UT to HORSEPEN CREEK at PRICE PARK STREAM RESTORATION
2005 MONITORING REPORT

CONDUCTED FOR THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

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I. Executive Summary/Project Abstract

The stream restoration site on the Unnamed Tributary to Horsepen Creek is not stable. Numerous areas of instability exist along the project reach. Problem locations are found throughout the project but are concentrated in the upper 700 feet of channel between station 0+50 and 7+50. The majority of bank problems are related to poor establishment of vegetation and overland flow interception.

A beaver dam located at the end of the project is creating backwater from the end of the project at 17+50 to station 12+00. Several slumping banks are located in this area and are likely related to the beaver dam. Channel bedform is also being impaired by the beaver dam. Channel bedform is also impaired in the upstream section due to several cross vanes that are presently or are at risk of piping.

Vegetation within the riparian buffer of this unnamed tributary to Horsepen Creek is overall considered unsuccessful. Extrapolation from the eight plots resulted in an overall average of approximately 182 planted trees per acre for this restoration site.

Bare banks and bank erosion are major sources of concern for this project. Poor herbaceous vegetation establishment is a strongly related to the bank erosion problems on this site. Remedial efforts are needed to establishment vegetation along the banks and restabilize the streambanks.

Mowing has encroached on the buffer in a few places on the left bank. Mowing bollards and signs are needed in this area.

Lespedeza is scattered throughout the project and has achieved a monoculture in several large areas. It increased in abundance from the previous year's survey. Tree of heaven (*Ailanthus altimissima*) was spotted on the site for the first time.

II. Project Background

The background information for this report is referenced from previous monitoring reports conducted by Earth Tech, Inc. The following was excerpted from 2001 Earth Tech As-Built monitoring report section 1.1:

> This site is located on the west side of Greensboro off New Garden Road. The stream reach is located at the entrance to Price Park on land that is held by the City of Greensboro (Figure 1). The stream is situated in the Upper Cape Fear River Basin (8-digit hydrologic code: 03030002). Jefferson Elementary is located to the west, Price Park to the east, and Guilford College is located south of the site. Local residents use the area surrounding the stream for walking, biking, and other recreational activities.
>
> The stream is the unnamed tributary to Horsepen Creek, henceforth referred to as the Jefferson Pilot stream. This stream drains into a private pond that backs up the lower portion of the channel. The pond elevation was raised after the restoration construction was completed. From a review of historical aerial photographs, this second order stream appears to have been straightened prior to 1937 for agricultural purposes. The drainage area is approximately 1.0 square mile (Figure 1).
>
> Prior to the restoration, a narrow riparian corridor existed along much of the stream banks and the channel was deeply incised with active erosion and undercutting. Within this buffer, the vegetation was relatively weedy and scrubby with only approximately 10 trees

with a basal diameter greater than 10 inches. Development pressures continue to increase the urbanization in the Jefferson Pilot watershed and adjacent watersheds.

The Priority I restoration involved converting the 1436 ft straightened channel into a sinuous channel that meanders for a total of 1646 ft as measured along the centerline or 1,776 along the thalweg (Appendix A). Cross-vanes and rootwads were incorporated for aquatic habitat enhancement and bed and bank stability. A 50-foot riparian buffer on either side of the stream was planted with native vegetation. In addition, an aerial sanitary sewer line was re-aligned to be perpendicular to the stream flow and a gas line was re-routed under the stream channel.

Table I and II list project structure and objectives. Figure 1 shows a map with detailed directions to the project site. Activities and reporting history for the project are listed in Table III. Table IV lists project contacts and Table V list background information for the project.

Table I. Project Structure

Project Number and Name: UT Horsepen Creek at Price Park

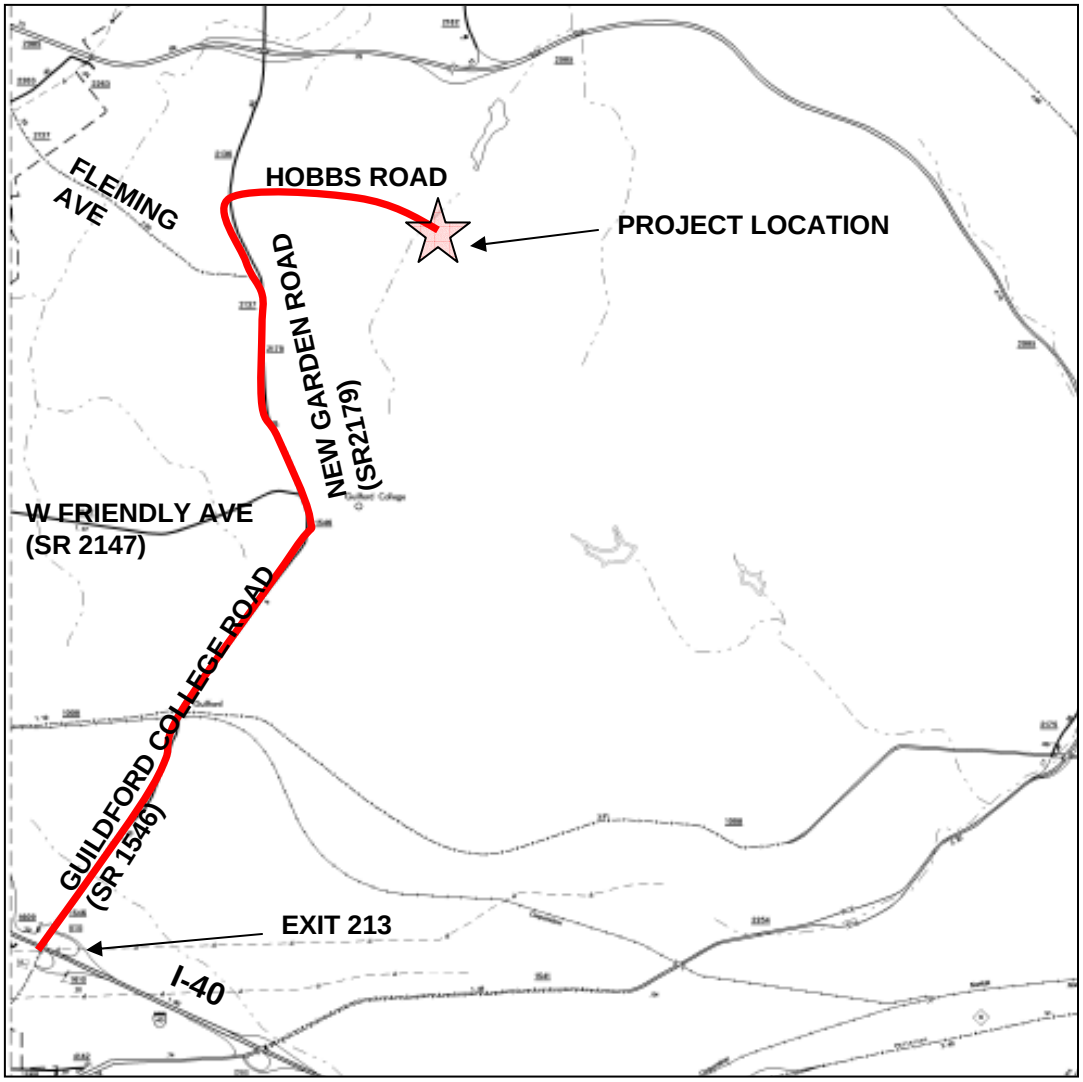
Segment/Reach ID	Linear Feet or Acreage
UT to Horsepen Creek at Price Park	1,776 linear feet

Table II. Project Objectives Table

Project Number and Name: UT Horsepen Creek at Price Park

Segment/Reach ID	Objectives	Linear Feet	Comment
UT to Horsepen Creek at Price Park	Full Restoration	1,776 linear feet	Priority 1 Approach

Figure 1. Project Location



Directions from I-85 and I-77 intersection:

From I-40 take Exit 213 (Guilford College Road SR1546) North. Follow Guilford College Road past W. Friendly Ave (SR 2147) where Guilford College Road becomes New Garden (SR2179). Continue on New Garden and stay right at the Fleming Rd (SR 2137) and New Garden 'Y' intersection. Continue on New Garden Rd. for approximately 300 yards. Turn right on Hobb's Rd (Private road). The project is located upstream and downstream of the culvert at the bottom of the hill.

Contact EEP project manager for access and landowner notification instructions.

Table III. Project Activity and Reporting History		
Project Number and Name: UT Horsepen Creek at Price Park		
Activity or Report	**Calendar Year of Completion or Planned Completion**	**Actual Completion Date**
Restoration Plan	N/A*	N/A*
Mitigation Plan	2000	Dec-00
Construction	2001	Aug-01
Temporary S&E mix applied to entire project area	2001	Aug-01
As-Built report	2002	June-02
Permanent seed mix applied to reach	2001	Aug-01
Containerized and B&B plantings for reach	Jan-02	Jan-02
Structural maintenance (Bank Grading)	Jan-04	Jan-04
Supplemental planting of containerized material	Jan-04	Jan-04
Initial – Year 1 monitoring	Aug-02	Aug-02
Year 2 Monitoring	Aug-03	Aug-03
Year 3 Monitoring	Aug-04	Aug-04
Year 4 Monitoring	Aug-05	Aug-05
Year 5 Monitoring	Aug-06	

Table IV. Project Contact Table Project Number and Name: UT Horsepen Creek at Price Park	
Designer	Earth Tech of North Carolina, Inc. 701 Corporate Center Drive, Suite 475 Raleigh, NC 27606
Primary project design POC	Ron Johnson (919) 854-6200
Construction Contractor	SEI Environmental, INC. 5100 North I-85, Suite 7 Charlotte, NC 28206
Construction contractor POC	Phone: 1-800-873-1250
Planting Contractor	N/A*
Planting contractor POC	N/A*
Seed Mix Sources	N/A*
Nursery Stock Suppliers	N/A*
Repair Contractor	North State Environmental Inc. 2889 Lowery Street, Suite B Winston-Salem, NC 27101
Repair contractor point of contact	Darrel Westmorland 336-725-2010
Monitoring Performers	Biological & Agricultural Engineering North Carolina State University Campus Box 7625 Raleigh, NC 27695
Stream Monitoring POC	Dan Clinton (919) 515-6771
Vegetation Monitoring POC	Dan Clinton (919) 515-6771

* Historical project documents necessary to provide these data were unavailable at the time of report submission

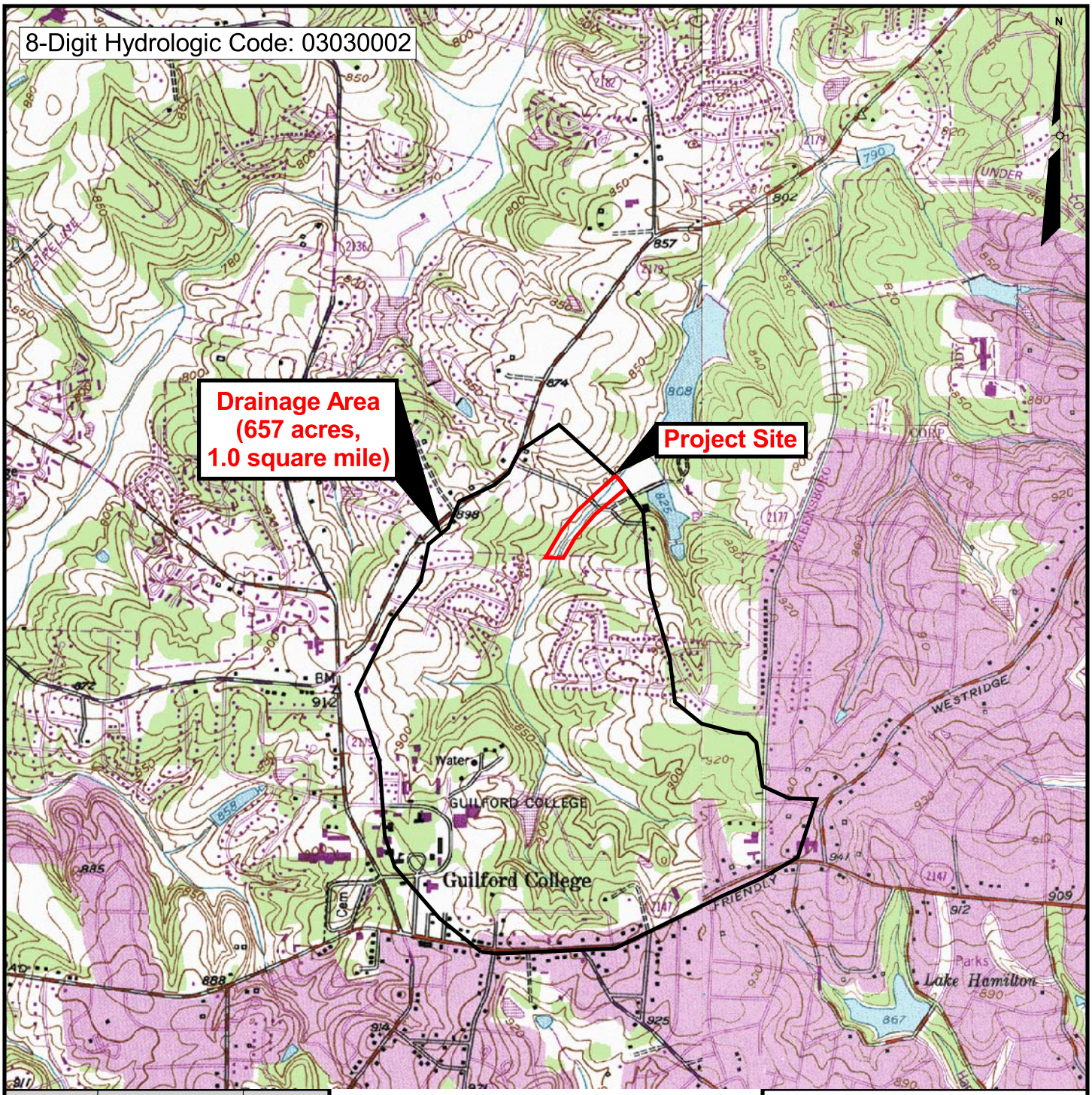
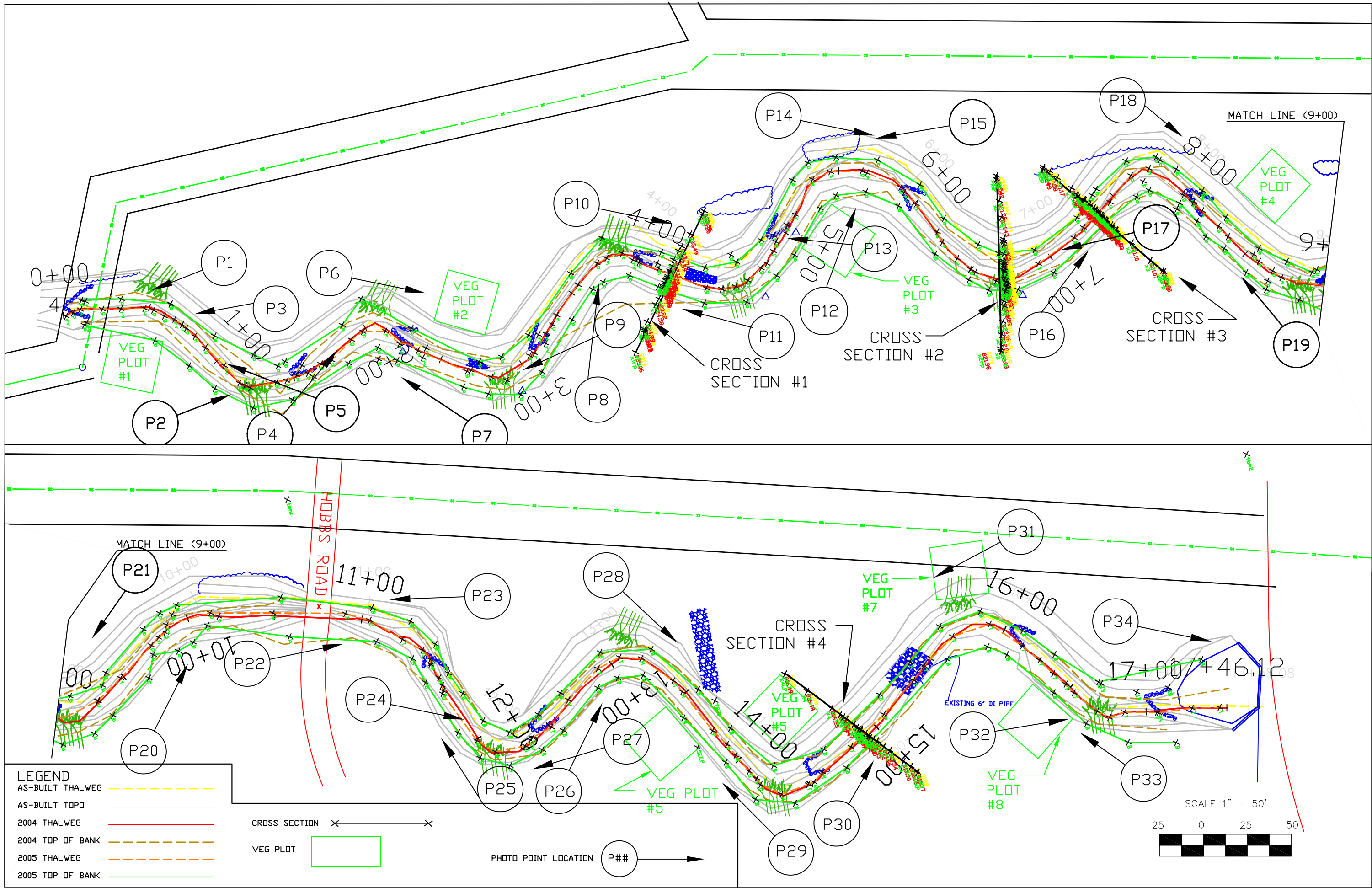


FIGURE 1
Site Map

Jefferson Pilot Stream Restoration
Greensboro, Guilford County, North Carolina

Table V. Project Background Table Project Number and Name: UT Horsepen Creek at Price Park	
Project County	Guilford
Drainage Area	1.0 sq miles
Drainage impervious cover estimate (%)	Estimated at >10%
Stream Order	1st order
Physiographic Region	Piedmont
Ecoregion	Southern Outer Piedmont (45b)
Rosgen Classification of As-built	E-Stream Type
Cowardin Classification	N/A*
Dominant soil types	N/A*
Reference site ID	N/A*
USGS HUC for Project and Reference	3030002
NCDWQ Sub-basin for Project and Reference	16-11-5-1
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	N/A
% of project easement fenced	0%

* Historical project documents necessary to provide these data were unavailable at the time of report submission



NO	REVISIONS	DRN	CHK	DATE
1	2004 MONITORING	DRC	DAB	02/04/06

NC STATE UNIVERSITY

BIOLOGICAL & AGRICULTURAL ENGINEERING
Weaver Laboratories Box 7625
North Carolina State University
Raleigh, NC 27695

PRICE PARK
UT to HORSEPEN CREEK
GUILFORD COUNTY, N.C.

