

**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**

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 DEPRM – Stormwater Engineering Section. DEPRM 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 DEPRM 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 2009 one thousand and thirty-five (1,035) plans were reviewed for stormwater management. Of these, two hundred and twenty-four (224) were approved, eight hundred eleven (811) were denied and sixty-four (64) 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 DEPRM'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 2009.

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**Table 1-1: Fee-in-lieu money received in 2009**

Watershed	# of Projects	Fee-in-lieu
<b>Upper Western Shore</b>		
Deer Creek	0	\$0
Prettyboy Reservoir	0	\$0
Loch Raven Reservoir	6	\$37,665
Lower Gunpowder	3	\$7,920
Little Gunpowder Falls	2	\$7,200
Bird River	2	\$3,880
Gunpowder River	0	\$0
Middle River	1	\$344
<b>Upper Western Shore Total</b>	<b>14</b>	<b>\$57,009</b>
<b>Patapsco/Back River</b>		
Liberty Reservoir	0	\$0
Patapsco	4	\$24,380
Gwynns Falls	6	\$51,134
Jones Falls	12	\$9,120
Back River	11	\$79,913
Baltimore Harbor	0	\$13,500
<b>Patapsco/Back River Total</b>	<b>33</b>	<b>\$178,047</b>
<b>County Totals</b>	<b>47</b>	<b>\$235,056</b>

### 1.3 Approved Stormwater Management Facility Analysis

The database of approved stormwater management facilities indicates that a total of 3,409 facilities have been approved through the end of 2009. Of the 3,409 approved facilities 2,763 have been built (1,067 public and 1,696 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 3,409 approved facilities listed in Table 1-2 will, if built, serve 35,439 acres of urban land. Sixty-one point five 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 2,763 built facilities serve 31,991 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 551 dry detention pond facilities serving 12,262 acres of urban land. There are 242 in public ownership and these represent 7,520 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.

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**Table 1-2: Approved Stormwater Management Facilities by Watershed Through 2009**

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.
<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	29	1,138	64	738	55	1,272
Lower Gunpowder	13	152	37	1,099	25	178	57	732
Little Gunpowder	1	1	0	0	5	16	9	107
Bird River	37	639	28	619	46	289	67	780
Gunpowder River	0	0	3	115	1	2	3	9
Middle River	5	78	3	138	8	23	3	22
<b>UWS Totals</b>	<b>116</b>	<b>2,058</b>	<b>100</b>	<b>3,109</b>	<b>149</b>	<b>1,246</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	54	565	63	604
Gwynns Falls	69	1,056	65	2,044	134	1,398	128	1,826
Jones Falls	33	815	22	724	62	728	21	438
Back River	53	313	15	196	59	405	38	365
Baltimore Harbor	6	139	2	86	8	65	1	14
<b>Patapsco/Back R. Tot</b>	<b>193</b>	<b>2,684</b>	<b>142</b>	<b>4,411</b>	<b>327</b>	<b>3,221</b>	<b>261</b>	<b>3,433</b>
<b>County Totals</b>	<b>309</b>	<b>4,742</b>	<b>242</b>	<b>7,520</b>	<b>476</b>	<b>4,467</b>	<b>460</b>	<b>6,391</b>
Watershed	Retention Pond (WP & SM)				Infil. Basins, Trenches, Dry Wells, Porous Paving, Level Spreader (DW, PP, IT, LS, TTWQE & IB)			
	Private		Public		Private		Public	
	N	D.A.	N	D.A.	N	D.A.	N	D.A.
<b>Upper Western Shore</b>								
Deer Creek	0	0	0	0	0	0	0	0
Prettyboy Res.	0	0	0	0	3	16	1	13
Loch Raven Res.	12	296	6	128	61	192	15	120
Lower Gunpowder	2	300	5	96	8	13	7	63
Little Gunpowder	1	50	1	7	9	65	2	32
Bird River	22	513	11	440	19	39	14	71
Gunpowder River	11	99	4	55	4	22	6	4
Middle River	16	247	10	187	15	49	5	9
<b>UWS Totals</b>	<b>64</b>	<b>1,505</b>	<b>37</b>	<b>913</b>	<b>119</b>	<b>396</b>	<b>50</b>	<b>312</b>
<b>Patapsco/Back River</b>								
Liberty Res.	1	22	0	0	15	32	2	2
Patapsco River	13	294	11	177	53	73	15	239
Gwynns Falls	17	749	6	151	63	79	24	61
Jones Falls	7	889	2	31	27	73	9	27
Back River	15	172	7	445	15	18	4	11
Baltimore Harbor	9	93	8	298	10	15	1	2
<b>Patapsco/Back R. Tot</b>	<b>61</b>	<b>2,219</b>	<b>34</b>	<b>1,102</b>	<b>183</b>	<b>290</b>	<b>55</b>	<b>342</b>
<b>County Totals</b>	<b>125</b>	<b>3,724</b>	<b>71</b>	<b>2,015</b>	<b>302</b>	<b>686</b>	<b>105</b>	<b>654</b>

