
Appendix F

Detailed Cost Estimates

COST ESTIMATION
Broad Run Watershed Study
Potential BMP Repairs and Retrofits

Watershed	Site ID	Drainage Area (acres)	Percent Impervious	Approximate Impervious Area (acres)	Size of Basin (SF)	Type of Project
Trib. To Rocky Branch (244)	244-688	32.3	39%	12.7	54,900	WQ Retrofit
	244-689	65.8	28%	18.4	44,900	Major Repair
Rocky Branch (246)						
	246-395	8.4	49%	4.1	5,200	WQ Retrofit
	246-5050	22.6	50%	11.4	30,900	WQ Retrofit
Dawkings Branch (262)	262-13	2.7	61%	1.6	6,195	Major Repair
	262-281	1.3	70%	0.9	2,100	Rebuild
	262-435	2.0	77%	1.5	1,800	Major Repair
	262-494	47.1	37%	17.5	148,500	WQ Retrofit
	262-5239	2.4	54%	1.3	3,010	Major Repair
	262-5361	2.8	90%	2.5	3,600	Major Repair
		187.2		71.9		

CONSTRUCTION COSTS BASED CENTER FOR WATERSHED PROTECTION RESEARCH

Cost based on acres of impervious surface treated

Type of BMP	Low Cost	Median Cost	High Cost
Pond Retrofit	\$3,600	\$11,100	\$37,100
New Const. Wetlands	\$2,000	\$2,900	\$9,600
New Extended Detention	\$2,200	\$3,800	\$7,500

Watershed	Site ID	Low Cost	Median Cost	High Costs	Type of Project
Trib. To Rocky Branch (244)	244-688	\$45,814	\$141,261	\$472,142	WQ Retrofit
	244-689	na	na	na	Major Repair
Rocky Branch (246)					
	246-395	\$14,687	\$45,284	\$151,356	WQ Retrofit
	246-5050	\$40,924	\$126,183	\$421,745	WQ Retrofit
Dawkings Branch (262)	262-13	na	na	na	Major Repair
	262-281	na	na	na	Rebuild
	262-435	na	na	na	Major Repair
	262-494	\$63,076	\$194,485	\$650,037	WQ Retrofit
	262-5239	na	na	na	Major Repair
	262-5361	na	na	na	Major Repair
Totals		\$164,502	\$507,213	\$1,695,280	

COSTS BASED ON UNIT COSTS FOR EACH FACILITY
(includes site specific costs)

Watershed	Site ID	Costs Const.	Design 30%	Contingency 20%	Total	WQ Retrofit \$/Imp Acre
Trib. To Rocky Branch (244)	244-688	\$89,013	\$26,704	\$23,144	\$138,861	\$10,911
	244-689	\$74,097	\$22,229	\$19,265	\$115,592	na
Rocky Branch (246)	246-243	na	\$25,000	na	\$25,000	na
	246-395	\$22,120	\$6,636	\$5,751	\$34,507	\$8,458
	246-5050	\$61,035	\$18,310	\$15,869	\$95,214	\$8,376
Dawkings Branch (262)	262-13	\$9,607	\$2,882	\$2,498	\$14,988	\$9,222
	262-281	\$20,436	\$6,131	\$5,313	\$31,879	\$36,330
	262-435	\$22,880	\$6,864	\$5,949	\$35,693	\$23,802
	262-494	\$223,982	\$67,195	\$58,235	\$349,412	\$19,942
	262-5239	\$35,876	\$10,763	\$9,328	\$55,966	\$43,184
	262-5361	\$11,917	\$3,575	\$3,098	\$18,590	\$7,377
Total		\$570,963	\$196,289	\$148,450	\$915,702	

Not to Standards

Broad Run Watershed Study

Prince William County, Virginia

Conceptual Narrative Cost Estimate

Site Number **244-688**
Site Name **Water Quality Retrofit**

ITEM	AMOUNT	
FOOT PRINT sf	54,900	sf
DEPTH OF EX. FT	1	ft
Volume	54,900	cf
10% Forebay Area	5,490	sf
70 % Emergent Area	38,430	sf
20% ED / Upland Areas	10,980	sf
10% Micropool Area	5,490	sf