YEAR 2005 MONITROING
1:50 SCALE PLAN SHEET

DATE	02/01/2006
PROJECT NO.	
FILENAME	PRICE-05FINAL.DWG
SHEET NO.	PL - 1
DRAWING NO.	

III. Project Condition and Monitoring Results

Results of the 2005 monitoring are shown below. 2005 Monitoring was conducted in June, 2005.

A. Vegetation Assessment

Using the protocols specified in the Content, Format and Data Requirements for EEP Monitoring Reports, eight vegetation monitoring plots were established and surveyed on June 20th, 2005 within the riparian buffer of the Price Park project.

Vegetation within the riparian buffer of this unnamed tributary to Horsepen Creek is overall considered unsuccessful. Extrapolation from the eight plots resulted in an overall average of approximately 182 planted trees per acre for this restoration site. Planted trees and shrubs are doing poorly throughout the entire buffer, although sycamores (*Platanus occidentalis*) and green ash (*Fraxinus pennsylvanica*) are growing well at a few locations. Plot diversity was low, with an average of only 3.4 planted species per plot. Fourteen planted species were seen across all plots. The site could benefit from larger containerized trees to increase bank stability, diversity, and aesthetics.

Bare banks and bank erosion are major sources of concern for this project. Remedial efforts are needed to restabilize the streambanks. Seedbed preparation inconjucton with seeding (both temporary and permanent seed types) and live staking is necessary to establish root mass able to withstand the intense urban flows see at this site. Compacted soils are also a concern along the stream banks and in the riparian areas. Braided social trails are present on the length of the project from users of the park. These trails need to be un-compacted, seeded, and replanted. A boardwalk, fencing, or shredded bark pathway is recommended to keep meandering foot traffic from further destroying vegetation. Mowing has encroached on the buffer in a few places on the left bank. Mowing bollards and signs are needed in this area.

Lespedeza is scattered throughout the project and has achieved a monoculture in several large areas. It increased in abundance from the previous year's survey. Tree of heaven (*Ailanthus altimissima*) was spotted on the site for the first time.

Recommendations include

- Replanting trees to obtain mitigation requirement levels.
- Live stake on bare and eroding banks
- Loosening of soil on foot trails
- Reseeding bare areas, including banks and foot trails
- Addition of mowing bollards or signs
- Removal of *Lespedeza* and continued attention to invasive species.

Table VI summarizes vegetation and soils results for 2005 monitoring. Soil samples were collected and analyzed during the 2005 monitoring period. Vegetation problem areas are summarized below in table VII. Raw vegetation data can be found in Appendix A. Data is summarized in Table VIII below. Photos of each vegetation plot can be found in the photo log.

Table VI. Preliminary Soil Data Project Number and Name: UT Horsepen Creek at Price Park					
Series	**Max Depth (in.)**	**% Clay on Surface**	**K**	**T**	**OM %**
Congaree (Co)	80		0.28	5	
Enon (EnC)	75		0.37	4	

Table VII. Vegetative Problem Areas Project Number and Name: UT Horsepen Creek at Price Park			
Feature/Issue	**Station # / Range**	**Probable Cause**	**Photo #**
Bare Bank	0+60 to 1+20	Poor subsoil nutrients Over compacted soils Improper soil preparation during planting	PA1 a & b, PA2, PA3, PA4, PA5, PA6, PA7, PA8, PA9, PA10, PA13, PA14, PA15, PA17, PA18, PA19
	1+60 to 1+90		
	2+20 to 2+40		
	2+40 to 2+70		
	2+90 to 3+10		
	3+30 to 3+60		
	3+35 to 3+75		
	4+00 to 4+60		
	4+00 to 5+30		
	5+10 to 5+40		
	6+95 to 7+50		
	7+20 to 7+50		
	9+20 to 9+55		
	13+10 to 13+40		
	13+90 to 14+10		
	16+50 to 16+60		
Bare Flood Plain	6+00 to 6+60		PA12, PA16
	12+40 to 12+60		
Invasive/Exotic Populations	Varies		No photo taken
Mowing in Floodplain	5+50		PA11

Table VIII: Stem counts for each species arranged by plot. Project Number and Name: UT Horsepen Creek at Price Park											
Species	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Initial Totals**	**Year 1 Totals**	**Survival %**
Shrubs											
Cornus amomum	1	0	0	0	0	0	2	1	N/A*	4	
Salix nigra	0	0	0	0	0	1	0	0	N/A*	1	
Sambucus nigra ssp. canadensis	0	0	0	1	0	0	0	0	N/A*	1	
Trees									N/A*		
Alnus serrulata	0	0	0	2	1	1	1	0	N/A*	5	
Betula nigra	1	0	0	0	0	0	0	0	N/A*	1	
Carpinus caroliniana	0	0	0	0	0	0	1	1	N/A*	2	
Carya aquatica	0	0	1	0	0	0	2	0	N/A*	3	
Fraxinus pennsylvanica	2	1	0	0	0	1	0	2	N/A*		
Nyssa sylvatica	0	0	0	0	1	0	0	0	N/A*	1	
Platanus occidentalis	0	0	1	0	0	2	0	0	N/A*	3	
Quercus alba	0	1	0	0	0	0	0	0	N/A*	1	
Quercus michauxii	0	2	3	0	0	0	0	1	N/A*	6	
Quercus nigra	1	0	0	0	0	0	0	0	N/A*	1	
Quercus phellos	0	0	0	1	0	0	0	0	N/A*	1	
										Averages	
Woody stem plot totals	5	4	5	4	2	5	6	5		4.5	
Extrapolated woody stems/acre	202	162	202	162	80.9	202	243	202		182	

* Historical project documents necessary to provide these data were unavailable at the time of report submission

B. Stream Assessment

The stream restoration site on the Unnamed Tributary to Horsepen Creek is not stable. Numerous areas of instability exist along the project reach. Baseline morphology and Summary morphology data are located in tables X and XI, respectively. Problem locations and descriptions are listed in Table IX. The majority of bank problems are related to poor establishment of vegetation and overland flow interception.

Channel profile shows the effects of instability through changes over the past monitoring events. The number of defined riffles has decreased from 16 to 9 over the past year but the total length of riffles and pools have remained relatively consistent over the past year. Five significant steps exist along the project where the channel has downcut below cross vanes or is piping through the vane. Theses steps are of compromising the stability of the vane structures and channel stability, in general.

Bedform still appears to be in a state of transition and will likely continue to change over future monitoring periods. Generally, feature locations have remained in tact from prior surveys but individual features have adjusted in length and slope. Channel profile data and graphical plots are shown in Appendix B

Channel pattern has not changed significantly from 2004 measurements. There is some bank scour and erosion but not to the point it has changed pattern to any measurable degree. Channel pattern data are shown in Appendix B

Channel cross-sections have remained mostly consistent since construction. Cross-section #1 has continued to widen and increase cross-sectional area. The widening is primarily a result of bank scour resulting from high flows and poor vegetation establishment. Cross-section #2 in contrast has excellent vegetation established and has maintained cross-sectional area since construction. Cross-section #3, the pool cross-section, has concentrated overland flow intersecting the left bank causing bank slumping and increasing the cross-sectional area. The overland flow is significant enough that vegetation alone is not able to maintain a stable bank in this area. Cross-section #4, located within the backwater affected area of the beaver dam, has decreased in cross-sectional area since construction. This is due to siltation resulting from the beaver dam. Channel cross-section data and graphical plots are shown in Appendix B

Channel banks throughout the project vary in condition from stable and well vegetated to eroding with no vegetation. The majority of bank erosion exists between stations 0+00 and 5+50 and is the result very poor vegetation establishment. Other areas of erosion are localized and primarily the result of overland flow washing into the channel as concentrated flow. Backwater effects from the beaver dam are affecting channel stability from station 12+00 to the end of the project at station 17+50. The backwater is saturating soil in the banks causing localized areas of slumping.

Table IX. Stream Problem Areas				
Project Number and Name: UT Horsepen Creek at Price Park				
Problem Number	**Feature Issue**	**Station numbers**	**Suspected Cause**	**Photo number**
PA 1	Bank Erosion	0+60 to 1+20 left bank	Poor vegetation establishment Poor subsoil nutrients and compaction	PA1
PA 2	Bank Erosion	1+60 to 1+90 right bank	Poor vegetation establishment Poor subsoil nutrients and compaction	PA2
PA 3	Bank Erosion	2+20 to 2+40 right bank	Poor vegetation establishment Poor subsoil nutrients and compaction	PA3
PA 4	Bank Erosion	2+40 to 2+70 left bank	Poor vegetation establishment Poor subsoil nutrients and compaction	PA4
PA 5	Bank Erosion	2+90 to 3+10 right bank	Poor vegetation establishment Poor subsoil nutrients and compaction	PA5
PA 6	Bank Erosion	3+30 to 3+60 right bank	Poor vegetation establishment Poor subsoil nutrients and compaction	PA6
PA 7	Bank Erosion	3+35 to 3+75 left bank	Poor vegetation establishment Overland flow interception	PA7
PA 8	Bank Erosion	4+00 to 4+60 left bank	Poor vegetation establishment Overland flow interception	PA8
PA 9	Bank Erosion	4+00 to 5+30 right bank	Poor vegetation establishment Poor subsoil nutrients and compaction	PA9
PA 10	Bank Erosion	5+10 to 5+40 left bank	Poor vegetation establishment Overland flow interception	PA10
PA 11	Bank Erosion	5+50 left floodplain	Poor vegetation establishment Poor subsoil nutrients and compaction	PA11
PA 12	Bank Erosion Bare Floodplain	6+00 to 6+60 right bank	Poor vegetation establishment Poor subsoil nutrients and compaction	PA12
PA 13	Bank Erosion	6+95 to 7+50 right bank	Poor vegetation establishment Poor subsoil nutrients and compaction	PA13
PA 14	Bank Erosion	7+20 to 7+50 left bank	Poor vegetation establishment Overland flow interception	PA14
PA 15	Bank Erosion	9+20 to 9+55 right bank	Poor vegetation establishment	PA15
PA 16	Bank Erosion Bare Floodplain	12+40 to 12+60 right bank	Poor vegetation establishment	PA16
PA 17	Bank Erosion	13+10 to 13+40 left bank	Poor vegetation establishment Channel constriction	PA17
PA 18	Bank Erosion	13+90 to 14+10 right bank	Overland flow interception	PA18
PA 19	Bank Erosion	16+50 to 16+60 right bank	Overland flow interception	PA19
PA 20	Beaver Dam	17+30	Beaver Dam	PA20 A, B & C
PA21	Cros Vane Piping	1+50 2+25 3+10 4+00 5+00	Beaver Dam	No photo taken See previous reports

Table X. Baseline Morphology and Hydraulic Summary
Project Number and Name: UT Horsepen Creek at Price Park
Segment/Reach:

Parameter	USGS Gage Data			Regional Curve			Pre-Existing			Project Reference			Design		As-built Riffle		
Dimension	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Riffle	Pool	Min	Max	Med
BF Width (ft)	USGS gage data is						N/A*			N/A*			16.4	18	13.3	17.2	14
Floodprone Width (ft)	unavailable for this																
BF Cross Sectional Area (ft2)	project												32.5	36.8	24.1	36.7	31.9
BF Mean Depth (ft)													2	2	1.8	2.3	2.1
BF Max Depth (ft)													3.5	4.3	3.2	3.6	3.5
Width/Depth Ratio													8.3	n/a	6.2	8.1	7.3
Entrenchment Ratio													>2.2	n/a	4.9	7.1	5.8
Wetted Perimeter(ft)																	
Hydraulic radius (ft)																	
Pattern																	
Channel Beltwidth (ft)																	
Radius of Curvature (ft)																	
Meander Wavelength (ft)																	
Meander Width ratio																	
Profile																	
Riffle length (ft)																	
Riffle slope (ft/ft)																	
Pool length (ft)																	
Pool spacing (ft)																	
Substrate																	
d50 (mm)															0.22	0.45	0.33
d84 (mm)															8	103	8
Additional Reach Parameters																	
Valley Length (ft)																	
Channel Length (ft)																	
Sinuosity																	
Water Surface Slope (ft/ft)																	
BF slope (ft/ft)																	
Rosgen Classification													E5		E5		
Number of Bankfull Events																	
Extent of BF floodplain (acres)																	

* Historical project documents necessary to provide these data were unavailable at the time of report submission.

Table XI. Morphology and Hydraulic Monitoring Summary
Project Number and Name: UT Horsepen Creek at Price Park
Segment/Reach:

Parameter	Cross Section 1					Cross Section 2					Cross Section 3					Cross Section 4				
	Riffle					Pool					Riffle					Riffle				
Dimension	MY0	MY1	MY2	MY3	MY4	MY0	MY1	MY2	MY3	MY4	MY0	MY1	MY2	MY3	MY4	MY0	MY1	MY2	MY3	MY4
BF Width (ft)	13.3	14.8	15	16.8	14.1	22.2	21	21.2	21.2	20.6	14	14	14.7	14.7	21.4	17.2	17.3	17.2	17.1	16.2
Floodprone Width (ft) (approx)				>89.17	>89.17				>99.9	>99.9				>90.23	>90.23				>100.4	>100.4
BF Cross Sectional Area (ft^2)	25.2	25.6	37.8	34.9	41.5	50.7	47.5	42.9	44.6	48.9	30.7	28.4	30.8	29.7	36.8	37.2	35.47	36.3	35.1	32.14
BF Mean Depth (ft)	1.9	1.7	2.5	2.1	3	2.3	2.3	2	2.1	2.4	2.2	2	2.1	2	1.7	2.1	2.1	2.1	2	2
BF Max Depth (ft)	3.6	3.6	4.4	4.4	4.9	5	4.7	4.7	4.2	5	3.5	3.3	3.6	3.6	3.6	3.2	3.6	3.7	3.7	3.5
Width/Depth Ratio	7.0	8.7	6.0	8.0	4.7	9.7	9.1	10.6	10.1	8.6	6.4	7.0	7.0	7.4	12.588	8.2	8.2	8.2	8.6	8.1
Entrenchment Ratio				>5.3					>4.7					>6.1					>5.9	
Wetted Perimeter(ft)																				
Hydraulic radius (ft)																				
Substrate																				
d50 (mm)	0.34		0.11	2.6		0.26		1.35	2.3		0.16		0.14	0.6		0.25		0.3	1.41	
d84 (mm)	87.7		19.6	8		1.5		14.5	13.7		6.7		12.1	8.5		6.9		14.8	16.7	

Parameter	MY-00 (2001) - N/A* for MY-01					MY-02 (2003)					MY-03 (2004)					MY-04 (2005)				
Pattern	Min	Max	Med			Min	Max	Med			Min	Max	Med			Min	Max	Med		
Channel Beltwidth (ft)	49	80				52	95				46	97	69			59	94	76		
Radius of Curvature (ft)	49	84	65			48	85	61			27	97	50			29	71	48		
Meander Wavelength (ft)	127	183	150			118	197	162			126	211	162			136	202	161		
Meander Width ratio	8.8	12.6	10.3			8.1	13.6	11.2			8.7	14.6	11.2			9.4	13.9	11.1		
Profile																				
Riffle length (ft)	N/A*					9	87	47			8.6	38	19.1							
Riffle slope (ft/ft)						0.32%	3.01%	0.0092			0.58%	8.42%	0.0183							
Run Length						29.4	79.3	37.3			16.8	104.8	54.3							
Run Slope						-0.03%	0.69%	0.0012			-0.03%	0.48%	0.07%							
Pool length (ft)						28	73	59			15	71	35							
Pool spacing (ft)	21	153	92			34.5	219	62.5			15	58	35							

Additional Reach Parameters	MY-00 (2001)	MY-00 (2002)	MY-02 (2003)	MY-03 (2004)	MY-04 (2005)	MY-05 (2006)
Valley Length (ft)	1384					
Channel Length (ft)	1776					
Sinuosity	1.3					
Water Surface Slope (ft/ft)**	0.64%	0.62%	0.78%	0.76%	0.66%	
BF slope (ft/ft)	0.64%	0.64%	0.72%	0.80%	0.56%	
Rosgen Classification	E5	E5	E5	E5	E5	
Number of Bankfull Events***	N/A*	N/A*	N/A*	N/A*	N/A*	
Extent of BF floodplain (acres)	Typically > 90'					

* Historical project documents necessary to provide these data were unavailable at the time of report submission.

** Water surface data excludes backwater effects from the downstream pond and beaver dam

*** Peak stage recorder installed September 2005. Data will be included in upcoming reports.

IV. Methodology Section

Monitoring methods used are based on US Army Corps of Engineering and NC Division of Water Quality Guides as referenced below.