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**Table 1-2: Approved Stormwater Management Facilities by Watershed Through 2009 (continued)**

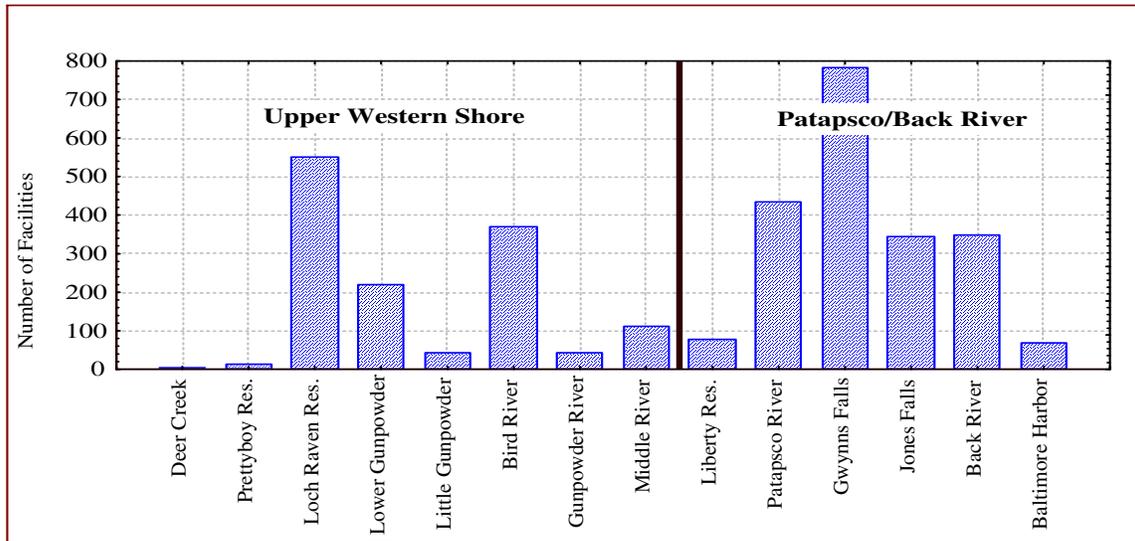
Watershed	Sand Filter, Bioretention, Filter Strip, Swale (SF, BIO, FS, SW)				Underground Storage & Oil/Grit Separator (UGS, OGS, SC, O, UK)			
	Private		Public		Private		Public	
	N	D.A.	N	D.A.	N	D.A.	N	D.A.
<b>Upper Western Shore</b>								
Deer Creek	0	0	0	0	0	0	0	0
Prettyboy Res.	0	0	5	43	0	0	0	0
Loch Raven Res.	80	248	78	652	74	179	18	85
Lower Gunpowder	25	86	23	131	17	45	1	2
Little Gunpowder	8	14	5	40	2	1	2	10
Bird River	41	123	57	355	23	69	3	3
Gunpowder River	8	16	2	10	0	0	1	1
Middle River	29	83	9	64	7	13	3	67
<b>UWS Totals</b>	<b>191</b>	<b>570</b>	<b>179</b>	<b>1,295</b>	<b>123</b>	<b>307</b>	<b>28</b>	<b>168</b>
<b>Patapsco/Back River</b>								
Liberty Res.	12	20	22	134	4	2	2	1
Patapsco River	65	150	43	323	39	137	8	18
Gwynns Falls	100	366	64	339	105	293	8	65
Jones Falls	68	160	28	150	57	179	9	114
Back River	58	128	36	150	44	106	3	18
Baltimore Harbor	11	32	3	7	8	11	0	0
<b>Patapsco/Back R. Tot</b>	<b>314</b>	<b>856</b>	<b>196</b>	<b>1,103</b>	<b>257</b>	<b>728</b>	<b>30</b>	<b>216</b>
<b>County Totals</b>	<b>505</b>	<b>1,426</b>	<b>375</b>	<b>2,398</b>	<b>380</b>	<b>1,035</b>	<b>58</b>	<b>384</b>
