, 2012 SURVEY DATA**  
**PROJECT** NAKED CREEK **CROSS-SECTION:** 5  
**TASK** CROSS SECTION **FEATURE:** Pool  
**REACH** NAKED CREEK  
**DATE** 8/07/2012 to 8/10/2012  
**CREW** BUCHHOLZ/PARRISH

**Summary Data**

All dimensions in feet.

Bankfull X-sec area	24.1	sq. ft.
Bankfull Width	22.0	ft.
Bankfull Mean Depth	1.1	ft.
Bankfull Max Depth	2.6	ft.
Width/Depth Ratio	20.0	ft.
Entrenchment Ratio	n/a	ft.
Classification	n/a	

Bankfull Elevation: 1281.56 ft.

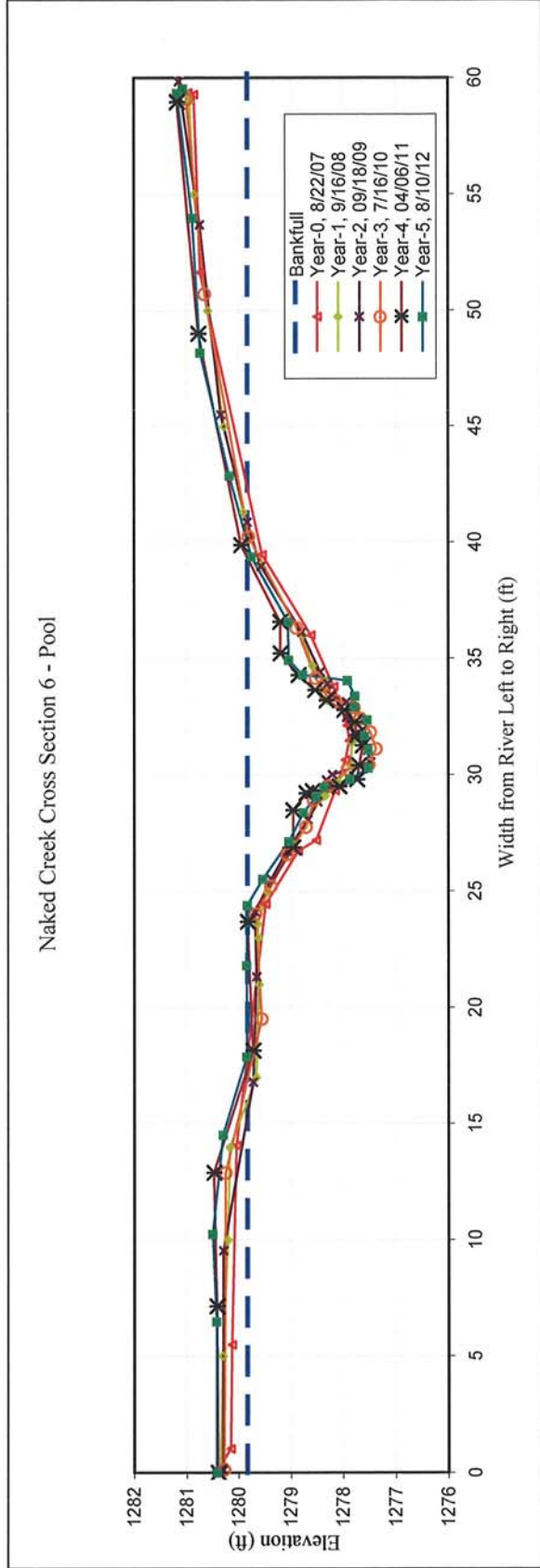


**CROSS SECTION PHOTO - LOOKING DOWNSTREAM**



NAKED CREEK		EEP PROJECT # 261										CROSS SECTION 6			
Year-0		Year-1		Year-2		Year-3		Year-4		Year-5		Year-6			
Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)		
0.00	1280.44	0.00	1280.34	0.00	1280.34	0.14	1280.27	0	1280.39	0	1280.42	0	1280.42		
1.02	1280.14	5.00	1280.30	5.00	1280.30	12.89	1280.24	7.15	1280.41	7.15	1280.41	6.49	1280.42		
5.49	1280.12	10.00	1280.20	10.00	1280.20	19.52	1279.55	12.9	1280.47	10.26	1280.49	10.26	1280.49		
14.07	1280.04	14.00	1280.16	14.00	1280.16	24.03	1279.67	18.14	1279.72	14.53	1280.29	14.53	1280.29		
24.46	1279.47	17.00	1279.65	17.00	1279.65	25.22	1279.37	23.69	1279.82	17.89	1279.84	17.89	1279.84		
26.73	1278.85	21.00	1279.60	21.00	1279.60	26.60	1279.06	26.88	1278.95	21.82	1279.84	21.82	1279.84		
27.19	1278.51	23.00	1279.61	23.00	1279.61	27.77	1278.70	28.47	1278.95	24.4	1279.83	24.4	1279.83		
29.33	1278.15	23.60	1279.63	23.60	1279.63	28.93	1278.55	29.21	1278.7	25.53	1279.53	25.53	1279.53		
30.64	1277.95	25.00	1279.44	25.00	1279.44	29.52	1278.26	29.3	1278.58	27.14	1279.03	27.14	1279.03		
31.47	1277.87	27.00	1278.94	27.00	1278.94	30.24	1277.90	29.5	1278.07	28.39	1278.75	28.39	1278.75		
32.13	1277.92	29.00	1278.42	29.00	1278.42	30.45	1277.51	29.8	1277.73	29.06	1278.51	29.06	1278.51		
33.79	1278.17	29.10	1278.33	29.10	1278.33	31.13	1277.37	30.4	1277.69	29.47	1278.36	29.47	1278.36		
