

## **1.0 Permit Requirements**

### **E.1. Stormwater Management**

An acceptable stormwater management program shall be maintained in accordance with the Environment Article, Title 4, Subtitle 2, Annotated Code of Maryland. At a minimum, Baltimore County shall:

- a. Implement the stormwater management design policies, principles, methods, and practices found in the *2000 Maryland Stormwater Design Manual* or other innovative stormwater management technologies approved by MDE;
- b. Track progress toward implementing the *2000 Maryland Stormwater Design Manual* or other innovative stormwater management technologies approved by MDE and report annually the modifications needed to address any programmatic problems; and
- c. Maintain programmatic and implementation information according to the requirement established as part of MDE's triennial stormwater program review.

### **E.2. Stormwater Management BMP Inspections**

- a. Within 6 months of this permit being issued, Baltimore County shall designate sufficient staff and resources to ensure that maintenance inspections are performed for all stormwater management BMPs in the County. At a minimum, the County shall:
  - i. identify the specific individual(s) responsible for BMP maintenance inspections;
  - ii. develop and implement specific written procedures for conducting routine maintenance inspections, preparing inspection reports, enforcing requirements, and following up to ensure that specified maintenance is performed for all BMPs in Baltimore County;
  - iii. perform routine maintenance inspections on all stormwater management BMPs in Baltimore County by June 15, 2007; and
  - iv. submit annually copies of all BMP maintenance inspection reports and a current database of all stormwater management BMPs in Baltimore County with each facility's maintenance status clearly described.
- b. In its first report, Baltimore County shall report the progress toward completing the BMP maintenance inspections specified in Part III E.2.a. above. Based on Baltimore County's progress toward inspecting all BMPs, MDE will approve a maintenance inspection frequency for the remainder of this permit.

## **1.1 Introduction**

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The Stormwater Management Program addresses the impacts on stormwater quantity and quality resulting from new development after the construction phase is complete. These impacts are mainly associated with the increase in impervious area due to the installation of roadways and buildings. Baltimore County has been delegated authority by the State of Maryland to enforce stormwater management regulations. The Stormwater Management Program is located within the EPS – Stormwater Engineering Section. EPS currently implements the requirements of the 2000 Maryland Stormwater Design Manual to new and redevelopment activities. The Stormwater Management Act of 2007 was incorporated into the County’s regulations in May 2010 and further refinements will be integrated when all State regulatory changes have been completed. The delegation of this program is periodically reviewed by the Maryland Department of the Environment (MDE) and has consistently passed the review requirements.

The Program contains several components, including:

- review of stormwater management facilities plans,
- review of variance and associated fee-in-lieu requests,
- as built inspections, and
- periodic inspections.

The three-year inspection and maintenance of publicly owned facilities is conducted by the operations program, located within the EPS Capital Program and Operations Section. Their staff consists of six field crew members and a supervisor. The Stormwater Engineering Section inspects privately owned facilities. Their staff consists of a supervisor and two inspectors.

**1.2 Plan, and Variance and Fee-in-lieu Reviews**

*1.2.1 Plan Reviews*

During the calendar year 2010 one thousand three hundred seventeen (1,317) plans were reviewed for stormwater management. Of these, three hundred eighty-one (381) were approved, nine hundred thirty-six (936) were denied and fifty-one (51) were pending at the end of the year. Most plans are not approved on the first submittal, and these numbers reflect multiple plan submittals for the same project.

*1.2.2 Variance and Fee-in-lieu Reviews*

A variance in accordance with Council Bill 51-01 may be approved for a project when exceptional circumstances are applicable to the site. A variance is only granted when the result is more beneficial for the watershed and it is accompanied by a fee-in-lieu. This option is only acceptable to Baltimore County if it is proven to be infeasible to provide stormwater management (SWM) on site and a suitable outfall has been identified for the project. The fee-in-lieu money is used by EPS’s Capital Program and Operations section for water quality restoration projects. Table 1-1 indicates the fee-in-lieu money received by watershed for the calendar year 2010.

Table 1-1: Fee-in-lieu money received in 2010

Watershed	# of Projects	Fee-in-lieu
Upper Western Shore		

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Deer Creek	0	\$0
Prettyboy Reservoir	6	\$8700
Loch Raven Reservoir	22	\$97,333
Lower Gunpowder	6	\$33,200
Little Gunpowder Falls	0	\$0
Bird River	2	\$26,120
Gunpowder River	0	\$0
Middle River	4	\$55,930
<b>Upper Western Shore Total</b>	<b>40</b>	<b>221,283</b>
<b>Patapsco/Back River</b>		
Liberty Reservoir	0	\$0
Patapsco	9	\$27,510
Gwynns Falls	13	\$24,958
Jones Falls	6	\$7,800
Back River	8	\$7,173
Baltimore Harbor	2	\$1,600
<b>Patapsco/Back River Total</b>	<b>38</b>	<b>\$69,041</b>
<b>County Totals</b>	<b>78</b>	<b>\$290,324</b>

### 1.3 Approved Stormwater Management Facility Analysis

The database of approved stormwater management facilities indicates that a total of 3,434 facilities have been approved through the end of 2010. Of the 3,434 approved facilities 2,881 have been built (1,153 public and 1,728 private). Table 1-2 lists approved facilities, but not necessarily built, by watershed, type and ownership. The last two sections of the table include both the total approved facilities by watershed and the number of built facilities by watershed.

The 3,434 approved facilities listed in Table 1-2 will, if built, serve 35,071 acres of urban land. Sixty point three percent of all approved facilities are privately owned and operated. The private facilities represent 45% of the drainage area served by stormwater management facilities. The 2,881 built facilities serve 32,150 acres of urban land, with 45% of the drainage area served by private facilities.

Stormwater management facilities classified as detention ponds provide minimal water quality. The database indicates that there are approved plans for 560 dry detention pond facilities serving 12,261 acres of urban land. There are 246 in public ownership and these represent 7,579 acres of the drainage area. These facilities present an opportunity for conversion in the future to other facility types with greater pollutant removal potential. An assessment of the existing stormwater management facilities and possibilities for conversion is a component of each watershed management plan. Conversions are typically cost effective only for facilities with greater than ten acres of drainage. Preparation of Small Watershed Action Plans (see Section 7) will result in assessing each built stormwater management facility for conversion possibilities.

Table 1-2: Approved Stormwater Management Facilities by Watershed Through 2010

Watershed	Detention Ponds (DP)				Extended Detention (ED, EDSD, EDSW)			
	Private		Public		Private		Public	
	N	D.A.	N	D.A.	N	D.A.	N	D.A.