Watershed	Total Approved SWM				Total Constructed SWM			
	Private		Public		Private		Public	
	N	D.A.	N	D.A.	N	D.A.	N	D.A.
<b>Upper Western Shore</b>								
Deer Creek	0	0	0	0	0	0	0	0
Prettyboy Res.	3	16	11	92	0	0	11	62
Loch Raven Res.	351	2,842	201	3,396	286	2,676	176	3,081
Lower Gunpowder	90	774	130	2,123	70	695	113	1,995
Little Gunpowder	26	147	19	197	16	135	14	138
Bird River	188	1,672	180	2,269	165	1,537	142	1,940
Gunpowder River	24	139	19	193	16	81	16	191
Middle River	80	493	33	486	52	343	28	412
<b>UWS Totals</b>	<b>762</b>	<b>6,083</b>	<b>593</b>	<b>8,756</b>	<b>605</b>	<b>5,467</b>	<b>500</b>	<b>7,819</b>
<b>Patapsco/Back River</b>								
Liberty Res.	42	136	37	330	31	119	20	236
Patapsco River	256	1,579	177	2,713	202	1,438	137	2,450
Gwynns Falls	488	3,942	295	4,486	407	3,501	242	4,182
Jones Falls	254	2,843	91	1,484	204	2,658	71	1,329
Back River	244	1,142	103	1,185	206	993	90	1,138
Baltimore Harbor	52	354	15	406	41	297	7	364
<b>Patapsco/Back R. Tot</b>	<b>1,336</b>	<b>9,996</b>	<b>718</b>	<b>10,604</b>	<b>1,091</b>	<b>9,006</b>	<b>567</b>	<b>9,699</b>
<b>County Totals</b>	<b>2,098</b>	<b>16,079</b>	<b>1,311</b>	<b>19,360</b>	<b>1,696</b>	<b>14,473</b>	<b>1,067</b>	<b>17,518</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