36.00	1278.61	29.70	1278.10	29.70	1278.10	31.84	1277.48	31.26	1277.62	29.79	1277.87	29.79	1277.87		
39.47	1279.54	30.40	1277.84	30.40	1277.84	32.42	1277.66	31.7	1277.73	30.29	1277.52	30.29	1277.52		
51.65	1280.73	31.40	1277.83	31.40	1277.83	32.90	1277.79	32.25	1277.77	31.07	1277.52	31.07	1277.52		
59.31	1280.85	32.30	1277.80	32.30	1277.80	33.19	1278.13	32.78	1277.97	31.66	1277.59	31.66	1277.59		
59.38	1280.96	33.20	1278.30	33.20	1278.30	33.42	1278.31	33.19	1278.31	32.37	1277.54	32.37	1277.54		
		34.05	1278.33	34.05	1278.33	34.16	1278.51	33.63	1278.53	32.92	1277.78	32.92	1277.78		
		34.70	1278.58	34.70	1278.58	36.33	1278.88	34.28	1278.85	33.39	1277.77	33.39	1277.77		
		36.00	1278.77	36.00	1278.77	40.25	1279.80	35.21	1279.19	34.06	1277.91	34.06	1277.91		
		39.00	1279.57	39.00	1279.57	50.72	1280.64	36.57	1279.2	34.3	1278.77	34.3	1278.77		
		41.30	1279.90	41.30	1279.90	59.13	1280.99	39.87	1279.94	34.94	1279.04	34.94	1279.04		
		45.00	1280.27	45.00	1280.27			48.99	1280.76	36.58	1279.05	36.58	1279.05		
		50.00	1280.58	50.00	1280.58			58.96	1281.17	39.39	1279.75	39.39	1279.75		
		55.00	1280.84	55.00	1280.84					42.88	1280.17	42.88	1280.17		
		59.00	1280.93	59.00	1280.93					48.18	1280.73	48.18	1280.73		
		59.40	1281.02	59.40	1281.02					54	1280.88	54	1280.88		
										59.37	1281.17	59.37	1281.17		
										59.57	1281.06	59.57	1281.06		





**CROSS SECTION PLOT - LOOKING DOWNSTREAM**

**YEAR-5, 2012 SURVEY DATA**  
**CROSS-SECTION:** 6  
**PROJECT NAKED CREEK**  
**FEATURE:** Pool  
**TASK CROSS SECTION**  
**REACH NAKED CREEK**  
**DATE 8/07/2012 to 8/10/2012**  
**CREW BUCHHOLZ/PARRISH**

**Summary Data**  
 All dimensions in feet.

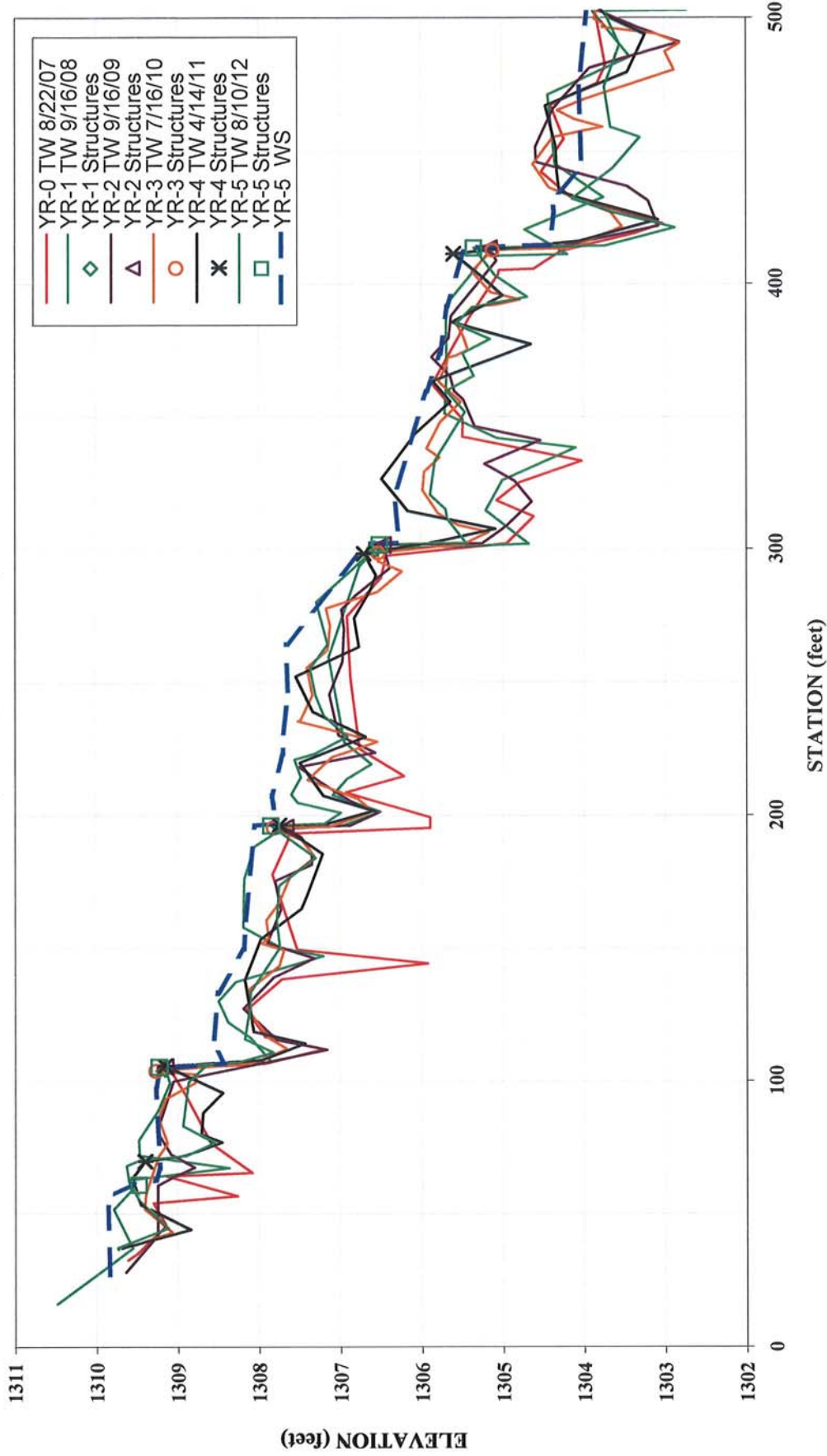
Bankfull X-sec area	14.4	sq. ft.
Bankfull Width	10.5	ft.
Bankfull Mean Depth	1.4	ft.
Bankfull Max Depth	2.3	ft.
Width/Depth Ratio	7.7	ft.
Entrenchment Ratio	n/a	ft.
Classification	n/a	
Bankfull Elevation:	1279.83	ft.