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<b>Upper Western Shore</b>								
Deer Creek	0	0	0	0	0	0	0	0
Prettyboy Res.	0	0	0	0	0	0	5	36
Loch Raven Res.	60	1,188	28	1,133	63	731	55	1,272
Lower Gunpowder	12	150	38	1,129	27	190	57	732
Little Gunpowder	1	2	0	0	5	16	9	107
Bird River	35	555	28	619	43	259	67	780
Gunpowder River	0	0	3	115	2	4	3	9
Middle River	5	78	3	138	8	23	3	22
<b>UWS Totals</b>	<b>113</b>	<b>1,973</b>	<b>100</b>	<b>3,134</b>	<b>148</b>	<b>1223</b>	<b>199</b>	<b>2,958</b>
<b>Patapsco/Back River</b>								
Liberty Res.	0	0	1	8	10	60	10	186
Patapsco River	32	361	37	1,353	52	557	63	604
Gwynns Falls	68	1,509	68	2,073	131	1,372	125	1,787
Jones Falls	35	833	23	729	61	725	21	438
Back River	50	267	15	196	58	413	40	375
Baltimore Harbor	6	139	2	86	7	61	1	14
<b>Patapsco/Back R. Tot</b>	<b>191</b>	<b>3,109</b>	<b>146</b>	<b>4,445</b>	<b>319</b>	<b>3,188</b>	<b>260</b>	<b>3,404</b>
<b>County Totals</b>	<b>304</b>	<b>5,082</b>	<b>246</b>	<b>7,579</b>	<b>467</b>	<b>4,411</b>	<b>459</b>	<b>6,362</b>
<b>Watershed</b>	<b>Retention Pond (WP &amp; SM)</b>				<b>Infil. Basins, Trenches, Dry Wells, Porous Paving, Level Spreader (DW, PP, IT, LS, TTWQE &amp; IB)</b>			
	<b>Private</b>		<b>Public</b>		<b>Private</b>		<b>Public</b>	
	<b>N</b>	<b>D.A.</b>	<b>N</b>	<b>D.A.</b>	<b>N</b>	<b>D.A.</b>	<b>N</b>	<b>D.A.</b>
<b>Upper Western Shore</b>								
Deer Creek	0	0	0	0	0	0	0	0
Prettyboy Res.	0	0	0	0	1	16	1	13
Loch Raven Res.	12	296	6	128	56	183	15	120
Lower Gunpowder	2	300	5	96	7	12	25	54
Little Gunpowder	1	50	1	7	9	62	2	32
Bird River	22	513	11	440	18	38	10	50
Gunpowder River	11	99	4	55	4	22	6	4
Middle River	16	247	10	83	12	15	6	14
<b>UWS Totals</b>	<b>64</b>	<b>1505</b>	<b>37</b>	<b>809</b>	<b>107</b>	<b>348</b>	<b>65</b>	<b>287</b>
<b>Patapsco/Back River</b>								
Liberty Res.	1	22	0	0	14	32	1	2
Patapsco River	13	294	11	187	50	63	13	217
Gwynns Falls	16	289	7	174	55	74	29	57
Jones Falls	7	889	2	31	25	49	21	36
Back River	15	172	7	498	15	18	5	11
Baltimore Harbor	9	93	7	207	9	15	1	2
<b>Patapsco/Back R. Tot</b>	<b>61</b>	<b>1759</b>	<b>34</b>	<b>1097</b>	<b>168</b>	<b>251</b>	<b>70</b>	<b>325</b>
<b>County Totals</b>	<b>125</b>	<b>3,264</b>	<b>71</b>	<b>1,906</b>	<b>275</b>	<b>599</b>	<b>135</b>	<b>612</b>

Table 1-2: Approved Stormwater Management Facilities by Watershed Through 2010 (continued)

<b>Watershed</b>	<b>Sand Filter, Bioretention, Filter Strip, Swale (SF, BIO, FS, SW)</b>				<b>Underground Storage &amp; Oil/Grit Separator (UGS, OGS, SC, O, UK)</b>			
	<b>Private</b>		<b>Public</b>		<b>Private</b>		<b>Public</b>	
	<b>N</b>	<b>D.A.</b>	<b>N</b>	<b>D.A.</b>	<b>N</b>	<b>D.A.</b>	<b>N</b>	<b>D.A.</b>

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Upper Western Shore								
Deer Creek	0	0	0	0	0	0	0	0
Prettyboy Res.	0	0	5	43	0	0	0	0
Loch Raven Res.	80	248	79	654	73	177	17	82
Lower Gunpowder	25	86	22	131	17	45	1	2
Little Gunpowder	8	14	5	40	2	1	2	10
Bird River	41	123	57	355	22	73	4	13
Gunpowder River	8	16	2	10	0	0	3	1
Middle River	29	83	9	64	7	13	2	2
<b>UWS Totals</b>	<b>191</b>	<b>570</b>	<b>179</b>	<b>1297</b>	<b>121</b>	<b>309</b>	<b>29</b>	<b>110</b>
Patapsco/Back River								
Liberty Res.	12	26	22	134	4	2	2	1
Patapsco River	63	149	42	250	36	130	8	18
Gwynns Falls	102	371	64	339	111	304	8	65
Jones Falls	64	131	29	158	57	179	13	114
Back River	59	131	36	149	43	101	5	40
Baltimore Harbor	11	32	3	7	9	12	11	75
<b>Patapsco/Back R. Tot</b>	<b>311</b>	<b>840</b>	<b>196</b>	<b>1037</b>	<b>260</b>	<b>728</b>	<b>47</b>	<b>313</b>
<b>County Totals</b>	<b>502</b>	<b>1,410</b>	<b>375</b>	<b>2,334</b>	<b>381</b>	<b>1,037</b>	<b>76</b>	<b>323</b>

Watershed	Total Approved SWM				Total Constructed SWM			
	Private		Public		Private		Public	
	N	D.A.	N	D.A.	N	D.A.	N	D.A.
Upper Western Shore								
Deer Creek	0	0	0	0	0	0	0	0
Prettyboy Res.	3	16	11	92	0	0	11	92
Loch Raven Res.	348	2,831	200	3,391	281	2,673	183	3,121
Lower Gunpowder	91	784	149	2,153	74	713	136	2,040
Little Gunpowder	26	147	19	197	21	142	17	178
Bird River	182	1,563	180	2,269	161	1,470	145	1,970
Gunpowder River	25	141	21	194	17	83	20	193
Middle River	80	493	34	324	52	343	28	288
<b>UWS Totals</b>	<b>755</b>	<b>5,975</b>	<b>614</b>	<b>8,620</b>	<b>606</b>	<b>5,424</b>	<b>540</b>	<b>7,882</b>
Patapsco/Back River								
Liberty Res.	42	142	37	331	33	120	21	240
Patapsco River	247	1,555	176	2,650	199	1,437	145	2,442
Gwynns Falls	487	3,929	301	4,494	424	3,539	254	4,221
Jones Falls	251	2,829	110	1,508	213	2,700	94	1,390
Back River	240	1,103	108	1,270	213	1,021	92	1,166
Baltimore Harbor	51	349	15	316	40	294	7	274
<b>Patapsco/Back R. Tot</b>	<b>1318</b>	<b>9,907</b>	<b>747</b>	<b>10,569</b>	<b>1122</b>	<b>9,111</b>	<b>613</b>	<b>9,733</b>
<b>County Totals</b>	<b>2,073</b>	<b>15,882</b>	<b>1,361</b>	<b>19,189</b>	<b>1,728</b>	<b>14,535</b>	<b>1,153</b>	<b>17,615</b>

Figure 1-1 displays the number of approved facilities, both private and public, by watershed. The Gwynns Falls watershed continues to have the greatest total number of existing and newly approved facilities. The large number of facilities in the Gwynns Falls watershed can be attributed to the fact that the Owings Mills growth area was built mostly after SWM regulations were in place. Many older communities, developed prior to regulatory authority, do not have any SWM facilities. Deer Creek, Prettyboy Reservoir, Liberty Reservoir, the Little Gunpowder Falls and the Gunpowder River

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watersheds have only a few facilities, which is reflective of fewer development projects and the small size of those watersheds. This pattern has not changed from past reports.

Figure 1-2 displays acreage to be served by approved private stormwater management facilities by watershed, and Figure 1-3 displays the same information for public facilities.