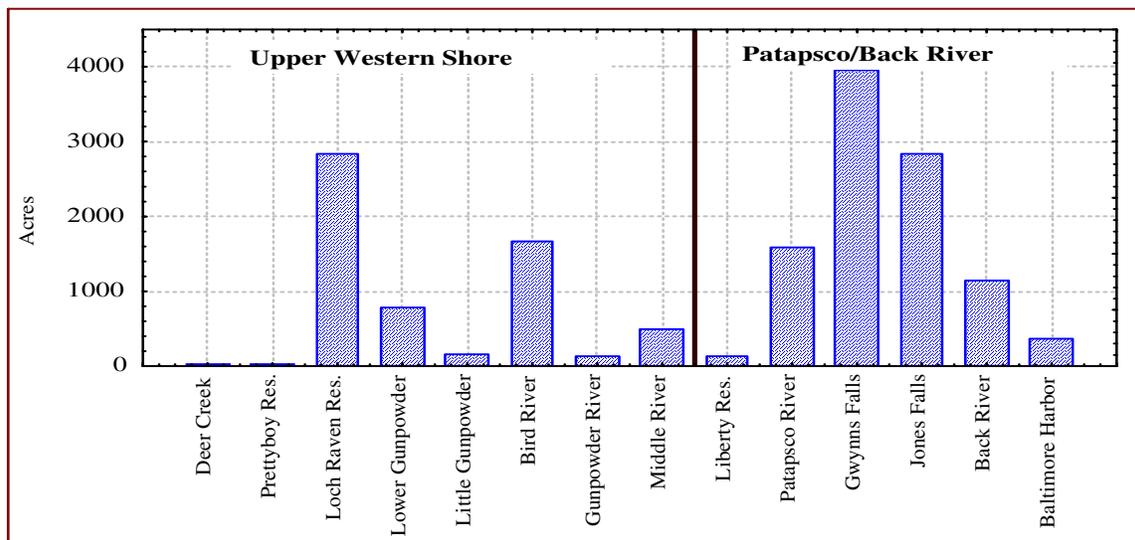
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existing and newly approved facilities. The large number of facilities in the Gwynns Falls watershed can be attributed to the fact that the Owings Mills growth area was built mostly after SWM regulations were in place. Many older communities, developed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

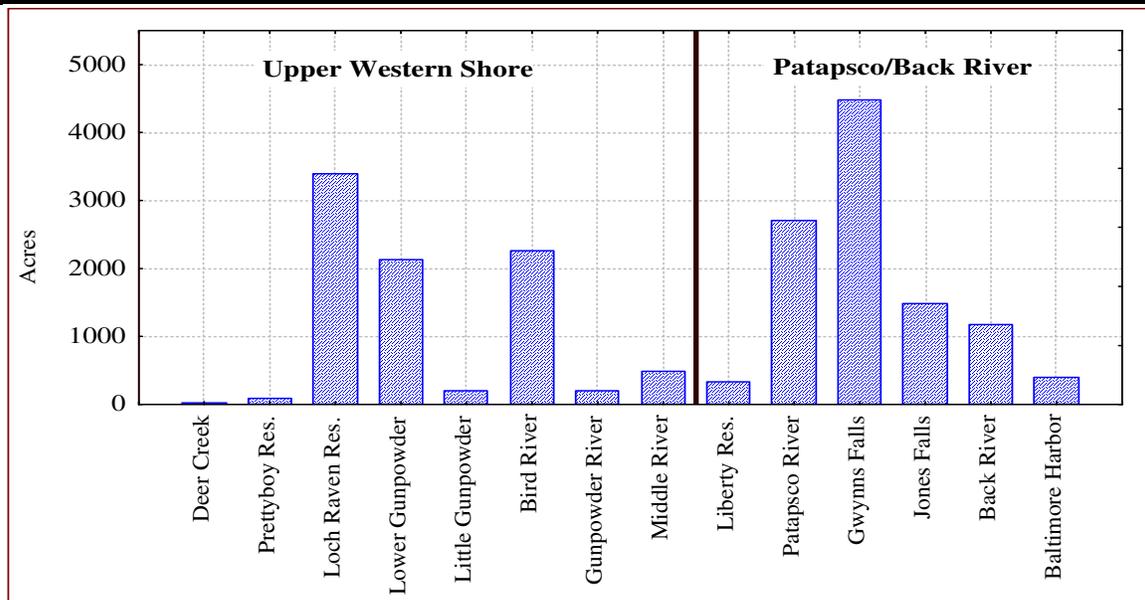


**Figure 1-1: Number of Approved SWM Facilities by Watershed – Through Calendar-Year 2009**



**Figure 1-2: Acreage Served by Approved Private SWM Facilities by Watershed Through Calendar-Year 2009**

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**Figure 1-3: Acreage Served by Approved Public SWM Facilities by Watershed Through Calendar-Year 2009**