**CROSS SECTION PHOTO - LOOKING DOWNSTREAM**

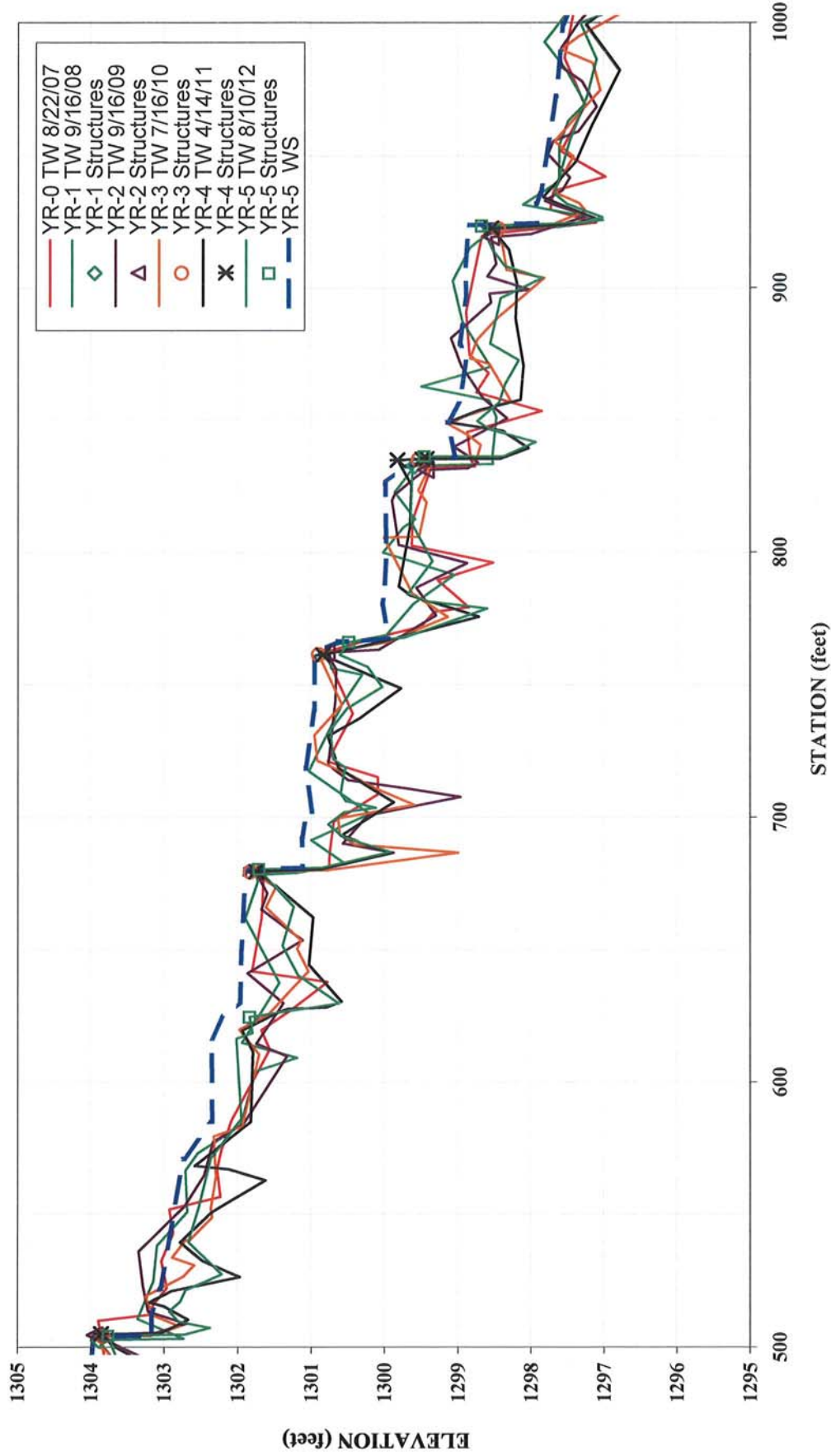


**Naked Creek  
Longitudinal Profile  
2012 (Year-5) Monitoring**



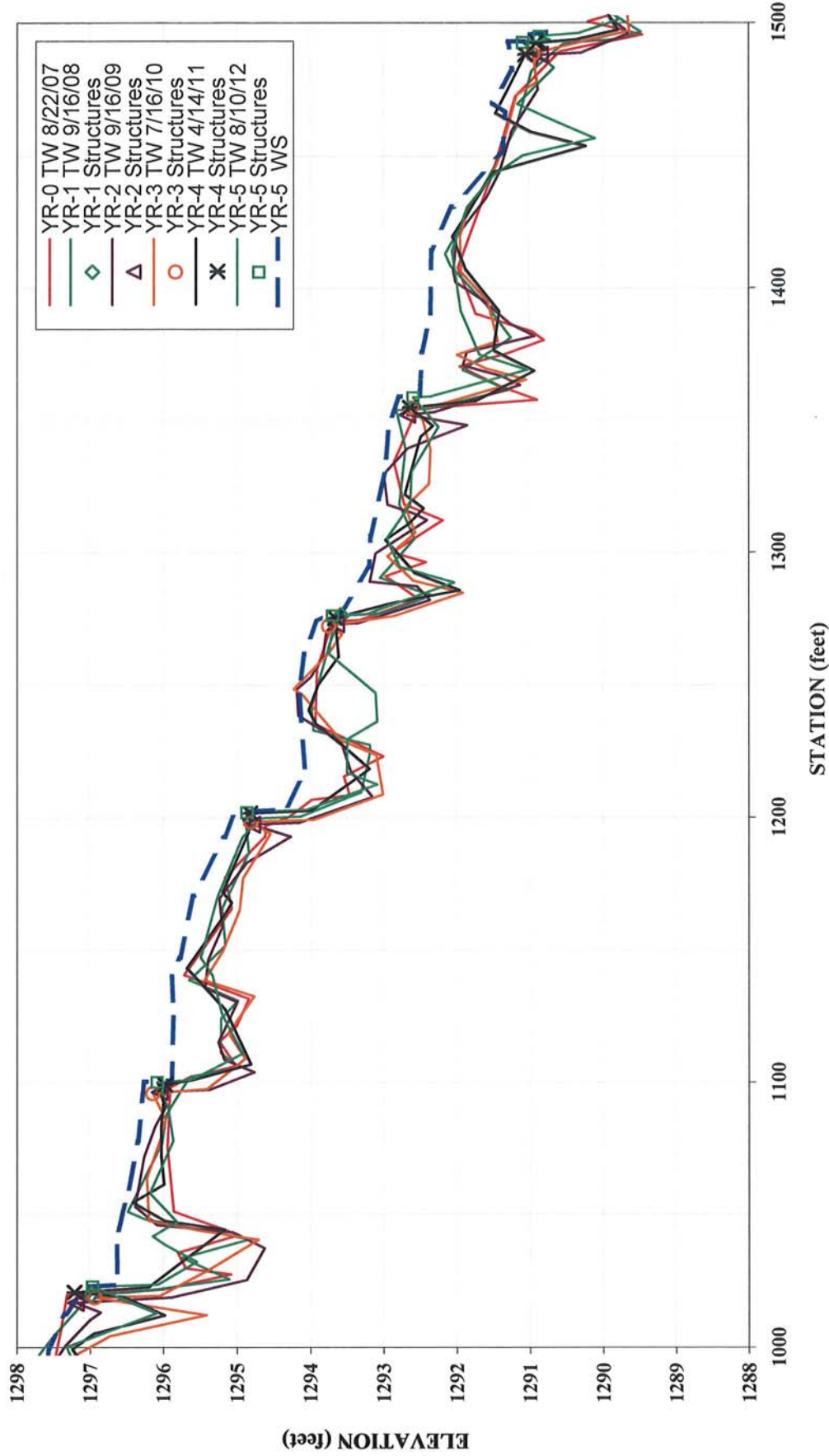
Note: Due to slight differences in thalweg length, longitudinal profile was adjusted horizontally. Elevation data was not changed.