References:

USACOE (2003) *Stream Mitigation Guidelines*. USACOE, USEPA, NCWRC, NCDENR-DWQ

Rosgen, D L. (1996) *Applied River Morphology*. Wildland Hydrology Books, Pagosa Springs, CO.

APPENDIX A

Vegetation Raw Data

1. Vegetation Photo Log
2. Vegetation Survey Data Tables

Note: Vegetation problem areas are shown in problem are plan view in Appendix B

APPENDIX B

Morphology Raw Data

1. Problem Area Plan View
2. Plan View of Monitoring Overlain Design Plans
3. Project Photo Log
4. Stream Problem Area Photos
5. Cross section and Pebble Count Plots and Raw Data Tables
6. Longitudinal Plots and Raw Data Tables
7. GPS Point Table
8. BEHI Results Table

UT to Horsepen Creek at Price Park

Vegetation Plot Photos

Plot 1

Plot 2

Plot 3

Plot 4

Plot 5

Plot 6

Plot 7

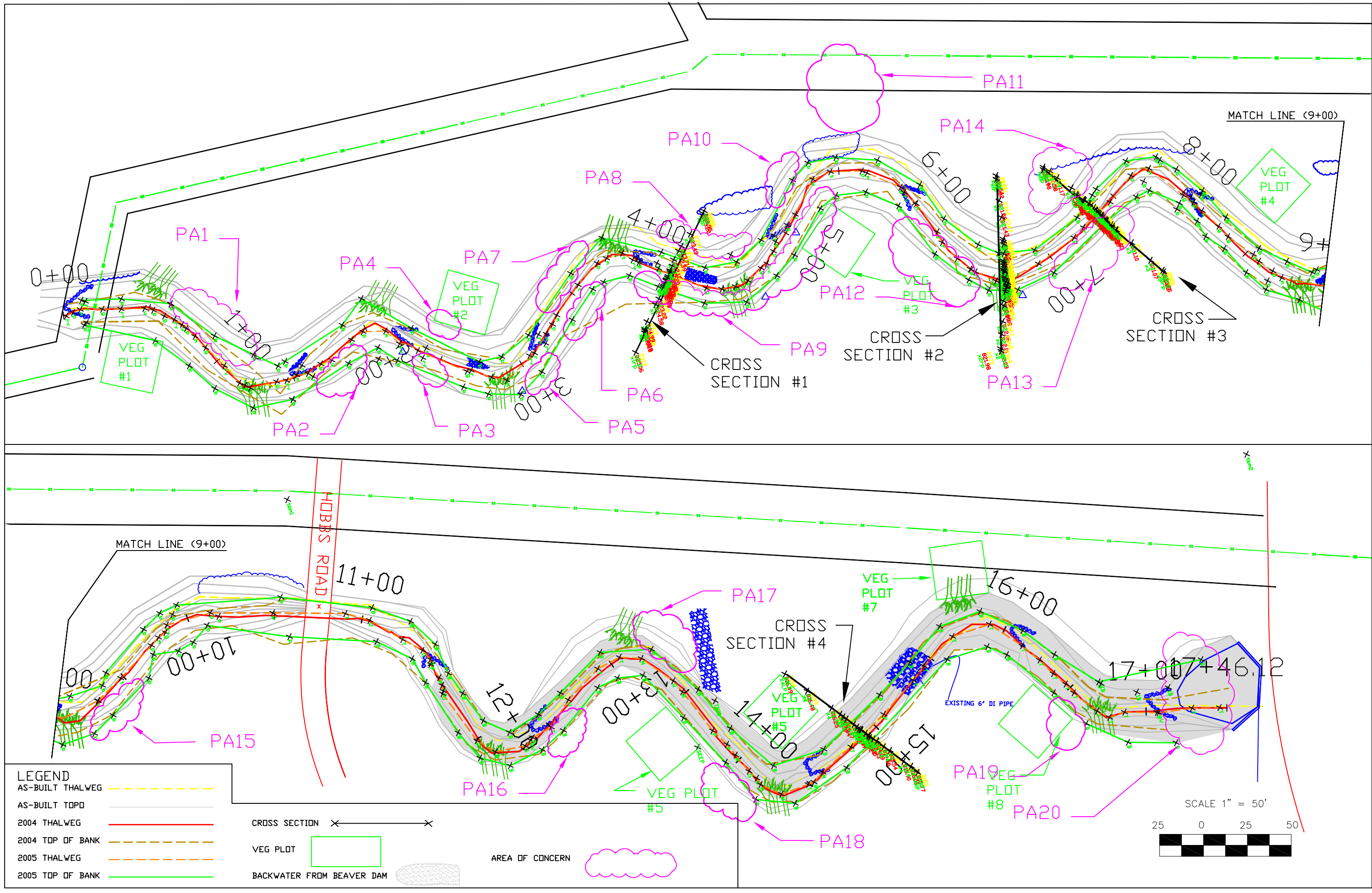
Plot 8

Price Park				
Vegetation Raw Data Table				
6/22/2005				
No.	Species	Count		
1	COAM	1		
	FRPE	2		
	BENI	1		
	quni	1		
2	qual	1		
	qumi	2		
	frpe	1		
3	ploc	1		
	qumi	3		
	caaq	1		
4	saca	1		
	quph	1		
	alse	2		
5	alse	1		
	nysy	1		
6	ploc	2		
	alse	1		
	sani	1		
	frpe	1		
7	coam	2		
	alse	1		
	caaq	2		
	caca	1		
8	frpe	2		
	qumi	1		
	caca	1		
	coam	1		

APPENDIX B

Morphology Raw Data

1. Problem Area Plan View
2. Plan View of Monitoring Overlain Design Plans
3. Project Photo Log
4. Stream Problem Area Photos
5. Cross section and Pebble Count Plots and Raw Data Tables
6. Longitudinal Plots and Raw Data Tables
7. GPS Point Table
8. BEHI Results Table



NO	REVISIONS	DRN	CHK	DATE
1	2004 MONITORING	DRC	DAB	02/04/06

NC STATE UNIVERSITY

BIOLOGICAL & AGRICULTURAL ENGINEERING
Weaver Laboratories, Box 7625
North Carolina State University
Raleigh, NC 27695

PRICE PARK
UT to HORSEPEN CREEK
GUILFORD COUNTY, N.C.

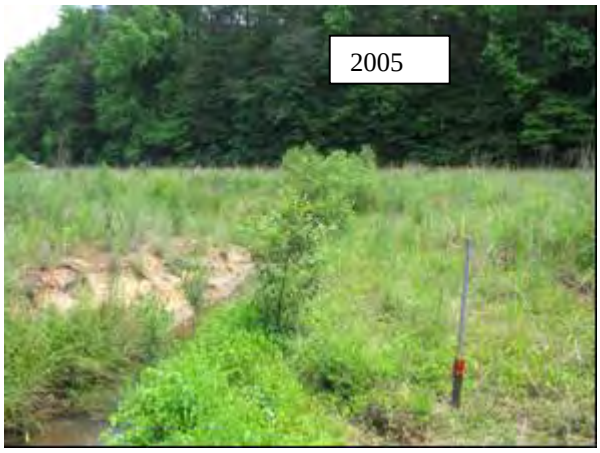
YEAR 2005 MONITROING
1:50 SCALE PLAN SHEET

DATE	02/04/2006
PROJECT NO.	
FILENAME	PRICE-04 PROB.DWG
SHEET NO.	PL - 1
DRAWING NO.	

Photo Reference Points

Price Park Stream Restoration
Guilford County, North Carolina

P1: Meander 1, looking in the upstream direction. Fenceline represents the beginning of the project and longitudinal profile. Note bar formation and vegetation establishment in this region.



P2: View from Meander 1, looking downstream towards M2.

P3: View from Meander 2 looking in the upstream direction towards M1.

P4: View from Meander 2, looking downstream at M3.

P5: View from Meander 3 looking upstream.

P6: View from Meander 3 looking downstream towards a cross vane that was installed after the main construction period due to concerns with the grade downstream.

P7: View from Meander 4 looking upstream at Meander 3.

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P14: View from Meander 7 looking downstream.67

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P18: View from Meander 9 looking downstream. Note the point bar formation in the lower right corner of picture.71

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UT to Horsepen Creek at Price Park

Problem Area Photos

P1a. Bank Erosion

P1b. Unvegetated Bank

P2. Bank Erosion

P3. Bank Erosion

P4. Bank Erosion

P5. Bank Erosion

P6. Bank Erosion

P7. Bank Erosion

P8. Bank Erosion

P9. Bank Erosion

P10. Bank Erosion

P11. Bank Erosion

P12a. Bank Erosion

P12a. Bank Erosion

P13. Bank Erosion

P14. Bank Erosion

P15. Bank Erosion

P16. Bank Erosion

P18a. Bank Erosion

P18b. Bank Erosion

P19. Bank Erosion

P20a. Beaver Dam

P20b. Beaver Dam

P20c. Beaver Dam

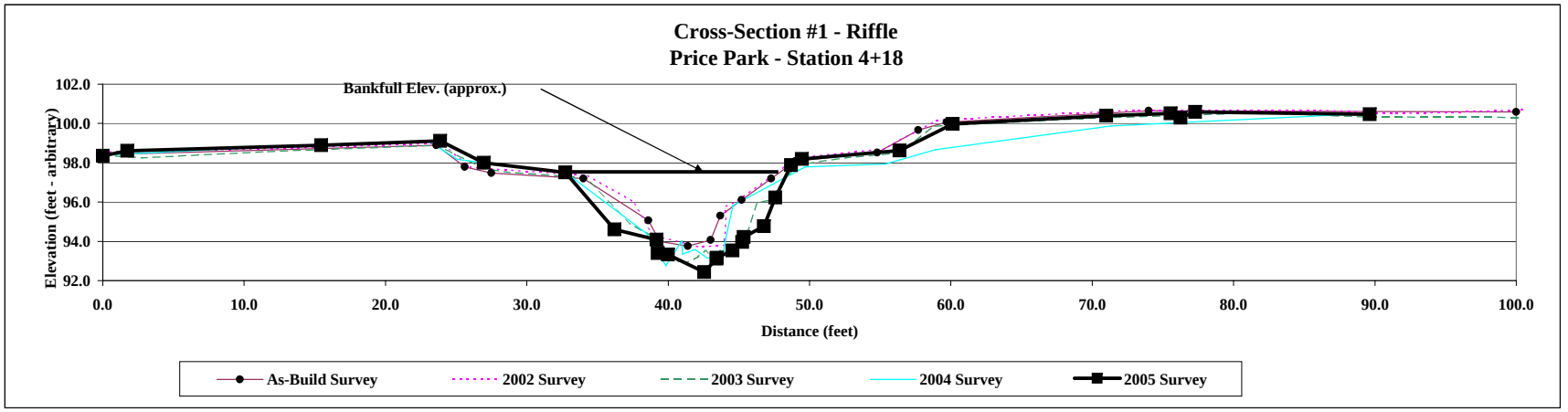
Project Name	Price Park
Cross Section	#1
Feature	Riffle
Date	6/4/05
Station	4+18
Crew	Clinton, Bidelspach

adjusted up 1.63 adjusted up 1.63

2001 As-Build Survey			2002 2002 Survey			2003 2003 Survey			2004 2004 Survey			2005 2005 Survey		
Station	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**
0.0	98.4	edge scrub v	0	98.55	LPIN GRD	0	98.3877		0	98.39	X1PIN	0	98.35	X1LP
23.6	98.9	LT BOB	12	98.72		2.81	98.25001		11.01	98.78		1.73	98.6	X1
25.6	97.8	Toe BOB	24	98.99	LT BOB	11.5	98.56661	LPIN GRD	23.03	99.11		15.46	98.89	X1
27.5	97.5		26	97.76	Toe BOB	23.67	98.89014	LT BOB	25.07	98.18		23.87	99.11	X1
34.0	97.2	LBKF	34.3	97.35	LBKF	26.91	97.71921		32.85	97.45	LBKF	26.95	97.99	X1
38.6	95.1		37.5	96.03		28.56	97.51953		38.48	94.39		32.72	97.51	BKF
39.4	94.0	LEW/WS	38.7	94.58		34.14	97.244	LBKF	38.88	93.82		36.2	94.6	X1
41.4	93.8	TW	38.9	94.32	LEW	37.32	94.89443		39.84	92.76		39.19	94.08	X1
43.0	94.1	REW	42.2	93.71	TW	38.96	94.22712		40.96	94.03	X1W	39.27	93.4	X1
43.7	95.3		44	93.8	REW	39.72	93.5669		41.02	93.36		39.98	93.33	X1
45.2	96.1		44.1	95.78		40.82	92.9152		41.91	93.58	X1W	42.55	92.43	X1
47.3	97.2	RBKF	44.8	96.01		41.35	92.9173		42.79	93.15		43.42	93.12	X1
49.0	98.1		47.4	97.35		42.14	93.23559		43.9	93.34		43.45	93.16	X1
54.8	98.5	Toe BOB	49.1	98.25	RBKF	42.62	93.53453	TW	44.04	94.04		44.55	93.54	X1
57.7	99.7	RT BOB	55.3	98.71	Toe BOB	43.21	93.08141		44.57	95.83		45.25	93.97	X1
59.7	100.1		56	98.99		43.7	93.5185		49.68	97.79	RBKF	45.35	94.21	X1
74.0	100.6		59	100.17	RT BOB	44.38	93.45383		55.37	97.94		46.77	94.77	X1
100.0	100.6		73	100.67		45.51	94.24056		58.92	98.66		47.58	96.22	X1
124.0		edge g-way	86	100.67		46.3	95.96063		71.3	99.87		48.7	97.88	BKF
			91.5	100.49		47.05	96.08462		89.17	100.50	X1PIN	49.46	98.19	X1
			100	100.67	RPIN GRD	49.14	97.90004	RBKF				56.37	98.62	X1
			124	101.4	edge g-way	52.56	98.24567					60.14	99.98	X1
						56.42	98.5006					71	100.39	X1
						58.72	99.86416					75.54	100.51	X1
						69.13	100.25143	RPIN GRD				76.25	100.29	X1
						81.89	100.54242					77.29	100.58	X1
						89.22	100.33631					89.63	100.46	X1RP
						101.78	100.30646							
						113.56	100.53927							
						122.79	100.89963							

Photo of Cross-Section #1 - Looking Upstream

	As-Built	2002	2003	2004	2005
Area	25.2	25.6	37.8	34.9	41.5
Width	13.3	14.8	15.0	16.8	14.1
Mean Depth	1.9	1.7	2.5	2.1	3.0
Max Depth	3.6	3.6	4.4	4.4	4.9



Project Name	Price Park
Cross Section	#2
Feature	Pool
Date	6/4/05
Station	6+70
Crew	Clinton, Bidelspach

adjusted up 2.50 adjusted up 2.50

2001 As-Build Survey

Station	Elevation	Notes
0.0	96.9	LPIN
21.4	96.9	
34.7	96.9	LT BOB
38.5	95.6	Toe BOB
44.8	95.2	LBKF
52.0	92.7	
54.5	92.4	
56.3	91.8	LEW/WS
57.1	91.4	
57.7	90.8	
59.2	90.4	TW
61.6	91.0	
62.7	94.0	
67.0	95.7	RBKF
71.0	96.0	Toe BOB
73.7	97.4	RT BOB
80.0	97.5	
87.3	97.5	
92.4	97.2	
100	97.29	

2002 2002 Survey

Station	Elevation	Notes
0	97	LPIN GRD
15	97.03	
35.3	97.07	LT BOB
38.6	95.83	Toe BOB
45	95.37	LBKF
51.8	92.94	bench
54.2	93.11	
56	92.42	
56.8	91.17	LEW
61	90.6	TW
61.8	91.04	
62.6	93.64	
66	95.68	RBKF
71.3	96.16	Toe BOB
74	97.54	RT BOB
84	97.5	
92.7	97.33	
100	97.49	RPIN GRD

2003 2003 Survey

Station	Elevation	Notes
0	97.00	LPIN GRD
4.81	97.14	
16.12	97.00	
26.54	96.98	
35.97	97.04	LT BOB
38.34	95.72	Toe BOB
44.55	95.40	LBKF
49.27	93.44	
53.1	93.27	
54.65	93.09	
56.06	92.04	
58.62	91.44	
58.67	91.44	
60.21	91.20	
61.49	90.63	TW
61.83	92.93	
62.24	94.44	
64.43	95.12	
65.71	95.72	RBKF
68.03	95.96	Toe BOB
71.17	96.29	
73.74	97.50	RT BOB
80.58	97.62	
90.67	97.48	
99.55	97.47	RPIN GRD