		Unit Costs	Quantity	Cost
Excavation Dry Sediment	CY	\$25	2,033	\$50,833
Excavate Wet Sediment	CY	\$75	0	\$0
Top Soil 4 inchs, SY	SY	\$5	0	\$0
Tree/shrubs	EA	\$35	110	\$3,843
Emergent Plants	EA	\$4	4,270	\$14,945
Minor Outlet Modification	EA	\$1,000	1	\$1,000
Major Outlet Mod, ea	EA	\$5,000	0	\$0
Forebay Construction	EA	\$5,000	2	\$10,000
Replace Riser	LS	\$25,000	0	\$0
Stabilize Inlet	EA	\$500	0	\$0
Tree/Shrub Removal	LS	\$500	0	\$0
Stabilize Slope with Matting	SY	\$4	0	\$0
Repair Fencing	LF	\$25	0	\$0
Repair Spillway	LS	\$500	0	\$0
Stabilize Headcuts	EA	\$2,000	0	\$0
Mowing	LS	\$500	0	\$0
Minor LF Orific Clean Out	LS	\$200	0	\$0
Litter/ Debris Removal	LS	\$300	1	\$300

TOTAL:		\$80,921
Mobilization		\$8,092

Total Construction Costs		\$89,013
Engineering and Survey	30%	\$26,704
Contingency	20%	\$23,144
TOTAL COSTS		\$138,861

Broad Run Watershed Study

Prince William County, Virginia

Conceptual Narrative Cost Estimate

Site Number **244-689**
 Site Name **Major Repair, Dredging and Forebays**

ITEM **AMOUNT**
 FOOT PRINT sf 44,900 sf
 DEPTH OF EX 1.5 ft
 Volume 67,350 cf

		Unit Costs	Quantity	Cost
Excavation Dry Sediment	CY	\$25	2,494	\$62,361
Excavate Wet Sediment	CY	\$75	0	\$0
Top Soil 4 inchs, SY	SY	\$5	0	\$0
Tree/shrubs	EA	\$35	0	\$0
Emergent Plants	EA	\$4	0	\$0
Minor Outlet Modification	EA	\$1,000	0	\$0
Major Outlet Mod, ea	EA	\$5,000	0	\$0
Forebay Construction	EA	\$5,000	1	\$5,000
Replace Riser	LS	\$25,000	0	\$0
Stabilize Inlet	EA	\$500	0	\$0
Tree/Shrub Removal	LS	\$500	0	\$0
Stabilize Slope with Matting	SY	\$4	0	\$0
Repair Fencing	LF	\$25	0	\$0
Repair Spillway	LS	\$500	0	\$0
Stabilize Headcuts	EA	\$2,000	0	\$0
Mowing	LS	\$500	0	\$0
Minor LF Orific Clean Out	LS	\$200	0	\$0
Litter/ Debris Removal	LS	\$300	0	\$0
TOTAL:				\$67,361
Mobilization				\$6,736

Total Construction Costs		\$74,097
Engineering and Survey	30%	\$22,229
Contingency	20%	\$19,265
TOTAL COSTS		\$115,592

Broad Run Watershed Study

Prince William County, Virginia

Conceptual Narrative Cost Estimate

Site Number **246-395**
 Site Name **WQ repair**

ITEM **AMOUNT**
 FOOT PRINT sf 5,200 sf
 DEPTH OF EX 3 ft
 Volume 15,600 cf

Forebay size 1,000 sf Excavate 2 feet

		Unit Costs	Quantity	Cost
Excavation Dry Sediment	CY	\$25	578	\$14,444
Backfill with Gravel	CY	\$25	578	\$14,444
Excavate Wet Soils	CY	\$75	74	\$5,556
Top Soil 4 inchs, SY	SY	\$5	0	\$0
Tree/shrubs	EA	\$35	0	\$0
Emergent Plants	EA	\$4	0	\$0
Minor Outlet Modification	EA	\$1,000	0	\$0
Major Outlet Mod, ea	EA	\$5,000	0	\$0
Forebay Construction	EA	\$5,000	0	\$0
Replace Riser	LS	\$25,000	0	\$0
Stabilize Inlet	EA	\$500	0	\$0
Tree/Shrub Removal	LS	\$500	1	\$500
Stabilize Slope with Matting	SY	\$4	0	\$0
Repair Fencing	LF	\$25	0	\$0
Repair Spillway	LS	\$500	0	\$0
Stabilize Headcuts	EA	\$2,000	0	\$0
Mowing	LS	\$500	0	\$0
Minor LF Orific Clean Out	LS	\$200	0	\$0
Litter/ Debris Removal	LS	\$300	1	\$300
TOTAL:				\$35,244
Mobilization				\$3,524