**Naked Creek  
Longitudinal Profile  
2012 (Year-5) Monitoring**



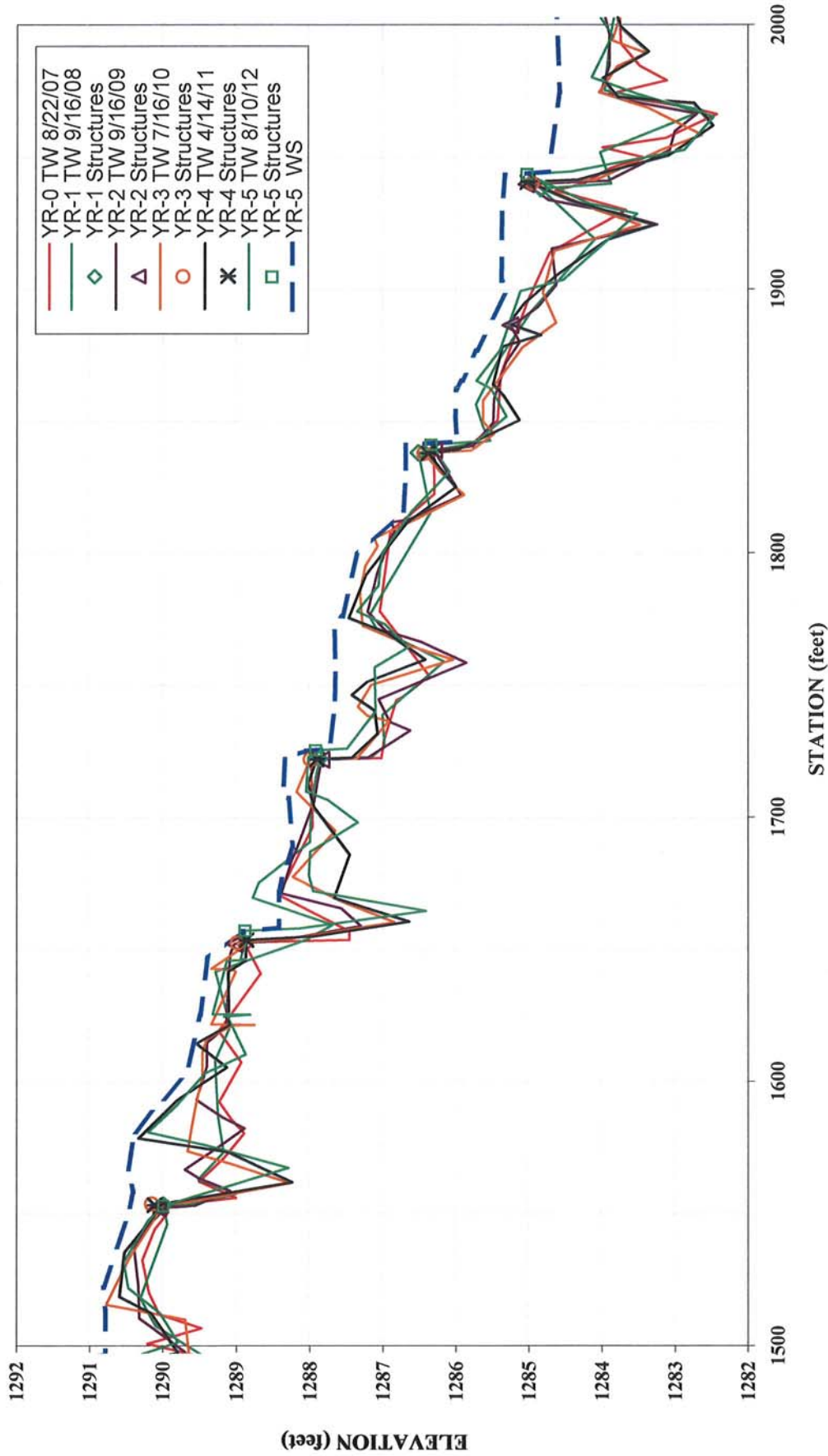
Note: Due to slight differences in thalweg length, longitudinal profile was adjusted horizontally. Elevation data was not changed.