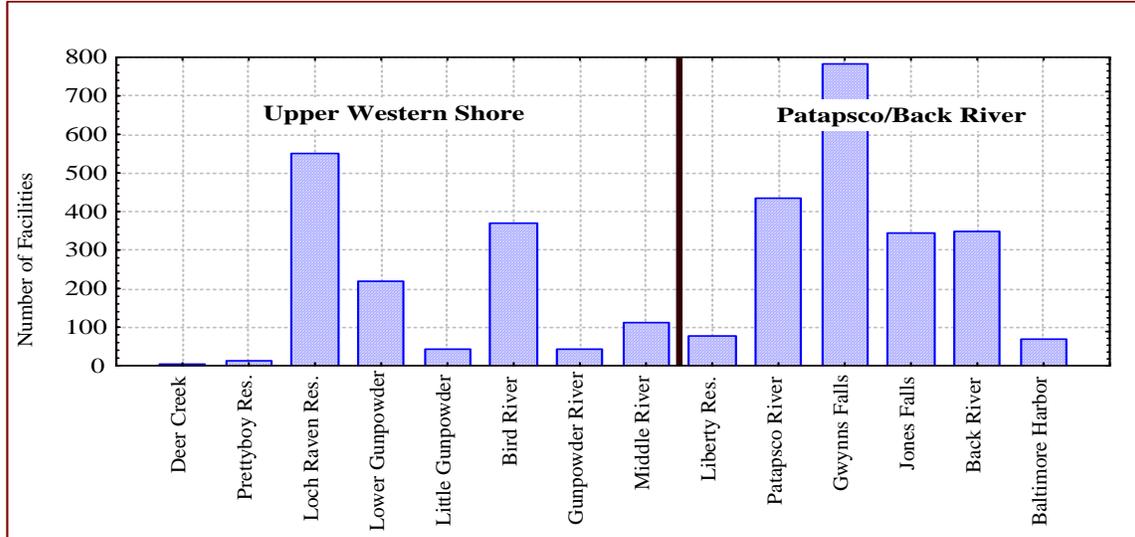


Figure 1-1: Number of Approved SWM Facilities by Watershed – Through Calendar-Year 2010

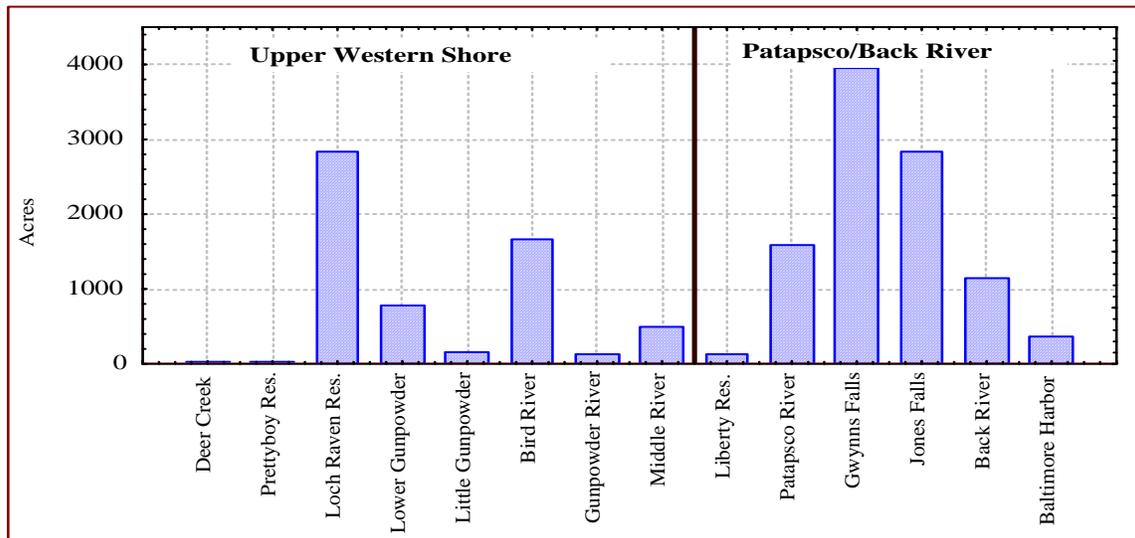


Figure 1-2: Acreage Served by Approved Private SWM Facilities by Watershed Through Calendar-Year 2010

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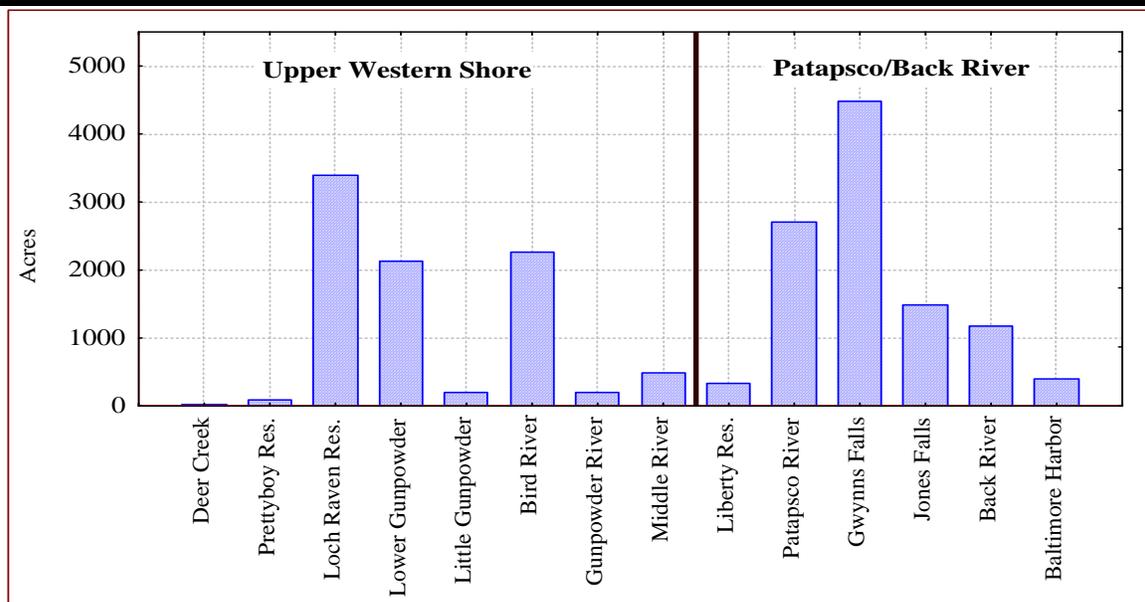


Figure 1-3: Acreage Served by Approved Public SWM Facilities by Watershed Through Calendar-Year 2010

### 1.4 Inspections

Inspections of stormwater management facilities are conducted by the Stormwater Engineering Section for private facilities and by the Capital Programs and Operations Section for public facilities. Engineers in the Stormwater Engineering Section complete all as-built inspections and one-year inspections. All three-year inspections of public facilities are conducted by the Capital Programs and Operations Section and for private facilities by the Stormwater Engineering Section. Within the Stormwater Engineering Section an Engineering Associate IV and two Engineering Associates III conduct the three-year inspections of private stormwater facilities. An Engineer II and an Engineer III were transferred in 2010 to the Capital Programs and Operations Section to provide added staff for management of stream restoration and stormwater designs for new restoration projects. This was possible because of the reduced amount of new development projects due to the downturn in the economy.

Table 1-3 presents the SWM facility inspections conducted by EPS during the calendar year 2010.