Total Construction Costs		\$38,769
Engineering and Survey	30%	\$11,631
Contingency	20%	\$10,080
TOTAL COSTS		\$60,479

Broad Run Watershed Study

Prince William County, Virginia

Conceptual Narrative Cost Estimate

Site Number **246-395**
Site Name **WQ retrofit**

ITEM	AMOUNT		
FOOT PRINT sf	1,200	sf	
DEPTH OF EX	3	ft	
Volume	3,600	cf	
Forebay size	1,000	sf	Excavate 2 feet

		Unit Costs	Quantity	Cost
Excavation Dry Sediment	CY	\$25	133	\$3,333
Backfill with Bioretention soils	CY	\$75	133	\$10,000
Excavate Wet Soils	CY	\$75	74	\$5,556
Top Soil 4 inchs, SY	SY	\$5	0	\$0
Tree/shrubs	EA	\$35	12	\$420
Emergent Plants	EA	\$4	0	\$0
Minor Outlet Modification	EA	\$1,000	0	\$0
Major Outlet Mod, ea	EA	\$5,000	0	\$0
Forebay Construction	EA	\$5,000	0	\$0
Replace Riser	LS	\$25,000	0	\$0
Stabilize Inlet	EA	\$500	0	\$0
Tree/Shrub Removal	LS	\$500	1	\$500
Stabilize Slope with Matting	SY	\$4	0	\$0
Repair Fencing	LF	\$25	0	\$0
Repair Spillway	LS	\$500	0	\$0
Stabilize Headcuts	EA	\$2,000	0	\$0
Mowing	LS	\$500	0	\$0
Minor LF Orific Clean Out	LS	\$200	0	\$0
Litter/ Debris Removal	LS	\$300	1	\$300

TOTAL:	\$20,109
Mobilization	\$2,011

Total Construction Costs		\$22,120
Engineering and Survey	30%	\$6,636
Contingency	20%	\$5,751
TOTAL COSTS		\$34,507

Broad Run Watershed Study

Prince William County, Virginia

Conceptual Narrative Cost Estimate

Site Number **262-281**
Site Name **Major Repair, Reconstruction**

ITEM **AMOUNT**
 FOOT PRINT sf 2,100 sf
 DEPTH OF EX 4 ft
 Volume 8,400 cf

		Unit Costs	Quantity	Cost
Excavation Dry Sediment	CY	\$25	311	\$7,778
Excavate Wet Sediment	CY	\$75	0	\$0
Top Soil 4 inchs, SY	SY	\$5	0	\$0
Tree/shrubs	EA	\$35	0	\$0
Emergent Plants	EA	\$4	0	\$0
Minor Outlet Modification	EA	\$1,000	0	\$0
Major Outlet Mod, ea	EA	\$5,000	1	\$5,000
Forebay Construction	EA	\$5,000	1	\$5,000
Replace Riser	LS	\$25,000	0	\$0
Stabilize Inlet	EA	\$500	0	\$0
Tree/Shrub Removal	LS	\$500	1	\$500
Stabilize Slope with Matting	SY	\$4	0	\$0
Repair Fencing	LF	\$25	0	\$0
Repair Spillway	LS	\$500	0	\$0
Stabilize Headcuts	EA	\$2,000	0	\$0
Mowing	LS	\$500	0	\$0
Minor LF Orific Clean Out	LS	\$200	0	\$0
Litter/ Debris Removal	LS	\$300	1	\$300
TOTAL:				\$18,578
Mobilization				\$1,858

Total Construction Costs		\$20,436
Engineering and Survey	30%	\$6,131
Contingency	20%	\$5,313
TOTAL COSTS		\$31,879