**Naked Creek  
Longitudinal Profile  
2012 (Year-5) Monitoring**



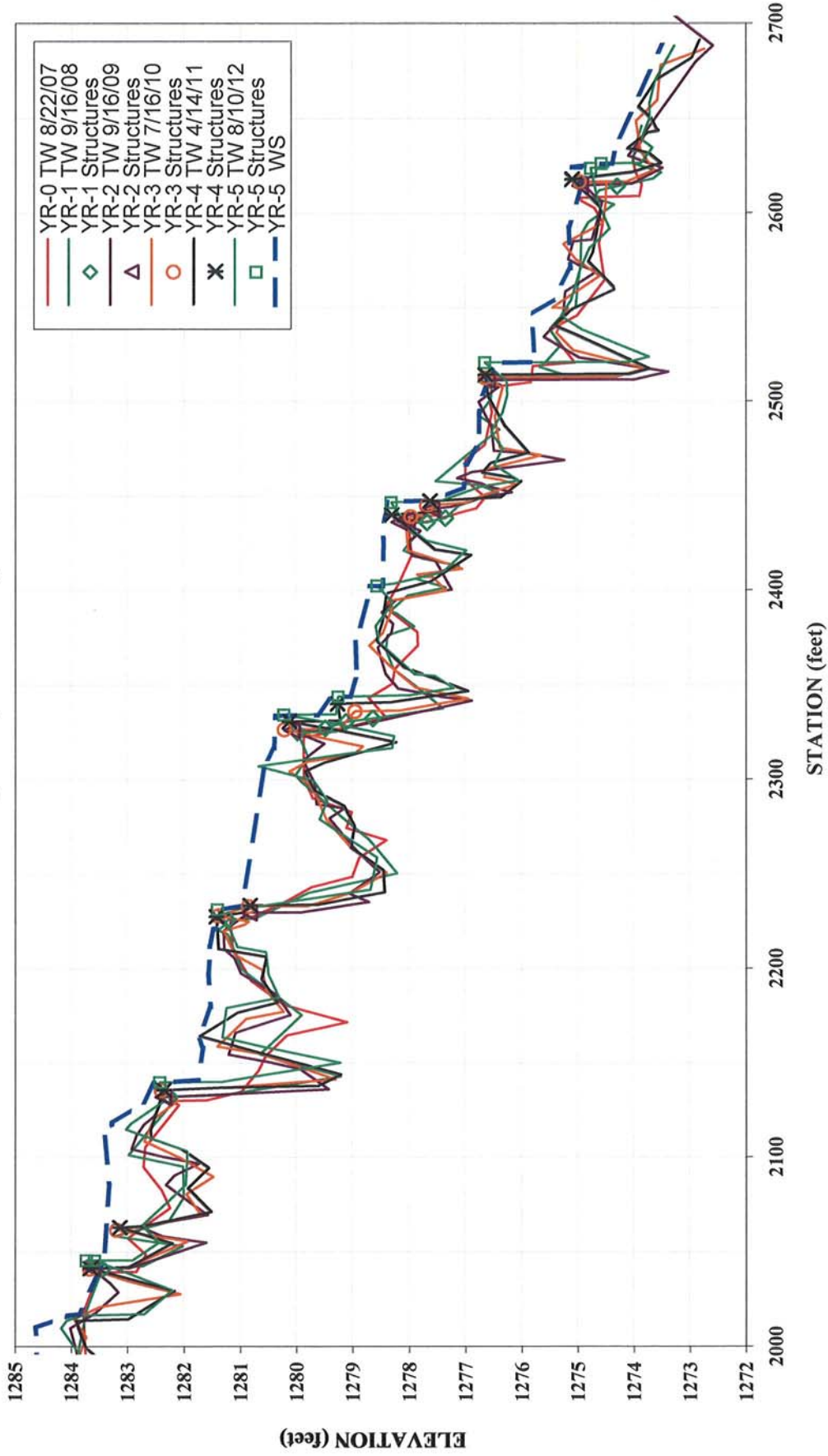
Note: Due to slight differences in thalweg length, longitudinal profile was adjusted horizontally. Elevation data was not changed.