2004 2004 Survey

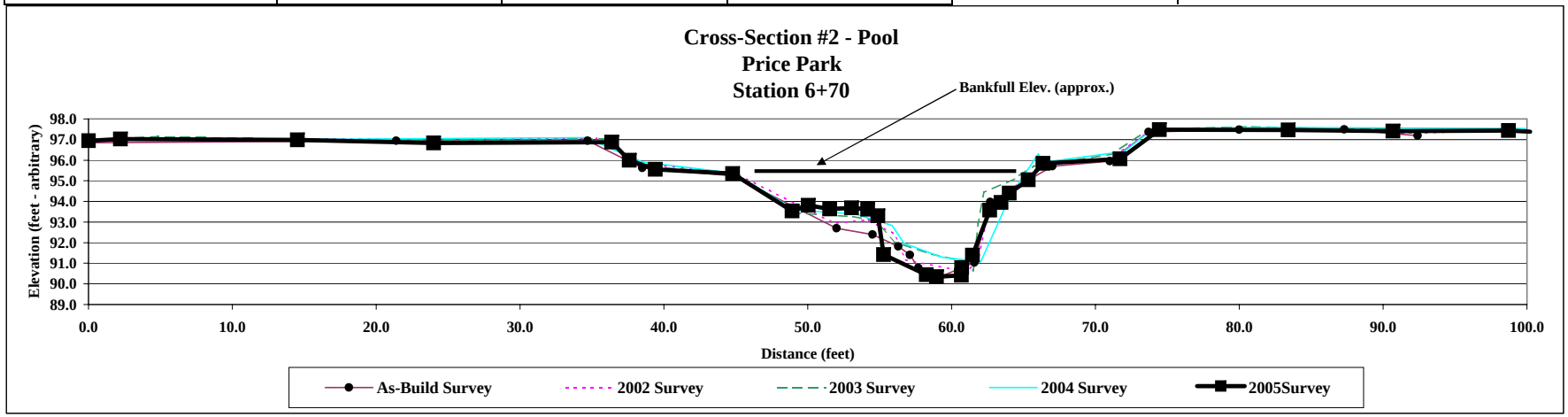
Station	Elevation	Notes
0	97.00	X2PIN
15.5	97.01	
34.58	97.10	
38.51	95.91	
44.84	95.38	LBKF
49.13	93.58	
53.27	93.40	
55.87	92.83	
56.69	91.97	
59.27	91.94	X2W
59.34	91.30	
62.03	91.07	
64.1	94.29	
66.03	96.30	RBKF
66.41	95.90	
71.99	96.42	
74.03	97.53	
82.22	97.59	
99.9	97.54	X2PIN

2005 2005 Survey

Station	Elevation	Notes
0	96.94	X2LP
2.22	97.02	X2
14.53	96.98	X2
23.99	96.83	X2
36.38	96.88	X2
37.6	96	X2
39.41	95.56	X2
44.78	95.35	BKF
48.92	93.53	X2
50.04	93.81	X2
51.54	93.63	X2
53.06	93.69	X2
54.18	93.62	X2
54.88	93.3	X2
55.28	91.42	X2
58.24	90.44	X2
58.95	90.34	X2
60.68	90.41	X2
60.71	90.79	X2
61.45	91.39	X2
62.65	93.57	X2
63.44	93.95	X2
64.01	94.4	X2
65.34	95.05	BKF
66.35	95.84	X2
71.72	96.06	X2
74.44	97.48	X2
83.4	97.46	X2
90.68	97.41	X2
98.72	97.43	X2
100.21	97.38	X2RP

Photo of Cross-Section #2 - Looking Downstream

	As-Built	2002	2003	2004	2005
Area	50.7	47.5	42.9	44.6	48.9
Width	22.2	21.0	21.2	21.2	20.6
Mean Dept	2.3	2.3	2.0	2.1	2.4
Max Depth	5.0	4.7	4.7	4.2	5.0



Project Name	Price Park
Cross Section	#3
Feature	Riffle
Date	6/4/05
Station	7+35
Crew	Clinton, Bidelspach

*adjusted up 2.51 feet adjusted up 2.51

2001 As-Build Survey

Station	Elevation	Notes
0.0	96.5	LPIN
12.5	96.7	
24.0	96.2	LT BOB
25.3	95.3	
32.0	95.1	LBKF
36.2	92.5	
37.0	91.9	
37.6	91.7	LEW/WS
39.3	91.5	
41.0	91.5	TW
42.4	91.7	REW
42.8	92.6	
46.0	94.9	RBKF
48.0	95.2	
52.0	95.2	
55.0	96.4	RT BOB
70.0	96.4	
100.0	96.5	RPIN

2002 2002 Survey

Station	Elevation	Notes
0	96.62	LPIN GRD
6	96.48	
12.5	96.93	
23.8	96.46	LT BOB
24.8	95.58	Toe BOB
29.8	95.1	overland wa
30.3	94.91	overland wa
30.7	94.4	overland wa
31	94.18	overland wa
31.3	95.05	
32	95.07	LBKF
36.5	92.88	
37	91.98	LEW
40.1	91.65	TW
42.2	91.81	REW
42.8	92.95	
46	95.04	RBKF
52	95.44	Toe BOB
55.4	96.67	RT BOB
72	96.56	
100	96.73	RPIN GRD

2003 2003 Survey

Station	Elevation	Notes
0	96.65	LPIN GRD
2.2	96.14	
10.05	96.91	
18.28	96.56	
23.93	96.35	LT BOB
24.66	95.38	Toe BOB
30.59	95.04	
30.7	95.04	LBKF
31.38	93.49	
33.01	93.54	
34.05	93.26	
35.78	93.16	
36.52	92.74	
37.03	91.68	
37.58	91.52	
37.64	91.70	
39.23	91.40	TW
39.75	91.61	
40.22	91.48	
41.54	91.74	
41.75	91.75	
41.96	92.91	
42.8	93.20	
45.42	95.04	RBKF
48.8	95.13	Toe BOB
51.69	95.43	RT BOB
54.21	96.65	
72.15	96.52	
87.47	96.52	
99.76	96.71	RPIN GRD

2004 2004 Survey

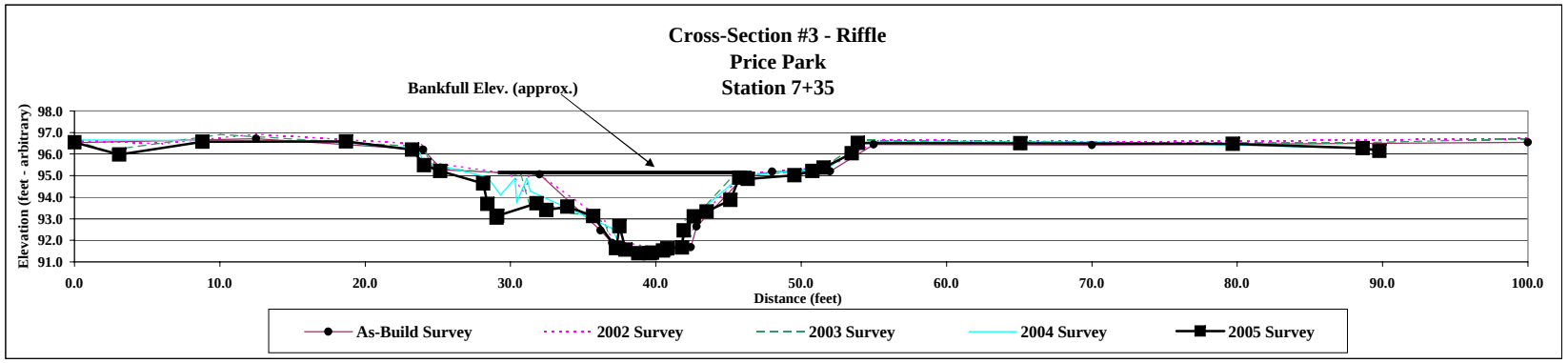
Station	Elevation	Notes
0	96.65	X3PIN
16.9	96.60	
23.68	96.25	
23.96	95.67	
28.42	94.93	
29.32	94.10	
30.31	94.87	
30.44	93.77	
31.13	94.87	LBKF
31.36	94.28	
36.95	92.57	
37.67	91.57	
39.15	91.65	X3W
39.16	91.40	
41.64	91.64	
42.53	93.08	
45.87	94.98	RBKF
51.78	95.35	
54.61	96.55	
70.57	96.56	
90.23	96.25	

2005 2005 Survey

Station	Elevation	Notes
0	96.54	X3LP
3.08	95.98	x3
8.81	96.57	x3
18.69	96.58	x3
23.24	96.21	x3
24.05	95.48	x3
25.17	95.21	x4
28.13	94.63	BKF
28.42	93.69	x3
29.04	93.05	x3
29.1	93.14	x3
31.79	93.72	x3
32.47	93.41	x3
33.91	93.56	x3
35.69	93.12	x3
37.27	91.63	x3
37.5	92.65	x3
37.91	91.57	x3
38.81	91.4	x3
39.59	91.39	x3
39.75	91.43	x3
40.49	91.53	x3
40.8	91.62	x3
41.8	91.67	x3
41.93	92.45	x3
42.61	93.11	x3
43.5	93.33	x3
45.13	93.87	x3
45.74	94.9	x3
46.34	94.85	x3
49.54	95.02	BKF
50.78	95.22	x3
51.56	95.37	x3
53.49	96.03	x3
53.9	96.51	x3
65.07	96.5	x3
79.7	96.47	x3
88.63	96.28	x3
89.78	96.15	X3RP

Photo of Cross-Section #3 - Looking Upstream

	As-Built	2002	2003	2004	2005
Area	30.7	28.4	30.8	29.7	36.8
Width	14.0	14.0	14.7	14.7	21.4
Mean Dept	2.2	2.0	2.1	2.0	1.7
Max Depth	3.5	3.3	3.6	3.6	3.6



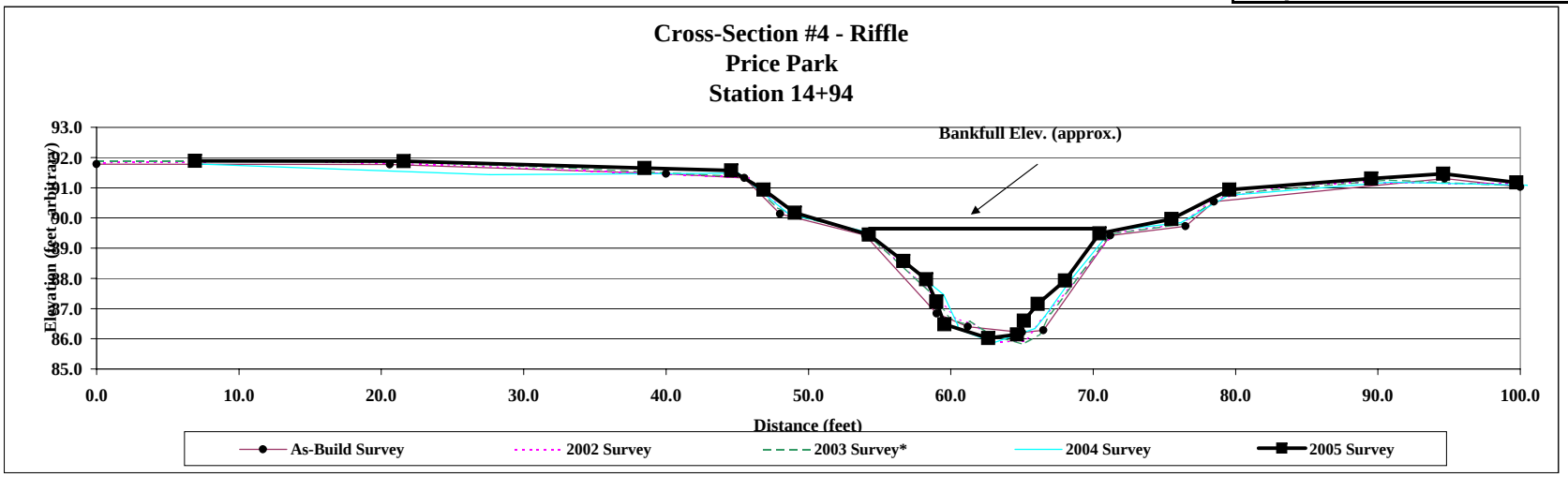
Project Name	Price Park
Cross Section	#4
Feature	Riffle
Date	6/4/05
Station	14+94
Crew	Clinton, Bidelspach

*adjusted by 2.43 **sta adj 6.9 ft, elev adj 2.35 ***sta adj 6.9 ft

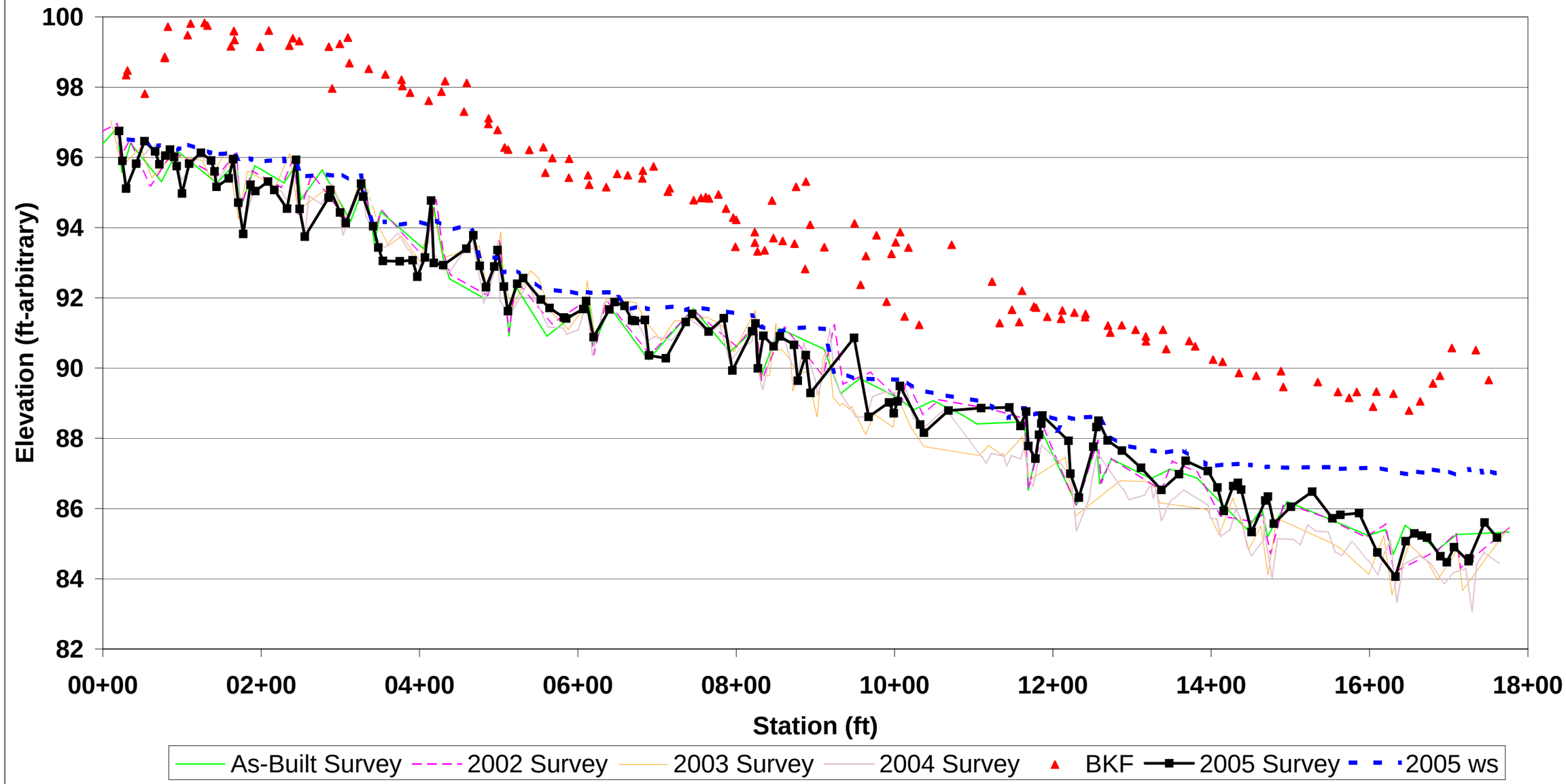
2001 As-Build Survey			2002 2002 Survey			2003 2003 Survey*			2004 2004 Survey**			2005 2005 Survey		
Station	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**
0.0	91.8		0	91.83	LPIN GRD	0	91.87	LPIN GRD	6.9	91.79	XS4LP	6.9	91.89	X4PIN
20.6	91.8		14	91.89		9.24	91.87		27.62	91.43		21.57	91.88	X4
40.0	91.5		25	91.75		19.52	91.90		45.09	91.48	XS4TB	38.48	91.65	X4
45.5	91.3	LT BOB	45.8	91.33	LT BOB	34.09	91.63		48.65	90.12		44.57	91.57	X4
48.0	90.1		48.4	90.2	Toe BOB	45.58	91.36	LT BOB	54.12	89.54	XS4BF	46.86	90.94	X4
54.0	89.4	LBKF	54.2	89.5	LBKF	47.77	90.34	Toe BOB	59.49	87.46		49.04	90.17	X4
59.0	86.8		59.3	87.2		49.57	90.02		60.48	86.46	XS4WS	54.24	89.45	BKF
61.2	86.4	LEW/WS	60.4	86.67	LEW/WS	54.12	89.49	LBKF	60.53	86.32		56.66	88.57	X4
65.0	86.2	TW	61.8	86.45		58.46	87.57		63.03	85.88		58.26	87.97	X4
66.5	86.3	REW	63	85.9	TW	59.96	86.69		65.91	86.34		58.99	87.23	X4W
71.2	89.4	RBKF	65.2	85.91		60.86	86.49		66.57	86.72		59.56	86.48	X4
76.5	89.7		66.4	86.64	REW	61.36	86.59		68.43	87.95		62.63	86.02	X4
78.5	90.5	RT BOB	67.5	87.24		61.8	86.44		71.25	89.58	XS4BF	64.66	86.14	X4
94.7	91.3		71.5	89.5	RBKF	63.07	86.09		76.15	89.85		65.13	86.6	X4
100.0	91.0		76.3	89.81	Toe BOB	65.05	85.83	TW	79.51	90.75	XS4TB	66.1	87.15	X4
			78.3	90.6	RT BOB	66.25	86.14		90.88	91.19		68.03	87.93	X4
86.0		Sewerline	84	91.08		66.99	86.84		100.48	91.09	XS4RP	70.44	89.49	BKF
			89	91.18		71.27	89.47	RBKF	100.48	91.08		75.51	89.96	X4
			100	91.11	RPIN GRD	76.27	89.79	Toe BOB				79.57	90.94	X4
						79.03	90.78	RT BOB				89.53	91.3	X4
						90.66	91.26					94.59	91.46	X4
						99.89	91.07	RPIN GRD				99.72	91.17	X4PIN