Broad Run Watershed Study

Prince William County, Virginia

Conceptual Narrative Cost Estimate

Site Number **262-494**
Site Name **Water Quality Retrofit**

ITEM	AMOUNT
FOOT PRINT sf	148,500 sf
DEPTH OF EX	1 ft
Volume	148,500 cf
10% Forebay Area	14,850 sf
70 % Emergent Area	103,950 sf
20% ED / Upland Areas	29,700 sf
10% Micropool Area	14,850 sf

		Unit Costs	Quantity	Cost
Excavation Dry Sediment	CY	\$25	5,500	\$137,500
Excavate Wet Sediment	CY	\$75	0	\$0
Top Soil 4 inchs, SY	SY	\$5	0	\$0
Tree/shrubs	EA	\$35	297	\$10,395
Emergent Plants	EA	\$4	11,550	\$40,425
Minor Outlet Modification	EA	\$1,000	0	\$0
Major Outlet Mod, ea	EA	\$5,000	1	\$5,000
Forebay Construction	EA	\$5,000	2	\$10,000
Replace Riser	LS	\$25,000	0	\$0
Stabilize Inlet	EA	\$500	0	\$0
Tree/Shrub Removal	LS	\$500	0	\$0
Stabilize Slope with Matting	SY	\$4	0	\$0
Repair Fencing	LF	\$25	0	\$0
Repair Spillway	LS	\$500	0	\$0
Stabilize Headcuts	EA	\$2,000	0	\$0
Mowing	LS	\$500	0	\$0
Minor LF Orific Clean Out	LS	\$200	0	\$0
Litter/ Debris Removal	LS	\$300	1	\$300

TOTAL:	\$203,620
Mobilization	\$20,362

Total Construction Costs		\$223,982
Engineering and Survey	30%	\$67,195
Contingency	20%	\$58,235
TOTAL COSTS		\$349,412

Broad Run Watershed Study

Prince William County, Virginia

Conceptual Narrative Cost Estimate

Site Number **246-5050**
Site Name **Water Quality Retrofit**

ITEM	AMOUNT	
FOOT PRINT sf	30,900	sf
DEPTH OF EX	1	ft
Volume	30,900	cf
10% Forebay Area	3,090	sf
70 % Emergent Area	21,630	sf
20% ED / Upland Areas	6,180	sf
10% Micropool Area	3,090	sf

		Unit Costs	Quantity	Cost
Excavation Dry Sediment	CY	\$25	1,144	\$28,611
Excavate Wet Sediment	CY	\$75	0	\$0
Top Soil 4 inchs, SY	SY	\$5	0	\$0
Tree/shrubs	EA	\$35	62	\$2,163
Emergent Plants	EA	\$4	2,403	\$8,412
Minor Outlet Modification	EA	\$1,000	1	\$1,000
Major Outlet Mod, ea	EA	\$5,000	0	\$0
Forebay Construction	EA	\$5,000	3	\$15,000
Replace Riser	LS	\$25,000	0	\$0
Stabilize Inlet	EA	\$500	0	\$0
Tree/Shrub Removal	LS	\$500	0	\$0
Stabilize Slope with Matting	SY	\$4	0	\$0
Repair Fencing	LF	\$25	0	\$0
Repair Spillway	LS	\$500	0	\$0
Stabilize Headcuts	EA	\$2,000	0	\$0
Mowing	LS	\$500	0	\$0
Minor LF Orific Clean Out	LS	\$200	0	\$0
Litter/ Debris Removal	LS	\$300	1	\$300

TOTAL:				\$55,486
Mobilization				\$5,549

Total Construction Costs		\$61,035
Engineering and Survey	30%	\$18,310
Contingency	20%	\$15,869
TOTAL COSTS		\$95,214

Broad Run Watershed Study

Prince William County, Virginia

Conceptual Narrative Cost Estimate

Site Number **262-5239**
Site Name **Major Repair,**

ITEM	AMOUNT	
FOOT PRINT sf	3,010	sf
DEPTH OF EX	3	ft
Volume	9,030	cf
10% Forebay Area	301	sf
70 % Emergent Area	2,107	sf
20% ED / Upland Areas	602	sf
10% Micropool Area	903	sf