Table 1-3: SWM Inspections 2010

	As Built	One year	Three year	Totals
Private Stormwater Facilities	110	134	505	<b>749</b>
Public Stormwater Facilities	89	80	145	<b>314</b>
<b>Totals</b>	<b>199</b>	<b>214</b>	<b>650</b>	<b>1,063</b>

A total of 199 as-built inspections were completed in calendar year 2010. A total of 214 one-year inspections were completed. Approval of the one-year maintenance inspection initiates the three-year maintenance inspection cycle. A total of 505 three-year inspections of private stormwater facilities were conducted.

The three-year inspection of publicly owned facilities is completed by the Capital Program and Operations Section. A total of 145 three-year inspections were completed for public facilities. This results in a total of 650 three-year inspections of all stormwater

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management facilities by EPS for the calendar year 2010. The program has increased the total number of inspections from last year’s total. The inspection program’s goal is to inspect all built facilities every three years.

A total of 1,063 inspections were completed for all built facilities. This represents an increase of 110 inspections over last year. Most of that increase is associated with an increase in 3-year inspections.

**1.5 Stormwater Management Facility Maintenance**

The Baltimore County Department of Environmental Protection and Sustainability has an operations crew in the Capital Program and Operations Section. This crew consists of six environmental maintenance specialists and one supervisor. The crews are divided geographically into eastern and western districts. A database has been developed to track all routine maintenance and responses to complaints. Table 1-4 summarizes the number of maintenance visits due to complaints versus routine maintenance. There were 143 routine maintenance assessments and 102 complaint driven site assessments during the calendar year 2010.

Table 1-4: Stormwater Facility Maintenance Visits by Type 2010

Watershed	# of Routine Maintenance Visits	# of Complaint Maintenance Visits
Loch Raven Reservoir	12	4
Lower Gunpowder	26	16
Little Gunpowder	3	2
Bird River	21	5
Gunpowder River	2	5
Middle River	1	1
Liberty Reservoir	0	1
Patapsco River	13	14
Gwynns Falls	40	41
Jones Falls	5	5
Back River	18	7
Baltimore Harbor	2	0
Pretty Boy	0	1
<b>Total</b>	<b>143</b>	<b>102</b>

A summary of the maintenance activities for the time period by watershed and drainage basin is presented in Table 1-5. One hundred and eighty-six facilities were maintained during the reporting time period. The total number of site visits was 248, indicating that some facilities required several visits. The most frequent activities are debris removal, fence trimming, cleaning of the riser, and cleaning the low flow channel. Appendix 1-1 contains the SWM maintenance data for the time period of January 1, 2010 through December 31, 2010. The data are arranged by watershed, with facility ID number, and by type of maintenance activity.

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Table 1-5: SWM Pond Maintenance Activities for Calendar Year 2010

Watershed	# Ponds Maintained	Total # inspections	Repair Fence	Secure Gate	Clean Riser	Clean Low Flow	Remove Debris	Trim Fence	Cleared Berm	Tar- Riser
<b>Upper Western Shore</b>										
Prettyboy	1	1	1	0	0	1	0	0	0	0
Loch Raven	13	16	10	3	4	3	7	3	1	0
Lower Gunpowder	33	43	10	15	20	9	19	23	5	0
Little Gunpowder	5	5	2	0	1	1	1	0	0	0
Bird River	18	28	13	9	7	2	7	11	1	0
Gunpowder River	6	7	1	0	3	4	3	1	1	1
Middle River	2	2	2	1	1	0	1	1	0	0
<b>Upper Western Shore. Total</b>	<b>78</b>	<b>102</b>	<b>39</b>	<b>28</b>	<b>36</b>	<b>20</b>	<b>38</b>	<b>39</b>	<b>8</b>	<b>1</b>
<b>Patapsco/Back River</b>										
Liberty	1	1	1	0	0	0	0	0	0	0
Patapsco	20	27	8	12	11	13	12	14	5	0
Gwynns Falls	61	80	13	22	40	44	51	37	27	2
Jones Falls	9	10	2	4	5	6	8	6	3	0
Back River	15	26	12	9	5	2	9	8	2	0
Baltimore Harbor	2	2	2	0	0	0	0	0	0	0
<b>Patapsco/Back River Total</b>	<b>108</b>	<b>146</b>	<b>38</b>	<b>47</b>	<b>61</b>	<b>65</b>	<b>72</b>	<b>65</b>	<b>37</b>	<b>2</b>
<b>County Totals</b>	<b>186</b>	<b>248</b>	<b>77</b>	<b>75</b>	<b>97</b>	<b>85</b>	<b>110</b>	<b>104</b>	<b>45</b>	<b>3</b>

### 1.6 Constructed Stormwater Management Facility Data Analysis

An analysis of the databases related to stormwater management facilities indicated that a total of 2,881 facilities have been built to date. The 2,881 built facilities have a combined drainage area of 32,154 acres. The drainage areas of 2,393 built facilities were delineated and digitized into the County GIS. The drainage area for the 2,393 facilities that have been delineated is 30,442 acres or approximately 95% of the area (32,154 acres) served by the built stormwater facilities. The remaining 488 built facilities have a combined drainage area of 1,712 acres (5% of the area served by stormwater management). As new facilities are built their drainage areas will also be added to the GIS data layer. Overall, built stormwater management facilities serve 22.8% of the designated urban acreage (141,059 acres). The total urban acreage is based on the Water Resources Analysis for 2005.

The drainage areas were overlaid on the Maryland Department of Planning (MDP) 2007 land use and the Baltimore County 2008 planimetric (impervious surface) data to determine the specific land use and impervious cover draining to each facility. Table 1-6 presents a summary of the land use served by built SWM facilities by watershed. It should be noted that the date of the creation of the MDP GIS data layer might precede the building of a number of the stormwater management facilities. This fact will result in some error in the determination of land use draining to those facilities.

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Table 1-6: Constructed SWM Facility Drainage Area Land Use (Acres) through Calendar-Year 2010

Watershed	Pervious Urban	Impervious Urban	Agriculture	Forest and Wetlands	Bare Ground	Total
<b>Upper Western Shore</b>						
PR	40.0	7.8	1.5	1.7	0.0	51.0
LR	3,318.6	1,909.7	208.5	507.4	0.0	5,944.2
GU	1,435.4	536.2	113.8	158.7	0.0	2,244.1
LG	194.4	36.6	46.7	8.9	0.0	286.6
BI	1,557.8	1,149.8	198.3	481.1	5.4	3,392.4
GR	127.6	73.7	0.1	74.8	0.0	276.2
MR	208.5	156.0	0.0	143.4	0.0	507.9
<b>Total</b>	<b>6,882.3</b>	<b>3,869.8</b>	<b>568.9</b>	<b>1,376.0</b>	<b>5.4</b>	<b>12,702.4</b>
<b>Patapsco/Back River</b>						
LI	150.7	72.4	13.7	22.6	0.0	259.4
PA	1,909.4	1,318.7	69.3	397.3	0.9	3,695.6
GW	4,088.7	3,051.9	108.2	480.0	8.5	7,737.3
JF	2,400.3	1,112.9	73.6	330.4	3.8	3,921.0
BR	1,024.0	919.1	33.5	147.9	23.6	2,148.1
BH	217.1	210.3	0.0	13.4	0.0	440.8
P/B	<b>9,790.2</b>	<b>6,685.3</b>	<b>298.3</b>	<b>1,391.6</b>	<b>36.8</b>	<b>18,202.2</b>
<b>County</b>	<b>16,672.5</b>	<b>10,555.1</b>	<b>867.2</b>	<b>2,767.6</b>	<b>42.2</b>	<b>30,904.6</b>

LR = Loch Raven Reservoir      PR = Prettyboy Reservoir      GU = Lower Gunpowder  
 LG = Little Gunpowder Falls      BI = Bird River      GR = Gunpowder River  
 PA = Patapsco River      LI = Liberty Reservoir      GW = Gwynns Falls  
 JF = Jones Falls      MR = Middle River      BH = Baltimore Harbor  
 BR = Back River

The pollutant loads were determined by the methodology described in Section 10 for each of the 2,393 facilities that are currently built with drainage area digitized (an additional 488 facilities that have been built do not have their drainage areas digitized at this time). Table 1-7 presents the loads Total Phosphorus and Total Nitrogen delivered to storm water management facilities. The table is organized into watersheds and the two Tributary Strategy groups. A separate load is calculated for the Upper Western Shore and the Patapsco/Back River basins.