**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. In 2005 the Stormwater Engineering Section added an Engineer III for review of stormwater facility designs and two Engineering Associates III to conduct three-year inspections of private stormwater facilities. In addition, an existing Engineering Associate IV was reassigned as a supervisor to the private facility three-year inspection program. An Engineer II and an Engineer III were added in 2009 to the Stormwater Engineering Section to provide added staff for review of stormwater management designs for new development and redevelopment under the Stormwater Management Act of 2007.

Table 1-3 presents the SWM facility inspections conducted by DEPRM during the calendar year 2009.

**Table 1-3: SWM Inspections 2009**

	<b>As Built</b>	<b>One year</b>	<b>Three year</b>	<b>Totals</b>
Private Stormwater Facilities	84	125	461	<b>670</b>
Public Stormwater Facilities	103	87	93	<b>283</b>
<b>Totals</b>	<b>187</b>	<b>212</b>	<b>554</b>	<b>953</b>

Engineers in the Stormwater Engineering Section complete all as-built inspections and one-year inspections. A total of 187 as-built inspections were completed in calendar year 2009. A total of 212 one-year inspections were completed. Approval of the one-year maintenance inspection initiates the three-year maintenance inspection cycle. The Stormwater Engineering Section also completes three-year inspections for the facilities in private ownership. A total of 461 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 93 three-year inspections were completed for

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public facilities. This results in a total of 554 three-year inspections of all stormwater management facilities by DEPRM for the calendar year 2009.

A total of 953 inspections were completed for all built facilities. This represents 35% of all the built facilities in Baltimore County. The program is very close to last year’s inspection totals with less “as-built” inspections and more “3-year” inspections than last year. The inspection program’s goal is to inspect all built facilities every three years.

**1.5 Stormwater Management Facility Maintenance**

The Baltimore County Department of Environmental Protection and Resource Management 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 central, 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 191 routine maintenance assessments and 75 complaint driven site assessments during the calendar year 2009.

**Table 1-4: Stormwater Facility Maintenance Visits by Type 2009**

Watershed	# of Routine Maintenance Visits	# of Complaint Maintenance Visits
Loch Raven Reservoir	17	5
Lower Gunpowder	33	19
Little Gunpowder	3	1
Bird River	12	3
Gunpowder River	7	2
Middle River	9	2
Liberty Reservoir	0	0
Patapsco River	29	7
Gwynns Falls	50	22
Jones Falls	10	5
Back River	21	9
Baltimore Harbor	0	0
<b>Total</b>	<b>191</b>	<b>75</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-eight facilities were maintained during the reporting time period. The total number of site visits was 252, 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, 2009 through December 31, 2009. 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 2009**