		Unit Costs	Quantity	Cost
Excavation Dry Sediment	CY	\$25	334	\$8,361
Backfill with Bioretention Soils	CY	\$75	223	\$16,722
Top Soil 4 inchs, SY	SY	\$5	0	\$0
Tree/shrubs	EA	\$35	6	\$211
Emergent Plants	EA	\$4	234	\$820
Minor Outlet Modification	EA	\$1,000	1	\$1,000
Major Outlet Mod, ea	EA	\$5,000	0	\$0
Forebay Construction	EA	\$5,000	1	\$5,000
Replace Riser	LS	\$25,000	0	\$0
Stabilize Inlet	EA	\$500	0	\$0
Tree/Shrub Removal	LS	\$500	1	\$500
Stabilize Slope with Matting	SY	\$4	0	\$0
Repair Fencing	LF	\$25	0	\$0
Repair Spillway	LS	\$500	0	\$0
Stabilize Headcuts	EA	\$2,000	0	\$0
Mowing	LS	\$500	0	\$0
Minor LF Orific Clean Out	LS	\$200	0	\$0
Litter/ Debris Removal	LS	\$300	0	\$0

TOTAL:		\$32,614
Mobilization		\$3,261

Total Construction Costs		\$35,876
Engineering and Survey	30%	\$10,763
Contingency	20%	\$9,328
TOTAL COSTS		\$55,966

Broad Run Watershed Study

Prince William County, Virginia

Conceptual Narrative Cost Estimate

Site Number **262-5136**
 Site Name **Major Repair**

ITEM	AMOUNT
FOOT PRINT sf	3,600 sf
DEPTH OF EX	0.3 ft
Volume	900 cf

		Unit Costs	Quantity	Cost
Excavation Dry Sediment	CY	\$25	33	\$833
Backfill with Bioretention Soils	CY	\$75	0	\$0
Top Soil 4 inchs, SY	SY	\$5	0	\$0
Tree/shrubs	EA	\$35	0	\$0
Emergent Plants	EA	\$4	0	\$0
Minor Outlet Modification	EA	\$1,000	0	\$0
Major Outlet Mod, ea	EA	\$5,000	1	\$5,000
Forebay Construction	EA	\$5,000	1	\$5,000
Replace Riser	LS	\$25,000	0	\$0
Stabilize Inlet	EA	\$500	0	\$0
Tree/Shrub Removal	LS	\$500	0	\$0
Stabilize Slope with Matting	SY	\$4	0	\$0
Repair Fencing	LF	\$25	0	\$0
Repair Spillway	LS	\$500	0	\$0
Stabilize Headcuts	EA	\$2,000	0	\$0
Mowing	LS	\$500	0	\$0
Minor LF Orific Clean Out	LS	\$200	0	\$0
Litter/ Debris Removal	LS	\$300	0	\$0
TOTAL:				\$10,833
Mobilization				\$1,083

Total Construction Costs		\$11,917
Engineering and Survey	30%	\$3,575
Contingency	20%	\$3,098
TOTAL COSTS		\$18,590

Broad Run Watershed Study

Prince William County, Virginia

Conceptual Narrative Cost Estimate

Site Number **262-13**
Site Name **Major Repair**

ITEM **AMOUNT**
 FOOT PRINT sf 6,195 sf
 DEPTH OF EX 0.3 ft
 Volume 1,549 cf

		Unit Costs	Quantity	Cost
Excavation Dry Sediment	CY	\$25	57	\$1,434
Backfill with Bioretention Soils	CY	\$75	0	\$0
Top Soil 4 inchs, SY	SY	\$5	0	\$0
Tree/shrubs	EA	\$35	0	\$0
Emergent Plants	EA	\$4	0	\$0
Minor Outlet Modification	EA	\$1,000	1	\$1,000
Major Outlet Mod, ea	EA	\$5,000	0	\$0
Forebay Construction	EA	\$5,000	1	\$5,000
Replace Riser	LS	\$25,000	0	\$0
Stabilize Inlet	EA	\$500	1	\$500
Tree/Shrub Removal	LS	\$500	1	\$500
Stabilize Slope with Matting	SY	\$4	0	\$0
Repair Fencing	LF	\$25	0	\$0
Repair Spillway	LS	\$500	0	\$0
Stabilize Headcuts	EA	\$2,000	0	\$0
Mowing	LS	\$500	0	\$0
Minor LF Orific Clean Out	LS	\$200	0	\$0
Litter/ Debris Removal	LS	\$300	1	\$300
TOTAL:				\$8,734
Mobilization				\$873