Photo of Cross-Section #4 - Looking Upstream

	As-Built	2002	2003	2004	2005
Area	37.2	35.47	36.05	34.16	32.14
Width	17.2	17.3	17.2	17.1	16.2
Mean Dept	2.2	2.1	2.1	2.0	2.0
Max Depth	3.3	3.6	3.6	3.6	3.5



Longitudinal Profile
2005 Price Park
Monitoring Report



Project Name Price Park
Task Longitudinal Profile

Date 6/6/05
Crew Shaffer, Bidelspach, Clinton

Symbol Key			
T	Thalweg	U	Head of Run
R	Head of Riffle	M	Max Pool
P	Head of Pool	RV	Rock Cross Vane

2005 Survey

Note: Station adjusted downstream by 19 feet and elevation adjusted down by -724.60 feet

TW Station	TW Elev	WS Station	WS Elev	BKF Station	BKF Elev	Feature
20.45	96.75	32.78	96.51	29.39	98.34	rv
24.72	95.9	42.81	96.48	31.13	98.47	p
29.34	95.11	53.64	96.45	52.96	97.81	m
42.03	95.82	65.76	96.15	78.12	98.83	g
52.6	96.46	71.04	96.33	78.25	98.86	rv
66	96.17	79.3	96.36	82.17	99.72	u
71.47	95.8	85.53	96.22	107.06	99.48	p
79	96.05	90.21	96.02	110.87	99.81	g
84.81	96.22	92.79	96.19	128.46	99.83	rv
90.12	96.01	96.64	96.26	132.13	99.75	u
93.35	95.75	100.64	96.22	144.53	100.23	p
100.08	94.97	108.87	96.36	161.69	99.16	m
109.01	95.82	124.15	96.22	165.56	99.59	g
123.92	96.13	135.57	96.13	165.57	99.6	rv
136.86	95.91	139.13	96.06	166.34	99.34	u
141	95.6	143.53	96.09	198.59	99.15	p
143.67	95.16	159	96.11	209.69	99.61	m
159.02	95.4	166.06	96.12	224.82	100.41	g
164.69	95.95	171.25	95.96	235.59	99.18	rv
171.12	94.71	173.96	96.02	240.06	99.39	m
177.35	93.82	187.65	95.95	248.19	99.31	m
186.41	95.22	192.38	95.87	285.45	99.15	g
192.6	95.04	211.11	95.91	289.71	97.96	u
208.71	95.31	228.72	95.96	299.31	99.23	g
216.63	95.07	229.74	95.89	309.46	99.41	p
232.59	94.54	244.36	95.83	311.44	98.68	m
244	95.93	250.04	95.53	335.82	98.52	rv
248.58	94.53	256.41	95.46	356.91	98.36	p
255.04	93.74	283.83	95.51	377.27	98.21	m
285.19	94.85	289.4	95.48	378.33	98.03	g
287.29	95.07	298.94	95.56	388.05	97.84	r
299.62	94.43	311.41	95.35	411.64	97.61	p
306.92	94.13	326.11	95.48	427.71	97.87	m
326.18	95.25	328.73	95.06	432.28	98.17	rv
328.8	94.88	340.29	94.19	456.23	97.3	r
341.5	94.04	348.28	94.14	459.66	98.12	u
348	93.43	356.12	94.17	486.92	96.95	p
353.78	93.05	375.41	94.08	487.33	97.11	m
374.93	93.04	399.91	94.17	498.64	96.78	t
391.25	93.07	416.5	94.04	507.43	96.28	p
397.25	92.6	422.17	94.18	511.86	96.22	m
406.84	93.15	443.47	93.95	538.67	96.21	t
414.69	94.77	458.19	94.06	556.41	96.29	rv
418.05	92.99	466.28	93.91	558.91	95.56	p
429.93	92.93	476.17	93.19	567.69	95.98	m
459.16	93.4	494.77	93.15	588.68	95.42	g
468.01	93.78	498.58	93.12	589.01	95.96	r
475.97	92.91	506.46	92.73	612.87	95.49	p
484.06	92.3	524.15	92.8	614.35	95.22	m
494.43	92.89	525.12	92.76	635.78	95.15	g
498.61	93.36	551.9	92.27	649.65	95.53	rv
506.55	92.32	581.01	92.18	663	95.49	p
511.68	91.62	585.92	92.2	681.47	95.4	m
523.43	92.4	605.87	92.09	682.09	95.62	g
530.87	92.56	610.28	92.17	695.64	95.74	r
553.22	91.95	615.93	92.14	713.62	95.02	u
564.21	91.71	620.03	92.15	715.88	95.12	t
582.21	91.44	638.89	92.15	746.33	94.78	p
585.3	91.41	647.21	92.16	755.54	94.84	m
606.91	91.68	659.25	91.8	761.55	94.87	g
610.44	91.91	667.97	91.69	765.66	94.83	rv
619.89	90.88	681.47	91.78	777.56	94.94	m
639.85	91.67	684.36	91.73	787.18	94.54	g
646.4	91.88	688.41	91.68	796.29	94.28	r
658.86	91.77	719.02	91.75	798.97	93.45	u
668.51	91.36	736.91	91.65	800.1	94.22	p
671.97	91.34	744.55	91.75	823.5	93.87	m
684.69	91.37	819.87	91.49	823.61	93.57	p
689.82	90.36	826.27	91.22	826.95	93.32	m
711.15	90.28	831.76	91.18	835.94	93.35	t
736.32	91.31	854.9	91.04	845.3	94.77	g
744.39	91.54	870.41	91.13	847.01	93.7	r
765.19	91.04	889.44	91.16	858.72	93.62	u
784.31	91.42	910.76	91.11	873.65	93.54	p
795.15	89.93	923.6	89.9	875.57	95.16	m
820.14	91.05	935.13	89.85	887.15	92.82	g
824.29	91.27	948.15	89.7	888.07	95.31	rv
827.34	89.99	1003.09	89.67	893.37	94.08	p
834.27	90.92	1008.76	89.69	911.29	93.44	m
847.16	90.62	1028.8	89.38	949.4	94.12	g
855.1	90.9	1063.31	89.23	957.17	92.37	g
873.01	90.66	1109.17	89.05	963.9	93.19	p
877.83	89.64	1123.56	88.89	977.2	93.78	m
887.82	90.37	1144.16	88.57	989.96	91.89	p
893.85	89.29	1160.3	88.86	996.18	93.25	m
948.92	90.86	1164.41	88.85	1001.52	93.58	u
967.18	88.61	1169.09	88.64	1007.07	93.87	t
992.99	89.02	1179.66	88.71	1012.79	91.47	p
998.94	88.71	1183.32	88.69	1017.46	93.43	m
1003.79	89.05	1204.72	88.53	1031.2	91.23	g
1006.77	89.49	1205.07	88.22	1072.12	93.51	rv
1032.33	88.39	1216.07	88.62	1123.22	92.46	p
1037.16	88.16	1225.45	88.55	1132.71	91.28	m
1068	88.79	1241.77	88.6	1148.39	91.66	g
1109.32	88.86	1251.41	88.61	1157.63	91.31	T
1144.96	88.88	1258.08	88.62	1161.08	92.2	T
1159.07	88.35	1273.28	88.04	1175.96	91.75	G
1166.26	88.76	1289.43	87.8	1178.69	91.72	RV
1168.93	87.78	1325.72	87.65	1192.94	91.46	P
1177.98	87.42	1333.01	87.61	1210.28	91.4	M
1182.53	88.1	1341.06	87.59	1211.95	91.64	T
1185.48	88.42	1357.72	87.66	1227.2	91.58	R
1186.65	88.65	1366.01	87.64	1240.65	91.45	U

2005 Survey Continued

TW READJ	Adj Elevation	WS READJ	WS Elevation	BKF READJ	BKF Elevation	Feature
1186.65	88.65	1366.01	87.64	1175.96	91.75	U
1219.68	87.93	1392.82	87.27	1178.69	91.72	P
1222.11	86.99	1400.06	87.21	1192.94	91.46	T
1232.83	86.31	1406.26	87.22	1210.28	91.4	M
1251	87.76	1413.71	87.25	1211.95	91.64	G
1255.08	88.32	1426.93	87.26	1227.2	91.58	RV
1257.58	88.5	1433.22	87.27	1240.65	91.45	R
1269.15	87.94	1437.32	87.26	1241.31	91.54	T
1287.19	87.65	1449.97	87.24	1269.54	91.21	U
1311.32	87.16	1468.77	87.18	1272.48	91.01	T
1337.12	86.53	1471.67	87.19	1287.04	91.22	M
1359.32	86.98	1478.26	87.18	1304.44	91.09	G
1367.62	87.36	1497.57	87.16	1317.42	90.9	R
1395.71	87.07	1528.69	87.18	1317.61	90.76	P
1407.84	86.6	1549.88	87.18	1339.06	91.09	P
1415.83	85.93	1563.93	87.13	1343.2	90.54	M
1427.7	86.64	1587.44	87.15	1372.17	90.77	G
1433.67	86.73	1611.73	87.16	1379.71	90.62	U
1437.76	86.54	1633.56	87.04	1402.41	90.24	P
1451.08	85.33	1646.03	86.98	1414.36	90.18	M
1468.23	86.23	1656.14	87.06	1435.12	89.86	T
1471.61	86.34	1667.13	87.02	1456.89	89.78	RV
1479.09	85.57	1673.42	87.13	1488.15	89.91	M
1500.73	86.05	1687.78	87.07	1491.05	89.46	T
1527.47	86.48	1698.78	87.07	1534.66	89.6	P
1553.09	85.72	1706.98	86.97	1560.12	89.32	T
1563.17	85.82	1725.27	87.12	1574.15	89.15	T
1586.72	85.87	1726.97	87.04	1583.8	89.32	T
1609.84	84.75	1741.13	87.07	1604.47	88.9	T
1632.73	84.06	1742.55	87.03	1608.63	89.33	T
1645.62	85.07	1745.02	87.06	1626.96	81.25	T
1656.53	85.29	1748.45	87.07	1630.14	89.27	T
1665.87	85.23	1757.93	87.01	1649.82	88.79	T
1672.59	85.17	1759.79	87.08	1663.95	89.05	T
1689.47	84.64	1761.54	87.06	1680.02	89.56	T
1697.58	84.47	1762.97	87.06	1688.87	89.78	T
1706.69	84.9			1703.93	90.57	T
1725.06	84.5			1734.24	90.51	T
1725.99	84.58			1750.52	89.66	RV
1745.29	85.6					T
1760.95	85.17					T

Project Name Price Park
Task Longitudinal Profile

Date 6/5/04
Crew Shaffer, Bidelspach, Clinton

Symbol Key

T	Thalweg	TU	Head of Run
TR	Head of Riffle	TM	Max Pool
TP	Head of Pool		

2004 Survey

Note: Station adjusted downstream by 19 feet and elevation adjusted down by -724.60 feet

TW Station	TW Elevation	WS Station	WS Elevation	BKF Station	BKF Elevation	Feature
19.00	96.43	19.04	96.94			
20.86	96.78	20.69	96.92			TR
25.45	95.88	25.27	96.48			TP
31.58	95.05	31.38	96.48			
39.51	95.85	40.26	96.48			
55.91	96.17	55.74	96.53			TR
66.95	96.38	67.59	96.38			
75.48	95.97	74.92	96.34	83.44	98.92	Trun
92.36	96.02	92.32	96.34			
99.44	95.37	99.20	96.34	105.48	98.55	
122.08	96.08	122.18	96.29	119.09	99.38	
140.54	95.67	140.02	96.17	134.07	98.91	
144.60	95.33	146.62	96.23	142.95	99.75	
160.19	95.86	160.02	96.22	159.91	99.21	TR
167.37	96.12	167.19	96.02			
175.64	93.95	167.97	96.10			
191.48	95.10	175.46	96.03	184.17	98.72	TP
207.82	95.25	191.35	96.00			
217.68	95.11	207.76	96.06	212.94	99.22	
225.30	95.02	225.11	96.05			
233.22	94.78	232.95	96.04			TR
242.68	95.64	242.60	95.95			
244.12	95.86	244.10	95.86	239.49	98.60	Tstep
245.70	94.61	245.44	95.47			TP
254.85	93.77	254.57	95.56			
260.54	94.91	260.39	95.57	266.77	99.41	Trun
275.97	94.66	275.46	95.53	267.38	98.73	
287.75	95.25	287.62	95.55			TR
296.13	94.89	296.25	95.50	293.26	99.18	TP
303.15	93.79	324.07	95.43	309.51	98.37	Tstep
324.30	95.00	332.13	94.72	323.68	99.34	TR
326.28	95.43	346.67	94.38			
332.40	94.31	355.38	94.32			Trun
346.71	93.66	372.15	94.31			TP
355.79	93.44	385.97	94.28	343.14	98.47	
372.36	93.83	399.83	94.34	354.39	98.22	
386.10	93.37	411.29	94.31	378.40	97.81	TR - Vane piping
400.48	92.89	416.00	93.94			TP - Scour
411.72	93.59	428.55	93.79	398.58	97.23	
413.82	94.72	437.17	93.92			
416.81	93.31	453.14	93.92			
428.83	92.80	466.12	93.95			TR- Step
437.86	92.75	476.81	93.05	421.89	97.35	TP - Scour
453.83	93.24	480.89	92.91	442.17	96.89	
466.48	93.66	495.29	93.12	460.66	97.99	TR - Vane piping
477.43	92.42	501.73	92.66			TP - Scour
480.93	91.86	513.95	92.63			
495.22	92.76	535.99	92.61	482.99	96.59	TR
498.54	93.55	547.46	92.27			Trun
501.92	91.89	562.84	92.29			
513.80	91.50	580.90	92.25	510.77	96.19	
536.39	92.40	585.85	92.21			
547.75	91.88	600.64	92.19	542.37	95.41	
562.57	91.17	610.80	92.29	545.39	95.43	TP
580.88	91.14	618.40	92.15			
586.16	90.96	633.54	92.30			
600.49	91.09	651.31	92.31			TR
611.05	91.86	670.29	91.82	602.50	94.34	Trun
618.60	90.36	688.24	91.82			
633.35	91.84	696.02	91.82			
651.36	92.07	718.03	91.70	633.96	95.26	
670.81	91.48	741.52	91.72	641.21	94.35	TR
688.02	90.75	766.01	91.31			
696.41	90.90	779.51	91.41	663.92	95.46	TP
718.14	90.79	807.54	91.28			
741.73	91.40	820.34	91.23			TR - Vane piping
765.97	90.98	826.08	91.21			TP - Scour
779.00	91.24	833.65	91.20			
791.54	90.20	848.61	91.24	726.00	94.98	
807.07	90.58	859.27	91.22	748.47	94.95	TR
820.01	90.77	870.36	91.13	804.32	93.75	
823.25	91.56	878.12	91.11			
826.10	90.07	885.41	91.17			TP
833.42	89.39	899.53	91.12	833.44	94.60	
848.72	90.89	902.67	91.18			TR - Vane piping
859.62	90.92	907.60	90.98	866.32	93.46	
870.07	90.12	932.90	90.00	871.27	94.77	Bottom Step
878.26	89.85	951.93	89.85			
885.33	90.70	964.60	89.78	892.44	95.18	Trun
899.80	89.68	973.37	89.82			
902.81	89.23	986.87	89.67			
907.55	89.59	1005.47	89.81	907.97	93.07	
918.47	91.11	1015.07	89.54			TR - Step
923.98	89.78	1024.15	89.10			
932.85	89.23	1035.20	89.01	931.04	95.17	TP - Scour
951.66	88.60	1048.48	89.08	947.99	94.27	
964.99	88.61	1077.58	89.06			Culvert in
972.30	89.18	1110.26	88.07	973.48	93.01	Trun - Culvert out
987.04	89.32	1116.21	88.06	992.69	92.59	
1004.88	89.28	1122.6	88.02			
1015.11	89.36	1141.87	88.04			
1024.17	88.56	1147.96	88.02	1020.08	91.98	
1035.32	88.28	1158.47	88			
1047.70	88.50	1164.58	88.03			TR
1063.51	88.85	1168	88.02	1044.61	91.37	
1110.5	87.47	1174.56	87.84	1063.10	91.59	
1115.44	87.3	1185.71	87.85			TP
1122.63	87.57	1206.39	87.83	1075.18	91.94	
1135.89	87.5	1222.42	87.83	1118.3	91.91	
1136.97	87.55	1229.27	87.78	1146.44	90.9	
1141.77	87.22	1245.85	87.78	1184.23	90.9	
1148.07	87.51	1250.49	87.76	1212.02	90.58	
1159.18	87.41	1256.04	87.77	1217.9	90.4	TR

2004 Survey - Continued

Note: Station adjusted downstream19 feet and elevation adjusted down -724.60 feet