<b>Watershed</b>	<b># Ponds Maintained</b>	<b>Total # inspections</b>	<b>Repair Fence</b>	<b>Secure Gate</b>	<b>Clean Riser</b>	<b>Clean Low Flow</b>	<b>Remove Debris</b>	<b>Trim Fence</b>	<b>Cleared Berm</b>	<b>Tar-Riser</b>
<b>Upper Western Shore</b>										
Prettyboy	0	0	0	0	0	0	0	0	0	0
Loch Raven	18	22	4	8	10	8	11	10	7	0
Lower Gunpowder	33	53	24	15	12	7	16	18	6	1
Little Gunpowder	4	4	1	1	2	1	1	1	0	0
Bird River	12	38	8	6	7	2	7	7	1	0
Gunpowder River	5	5	3	0	0	0	2	0	0	0
Middle River	3	11	4	0	2	0	2	0	1	0
<b>Upper Western Shore. Total</b>	<b>75</b>	<b>138</b>	<b>44</b>	<b>30</b>	<b>33</b>	<b>18</b>	<b>39</b>	<b>36</b>	<b>15</b>	<b>1</b>
<b>Patapsco/Back River</b>										
Liberty	0	0	0	0	0	0	0	0	0	0
Patapsco	32	36	13	22	26	28	28	24	22	0
Gwynns Falls	64	73	26	46	53	53	59	55	33	0
Jones Falls	14	15	3	9	7	13	8	8	3	1
Back River	20	79	14	13	13	6	13	18	2	0
Baltimore Harbor	0	0	0	0	0	0	0	0	0	0
<b>Patapsco/Back River Total</b>	<b>130</b>	<b>203</b>	<b>56</b>	<b>90</b>	<b>99</b>	<b>100</b>	<b>108</b>	<b>105</b>	<b>60</b>	<b>1</b>
<b>County Totals</b>	<b>205</b>	<b>241</b>	<b>100</b>	<b>120</b>	<b>132</b>	<b>118</b>	<b>147</b>	<b>141</b>	<b>75</b>	<b>2</b>

### 1.6 Constructed Stormwater Management Facility Data Analysis

An analysis of the databases related to stormwater management facilities indicated that a total of 2,763 facilities have been built to date. The 2,763 built facilities have a combined drainage area of 31,911 acres. The drainage areas of 2,209 built facilities were delineated and digitized into the County GIS. The drainage area for the 2,209 facilities that have been delineated is 27,768 acres or approximately 88% of the area (31,911 acres) served by the built stormwater facilities. The remaining 554 built facilities have a combined drainage area of 4,223 acres (12% 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 22.6% 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 2009**

Watershed	Pervious Urban	Impervious Urban	Agriculture	Forest and Wetlands	Bare Ground	Total
<b>Upper Western Shore</b>						
PR	35.1	7.3	1.3	1.6	0.0	45.3
LR	3,030.3	1,442.4	191.4	474.1	0.0	5,139.3
GU	1,388.7	517.6	104.1	144.8	0.0	2,155.3
LG	187.3	37.6	41.9	8.5	0.0	275.2
BI	1,526.2	1,031.6	148.6	365.5	4.7	3,076.6
GR	103.7	68.1	0.0	55.1	0.0	226.9
MR	188.6	175.5	0.0	84.9	0.0	449.1
<b>Total</b>	<b>6,459.9</b>	<b>3,280.1</b>	<b>487.3</b>	<b>1134.5</b>	<b>4.7</b>	<b>11,367.7</b>
<b>Patapsco/Back River</b>						
LI	99.1	38.8	4.6	9.3	0.0	151.8
PA	1,834.5	1,069.1	57.6	355.5	0.7	3,317.4
GW	4,061.5	2,528.9	92.2	413.1	0.9	7,096.7
JF	2,235.1	872.4	60.1	292.3	3.3	3,463.1
BR	1,027.7	885.6	9.1	123.6	0.0	2,046.1
BH	169.3	145.3	0.0	11.0	0.0	325.6
P/B	<b>9,427.2</b>	<b>5,540.1</b>	<b>223.6</b>	<b>1204.8</b>	<b>4.9</b>	<b>16,400.7</b>
<b>County</b>	<b>15,887.1</b>	<b>8,820.2</b>	<b>710.9</b>	<b>2,339.3</b>	<b>9.6</b>	<b>27,768.4</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 2,209 facilities that are currently built with drainage area digitized (an additional 554 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.	32.5	381
Loch Raven Res.	4,708.0	45,809
Lower Gunpowder	1,843.7	19,058
Little Gunpowder	195.7	2,520
Bird River	3,099.0	28,113
Gunpowder River	199.4	1,783
Middle River	479.3	3,951
<b>Total</b>	<b>10,557.6</b>	<b>101,615</b>
<b>Patapsco/Back River</b>		
Liberty Res.	133.8	1,355
Patapsco	3,252.3	29,696
Gwynns Falls	7,533.3	67,069