**Naked Creek  
Longitudinal Profile  
2012 (Year-5) Monitoring**



Note: Due to slight differences in thalweg length, longitudinal profile was adjusted horizontally. Elevation data was not changed.

**Naked Creek  
Longitudinal Profile  
2012 (Year-5) Monitoring**



Note: Due to slight differences in thalweg length, longitudinal profile was adjusted horizontally. Elevation data was not changed.

**5-YEAR, 2012 SURVEY DATA**

**PROJECT NAME** NAKED CREEK

**FEATURE/FACET SLOPE  
LENGTH, AND SPACING AND  
LONGITUDINAL PROFILE DATA**

**TASK** LONGITUDINAL PROFILE  
**REACH** NAKED CREEK  
**DATE** 8/7/2012 to 8/10/2012  
**CREW** BUCHHOLZ/PARRISH

Overall water surface slope =	1.4%	DESIGN	MIN.	MAX.
		Riffle	0.0195	0.025
WS sta. start =	36.32 ft	Run	---	---
WS sta. end =	2702.97 ft	p-p spacing	80	144
ELEV. Start =	1309.83 ft msl			
ELEV. End =	1273.48 ft msl			

**Results**

	n =	MIN.	MEDIAN.	AVG.	MAX.
Riffle slopes measured =	32	0.1%	1.5%	1.8%	4.9%
Run slopes measured =	28	0.1%	1.7%	4.2%	24.9%
Pools measured =	36	17	74	70	166

All data reported in units of **feet** unless otherwise specified.

Feature	Station	Length	Slope		
RIFFLE	62.11	5.99	0.50%	n =	32
RIFFLE	142.61	16.66	2.16%	MIN =	0.07%
RIFFLE	216.89	15.24	1.84%	MEDIAN =	1.54%
RIFFLE	254.12	19.13	0.78%	AVG. =	1.76%
RIFFLE	329.59	39.26	0.51%	MAX =	4.86%
RIFFLE	441.3	11.29	4.43%		
RIFFLE	522.42	8	2.75%		
RIFFLE	711.45	4.53	4.86%		
RIFFLE	732.63	22.54	0.09%		
RIFFLE	798.28	12.42	2.74%		
RIFFLE	863.7	7.01	4.28%		
RIFFLE	892.97	17.24	0.81%		
RIFFLE	949.75	36.81	1.22%		
RIFFLE	1072.17	19.72	1.62%		
RIFFLE	1154.56	52.15	0.79%		
RIFFLE	1275.87	11.5	0.52%		
RIFFLE	1319.27	25.3	1.34%		
RIFFLE	1428.26	35.99	2.70%		
RIFFLE	1483.71	13.63	3.67%		
RIFFLE	1535.82	25.5	1.06%		
RIFFLE	1594.76	22.47	3.47%		
RIFFLE	1692.22	8.94	0.22%		
RIFFLE	1723.87	12.89	0.23%		
RIFFLE	1792	37.76	1.96%		
RIFFLE	1879.47	34.02	1.76%		
RIFFLE	2177.67	15.45	0.45%		
RIFFLE	2225.58	19.82	1.82%		
RIFFLE	2386.79	29.72	0.07%		
RIFFLE	2445.63	8.38	2.98%		
RIFFLE	2497.68	19.85	1.46%		



5-YEAR, 2012 SURVEY DATA

PROJECT NAME NAKED CREEK

RIFFLE	2559.54	46.31	1.88%		
RIFFLE	2672.47	30.29	1.45%		
<b>Feature</b>	<b>Station</b>	<b>Length</b>	<b>Slope</b>		
RUN	68	2	7.54%	n =	28
RUN	159	46	0.24%	MIN =	0.1%
RUN	232	7	6.31%	MEDIAN =	1.7%
RUN	273	38	1.70%	AVG. =	4.2%
RUN	369	35	2.83%	MAX =	24.9%
RUN	453	61	0.20%		
RUN	530	65	1.18%		
RUN	716	2	24.86%		
RUN	755	25	0.08%		
RUN	811	40	0.28%		
RUN	871	16	1.69%		
RUN	910	8	7.53%		
RUN	987	50	0.52%		
RUN	1092	22	0.99%		
RUN	1207	9	0.64%		
RUN	1287	3	0.34%		
RUN	1345	28	0.07%		
RUN	1464	7	15.21%		
RUN	1497	10	4.51%		
RUN	1561	6	3.62%		
RUN	1617	21	1.40%		
RUN	1701	11	5.89%		
RUN	1737	3	3.66%		
RUN	1830	25	1.06%		
RUN	1913	29	5.46%		
RUN	2193	6	16.97%		
RUN	2518	17	2.30%		
RUN	2606	32	1.06%		