Table 1-7: Pollutant Loads to Constructed SWM Facilities by Watershed (Pounds)

Watershed	TP	TN
<b>Upper Western Shore</b>		
Prettyboy Res.	36.0	429
Loch Raven Res.	5,900.3	54,804
Lower Gunpowder	1,913.0	19,819
Little Gunpowder	200.1	2,631
Bird River	3,419.3	31,417
Gunpowder River	222.9	2,072
Middle River	444.9	3,914
<b>Total</b>	<b>12,136.55</b>	<b>115,086</b>
<b>Patapsco/Back River</b>		
Liberty Res.	238.6	2,371
Patapsco	3,857.5	33,981
Gwynns Falls	8,739.5	74,917

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Jones Falls	3,604.8	34,573
Back River	2,543.8	20,929
Baltimore Harbor	568.6	4,557
<b>Total</b>	<b>19,552.8</b>	<b>171,328</b>
<b>County Total</b>	<b>31,689.2</b>	<b>286,414</b>

The type of stormwater management facility has an influence on the percentage of a pollutant removed. Through a series of meetings conducted by the Chesapeake Bay Program – Urban Stormwater Workgroup a consensus was reached on the pollutant removal efficiencies by categories of practice for total suspended solids (TSS), total phosphorus (TP) and total nitrogen (TN). A copy of the resulting *Draft Recommendation for Storm Water Best Management Practice Categories and Pollutant Removal Efficiencies* document was included with Baltimore County’s 2004 NPDES report. The Chesapeake Bay Program conducted a more rigorous assessment of Best Management Practices with the document entitled *Developing Best Management Practice Definitions and Effectiveness Estimates for Nitrogen, Phosphorus and Sediment in the Chesapeake Bay Watershed* being finalized in December 2009 (Simpson and Weammert, 2009). The full document can be found at:

[http://archive.chesapeakebay.net/pubs/BMP\\_ASSESSMENT\\_REPORT.pdf](http://archive.chesapeakebay.net/pubs/BMP_ASSESSMENT_REPORT.pdf). The assessment resulted in some efficiency changes for urban BMPs. A new BMP efficiency table was published on the Chesapeake Bay Program website on February 9, 2011. It can be found at: [http://archive.chesapeakebay.net/pubs/NPS\\_BMP\\_Table1.8.pdf](http://archive.chesapeakebay.net/pubs/NPS_BMP_Table1.8.pdf). Maryland Department of the Environment has provided a listing of urban BMP types and the pollutant removal category that should be used to calculate load reductions. Table 1-8 presents the pollutant load removal efficiencies used in this report by facility category. The type of practice included in each category is indicated, along with the associated NPDES practice code, are shown below Table 1-8. As shown in the table, there is a wide range of pollutant removal efficiencies by facility type as well as for pollutant type. Where there is a lack of data for a type of facility the removal efficiency for a particular pollutant was assumed to be zero. This will result in a conservative estimate of the actual amounts of pollutants removed.

Table 1-8: Percent Removal Efficiency of BMPs

BMP	Pollutants					
	TN		TP		TSS	
	2009	2010	2009	2010	2009	2010
Detention Facilities	5		10		10	
Extended Detention Facilities	20		20		60	
Wet Ponds	20		45		60	
Infiltration Practices	85		85		95	
Filtration Practices	40		60		80	
Detention Facilities = Detention Pond and Hydrodynamic Devices (DP, OGS, SC, and UGS) Extended Detention Facilities = Extended Detention Ponds (EDSD, EDSW, ED) Wet Ponds and Wetlands = Wet Pond and Shallow Marsh (WP and SM) Infiltration Practices = Infiltration Trench and Infiltration Basins (IB, IT and ITWQC), Porous Paving (PP), Level Spreaders (LS), and Dry Wells (DW) Filtration Practices = Sand filters, Bioretention, Swales (SF, BIO, SW)						

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The results of the analysis are displayed in Tables 1-9 (Total Phosphorus) and 1-10 (Total Nitrogen)

Table 1-9: Total Phosphorus Removal by SWM Facility Type and Watershed

Watershed	Total # To SWM	Pounds of Removal by Facility Type					Total Removed	
		DP	EDP	WP	INF.	FIL.	#	%
<b>Upper Western Shore Watersheds</b>								
Prettyboy Res.	36.0	0	2.4	0	6.4	9.8	18.7	52
Loch Raven Res.	5,900.3	279.2	330.2	143.5	486.8	339.5	1,577.4	27
Lower Gunpowder	1,913.0	87.8	118.6	134.9	70.5	42.0	453.8	24
Little Gunpowder	200.0	1.9	15.3	15.5	46.9	8.6	88.3	44
Bird River	3,419.3	124.9	167.0	454.9	118.8	111.0	976.6	29
Gunpowder River	222.9	10.0	2.7	37.9	1.7	13.6	65.9	30
Middle River	444.9	15.9	7.8	76.0	18.3	34.0	152.0	34
<b>Totals</b>	<b>12,136.4</b>	<b>519.7</b>	<b>644.0</b>	<b>862.7</b>	<b>749.4</b>	<b>558.5</b>	<b>3,332.7</b>	<b>27</b>
<b>Patapsco/Back River Watersheds</b>								
Liberty Res.	238.6	0.7	33.3	14.6	21.0	6.0	75.7	32
Patapsco	3,857.5	196.7	188.4	167.6	301	132.7	986.7	26
Gwynns Falls	8,739.5	369.8	651.9	472.0	205.3	294.6	1,993.7	23
Jones Falls	3,604.8	185.8	197.3	243.4	42.4	102.0	770.9	21
Back River	2,543.8	69.7	171.7	330.4	24.6	134.9	731.4	29
Baltimore Harbor	568.6	28.7	36.4	33.7	16.0	3.4	118.2	21
<b>Totals</b>	<b>19,552.8</b>	<b>851.4</b>	<b>1279.0</b>	<b>1261.7</b>	<b>610.3</b>	<b>673.6</b>	<b>4,676.6</b>	<b>24</b>
<b>County Total</b>	<b>31,689.2</b>	<b>1,374.1</b>	<b>1,923.0</b>	<b>2,124.4</b>	<b>1,359.7</b>	<b>1,232.1</b>	<b>8,008.3</b>	<b>25</b>