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Jones Falls	2,982.0	29,821
Back River	2,451.2	20,217
Baltimore Harbor	401.3	3,710
<b>Total</b>	<b>16,753.9</b>	<b>151,868</b>
<b>County Total</b>	<b>27,311.5</b>	<b>253,483</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 April 28, 2010. It can be found at: [http://archive.chesapeakebay.net/pubs/NPS\\_BMP\\_Table1.3.pdf](http://archive.chesapeakebay.net/pubs/NPS_BMP_Table1.3.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 that were use in the 2009 report and the new efficiencies to be 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	<b>5</b>		<b>10</b>		<b>10</b>	
Extended Detention Facilities	30	<b>20</b>	<b>20</b>		<b>60</b>	
Wet Ponds	50	<b>20</b>	50	<b>45</b>	80	<b>60</b>
Infiltration Practices	50	<b>85</b>	70	<b>85</b>	90	<b>95</b>
Filtration Practices	<b>40</b>		<b>60</b>		85	<b>80</b>
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), 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.	32.5	0	1.6	0	7.6	9.4	18.7	57
Loch Raven Res.	4,708.0	280.1	304.3	83.9	284.6	206.4	1,151.5	24
Lower Gunpowder	1,843.7	80.8	123.2	134.9	67.4	24.3	430.6	23
Little Gunpowder	195.7	0.7	15.2	15.8	52.6	8.0	92.3	47
Bird River	3,099.0	109.4	158.2	398.6	128.5	106.1	900.8	29
Gunpowder River	199.4	8.6	2.8	34.9	6.1	8.9	70.7	27
Middle River	479.3	14.1	8.9	77.2	30.2	52.1	182.5	38
<b>Totals</b>	<b>10,557.6</b>	<b>493.7</b>	<b>614.2</b>	<b>745.3</b>	<b>577</b>	<b>415.2</b>	<b>2,847.1</b>	<b>27</b>
<b>Patapsco/Back River Watersheds</b>								
Liberty Res.	133.8	0.4	13.5	10.5	21.0	8.5	53.9	40
Patapsco	3,252.3	171.9	170.4	148.5	199.7	70.0	760.4	23
Gwynns Falls	7,533.3	290.3	635.5	429.6	114.9	217.6	1,688.0	22
Jones Falls	2,982.0	148.8	172.2	202.4	36.8	83.9	644.1	22
Back River	2,451.2	67.0	163.1	319.2	24.9	136.3	710.6	29
Baltimore Harbor	401.3	24.1	13.8	33.8	8.9	3.4	84.0	21
<b>Totals</b>	<b>16,753.9</b>	<b>702.5</b>	<b>1168.5</b>	<b>1144.0</b>	<b>406.2</b>	<b>519.7</b>	<b>3,941.0</b>	<b>24</b>
<b>County Total</b>	<b>27,311.5</b>	<b>1,348.1</b>	<b>2,072.4</b>	<b>2,226.2</b>	<b>946.7</b>	<b>1,079.5</b>	<b>6,788.1</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.	381	0	20	0	94	69	182	48
Loch Raven Res.	45,809	1,081	3,039	477	2,340	1,441	8,480	19
Lower Gunpowder	19,058	420	1,209	680	767	170	3,155	17
Little Gunpowder	2,520	3	214	92	661	51	1,021	41
Bird River	28,113	496	1,455	1,588	1,149	649	5,337	19
Gunpowder River	1,783	40	25	137	56	42	300	17
Middle River	3,951	65	76	284	208	242	875	22
<b>Totals</b>	<b>101,615</b>	<b>2,105</b>	<b>6,038</b>	<b>3,258</b>	<b>5,275</b>	<b>2,664</b>	<b>19,350</b>	<b>19</b>
<b>Patapsco/Back River Watersheds</b>								
Liberty Res.	1,355	1	141	44	207	64	457	34
Patapsco	29,696	772	1,593	640	1,730	422	5,157	17