TW Station	TW Elevation	WS Station	WS Elevation	BKF Station	BKF Elevation	Feature
1164.97	87.83	1263.2	87.59	1218.2	91.33	
1167.81	86.97	1288.61	86.81	1222.46	90.26	Trun
1174.93	86.64	1296.92	86.85	1231.45	90.65	
1185.81	87.81	1326.46	86.8			TP
1206.37	87.36	1331.03	86.73	1248.92	90.61	
1222.99	86.91	1337.13	86.78	1254.35	90.14	
1229.62	85.37	1347.87	86.77	1262.55	90.17	
1245.47	86.24	1365.78	86.78	1266.53	90.26	TR
1250.6	86.97	1396.16	86.19	1286.64	90.31	TP
1256.04	87.56	1398.79	86.22			
1288.67	86.55	1406.69	86.25	1310.3	89.8	
1296.67	86.25	1412.24	86.22	1317.35	89.82	
1315.04	86.38	1423.92	86.22			
1323.99	86.67	1430.83	86.21	1331.14	89.74	TR - Step
1326.56	86.3	1439.39	85.86	1355.05	90.2	TP - Scour
1330.71	86.52	1445.32	85.84	1356.39	89.92	
1337.06	85.66	1450.86	85.81	1370.72	90.08	
1348	86.18	1473.48	85.82			Trun - begin bac
1365.51	86.54	1477.4	85.77	1398.83	89.2	
1396.42	86.08	1483.95	85.75	1420.56	89.2	
1398.88	85.73	1504.54	85.83	1428.97	88.98	
1406.85	85.7	1512.56	85.8	1434.41	89.03	
1412.04	85.2	1522.56	85.83	1445.86	89.15	
1423.95	85.41	1531.57	85.8	1459.28	88.77	
1430.91	85.97	1547.88	85.8	1478.34	88.71	
1439.16	85.67	1556.69	85.71	1482.51	88.97	
1445.35	84.9	1564.59	85.73	1537.03	88.72	
1450.74	84.67	1578.27	85.75	1537.73	88.8	TP
1466.32	85.1	1598.34	85.73			
1467.34	85.77	1619.2	85.78	1572.38	88.5	
1467.7	85.24	1626.34	85.72	1581.87	87.88	
1472.77	84.61	1635.28	85.76	1584.82	88.44	
1476.87	84.03	1642.49	85.77	1603.53	88.15	
1483.85	85.14	1663.2	85.72	1617.16	87.61	
1504.47	85.12	1676.59	85.73	1621.54	88.22	
1512.07	84.96	1694.88	85.77			
1522.3	85.54	1706.77	85.77	1630.86	87.92	
1531.44	85.36	1721.56	85.85	1649.96	88.23	
1547.78	85.33	1729.84	85.7	1654.14	87.96	
1556.37	84.78	1736.06	85.82	1674.77	87.99	
1564.31	84.66	1745.22	85.77	1678.7	88.2	
1577.85	85.05			1687.38	88.08	
1598.32	84.52			1692.72	88.46	
1610.59	84.12			1727.85	87.41	
1619.2	84.75					
1626.32	85.09			1728.39	88.3	
1634.48	83.34					
1642.54	84.39					
1663.14	84.67					
1676.55	84.44					
1694.33	83.87					
1706.36	84.17					
1721.45	84.29					
1729.56	83.08					
1735.35	84.43					
1745.06	84.75					
1763.66	84.43					

2003 Survey

Note: Station adjusted downstream by 10 feet and elevation adjusted up by 2.0 feet

TW Station	TW Elev	WS Station	WS Elev	LBKF Station	LBKF Elev	RBKF Station	RBKF Elevation	Feature
10.00	97.05			13.93	99.90	12.86	100.46	XV
24.12	95.75			23.38	99.98			T
24.33	95.75	26.66	97.32			28.28	99.77	T
47.94	96.28	47.53	97.06	52.35	99.72	53.58	99.71	TP
61.95	95.41	63.03	96.86	72.03	99.50	62.05	99.74	TM
87.88	96.04	88.17	96.69			79.94	99.80	TU
125.61	95.91	124.21	96.67	112.25	99.44			TP
136.14	95.40	136.81	96.68	139.91	99.47	136.45	100.02	TM
156.38	96.20	157.56	96.62	159.15	99.44	159.87	99.33	XV
171.14	94.25	172.40	96.47					T
182.85	95.61	183.04	96.49	190.37	99.64			TU
200.87	95.39	200.29	96.50	192.18	99.57			TP
218.05	95.16	220.31	96.50					TM
236.13	96.10	235.19	96.52	227.74	99.34			XV
246.11	94.48	247.95	95.99					T
290.00	95.23	289.70	95.85	284.17	99.56			TP
308.26	94.24	310.34	95.82			306.32	99.59	TM
327.71	95.54	328.94	95.90	322.72	99.03	336.35	99.33	XV
349.57	93.97	350.14	94.90	338.22	99.01			T
360.88	93.49	362.20	94.85	365.59	98.99			T
377.52	93.76	379.52	94.86			378.86	98.44	TP
401.05	93.02	403.96	94.90			394.01	98.12	TM
416.47	94.56	417.05	94.84	416.24	98.15	426.62	98.38	XV
431.23	93.15			445.98	97.63			TP
475.59	93.48	474.31	93.79	465.50	97.50			TP
484.16	92.36	485.40	93.87					TM
495.25	92.76	496.02	93.83	498.98	96.89			T
502.66	93.87	502.78	93.64					XV
506.04	92.42	505.56	93.00					T
517.05	91.75	517.67	92.97			517.25	96.74	T
528.75	92.24	529.62	92.97	531.01	96.68			T
540.07	92.78	540.36	92.98					T
550.63	92.56	549.82	92.71			553.22	95.92	TU
564.38	91.63			570.37	95.84			TP
588.00	91.10	588.04	92.70	592.32	95.44			TM
608.39	91.73	608.74	92.72			604.23	95.75	TG
611.82	92.48	611.58	92.71	616.15	95.84			T
622.19	90.79	622.08	92.70					T
636.20	91.99			647.63	95.64	640.16	95.39	T
673.22	91.86	674.37	92.22			673.30	95.81	TU
688.06	91.25	687.99	92.17	681.05	95.47	690.20	96.19	TP
705.81	90.78	706.58	92.18					TM
721.59	91.33	722.91	92.14	712.72	95.38	723.38	95.38	TG
763.64	91.45	763.83	91.91	758.71	95.26	757.33	95.20	TU
783.25	91.20	783.82	91.92	788.26	94.81	789.89	94.98	TP
797.24	90.46							TM
809.78	91.02	810.06	91.92					T
824.13	91.64	823.76	91.88			824.37	94.93	XV
830.26	89.78							T
842.23	89.78			841.72	94.04			T
850.19	91.26	850.11	91.62			849.62	95.14	T
851.20	90.52	851.16	90.85					T
857.51	90.52	857.19	90.79	860.48	93.48	856.46	94.34	TU
868.99	90.22							T
871.57	89.36							T
876.98	89.69							T
882.23	89.83	884.07	90.79	885.86	93.61	886.69	94.77	T
890.14	89.93							T
892.42	89.53							T
902.12	88.62	901.42	90.82			905.08	95.33	TM
909.70	90.29							TBROCK
916.20	90.65	916.15	90.73	918.24	93.46			TBROCK
922.31	89.17	922.39	89.58			925.41	94.33	TBROCK
930.93	88.93							T
934.80	88.99	935.30	89.59					T
942.32	88.84							T
946.29	88.90							T
963.62	88.11	963.56	89.36	960.23	92.61			T
974.07	88.69	973.85	89.40	982.19	92.58	975.92	93.22	T
998.21	88.32	998.46	89.41					T
1004.26	89.16	1004.20	89.37	1004.39	92.81	1010.05	92.76	TBROCK
1020.90	88.31	1021.26	88.66					TBROCK
1037.32	87.76	1037.61	88.71			1043.94	93.25	T
1107.03	87.51	1108.58	88.38	1073.03	93.23			TC
1118.90	87.80	1119.02	88.47	1119.04	92.00			TP
1138.52	87.48	1144.29	88.43					TM
1161.38	88.04	1160.83	88.40	1152.43	91.52	1153.75	91.91	TM
1170.32	86.81	1173.83	88.15	1178.96	90.99			T
1215.71	87.46	1215.21	88.14	1207.46	90.76	1213.45	90.86	TP
1228.65	85.79	1232.47	88.15	1239.38	90.75	1235.35	90.88	TM
1285.00	86.79	1285.02	87.11	1273.02	90.73			TU
1317.96	86.77	1317.27	87.05	1317.09	90.24			TB
1329.50	86.59	1328.92	87.00	1331.67	90.41	1327.02	90.41	TB
1334.70	86.16	1335.78	87.03					T
1394.62	85.98	1395.23	86.52	1403.70	89.75	1382.54	89.81	TU
1409.95	85.25	1410.31	86.53					T
1427.37	86.29	1427.19	86.55	1426.49	89.05	1428.41	89.46	TB
1436.65	85.70	1437.41	86.14					TP
1447.66	84.84	1450.81	86.12					TM
1462.86	85.51	1463.24	86.06	1461.40	89.27			XV
1471.68	84.11	1474.49	86.09			1478.53	89.12	T
1482.96	85.72	1483.41	86.18	1488.93	89.25			TU
1547.13	85.07	1547.18	86.10	1538.71	89.15	1527.79	89.25	TU
1561.80	84.89	1560.65	86.10	1576.57	88.81	1570.78	88.64	TP
1599.04	84.13	1597.87	86.12			1591.15	88.89	TM
1617.96	85.23	1621.73	86.14					XV
1628.32	83.55			1622.92	88.28	1622.64	88.79	T
1649.82	84.98							T
1673.77	84.47	1661.30	86.12	1676.98	88.36	1662.05	88.53	T
1685.73	83.96					1688.44	88.71	T
1711.10	84.83							XV
1717.63	83.67	1715.91	86.09	1719.18	87.72	1716.55	88.61	T
1776.02	85.47	1775.91	86.17					TCI

Project Name Price Park
Task Longitudinal Profile

Date
Crew Shaffer, Bidelspach, Clinton

Symbol Key

T	Thalweg	TU	Head of Run
TR	Head of Riffle	TM	Max Pool
TP	Head of Pool		

2002 Survey

TW Station	TW Elevation	WS Elevation	BKF Elevation	Feature
00+00.0	96.74	97.23		Fenceline
00+18.0	96.96	97.09	99.91	XVANE
00+22.0	96.01	96.80		XVANE-Max Pool
00+34.0	96.48	96.71	99.18	TR
00+60.0	95.19	96.59		TM
00+89.0	96.17	96.50	99.52	TR
01+44.0	95.47	96.57		TM
01+69.0	96.12	96.44	99.29	XVANE
01+73.0	94.50	96.44		XVANE-Max Pool
01+89.0	95.62	96.43	99.52	TR
02+25.0	95.14	96.39		TM
02+42.0	96.02	96.33	99.29	XVANE
02+47.0	94.32	95.89		XVANE-Max Pool
02+64.0	95.51	95.88	99.78	TR
03+08.0	94.24	95.75		TM
03+28.0	95.43	95.63	99.16	XVANE
03+42.0	93.87	95.03		XVANE-Max Pool
03+52.0	94.48	95.04	98.57	TR
04+06.0	93.16	95.00		TM
04+21.0	94.79	94.94	98.11	XVANE
04+30.0	93.28	94.61		XVANE-Max Pool
04+39.0	92.67	94.61	97.97	TR
04+86.0	92.06	93.86		TM
05+01.0	93.62	93.72	96.94	XVANE
05+13.0	91.03	92.87		XVANE-Max Pool
05+22.0	92.48	92.86	96.61	TR
05+68.0	91.26	92.54		TM
06+12.0	91.95	92.2	95.17	XVANE
06+20.0	90.39	92.22		XVANE-Max Pool
06+36.0	91.91	92.15	95.48	TR
06+91.0	90.40	92.02		TM
07+46.0	91.66	92.04	94.31	TR
08+00.0	90.61	91.71		TM
08+25.0	91.30	91.7	94.92	XVANE
08+32.0	89.66	91.58		XVANE-Max Pool
08+61.0	91.16	91.5	94.15	TR
09+10.0	89.78	91.34		TM
09+24.0	91.23			Top Bedrock
09+35.0	89.54	90.26		Max Pool
09+70.0	89.89	90.15	93.5	TR
10+09.0	89.02	89.91		Top Bedrock
10+15.0	89.66	89.87	93.54	TM
10+36.0	88.68	89.51		TR
10+56.0	89.1	89.51		US Box Culvert
11+23.0	88.83	89.09		DS Box Culvert
11+65.0	88.55	88.98	92.15	XVANE
11+69.0	86.56	88.75		XVANE-Max Pool
11+88.0	88.3	88.64	91.81	TR
12+30.0	86.07	88.28		TM
12+57.0	87.94	88.13	91.1	XVANE
12+61.0	86.73	87.84		XVANE-Max Pool
12+74.0	87.42	87.82	90.86	TR
13+37.0	86.52	87.68		TM
13+51.0	87.35	87.69	90.68	TR
13+82.0	87.04	87.36	90.48	Intermediate Point
14+12.0	85.79	86.95		Lateral Scour Pool
14+51.0	85.63	86.95		TM
14+64.0	85.82	86.72	89.65	XVANE
14+75.0	84.72	86.72		XVANE-Max Pool
14+92.0	86.17	86.69	89.76	TR
15+47.0	85.72	86.71		Aerial Sewer Line
15+95.0	85.18	86.66		TM
16+20.0	85.56	86.69	89.4	XVANE
16+31.0	84.18	86.66		XVANE-Max Pool
16+88.0	84.84	86.68		TM
17+09.0	85.31	86.67	89.17	XVANE
17+15.0	84.30	86.63		XVANE-Max Pool
17+76.0	85.46	86.67		DBL 10' x 8' Box Cul

As-Built Survey

TW Station	TW Elevation	WS Elevation	BKF Elevation	Feature
00+00.0	96.39	96.86		Fenceline
00+18.0	96.83	96.83	99.55	XVANE
00+24.0	95.58	96.41		XVANE-Max Pool
00+35.0	96.40	96.51	98.85	TR
00+74.0	95.31	96.32		TM
00+94.0	96.18	96.32	98.90	TR
01+44.0	95.27	96.21		TM
01+69.0	95.86	96.11	98.90	XVANE
01+74.0	94.56	96.11		XVANE-Max Pool
01+92.0	95.76	96.11	99.30	TR
02+29.0	95.27	96.11		TM
02+46.0	95.85	96.06	99.01	XVANE
02+50.0	94.79	96.04		XVANE-Max Pool
02+77.0	95.64	96.01	99.37	TR
03+13.0	94.18	95.39		TM
03+31.0	95.25	95.32	98.89	XVANE
03+43.0	93.57	94.89		XVANE-Max Pool
03+51.0	94.45	94.86	98.31	TR
04+05.0	93.40	94.86		TM
04+18.0	94.58	94.86	97.83	XVANE
04+30.0	93.11	94.85		XVANE-Max Pool
04+38.0	92.54	94.82	97.73	TR
04+83.0	91.97	93.46		TM
05+02.0	93.54	93.37	96.51	XVANE
05+13.0	90.92	92.79		XVANE-Max Pool
05+20.0	92.38	92.78	96.45	TR
05+61.0	90.91	92.33		TM
06+14.0	91.85	92.09	94.88	XVANE
06+21.0	90.67	91.94		XVANE-Max Pool
06+40.0	91.75	91.94	95.19	TR
06+89.0	90.24	91.82		TM
07+46.0	91.69	91.81	94.98	TR
07+92.0	90.46	91.44		TM
08+24.0	91.12	91.41	94.24	XVANE
08+31.0	89.74	91.28		XVANE-Max Pool
08+54.0	91.13	91.29	94.00	TR
09+11.0	90.54	91.12		TM
09+32.0	89.27	90.02		TM
09+56.0	89.7	89.99	94.15	TR
10+04.0	89.16	89.68		Top Bedrock
10+24.0	88.81	89.27	93.41	TM
10+49.0	89.07	89.25		TR
10+86.0	88.66	89.04		US Box Culvert
11+04.0	88.41	88.93		DS Box Culvert
11+64.0	88.47	88.62	91.81	XVANE
11+69.0	86.53	88.46		XVANE-Max Pool
11+85.0	88.24	88.46	91.72	TR
12+30.0	86.11	88.09		TM
12+55.0	87.84	87.95	90.9	XVANE
12+59.0	86.71	87.66		XVANE-Max Pool
12+74.0	87.41	87.62	91.07	TR
13+24.0	86.85	87.39		TM
13+48.0	87.12	87.37	90.48	TR
13+82.0	86.87	87.36		Intermediate Point
14+45.0	85.41	86.43		TM
14+64.0	86.00	86.47	89.52	XVANE
14+71.0	85.20	86.47		XVANE-Max Pool
14+96.0	86.20	86.43	89.62	TR
15+47.0	85.72	86.35		Aerial Sewer Line
15+98.0	85.23	86.35		TM
16+20.0	85.40	85.35	89.18	XVANE
16+30.0	84.70	86.35		XVANE-Max Pool
16+45.0	85.52	86.35	89.11	TR
16+86.0	84.83	86.35		TM
17+10.0	85.26	86.35	88.94	XVANE
17+76.0	85.33	86.35		DBL 10' x 8' Box Cul

Project Name	Price Park
Task	Feature Slope and Length Calculations
Date	6/6/05
Crew	Bidelspach, Shaffer, Clinton

Note about As-buuilt and Year 1 survey:
Data given is Head of Riffle and max pool, cannot calculate lengths or slope.