Total Construction Costs		\$9,607
Engineering and Survey	30%	\$2,882
Contingency	20%	\$2,498
TOTAL COSTS		\$14,988

Broad Run Watershed Study

Prince William County, Virginia

Conceptual Narrative Cost Estimate

Site Number **250-3**
Site Name **Pond Restoration / Stream Enhancement**

ITEM	AMOUNT	
FOOT PRINT sf	8,700	sf
DEPTH OF EX	4.0	ft
Volume	34,800	cf
Wetland Area	4,300	sf
Buffer	600	lf

		Unit Costs	Quantity	Cost
Excavation Dry Sediment	CY	\$25	1,289	\$32,222
Backfill with Bioretention Soils	CY	\$75	0	\$0
Top Soil 4 inchs, SY	SY	\$5	0	\$0
Tree/shrubs	EA	\$35	100	\$3,500
Emergent Plants	EA	\$4	478	\$1,673
Minor Outlet Modification	EA	\$1,000	0	\$0
Major Outlet Mod, ea	EA	\$5,000	0	\$0
Forebay Construction	EA	\$5,000	1	\$5,000
Replace Riser	LS	\$25,000	1	\$25,000
Streambank Stabilization	LF	\$75	600	\$45,000
Tree/Shrub Removal	LS	\$500	0	\$0
Stabilize Slope with Matting	SY	\$4	0	\$0
Repair Fencing	LF	\$25	0	\$0
Repair Spillway	LS	\$500	0	\$0
Stabilize Headcuts	EA	\$2,000	0	\$0
Mowing	LS	\$500	0	\$0
Minor LF Orific Clean Out	LS	\$200	0	\$0
Litter/ Debris Removal	LS	\$300	1	\$300
TOTAL:				\$112,695
Mobilization				\$11,270

Total Construction Costs		\$123,965
Engineering and Survey	30%	\$37,189
Contingency	20%	\$32,231
TOTAL COSTS		\$193,385

Broad Run Watershed Study

Prince William County, Virginia

Conceptual Narrative Cost Estimate

Site Number **246-2**
Site Name **Stream Enhancement**

ITEM	AMOUNT	
Length of Stream	300	lf
Width	30.0	ft
Area	9,000	sf
Stream Area	900	sf
Buffer	9,000	sf

		Unit Costs	Quantity	Cost
Excavation Dry Sediment	CY	\$25	67	\$1,667
Cobble for stream bottom	CY	\$75	33	\$2,500
Top Soil 4 inchs, SY	SY	\$5	0	\$0
Tree/shrubs	EA	\$35	90	\$3,150
Emergent Plants	EA	\$4	1,000	\$3,500
Minor Outlet Modification	EA	\$1,000	0	\$0
Major Outlet Mod, ea	EA	\$5,000	0	\$0
Forebay Construction	EA	\$5,000	0	\$0
Replace Riser	LS	\$25,000	0	\$0
Streambank Stabilization	LF	\$12	600	\$7,200
Tree/Shrub Removal	LS	\$500	0	\$0
Stabilize Slope with Matting	SY	\$4	0	\$0
Repair Fencing	LF	\$25	0	\$0
Repair Spillway	LS	\$500	0	\$0
Stabilize Headcuts	EA	\$2,000	0	\$0
Mowing	LS	\$500	0	\$0
Minor LF Orific Clean Out	LS	\$200	0	\$0
Litter/ Debris Removal	LS	\$300	1	\$300
TOTAL:				\$18,317
Mobilization				\$1,832

Total Construction Costs		\$20,148
Engineering and Survey	30%	\$6,045
Contingency	20%	\$5,239
TOTAL COSTS		\$31,431