Table 1-10: Total Nitrogen Removal by SWM Facility Type and Watershed

Watershed	Total # To SWM	Pounds of Removal by Facility Type					Total Removed	
		DP	EDP	WP	INF.	FIL.	#	%
<b>Upper Western Shore Watersheds</b>								
Prettyboy Res.	429	0	20	0	94	69	182	43
Loch Raven Res.	54,804	1,255	3,209	703	3,770	2,287	11,181	21
Lower Gunpowder	19,819	446	1,181	675	703	318	3,323	17
Little Gunpowder	2,631	9	222	92	616	62	1,002	38
Bird River	31,417	549	1,550	1,854	1,137	835	5,925	19
Gunpowder River	2,072	47	22.8	157	42	74	343	17
Middle River	3,914	76	70	283	152	185	765	20
<b>Totals</b>	<b>115,086</b>	<b>2,382</b>	<b>6,274.8</b>	<b>3,764</b>	<b>6,514</b>	<b>3,830</b>	<b>22,721</b>	<b>20</b>
<b>Patapsco/Back River Watersheds</b>								
Liberty Res.	2,371	2	324	76	209	63	675	28
Patapsco	33,981	855	1,725	669	2,400	833	6,482	19
Gwynns Falls	74,917	1,569	5,754	1,782	1,612	1,583	12,299	16
Jones Falls	34,572	879	1,840	1,124	408	683	4,930	14
Back River	20,929	278	1,416	1,225	181	787	3,885	19
Baltimore Harbor	4,557	121	276	112	120	19	648	14
<b>Totals</b>	<b>171,327</b>	<b>3,704</b>	<b>11,335</b>	<b>4,988</b>	<b>4,930</b>	<b>3,968</b>	<b>28,919</b>	<b>17</b>
<b>County Total</b>	<b>286,413</b>	<b>5,809</b>	<b>17,373</b>	<b>8,246</b>	<b>10,205</b>	<b>6,632</b>	<b>51,631</b>	<b>18</b>

While the load reductions are conservative numbers, it is apparent from an inspection of Table 1-9 and Table 1-10 (phosphorus and nitrogen loads) that the County has not achieved a 40% reduction of these two constituents for existing development served by

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stormwater management facilities. This calculation does not include the nitrogen and phosphorus loads from development without stormwater controls.

In order to account for the impervious area served by state-of-the-art stormwater management, an analysis of the impervious area served by stormwater management facilities was performed. The drainage areas for facilities that are considered to have higher pollutant removal efficiencies and to have little or no conversion potential were overlaid on the Baltimore County 2008 impervious cover data layer. The facility types included in this analysis are wet ponds, shallow marsh, extended detention facilities, sand filters, bioretention, and infiltration facilities. Dry ponds and underground facilities were not included. The former were excluded due to low pollution removal efficiencies and the latter due to the impossibility of conversion to a type of facility that has higher pollution removal efficiency. The impervious cover layer for Baltimore County does not include sidewalks and driveways. It does include all roadways and parking lots, as well as all buildings based on aerial photography obtained in 2008. The results of the analysis of impervious cover served by storm water management are presented in Table 1-11. The 5,918.2 acres of impervious cover addressed by advanced stormwater management represents 15.4% of the Baltimore County impervious cover (minus State and Federally owned impervious cover).

Table 1-11: Impervious Cover Addressed by All SWM and Advanced SWM – 2008 Impervious

<b>Watershed</b>	<b>Watershed Impervious Acres (2008)</b>	<b>Baltimore County Impervious Acres</b>	<b>Impervious Acres – All SWM</b>	<b>Impervious Acres - Advanced SWM</b>	<b>% Covered by All SWM (BC Impervious)</b>	<b>% Covered by Advanced SWM</b>
<b>Upper Western Shore</b>						
Deer Creek	232	203	0.0	0.0	0.0	0.0
Prettyboy	563	542	7.8	7.8	1.4	1.4
Loch Raven	7,536	6,888	1,909.7	973.4	27.7	14.1
Lower Gunpowder	2,556	2,351	536.2	282.3	22.8	12.0
Little Gunpowder	730	643	36.6	30.3	5.7	4.7
Bird River	3,058	2,753	1,149.8	724.7	41.8	26.3
Gunpowder River	497	465	73.7	41.9	15.8	9.0
Middle River	1,561	1,275	156.0	105.3	12.2	8.3
<b>UWS Totals</b>	<b>16,733</b>	<b>15,120</b>	<b>3,869.8</b>	<b>2165.7</b>	<b>25.6</b>	<b>14.3</b>
<b>Patapsco/Back River</b>						
Liberty	740	610	70.9	67.9	11.6	11.1
Patapsco	4,779	4,046	1,318.7	637.0	32.6	15.7
Gwynns Falls	7,217	6,489	3,051.9	1,755.3	47.0	27.1
Jones Falls	4,060	3,582	1,112.9	523.7	31.1	14.6
Back River	6,138	5,568	919.1	659.2	16.5	11.8
Baltimore Harbor	3,332	2,882	210.3	109.4	7.3	3.8
<b>P/B Totals</b>	<b>26,266</b>	<b>23,177</b>	<b>6,683.8</b>	<b>3,752.5</b>	<b>28.8</b>	<b>16.1</b>
<b>County Total</b>	<b>42,999</b>	<b>38,297</b>	<b>10,553.6</b>	<b>5,918.2</b>	<b>27.6</b>	<b>15.4</b>

Maryland Department is currently working on guidance in calculating credit for stormwater management applied to development. One that guidance is approved the these calculations will be revised to be in conformance to the guidance.

### **1.7 Summary**

Baltimore County operates a comprehensive stormwater management program. EPS has always taken a firm stand on requiring water quality treatment even when quantity management was not required. EPS continues to require all projects to explore and implement methods for water quality treatment. EPS uses the option to accept a fee-in-lieu payment if an exhaustive search has resulted in no practicable opportunity for on-site treatment.

The stormwater management facility maintenance program within EPS has continued to inspect and maintain both publicly and privately owned facilities. The staff has compiled an extensive database of inspections and maintenance operations for the publicly and privately owned stormwater facilities. These inspections, and the resulting actions, are improving the overall pollutant reduction efficiency of all stormwater facilities.

Constructed stormwater management facilities serve ~22.8 % of the total urban land, 141,059 acres (84,262 P/B and 56,797 UWS), in Baltimore County. For the areas served by these facilities a significant amount of pollutants are removed annually. Facilities designed and constructed for water quantity management represent an opportunity for water quality improvement through conversion to water quality facilities that will be explored through the Small Watershed Action Plan planning process (Section 7). However, many of the facilities either have no conversion potential (underground facilities) or are already designed to provide advanced water quality treatment. Those facilities designed for water quality are serving 5,918.2 acres of impervious cover of the County's 38,285 acres of impervious area.

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**Appendix 1-1: Public Stormwater Facility Maintenance by Type for Calendar Year 2010**