2003 Data
Price Park

Riffle Station	Water Change	elevation	change	slope
26		97.32		
88	62.00	96.69	0.63	1.02%
136		96.68		
172	36.00	96.47	0.21	0.58%
417		94.84		
474	57.00	93.79	1.05	1.84%
540		92.98		
549	9.00	92.71	0.27	3.01%
622		92.70		
687	65.00	92.17	0.53	0.82%
722		92.14		
763	41.00	91.91	0.23	0.56%
823		91.88		
850	27.00	91.62	0.27	0.98%
935		89.59		
963	28.00	89.36	0.24	0.85%
1021		88.66		
1108	87.00	88.38	0.28	0.32%
1160		88.40		
1173	13.00	88.15	0.25	1.92%
1232		88.15		
1285	53.00	87.11	1.04	1.96%
1335		87.03		
1395	60.00	86.52	0.51	0.85%
total	538.00			
Min	9			0.32%
Max	538.00			3.01%
Median	53.00			0.92%
total	1076.00			

2004 Data
Price Park

Riffle Station	Water Change	elevation	change	slope
55.74		96.53		
74.92	19.18	96.34	0.19	0.99%
160.02		96.22		
175.46	15.44	96.03	0.19	1.23%
232.95		96.04		
244.10	11.15	95.86	0.18	1.61%
287.62		95.55		
296.25	8.63	95.50	0.05	0.58%
332.13		94.72		
355.38	23.25	94.32	0.40	1.72%
466.12		93.95		
476.81	10.69	93.05	0.90	8.42%
535.99		92.61		
547.46	11.47	92.27	0.34	2.96%
651.31		92.31		
670.29	18.98	91.82	0.49	2.58%
741.52		91.72		
779.51	37.99	91.41	0.31	0.82%
859.27		91.22		
878.00	18.73	91.11	0.11	0.59%
902.67		91.18		
932.90	30.23	90.00	1.18	3.90%
1015.07		89.54		
1035.20	20.13	89.01	0.53	2.63%
1164.98		88.03		
1185.71	20.73	87.85	0.18	0.87%
1256.04		87.77		
1288.61	32.57	86.81	0.96	2.95%
1365.78		86.78		
1396.16	30.38	86.19	0.59	1.94%
1430.83		86.21		
1439.39	8.56	85.86	0.35	4.09%
total	318.11			

2005 Data
Price Park

Riffle Station	Water Change	elevation	change	slope
53		96.45		
71	18	96.33	0.12	0.67%
124		96.22		
139	15	96.06	0.16	1.07%
525		92.76		
551	26	92.27	0.49	1.88%
647		92.16		
667	20	91.69	0.47	2.35%
910		91.11		
948	38	89.7	1.41	3.71%
1008		89.69		
1123	115	88.89	0.80	0.70%
1186		88.69		
1204	18	88.53	0.16	0.89%
1258		88.62		
1289	31	87.8	0.82	2.65%
1366		87.64		
1400	34	87.21	0.43	1.26%
Steps				
166		96.12		
171	5	95.96	0.16	3.20%
244		95.83		
250	6	95.53	0.30	5.00%
326		95.48		
340	14	94.19	1.29	9.21%
466		93.91		
476	10	93.19	0.72	7.20%
494		93.15		
506	12	92.73	0.42	3.50%

2003 Data
Price Park

Run Station	Water Change	elevation	change	slope
88		96.69		
136	36.04	96.68	0.02	0.06%
247		95.99		
328	37.27	95.90	-0.01	-0.03%
1108		88.38		
1160	41.75	88.40	0.14	0.34%
1285		87.11		
1335	29.38	87.03	0.04	0.12%
1437		86.14		
1483	79.25	86.18	0.54	0.69%
total	223.69			

2004 Data
Price Park

Run Station	Water Change	elevation	change	slope
74.92		96.34		
160.02	85.1	96.22	0.12	0.14%
260.39		95.57		
287.62	27.23	95.55	0.02	0.07%
355.38		94.32		
372.15	16.77	94.31	0.01	0.06%
547.46		92.27		
610.8	63.34	92.29	-0.02	-0.03%
670.29		91.82		
741.52	71.23	91.72	0.1	0.14%
964.6		89.78		
1015.07	50.47	89.54	0.24	0.48%
1110.26		88.07		
1164.58	54.32	88.03	0.04	0.07%
1288.61		86.81		
1326.46	37.85	86.8	0.01	0.03%
1473.48		85.82		
1578.27	104.79	85.75	0.07	0.07%
total	511.1			

2005 Data
Price Park

Run Station	Water Change	elevation	change	slope
71		96.33		
85	14	96.22	0.11	0.79%
192		95.87		
244	52	95.83	0.04	0.08%
289		95.48		
326	37	95.48	0	0.00%
551		92.27		
605	54	92.09	0.18	0.33%
741		91.75		
870	129	91.13	0.62	0.48%
1123		88.89		
1169	46	88.64	0.25	0.54%

2003 Data
Price Park

Pool	length	p-p spacing
172		
235	63	
350		
417	67	180
474		
502	28	105
505		
540	35	35
549		
622	73	63
687		
722	35	119
763		
823	60	89
857		
916	59	94
963		
1004	41	97
1173		
1232	59	219
1395		
1427	32	209
1483		
1775	backwater from pond	
	552	

2004 Data
Price Park

Pool	length	p-p spacing	
25			
56	31		
175			
233	58	164	
245			
260	15	49	
296			
324	28	58	
372			
411	39	82	
416			P
466	50	50	
476			P
495	19	45	
501			P
536	35	33	
610			
651	41	112	
779			
820	41	169	
826			P
859	33	43	
885			
902	17	51	
1035			P
1077	42	163	
1185			
1256	71	165	
1326			
1365	39	125	
1396			
1430	34	68	
1439			P
1473	34	43	
1578	627.00		
1745	backwater from pond		

2005 Data
Price Park

Pool	length	p-p spacing
32		
53	21	
85		
124	39	62
139		
166	27	48
171		
192	21	29
250		
289	39	88
340		
466	126	134
476		
494	18	82
506		
525	19	31
605		
647	42	111
667		
741	74	78
870		
910	40	186
948		
1008	60	88
1169		
1186	17	200
1204		
1258	54	54
1289		
1366	77	97
1400		
	backwater from pond	-628
	674	-700

PROFILE	Price Park As-built - 2001			Price Park 2003*			Price Park 2004			Price Park 2005		
	Min	Max	Median	Min	Max	Median	Min	Max	Median	Min	Max	Median
Riffle Length	Not Reported			9.0	87	47	8.6	38.0	19.1	5.0	115.0	18.0
Riffle Slope	Not Reported			0.32%	3.01%	0.92%	0.58%	8.42%	1.83%	0.67%	9.21%	2.50%
Run Length	Not Reported			29.4	79	37	16.8	104.8	54.3	14.0	129.0	49.0
Run Slope	Not Reported			-0.03%	0.69%	0.12%	-0.03%	0.48%	0.07%	0.00%	0.79%	0.41%
Pool Length	Not Reported			28	73	59	15	71	35	17	126	39
ool to Pool Spacing	51	150.3	63.7	35	219	63	33	169	63	29	200	85

*revised for 2004

Project Name Price Park
Task Longitudinal Profile

Date 6/6/05
Crew Shaffer, Bidelspach, Clinton

Symbol Key			
T	Thalweg	U	Head of Run
R	Head of Riffle	M	Max Pool
P	Head of Pool	RV	Rock Cross Vane

2005 Survey

Note: Station adjusted downstream by 19 feet and elevation adjusted down by -724.60 feet

TW Station	TW Elev	WS Station	WS Elev	BKF Station	BKF Elev	Feature
20.45	96.75	32.78	96.51	29.39	98.34	rv
24.72	95.9	42.81	96.48	31.13	98.47	p
29.34	95.11	53.64	96.45	52.96	97.81	m
42.03	95.82	65.76	96.15	78.12	98.83	g
52.6	96.46	71.04	96.33	78.25	98.86	rv
66	96.17	79.3	96.36	82.17	99.72	u
71.47	95.8	85.53	96.22	107.06	99.48	p
79	96.05	90.21	96.02	110.87	99.81	g
84.81	96.22	92.79	96.19	128.46	99.83	rv
90.12	96.01	96.64	96.26	132.13	99.75	u
93.35	95.75	100.64	96.22	144.53	100.23	p
100.08	94.97	108.87	96.36	161.69	99.16	m
109.01	95.82	124.15	96.22	165.56	99.59	g
123.92	96.13	135.57	96.13	165.57	99.6	rv
136.86	95.91	139.13	96.06	166.34	99.34	u
141	95.6	143.53	96.09	198.59	99.15	p
143.67	95.16	159	96.11	209.69	99.61	m
159.02	95.4	166.06	96.12	224.82	100.41	g
164.69	95.95	171.25	95.96	235.59	99.18	rv
171.12	94.71	173.96	96.02	240.06	99.39	m
177.35	93.82	187.65	95.95	248.19	99.31	m
186.41	95.22	192.38	95.87	285.45	99.15	g
192.6	95.04	211.11	95.91	289.71	97.96	u
208.71	95.31	228.72	95.96	299.31	99.23	g
216.63	95.07	229.74	95.89	309.46	99.41	p
232.59	94.54	244.36	95.83	311.44	98.68	m
244	95.93	250.04	95.53	335.82	98.52	rv
248.58	94.53	256.41	95.46	356.91	98.36	p
255.04	93.74	283.83	95.51	377.27	98.21	m
285.19	94.85	289.4	95.48	378.33	98.03	g
287.29	95.07	298.94	95.56	388.05	97.84	r
299.62	94.43	311.41	95.35	411.64	97.61	p
306.92	94.13	326.11	95.48	427.71	97.87	m
326.18	95.25	328.73	95.06	432.28	98.17	rv
328.8	94.88	340.29	94.19	456.23	97.3	r
341.5	94.04	348.28	94.14	459.66	98.12	u
348	93.43	356.12	94.17	486.92	96.95	p
353.78	93.05	375.41	94.08	487.33	97.11	m
374.93	93.04	399.91	94.17	498.64	96.78	t
391.25	93.07	416.5	94.04	507.43	96.28	p
397.25	92.6	422.17	94.18	511.86	96.22	m
406.84	93.15	443.47	93.95	538.67	96.21	t
414.69	94.77	458.19	94.06	556.41	96.29	rv
418.05	92.99	466.28	93.91	558.91	95.56	p
429.93	92.93	476.17	93.19	567.69	95.98	m
459.16	93.4	494.77	93.15	588.68	95.42	g
468.01	93.78	498.58	93.12	589.01	95.96	r
475.97	92.91	506.46	92.73	612.87	95.49	p
484.06	92.3	524.15	92.8	614.35	95.22	m
494.43	92.89	525.12	92.76	635.78	95.15	g
498.61	93.36	551.9	92.27	649.65	95.53	rv
506.55	92.32	581.01	92.18	663	95.49	p
511.68	91.62	585.92	92.2	681.47	95.4	m
523.43	92.4	605.87	92.09	682.09	95.62	g
530.87	92.56	610.28	92.17	695.64	95.74	r
553.22	91.95	615.93	92.14	713.62	95.02	u
564.21	91.71	620.03	92.15	715.88	95.12	t
582.21	91.44	638.89	92.15	746.33	94.78	p
585.3	91.41	647.21	92.16	755.54	94.84	m
606.91	91.68	659.25	91.8	761.55	94.87	g
610.44	91.91	667.97	91.69	765.66	94.83	rv
619.89	90.88	681.47	91.78	777.56	94.94	m
639.85	91.67	684.36	91.73	787.18	94.54	g
646.4	91.88	688.41	91.68	796.29	94.28	r
658.86	91.77	719.02	91.75	798.97	93.45	u
668.51	91.36	736.91	91.65	800.1	94.22	p
671.97	91.34	744.55	91.75	823.5	93.87	m
684.69	91.37	819.87	91.49	823.61	93.57	p
689.82	90.36	826.27	91.22	826.95	93.32	m
711.15	90.28	831.76	91.18	835.94	93.35	t
736.32	91.31	854.9	91.04	845.3	94.77	g
744.39	91.54	870.41	91.13	847.01	93.7	r
765.19	91.04	889.44	91.16	858.72	93.62	u
784.31	91.42	910.76	91.11	873.65	93.54	p
795.15	89.93	923.6	89.9	875.57	95.16	m
820.14	91.05	935.13	89.85	887.15	92.82	g
824.29	91.27	948.15	89.7	888.07	95.31	rv
827.34	89.99	1003.09	89.67	893.37	94.08	p
834.27	90.92	1008.76	89.69	911.29	93.44	m
847.16	90.62	1028.8	89.38	949.4	94.12	g
855.1	90.9	1063.31	89.23	957.17	92.37	g
873.01	90.66	1109.17	89.05	963.9	93.19	p
877.83	89.64	1123.56	88.89	977.2	93.78	m
887.82	90.37	1144.16	88.57	989.96	91.89	p
893.85	89.29	1160.3	88.86	996.18	93.25	m
948.92	90.86	1164.41	88.85	1001.52	93.58	u
967.18	88.61	1169.09	88.64	1007.07	93.87	t
992.99	89.02	1179.66	88.71	1012.79	91.47	p
998.94	88.71	1183.32	88.69	1017.46	93.43	m
1003.79	89.05	1204.72	88.53	1031.2	91.23	g
1006.77	89.49	1205.07	88.22	1072.12	93.51	rv
1032.33	88.39	1216.07	88.62	1123.22	92.46	p
1037.16	88.16	1225.45	88.55	1132.71	91.28	m
1068	88.79	1241.77	88.6	1148.39	91.66	g
1109.32	88.86	1251.41	88.61	1157.63	91.31	T
1144.96	88.88	1258.08	88.62	1161.08	92.2	T
1159.07	88.35	1273.28	88.04	1175.96	91.75	G
1166.26	88.76	1289.43	87.8	1178.69	91.72	RV
1168.93	87.78	1325.72	87.65	1192.94	91.46	P
1177.98	87.42	1333.01	87.61	1210.28	91.4	M
1182.53	88.1	1341.06	87.59	1211.95	91.64	T
1185.48	88.42	1357.72	87.66	1227.2	91.58	R
1186.65	88.65	1366.01	87.64	1240.65	91.45	U

2005 Survey Continued

TW READJ	Adj Elevation	WS READJ	WS Elevation	BKF READJ	BKF Elevation	Feature
1186.65	88.65	1366.01	87.64	1175.96	91.75	U
1219.68	87.93	1392.82	87.27	1178.69	91.72	P
1222.11	86.99	1400.06	87.21	1192.94	91.46	T
1232.83	86.31	1406.26	87.22	1210.28	91.4	M
1251	87.76	1413.71	87.25	1211.95	91.64	G
1255.08	88.32	1426.93	87.26	1227.2	91.58	RV
1257.58	88.5	1433.22	87.27	1240.65	91.45	R
1269.15	87.94	1437.32	87.26	1241.31	91.54	T
1287.19	87.65	1449.97	87.24	1269.54	91.21	U
1311.32	87.16	1468.77	87.18	1272.48	91.01	T
1337.12	86.53	1471.67	87.19	1287.04	91.22	M
1359.32	86.98	1478.26	87.18	1304.44	91.09	G
1367.62	87.36	1497.57	87.16	1317.42	90.9	R
1395.71	87.07	1528.69	87.18	1317.61	90.76	P
1407.84	86.6	1549.88	87.18	1339.06	91.09	P
1415.83	85.93	1563.93	87.13	1343.2	90.54	M
1427.7	86.64	1587.44	87.15	1372.17	90.77	G
1433.67	86.73	1611.73	87.16	1379.71	90.62	U
1437.76	86.54	1633.56	87.04	1402.41	90.24	P
1451.08	85.33	1646.03	86.98	1414.36	90.18	M
1468.23	86.23	1656.14	87.06	1435.12	89.86	T
1471.61	86.34	1667.13	87.02	1456.89	89.78	RV
1479.09	85.57	1673.42	87.13	1488.15	89.91	M
1500.73	86.05	1687.78	87.07	1491.05	89.46	T
1527.47	86.48	1698.78	87.07	1534.66	89.6	P
1553.09	85.72	1706.98	86.97	1560.12	89.32	T
1563.17	85.82	1725.27	87.12	1574.15	89.15	T
1586.72	85.87	1726.97	87.04	1583.8	89.32	T
1609.84	84.75	1741.13	87.07	1604.47	88.9	T
1632.73	84.06	1742.55	87.03	1608.63	89.33	T
1645.62	85.07	1745.02	87.06	1626.96	81.25	T
1656.53	85.29	1748.45	87.07	1630.14	89.27	T
1665.87	85.23	1757.93	87.01	1649.82	88.79	T
1672.59	85.17	1759.79	87.08	1663.95	89.05	T
1689.47	84.64	1761.54	87.06	1680.02	89.56	T
1697.58	84.47	1762.97	87.06	1688.87	89.78	T
1706.69	84.9			1703.93	90.57	T
1725.06	84.5			1734.24	90.51	T
1725.99	84.58			1750.52	89.66	RV
1745.29	85.6					T
1760.95	85.17					T

Project Name Price Park
Task Longitudinal Profile

Date 6/5/04
Crew Shaffer, Bidelspach, Clinton

Symbol Key

T	Thalweg	TU	Head of Run
TR	Head of Riffle	TM	Max Pool
TP	Head of Pool		

2004 Survey

Note: Station adjusted downstream by 19 feet and elevation adjusted down by -724.60 feet