5-YEAR, 2012 SURVEY DATA

PROJECT NAME NAKED CREEK

Feature	Station	Length	p-p spacing	n =	36
POOL	77	11		MIN =	17
POOL	120	9	43	MEDIAN =	74
POOL	210	8	90	AVG. =	70
POOL	239	14	29	MAX =	166
POOL	404	44	166		
POOL	430	12	26		
POOL	516	66	86		
POOL	639	119	123		
POOL	701	11	62		
POOL	718	4	17		
POOL	793	40	75		
POOL	856	50	63		
POOL	918	12	62		
POOL	941	7	23		
POOL	1046	15	106		
POOL	1125	25	79		
POOL	1227	14	102		
POOL	1303	18	76		
POOL	1383	16	80		
POOL	1471	14	88		
POOL	1515	16	45		
POOL	1581	29	66		
POOL	1679	69	97		
POOL	1712	20	33		
POOL	1778	47	66		
POOL	1866	47	88		
POOL	1943	33	77		
POOL	1980	29	37		
POOL	2069	40	89		
POOL	2164	19	95		
POOL	2199	30	35		
POOL	2273	57	74		
POOL	2362	21	90		
POOL	2435	23	73		
POOL	2472	28	37		
POOL	2538	35	66		

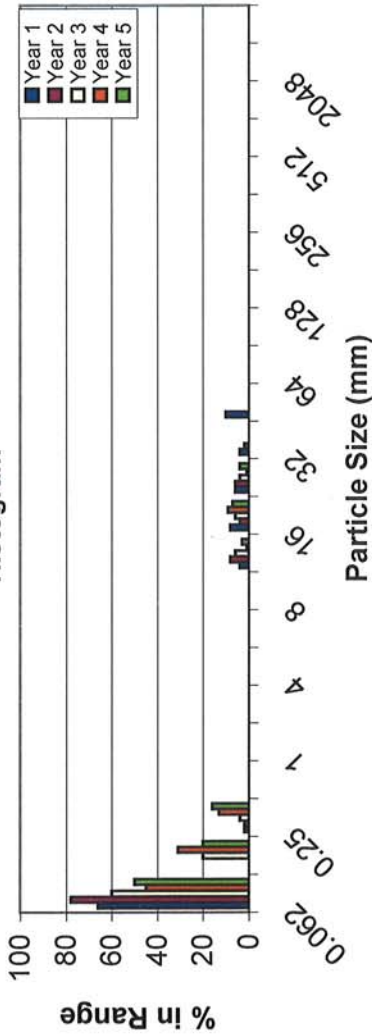
(p-p spacing)

EEP PROJECT ID: 261  
 CROSS-SECTION: 2  
 FEATURE: RIFFLE



PROJECT NAKED CREEK  
 TASK PEBBLE COUNT  
 REACH NAKED CREEK  
 DATE 8/07/2012 to 8/10/2012  
 CREW BUCHHOLZ/PARRISH

Histogram

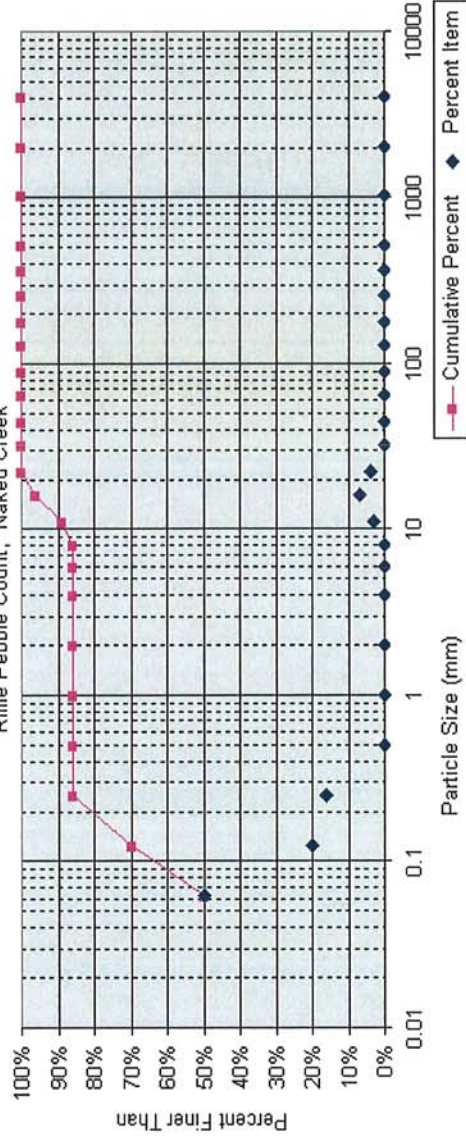


Material	Size Range (mm)	Count
silt/clay	0	50
very fine sand	0.062	20
fine sand	0.13	16
medium sand	0.25	0
coarse sand	0.5	0
very coarse sand	1	0
very fine gravel	2	0
fine gravel	4	0
fine gravel	6	0
medium gravel	8	3
medium gravel	11	7
coarse gravel	16	4
coarse gravel	22	0
very coarse gravel	32	0
very coarse gravel	45	0
small cobble	64	0
medium cobble	90	0
large cobble	128	0
very large cobble	180	0
small boulder	256	0
small boulder	362	0
medium boulder	512	0
large boulder	1024	0
very large boulder	2048	0
bedrock	4096	0
Total Particle Count:		100

Naked Creek

Note:

Riffle Pebble Count, Naked Creek



Size percent less than (mm)		Percent by substrate type			
D16	D35	D50	D84	D95	
#N/A	#N/A	0.1	0	15	
					silt/clay
					sand
					gravel
					cobble
					boulder
					bedrock
					Percent Item
					50%
					36%
					14%
					0%
					0%
					0%

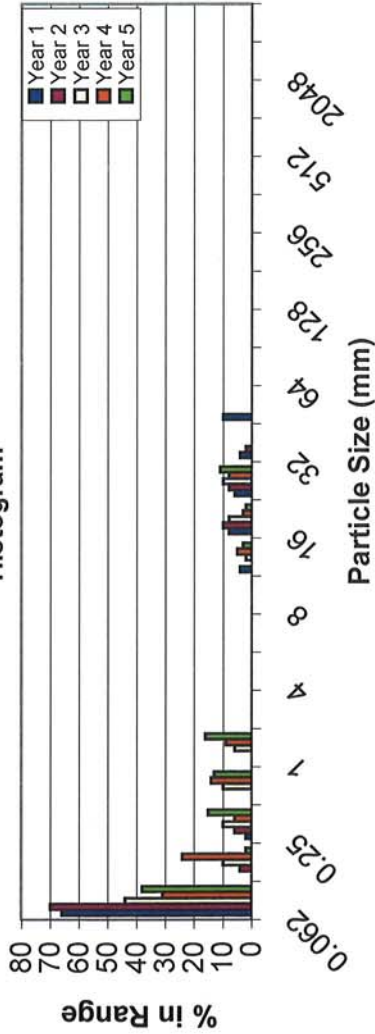


EEP PROJECT ID: 261  
 CROSS-SECTION: 4  
 FEATURE: RIFFLE



PROJECT NAKED CREEK  
 TASK PEBBLE COUNT  
 REACH NAKED CREEK  
 DATE 8/7/2012 to 8/10/2012  
 CREW BUCHHOLZ/PARRISH

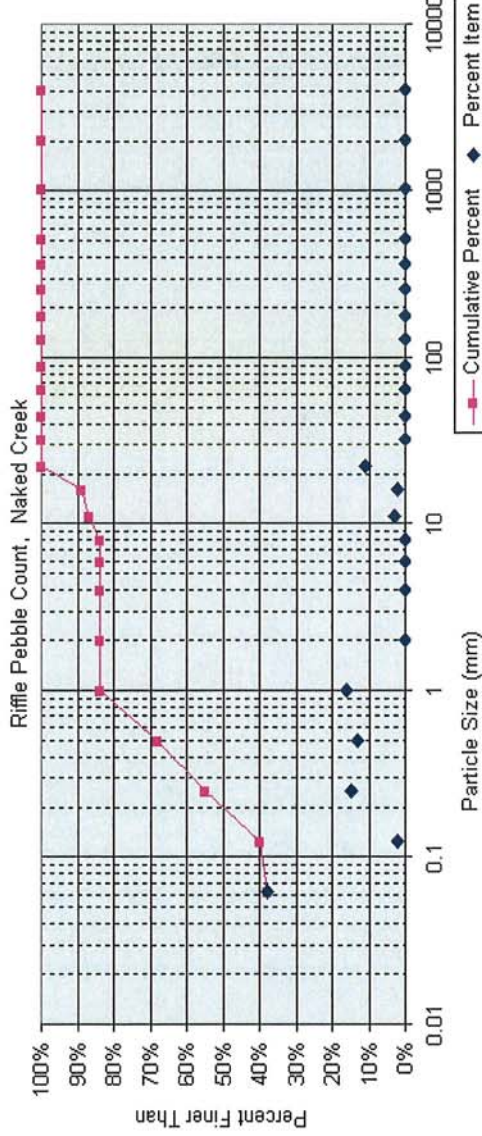
Histogram



Material	Size Range (mm)	Count
silt/clay	0 - 0.062	38
very fine sand	0.062 - 0.13	2
fine sand	0.13 - 0.25	15
medium sand	0.25 - 0.5	13
coarse sand	0.5 - 1	16
very coarse sand	1 - 2	0
very fine gravel	2 - 4	0
fine gravel	4 - 6	0
fine gravel	6 - 8	0
medium gravel	8 - 11	3
medium gravel	11 - 16	2
coarse gravel	16 - 22	11
coarse gravel	22 - 32	
very coarse gravel	32 - 45	
very coarse gravel	45 - 64	
small cobble	64 - 90	
medium cobble	90 - 128	
large cobble	128 - 180	
very large cobble	180 - 256	
small boulder	256 - 362	
small boulder	362 - 512	
medium boulder	512 - 1024	
large boulder	1024 - 2048	
very large boulder	2048 - 4096	
bedrock		
Total Particle Count:		100

Naked Creek

Note:



Size percent less than (mm)		Percent by substrate type									
D16	D35	#N/A	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
#N/A	#N/A		0.2	1	19	36%	45%	16%	0%	0%	0%

**BEHI and Sediment Export Estimates Table**  
**Naked Creek Stream Restoration Project/EEP Project Number: 261**

Time Point	Segment/ Reach	Linear Footage or Acreage	Extreme		Very High		High		Moderate		Low		Very Low		Sediment Export
			ft	%	ft	%	ft	%	ft	%	ft	%	ft	%	

Note: BEHI and NBS assessments were not conducted for the entire project pre-construction as part of the existing conditions survey. Therefore, BEHI and NBS assessments are not applicable during Monitoring Year 5.

APPENDIX E

Wetland Assessment  
(omitted, not applicable)