Date	Watershed	Pond #	Repaired Fence	Secured Gate	Cleaned Riser	Cleaned Low Flow	Removed Debris	Trimmed Fence	Cleared Berm	Tar Riser
3/24/2010	Back River	164	X							
4/19/2010	Back River	164					X	X		
7/21/2010	Back River	164								
5/ 6/2010	Back River	170		X						
1/26/2010	Back River	305					X			
11/ 9/2010	Back River	381		X	X	X	X	X		
1/ 4/2010	Back River	535	X							
4/19/2010	Back River	553		X	X		X	X		
4/20/2010	Back River	554		X			X	X	X	
6/18/2010	Back River	624				X	X		X	
4/20/2010	Back River	1007		X			X	X		
2/ 2/2010	Back River	1380	X							
5/25/2010	Back River	1380	X	X	X		X	X		
11/ 4/2010	Back River	1380	X							
11/30/2010	Back River	1380	X							
1/13/2010	Back River	1547	X							
3/29/2010	Back River	1547	X							
4/ 5/2010	Back River	1547		X			X	X		
6/11/2010	Back River	1547	X							
11/ 4/2010	Back River	1547	X							
7/20/2010	Back River	1829		X	X					
3/31/2010	Back River	1983	X							
11/ 4/2010	Back River	1983	X							
4/19/2010	Back River	2300		X	X			X		
1/27/2010	Back River	3031								
11/30/2010	Baltimore Harbor	1420	X							
11/30/2010	Baltimore Harbor	1421	X							
8/ 3/2010	Bird River	343	X	X	X		X	X		
3/23/2010	Bird River	478								
7/16/2010	Bird River	478							X	
6/22/2010	Bird River	610		X			X	X		
8/31/2010	Bird River	650	X							
9/13/2010	Bird River	650		X	X			X		
6/25/2010	Bird River	725								
10/25/2010	Bird River	725								
1/13/2010	Bird River	876				X		X		
4/ 5/2010	Bird River	876						X		
6/30/2010	Bird River	878		X	X					
8/19/2010	Bird River	878	X							
6/30/2010	Bird River	879		X			X			
8/19/2010	Bird River	879	X							
12/ 3/2010	Bird River	919				X				
1/13/2010	Bird River	1039	X							
3/23/2010	Bird River	1039	X							
4/ 1/2010	Bird River	1039								
1/13/2010	Bird River	1040	X							

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Date	Watershed	Pond #	Repaired Fence	Secured Gate	Cleaned Riser	Cleaned Low Flow	Removed Debris	Trimmed Fence	Cleared Berm	Tar Riser
3/23/2010	Bird River	1040	X				X			
1/13/2010	Bird River	1041	X							
3/25/2010	Bird River	1041	X				X	X		
3/24/2010	Bird River	1487	X							
8/31/2010	Bird River	1633		X	X		X	X		
8/ 5/2010	Bird River	1799		X	X			X		
8/ 3/2010	Bird River	1863		X	X			X		
5/ 6/2010	Bird River	2941	X					X		
5/10/2010	Bird River	2945	X	X	X		X	X		
7/22/2010	Gunpowder River	435			X		X			
7/ 1/2010	Gunpowder River	449			X	X	X	X		
2/19/2010	Gunpowder River	1307			X	X	X			
1/14/2010	Gunpowder River	3436				X			X	X
6/15/2010	Gunpowder River	3436				X				
5/25/2010	Gunpowder River	3595								
6/ 8/2010	Gunpowder River	3770	X							
8/26/2010	Gwynns Falls	45	X	X	X	X	X	X	X	
7/16/2010	Gwynns Falls	46		X	X	X	X	X		
7/20/2010	Gwynns Falls	46		X	X	X	X	X		
8/13/2010	Gwynns Falls	48			X	X	X		X	
10/12/2010	Gwynns Falls	48							X	
1/29/2010	Gwynns Falls	93				X				
1/19/2010	Gwynns Falls	110								
8/10/2010	Gwynns Falls	110								
7/27/2010	Gwynns Falls	150						X		
8/30/2010	Gwynns Falls	151		X	X	X	X	X	X	X
8/31/2010	Gwynns Falls	152			X	X	X		X	X
1/22/2010	Gwynns Falls	157					X			
4/16/2010	Gwynns Falls	172					X			
10/26/2010	Gwynns Falls	172		X	X	X	X	X	X	

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Date	Watershed	Pond #	Repaired Fence	Secured Gate	Cleaned Riser	Cleaned Low Flow	Removed Debris	Trimmed Fence	Cleared Berm	Tar Riser
11/ 9/2010	Gwynns Falls	173		X	X	X	X	X	X	
11/10/2010	Gwynns Falls	174		X	X	X	X		X	
4/22/2010	Gwynns Falls	227	X							
6/29/2010	Gwynns Falls	232		X	X	X	X	X		
1/ 4/2010	Gwynns Falls	270	X							
11/ 3/2010	Gwynns Falls	270					X			
4/15/2010	Gwynns Falls	274					X			
6/28/2010	Gwynns Falls	274		X	X	X	X	X		
10/25/2010	Gwynns Falls	274		X	X	X	X	X	X	
5/26/2010	Gwynns Falls	365								
6/22/2010	Gwynns Falls	365				X				
12/ 3/2010	Gwynns Falls	408		X	X	X	X	X	X	
11/ 8/2010	Gwynns Falls	424		X	X	X	X	X	X	
4/ 2/2010	Gwynns Falls	664				X				
5/ 5/2010	Gwynns Falls	738			X	X	X	X		
4/15/2010	Gwynns Falls	746					X			
1/29/2010	Gwynns Falls	759							X	
8/ 4/2010	Gwynns Falls	759			X	X	X			
3/18/2010	Gwynns Falls	849	X							
6/ 8/2010	Gwynns Falls	849		X	X	X	X	X	X	
9/ 7/2010	Gwynns Falls	925		X	X	X		X		
3/18/2010	Gwynns Falls	942					X			
3/18/2010	Gwynns Falls	943					X			
8/ 9/2010	Gwynns Falls	967						X		
3/10/2010	Gwynns Falls	996								
8/ 3/2010	Gwynns Falls	1032				X			X	

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Date	Watershed	Pond #	Repaired Fence	Secured Gate	Cleaned Riser	Cleaned Low Flow	Removed Debris	Trimmed Fence	Cleared Berm	Tar Riser
8/16/2010	Gwynns Falls	1032					X			
7/23/2010	Gwynns Falls	1112	X	X	X	X	X	X	X	
6/ 1/2010	Gwynns Falls	1144			X	X	X	X	X	
6/14/2010	Gwynns Falls	1146		X	X	X	X	X	X	
8/20/2010	Gwynns Falls	1188			X	X	X			
4/ 2/2010	Gwynns Falls	1191					X			
4/30/2010	Gwynns Falls	1191			X	X				
5/ 5/2010	Gwynns Falls	1191				X	X			
8/ 5/2010	Gwynns Falls	1194			X	X	X	X		
1/20/2010	Gwynns Falls	1278	X		X		X	X		
5/11/2010	Gwynns Falls	1278				X				
1/28/2010	Gwynns Falls	1423	X		X	X	X	X		
4/29/2010	Gwynns Falls	1580					X			
2/ 1/2010	Gwynns Falls	1601	X							
7/15/2010	Gwynns Falls	1651			X	X	X	X	X	
7/19/2010	Gwynns Falls	1652			X	X	X			
4/15/2010	Gwynns Falls	1657					X			
12/ 7/2010	Gwynns Falls	1729			X			X	X	
5/27/2010	Gwynns Falls	1730			X	X	X	X	X	
5/26/2010	Gwynns Falls	1731			X	X	X	X	X	
8/ 4/2010	Gwynns Falls	1754		X	X	X	X	X		
5/13/2010	Gwynns Falls	2016				X				
7/ 1/2010	Gwynns Falls	2016				X		X		
8/16/2010	Gwynns Falls	2067		X	X		X	X		
4/19/2010	Gwynns Falls	2091	X	X			X			
8/31/2010	Gwynns Falls	2203	X							