TW Station	TW Elevation	WS Station	WS Elevation	BKF Station	BKF Elevation	Feature
19.00	96.43	19.04	96.94			
20.86	96.78	20.69	96.92			TR
25.45	95.88	25.27	96.48			TP
31.58	95.05	31.38	96.48			
39.51	95.85	40.26	96.48			
55.91	96.17	55.74	96.53			TR
66.95	96.38	67.59	96.38			
75.48	95.97	74.92	96.34	83.44	98.92	Trun
92.36	96.02	92.32	96.34			
99.44	95.37	99.20	96.34	105.48	98.55	
122.08	96.08	122.18	96.29	119.09	99.38	
140.54	95.67	140.02	96.17	134.07	98.91	
144.60	95.33	146.62	96.23	142.95	99.75	
160.19	95.86	160.02	96.22	159.91	99.21	TR
167.37	96.12	167.19	96.02			
175.64	93.95	167.97	96.10			
191.48	95.10	175.46	96.03	184.17	98.72	TP
207.82	95.25	191.35	96.00			
217.68	95.11	207.76	96.06	212.94	99.22	
225.30	95.02	225.11	96.05			
233.22	94.78	232.95	96.04			TR
242.68	95.64	242.60	95.95			
244.12	95.86	244.10	95.86	239.49	98.60	Tstep
245.70	94.61	245.44	95.47			TP
254.85	93.77	254.57	95.56			
260.54	94.91	260.39	95.57	266.77	99.41	Trun
275.97	94.66	275.46	95.53	267.38	98.73	
287.75	95.25	287.62	95.55			TR
296.13	94.89	296.25	95.50	293.26	99.18	TP
303.15	93.79	324.07	95.43	309.51	98.37	Tstep
324.30	95.00	332.13	94.72	323.68	99.34	TR
326.28	95.43	346.67	94.38			
332.40	94.31	355.38	94.32			Trun
346.71	93.66	372.15	94.31			TP
355.79	93.44	385.97	94.28	343.14	98.47	
372.36	93.83	399.83	94.34	354.39	98.22	
386.10	93.37	411.29	94.31	378.40	97.81	TR - Vane piping
400.48	92.89	416.00	93.94			TP - Scour
411.72	93.59	428.55	93.79	398.58	97.23	
413.82	94.72	437.17	93.92			
416.81	93.31	453.14	93.92			
428.83	92.80	466.12	93.95			TR- Step
437.86	92.75	476.81	93.05	421.89	97.35	TP - Scour
453.83	93.24	480.89	92.91	442.17	96.89	
466.48	93.66	495.29	93.12	460.66	97.99	TR - Vane piping
477.43	92.42	501.73	92.66			TP - Scour
480.93	91.86	513.95	92.63			
495.22	92.76	535.99	92.61	482.99	96.59	TR
498.54	93.55	547.46	92.27			Trun
501.92	91.89	562.84	92.29			
513.80	91.50	580.90	92.25	510.77	96.19	
536.39	92.40	585.85	92.21			
547.75	91.88	600.64	92.19	542.37	95.41	
562.57	91.17	610.80	92.29	545.39	95.43	TP
580.88	91.14	618.40	92.15			
586.16	90.96	633.54	92.30			
600.49	91.09	651.31	92.31			TR
611.05	91.86	670.29	91.82	602.50	94.34	Trun
618.60	90.36	688.24	91.82			
633.35	91.84	696.02	91.82			
651.36	92.07	718.03	91.70	633.96	95.26	
670.81	91.48	741.52	91.72	641.21	94.35	TR
688.02	90.75	766.01	91.31			
696.41	90.90	779.51	91.41	663.92	95.46	TP
718.14	90.79	807.54	91.28			
741.73	91.40	820.34	91.23			TR - Vane piping
765.97	90.98	826.08	91.21			TP - Scour
779.00	91.24	833.65	91.20			
791.54	90.20	848.61	91.24	726.00	94.98	
807.07	90.58	859.27	91.22	748.47	94.95	TR
820.01	90.77	870.36	91.13	804.32	93.75	
823.25	91.56	878.12	91.11			
826.10	90.07	885.41	91.17			TP
833.42	89.39	899.53	91.12	833.44	94.60	
848.72	90.89	902.67	91.18			TR - Vane piping
859.62	90.92	907.60	90.98	866.32	93.46	
870.07	90.12	932.90	90.00	871.27	94.77	Bottom Step
878.26	89.85	951.93	89.85			
885.33	90.70	964.60	89.78	892.44	95.18	Trun
899.80	89.68	973.37	89.82			
902.81	89.23	986.87	89.67			
907.55	89.59	1005.47	89.81	907.97	93.07	
918.47	91.11	1015.07	89.54			TR - Step
923.98	89.78	1024.15	89.10			
932.85	89.23	1035.20	89.01	931.04	95.17	TP - Scour
951.66	88.60	1048.48	89.08	947.99	94.27	
964.99	88.61	1077.58	89.06			Culvert in
972.30	89.18	1110.26	88.07	973.48	93.01	Trun - Culvert out
987.04	89.32	1116.21	88.06	992.69	92.59	
1004.88	89.28	1122.6	88.02			
1015.11	89.36	1141.87	88.04			
1024.17	88.56	1147.96	88.02	1020.08	91.98	
1035.32	88.28	1158.47	88			
1047.70	88.50	1164.58	88.03			TR
1063.51	88.85	1168	88.02	1044.61	91.37	
1110.5	87.47	1174.56	87.84	1063.10	91.59	
1115.44	87.3	1185.71	87.85			TP
1122.63	87.57	1206.39	87.83	1075.18	91.94	
1135.89	87.5	1222.42	87.83	1118.3	91.91	
1136.97	87.55	1229.27	87.78	1146.44	90.9	
1141.77	87.22	1245.85	87.78	1184.23	90.9	
1148.07	87.51	1250.49	87.76	1212.02	90.58	
1159.18	87.41	1256.04	87.77	1217.9	90.4	TR

2004 Survey - Continued

Note: Station adjusted downstream19 feet and elevation adjusted down -724.60 feet

TW Station	TW Elevation	WS Station	WS Elevation	BKF Station	BKF Elevation	Feature
1164.97	87.83	1263.2	87.59	1218.2	91.33	
1167.81	86.97	1288.61	86.81	1222.46	90.26	Trun
1174.93	86.64	1296.92	86.85	1231.45	90.65	
1185.81	87.81	1326.46	86.8			TP
1206.37	87.36	1331.03	86.73	1248.92	90.61	
1222.99	86.91	1337.13	86.78	1254.35	90.14	
1229.62	85.37	1347.87	86.77	1262.55	90.17	
1245.47	86.24	1365.78	86.78	1266.53	90.26	TR
1250.6	86.97	1396.16	86.19	1286.64	90.31	TP
1256.04	87.56	1398.79	86.22			
1288.67	86.55	1406.69	86.25	1310.3	89.8	
1296.67	86.25	1412.24	86.22	1317.35	89.82	
1315.04	86.38	1423.92	86.22			
1323.99	86.67	1430.83	86.21	1331.14	89.74	TR - Step
1326.56	86.3	1439.39	85.86	1355.05	90.2	TP - Scour
1330.71	86.52	1445.32	85.84	1356.39	89.92	
1337.06	85.66	1450.86	85.81	1370.72	90.08	
1348	86.18	1473.48	85.82			Trun - begin bac
1365.51	86.54	1477.4	85.77	1398.83	89.2	
1396.42	86.08	1483.95	85.75	1420.56	89.2	
1398.88	85.73	1504.54	85.83	1428.97	88.98	
1406.85	85.7	1512.56	85.8	1434.41	89.03	
1412.04	85.2	1522.56	85.83	1445.86	89.15	
1423.95	85.41	1531.57	85.8	1459.28	88.77	
1430.91	85.97	1547.88	85.8	1478.34	88.71	
1439.16	85.67	1556.69	85.71	1482.51	88.97	
1445.35	84.9	1564.59	85.73	1537.03	88.72	
1450.74	84.67	1578.27	85.75	1537.73	88.8	TP
1466.32	85.1	1598.34	85.73			
1467.34	85.77	1619.2	85.78	1572.38	88.5	
1467.7	85.24	1626.34	85.72	1581.87	87.88	
1472.77	84.61	1635.28	85.76	1584.82	88.44	
1476.87	84.03	1642.49	85.77	1603.53	88.15	
1483.85	85.14	1663.2	85.72	1617.16	87.61	
1504.47	85.12	1676.59	85.73	1621.54	88.22	
1512.07	84.96	1694.88	85.77			
1522.3	85.54	1706.77	85.77	1630.86	87.92	
1531.44	85.36	1721.56	85.85	1649.96	88.23	
1547.78	85.33	1729.84	85.7	1654.14	87.96	
1556.37	84.78	1736.06	85.82	1674.77	87.99	
1564.31	84.66	1745.22	85.77	1678.7	88.2	
1577.85	85.05			1687.38	88.08	
1598.32	84.52			1692.72	88.46	
1610.59	84.12			1727.85	87.41	
1619.2	84.75					
1626.32	85.09			1728.39	88.3	
1634.48	83.34					
1642.54	84.39					
1663.14	84.67					
1676.55	84.44					
1694.33	83.87					
1706.36	84.17					
1721.45	84.29					
1729.56	83.08					
1735.35	84.43					
1745.06	84.75					
1763.66	84.43					

2003 Survey

Note: Station adjusted downstream by 10 feet and elevation adjusted up by 2.0 feet

TW Station	TW Elev	WS Station	WS Elev	LBKF Station	LBKF Elev	RBKF Station	RBKF Elevation	Feature
10.00	97.05			13.93	99.90	12.86	100.46	XV
24.12	95.75			23.38	99.98			T
24.33	95.75	26.66	97.32			28.28	99.77	T
47.94	96.28	47.53	97.06	52.35	99.72	53.58	99.71	TP
61.95	95.41	63.03	96.86	72.03	99.50	62.05	99.74	TM
87.88	96.04	88.17	96.69			79.94	99.80	TU
125.61	95.91	124.21	96.67	112.25	99.44			TP
136.14	95.40	136.81	96.68	139.91	99.47	136.45	100.02	TM
156.38	96.20	157.56	96.62	159.15	99.44	159.87	99.33	XV
171.14	94.25	172.40	96.47					T
182.85	95.61	183.04	96.49	190.37	99.64			TU
200.87	95.39	200.29	96.50	192.18	99.57			TP
218.05	95.16	220.31	96.50					TM
236.13	96.10	235.19	96.52	227.74	99.34			XV
246.11	94.48	247.95	95.99					T
290.00	95.23	289.70	95.85	284.17	99.56			TP
308.26	94.24	310.34	95.82			306.32	99.59	TM
327.71	95.54	328.94	95.90	322.72	99.03	336.35	99.33	XV
349.57	93.97	350.14	94.90	338.22	99.01			T
360.88	93.49	362.20	94.85	365.59	98.99			T
377.52	93.76	379.52	94.86			378.86	98.44	TP
401.05	93.02	403.96	94.90			394.01	98.12	TM
416.47	94.56	417.05	94.84	416.24	98.15	426.62	98.38	XV
431.23	93.15			445.98	97.63			TP
475.59	93.48	474.31	93.79	465.50	97.50			TP
484.16	92.36	485.40	93.87					TM
495.25	92.76	496.02	93.83	498.98	96.89			T
502.66	93.87	502.78	93.64					XV
506.04	92.42	505.56	93.00					T
517.05	91.75	517.67	92.97			517.25	96.74	T
528.75	92.24	529.62	92.97	531.01	96.68			T
540.07	92.78	540.36	92.98					T
550.63	92.56	549.82	92.71			553.22	95.92	TU
564.38	91.63			570.37	95.84			TP
588.00	91.10	588.04	92.70	592.32	95.44			TM
608.39	91.73	608.74	92.72			604.23	95.75	TG
611.82	92.48	611.58	92.71	616.15	95.84			T
622.19	90.79	622.08	92.70					T
636.20	91.99			647.63	95.64	640.16	95.39	T
673.22	91.86	674.37	92.22			673.30	95.81	TU
688.06	91.25	687.99	92.17	681.05	95.47	690.20	96.19	TP
705.81	90.78	706.58	92.18					TM
721.59	91.33	722.91	92.14	712.72	95.38	723.38	95.38	TG
763.64	91.45	763.83	91.91	758.71	95.26	757.33	95.20	TU
783.25	91.20	783.82	91.92	788.26	94.81	789.89	94.98	TP
797.24	90.46							TM
809.78	91.02	810.06	91.92					T
824.13	91.64	823.76	91.88			824.37	94.93	XV
830.26	89.78							T
842.23	89.78			841.72	94.04			T
850.19	91.26	850.11	91.62			849.62	95.14	T
851.20	90.52	851.16	90.85					T
857.51	90.52	857.19	90.79	860.48	93.48	856.46	94.34	TU
868.99	90.22							T
871.57	89.36							T
876.98	89.69							T
882.23	89.83	884.07	90.79	885.86	93.61	886.69	94.77	T
890.14	89.93							T
892.42	89.53							T
902.12	88.62	901.42	90.82			905.08	95.33	TM
909.70	90.29							TBROCK
916.20	90.65	916.15	90.73	918.24	93.46			TBROCK
922.31	89.17	922.39	89.58			925.41	94.33	TBROCK
930.93	88.93							T
934.80	88.99	935.30	89.59					T
942.32	88.84							T
946.29	88.90							T
963.62	88.11	963.56	89.36	960.23	92.61			T
974.07	88.69	973.85	89.40	982.19	92.58	975.92	93.22	T
998.21	88.32	998.46	89.41					T
1004.26	89.16	1004.20	89.37	1004.39	92.81	1010.05	92.76	TBROCK
1020.90	88.31	1021.26	88.66					TBROCK
1037.32	87.76	1037.61	88.71			1043.94	93.25	T
1107.03	87.51	1108.58	88.38	1073.03	93.23			TC
1118.90	87.80	1119.02	88.47	1119.04	92.00			TP
1138.52	87.48	1144.29	88.43					TM
1161.38	88.04	1160.83	88.40	1152.43	91.52	1153.75	91.91	TM
1170.32	86.81	1173.83	88.15	1178.96	90.99			T
1215.71	87.46	1215.21	88.14	1207.46	90.76	1213.45	90.86	TP
1228.65	85.79	1232.47	88.15	1239.38	90.75	1235.35	90.88	TM
1285.00	86.79	1285.02	87.11	1273.02	90.73			TU
1317.96	86.77	1317.27	87.05	1317.09	90.24			TB
1329.50	86.59	1328.92	87.00	1331.67	90.41	1327.02	90.41	TB
1334.70	86.16	1335.78	87.03					T
1394.62	85.98	1395.23	86.52	1403.70	89.75	1382.54	89.81	TU
1409.95	85.25	1410.31	86.53					T
1427.37	86.29	1427.19	86.55	1426.49	89.05	1428.41	89.46	TB
1436.65	85.70	1437.41	86.14					TP
1447.66	84.84	1450.81	86.12					TM
1462.86	85.51	1463.24	86.06	1461.40	89.27			XV
1471.68	84.11	1474.49	86.09			1478.53	89.12	T
1482.96	85.72	1483.41	86.18	1488.93	89.25			TU
1547.13	85.07	1547.18	86.10	1538.71	89.15	1527.79	89.25	TU
1561.80	84.89	1560.65	86.10	1576.57	88.81	1570.78	88.64	TP
1599.04	84.13	1597.87	86.12			1591.15	88.89	TM
1617.96	85.23	1621.73	86.14					XV
1628.32	83.55			1622.92	88.28	1622.64	88.79	T
1649.82	84.98							T
1673.77	84.47	1661.30	86.12	1676.98	88.36	1662.05	88.53	T
1685.73	83.96					1688.44	88.71	T
1711.10	84.83							XV
1717.63	83.67	1715.91	86.09	1719.18	87.72	1716.55	88.61	T
1776.02	85.47	1775.91	86.17					TCI

Task	Channel Pattern Measurements
	Price Park
Date	2005
Crew	Clinton

Price Park As-Built			2004			2005				
Radius of Curvature	**Meander Wavelength**	**Channel Beltwidth**	**Radius of Curvature**	**Meander Wavelength**	**Channel Beltwidth**	**Radius of Curvature**	**Change in Radius over past year**	**Meander Wavelength**	**Change in Wavelength over past year**	**Channel Beltwidth**
59.5		49-80	72.4	136.3	52.9	71.5	-0.9	136.0	-0.3	62.0
64.5	127		54.0	145.6	45.5	60.3	6.3	152.0	6.4	59.0
48.5	135		26.6	137.0	61.7	29.3	2.7	141.0	4.0	75.0
59.5	139		38.3	125.6	50.0	38.2	-0.1	140.0	14.5	65.0
76.5	152		40.2	138.7	53.4	43.3	3.2	141.0	2.3	61.0
68.5	150		44.7	169.5	75.3	51.6	6.9	147.0	-22.5	80.0
55.5	145		45.6	188.1	69.5	49.5	4.0	182.0	-6.1	76.0
72.5	174		54.2	177.0	74.3	48.9	-5.3	185.0	8.0	82.0
53.5	183		35.7	164.0	70.0	34.6	-1.1	164.0	0.0	83.0
69.5	166		57.4		81.9	58.7	1.3			89.0
83.8			62.1	150.1	74.8	53.5	-8.6	153.0	2.9	76.0
64.0		52-95	61.0	176.0	75.9	60.7	-0.3	159.0	-17.0	74.0
47.5	118		34.9	193.4	96.8	38.0	3.1	196.0	2.6	94.0
61.0	170		36.7	211.6	85.7	34.2	-2.5	202.0	-9.6	87.0
59.5	197		39.4			34.9	-4.5			
53.5	179		39.3			42.5	3.3			
61.5	123		61.3			63.2	1.9			
84.5										
47.5	118.0	***Min***	26.6	125.6	45.5	29.3	-8.6	136.0	-22.5	59.0
84.5	197.0	***Max***	72.4	211.6	96.8	71.5	6.9	202.0	14.5	94.0
63.5	154.1	***Avg***	47.3	162.5	69.1	47.8	0.6	161.4	-1.1	75.9

Task	GPS POINTS
	Price Park
Date	2005
Crew	Clinton

						WGS_1984_UTM_Zone_		NAD_1983_StatePlane_N		GCS_North_American_198	
Location	Plot Number	Northing	Easting	Notes	Start Photo Number	EASTING	NORTHING	EASTING	NORTHING	LONGITUDE	LATITUDE
Price Park	1	3996096	600688	top of project	Veg Plot #1	600688	3996096	530240.54	261524.84	-79.88137	36.10429
Price Park	2	3996199	600741	xvane	Veg Plot #2	600741	3996199	530295.64	261626.76	-79.88077	36.10521
Price Park	3	3996343	600874		Veg Plot #3	600874	3996343	530431.58	261768.06	-79.87928	36.10650
Price Park	4	3996394	600917		Veg Plot #4	600917	3996394	530475.62	261818.19	-79.87879	36.10695
Price Park	5	3996394	600898	xvane	Veg Plot #5	600898	3996394	530456.62	261818.57	-79.87900	36.10696
Price Park	6	3996347	600897	romu	Veg Plot #6	600897	3996347	530454.67	261771.59	-79.87902	36.10653
Price Park	7	3996252	600797	bare, privet	Veg Plot #7	600797	3996252	530352.72	261678.63	-79.88014	36.10569
Price Park	8	3996137	600726		Veg Plot #8	600726	3996137	530279.37	261565.07	-79.88095	36.10466