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Date	Watershed	Pond #	Repaired Fence	Secured Gate	Cleaned Riser	Cleaned Low Flow	Removed Debris	Trimmed Fence	Cleared Berm	Tar Riser
12/10/2010	Gwynns Falls	3055			X	X	X	X	X	
4/29/2010	Gwynns Falls	3103								
8/ 6/2010	Gwynns Falls	3120		X				X		
8/24/2010	Gwynns Falls	3125			X	X	X	X		
10/ 8/2010	Gwynns Falls	3125		X	X	X	X	X	X	
1/ 4/2010	Gwynns Falls	3239	X							
3/24/2010	Gwynns Falls	3269	X							
5/21/2010	Gwynns Falls	3269						X	X	
6/22/2010	Gwynns Falls	3269							X	
8/17/2010	Gwynns Falls	3269		X	X	X	X	X		
5/25/2010	Gwynns Falls	3459							X	
5/19/2010	Gwynns Falls	3569			X	X	X	X	X	
7/27/2010	Gwynns Falls	3645	X	X	X	X	X	X		
8/25/2010	Gwynns Falls	3951			X	X		X		
6/21/2010	Jones Falls	111		X	X	X	X	X		
9/15/2010	Jones Falls	111	X							
7/26/2010	Jones Falls	112		X	X	X	X	X		
6/10/2010	Jones Falls	113		X		X	X	X	X	
7/ 9/2010	Jones Falls	1340		X	X	X	X	X		
4/16/2010	Jones Falls	1807					X			
4/16/2010	Jones Falls	1809					X			
5/19/2010	Jones Falls	3570	X		X	X	X	X	X	
11/18/2010	Jones Falls	3570			X	X	X	X	X	
11/18/2010	Jones Falls	3571			X	X	X	X	X	
4/28/2010	Liberty	1456	X							
7/13/2010	Little Gunpowder	1970	X							
3/18/2010	Little Gunpowder	2225					X			
3/16/2010	Little Gunpowder	2226	X							
6/30/2010	Little Gunpowder	3347				X				

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Date	Watershed	Pond #	Repaired Fence	Secured Gate	Cleaned Riser	Cleaned Low Flow	Removed Debris	Trimmed Fence	Cleared Berm	Tar Riser
6/30/2010	Little Gunpowder	3381			X					
9/15/2010	Loch Raven	83					X			
3/17/2010	Loch Raven	155	X							
8/31/2010	Loch Raven	707	X							
11/ 3/2010	Loch Raven	707			X		X			
6/14/2010	Loch Raven	1457	X							
6/ 3/2010	Loch Raven	1825	X	X	X	X	X	X		
6/16/2010	Loch Raven	1868								
3/17/2010	Loch Raven	1997					X			
9/28/2010	Loch Raven	2095	X							
9/28/2010	Loch Raven	2096	X							
9/28/2010	Loch Raven	2099	X							
1/ 4/2010	Loch Raven	2879	X							
7/ 8/2010	Loch Raven	2879			X	X	X	X		
8/24/2010	Loch Raven	2879		X			X			
9/27/2010	Loch Raven	2879	X							
5/14/2010	Loch Raven	2903	X	X	X	X	X	X	X	
6/14/2010	Lower Gunpowder	146			X					
6/25/2010	Lower Gunpowder	340			X	X	X		X	
10/ 7/2010	Lower Gunpowder	340	X							
5/26/2010	Lower Gunpowder	354		X	X		X	X		
4/20/2010	Lower Gunpowder	393	X	X			X	X		
9/21/2010	Lower Gunpowder	393	X							
5/25/2010	Lower Gunpowder	452		X				X		
5/12/2010	Lower Gunpowder	525				X	X	X	X	
5/26/2010	Lower Gunpowder	557			X		X	X		
8/26/2010	Lower Gunpowder	557			X			X		
7/22/2010	Lower Gunpowder	730								
7/22/2010	Lower Gunpowder	734			X					
6/ 3/2010	Lower Gunpowder	741						X		
7/19/2010	Lower Gunpowder	741		X	X			X		
7/29/2010	Lower Gunpowder	741						X		
9/23/2010	Lower Gunpowder	815		X	X	X	X	X		

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Date	Watershed	Pond #	Repaired Fence	Secured Gate	Cleaned Riser	Cleaned Low Flow	Removed Debris	Trimmed Fence	Cleared Berm	Tar Riser
6/15/2010	Lower Gunpowder	850		X	X		X			
5/20/2010	Lower Gunpowder	1156						X	X	
6/ 8/2010	Lower Gunpowder	1156	X							
9/ 8/2010	Lower Gunpowder	1233		X	X		X	X		
9/24/2010	Lower Gunpowder	1233					X			
5/ 6/2010	Lower Gunpowder	1406						X	X	
5/25/2010	Lower Gunpowder	1406								
5/ 5/2010	Lower Gunpowder	1407	X							
4/ 5/2010	Lower Gunpowder	1408		X			X	X		
1/19/2010	Lower Gunpowder	1473				X	X			
7/26/2010	Lower Gunpowder	1473		X	X	X				
8/30/2010	Lower Gunpowder	1473			X	X	X	X		
8/ 5/2010	Lower Gunpowder	1476		X	X	X	X	X		
8/25/2010	Lower Gunpowder	1634			X					
7/ 1/2010	Lower Gunpowder	1744				X		X		
6/22/2010	Lower Gunpowder	1789	X	X	X		X	X		
6/18/2010	Lower Gunpowder	1790	X	X	X			X		
6/14/2010	Lower Gunpowder	1791		X	X			X		
5/ 4/2010	Lower Gunpowder	1838	X							
6/15/2010	Lower Gunpowder	1838		X	X		X			
1/21/2010	Lower Gunpowder	1842								
8/26/2010	Lower Gunpowder	2032		X	X		X	X	X	
8/31/2010	Lower Gunpowder	2032	X							
9/ 8/2010	Lower Gunpowder	2032					X			
6/25/2010	Lower Gunpowder	2144	X		X	X	X	X		
4/21/2010	Lower Gunpowder	2209		X			X	X		

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Date	Watershed	Pond #	Repaired Fence	Secured Gate	Cleaned Riser	Cleaned Low Flow	Removed Debris	Trimmed Fence	Cleared Berm	Tar Riser
1/21/2010	Lower Gunpowder	3046								
8/ 3/2010	Middle River	182	X							
4/19/2010	Middle River	950	X	X	X		X	X		
5/ 6/2010	Patapsco	255			X	X		X		
9/10/2010	Patapsco	256								
4/20/2010	Patapsco	258				X				
5/ 6/2010	Patapsco	258				X				
12/14/2010	Patapsco	341			X	X			X	
1/14/2010	Patapsco	359							X	
6/ 2/2010	Patapsco	415		X	X	X	X	X		
11/ 3/2010	Patapsco	454					X			
3/11/2010	Patapsco	594				X				
3/10/2010	Patapsco	596								
9/ 8/2010	Patapsco	596		X	X	X	X	X		
3/23/2010	Patapsco	782	X							
6/25/2010	Patapsco	1132	X	X	X	X	X	X	X	
5/20/2010	Patapsco	1204		X	X	X	X	X	X	
9/ 2/2010	Patapsco	1204		X	X	X	X	X		
6/23/2010	Patapsco	1335		X	X	X	X	X		
3/30/2010	Patapsco	1555	X							
4/ 5/2010	Patapsco	1817		X	X	X	X	X		
4/28/2010	Patapsco	1875	X					X		
1/ 4/2010	Patapsco	2917	X							
6/28/2010	Patapsco	2917		X				X		
6/28/2010	Patapsco	3558		X	X					
9/15/2010	Patapsco	3558			X	X	X	X	X	
10/15/2010	Patapsco	3558	X							
4/28/2010	Patapsco	3575	X	X			X	X		
6/28/2010	Patapsco	3575	X	X			X	X		
6/30/2010	Patapsco	4537		X			X	X		
7/15/2010	Prettyboy	1150	X			X				