Gwynns Falls	67,069	1,303	5,692	1,672	1,014	1,198	10,879	17
Jones Falls	29,821	750	1,629	967	372	563	4,281	14
Back River	20,217	267	1,349	1,192	186	778	3,773	19
Baltimore Harbor	3,710	105	96	114	72	19	406	12
<b>Totals</b>	<b>151,868</b>	<b>3,198</b>	<b>10,500</b>	<b>4,629</b>	<b>3,581</b>	<b>3,044</b>	<b>24,953</b>	<b>16</b>
<b>County Total</b>	<b>253,483</b>	<b>5,303</b>	<b>16,538</b>	<b>7,887</b>	<b>8,856</b>	<b>5,708</b>	<b>44,303</b>	<b>17</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. This is the first year that the 2008 impervious cover data has been used. The results of the analysis of impervious cover served by storm water management are presented in Table 1-11. The 5,114.1 acres of impervious cover addressed by advanced stormwater management represents 13.4% 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</b>	<b>% Covered by Advanced SWM</b>
<b>Upper Western Shore</b>						
Deer Creek	231.5	202.7	0.0	0.0	0.0	0.0
Prettyboy	563.2	541.8	7.3	7.3	1.3	1.3
Loch Raven	7,536.0	6,887.8	1,442.4	708.2	20.9	10.3
Lower Gunpowder	2,555.5	2,350.7	517.6	291.6	22.0	12.4
Little Gunpowder	730.0	643.4	37.6	34.9	5.8	5.4
Bird River	3,058.4	2,752.9	1,031.6	672.8	37.5	24.4
Gunpowder River	496.9	464.8	68.1	40.6	14.7	8.7
Middle River	1,560.9	1,274.9	175.5	129.1	13.8	10.1
<b>UWS Totals</b>	<b>16,732.4</b>	<b>15,119.0</b>	<b>3,280.1</b>	<b>1884.5</b>	<b>21.7</b>	<b>12.5</b>
<b>Patapsco/Back River</b>						
Liberty	740.3	609.5	38.8	37.1	6.4	6.1
Patapsco	4,779.3	4,045.8	1,069.1	494.0	26.4	12.2
Gwynns Falls	7,216.8	6,488.9	2,528.9	1,570.3	39.0	24.2
Jones Falls	4,059.5	3,582.0	872.4	427.7	24.4	11.9
Back River	6,137.8	5,568.1	885.6	636.8	15.9	11.4
Baltimore Harbor	3,331.9	2,881.9	145.3	63.7	5.0	2.2
<b>P/B Totals</b>	<b>26,265.6</b>	<b>23,176.2</b>	<b>5,540.1</b>	<b>3,229.6</b>	<b>23.9</b>	<b>13.9</b>
<b>County Total</b>	<b>42,997.9</b>	<b>38,285.1</b>	<b>8,820.2</b>	<b>5,114.1</b>	<b>23.0</b>	<b>13.4</b>

### **1.7 Summary**

Baltimore County operates a comprehensive stormwater management program. DEPRM has always taken a firm stand on requiring water quality treatment even when quantity management was not required. DEPRM continues to require all projects to explore and implement methods for water quality treatment. DEPRM 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 DEPRM 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 ~19.7 % 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 5,114.1 acres of impervious cover of the County's 38,285.1 acres of impervious area.

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**Appendix 1-1: Public Stormwater Facility Maintenance by Type for Calendar Year 2009**

Date	Watershed	Pond #	Repaired Fence	Secured Gate	Cleaned Riser	Cleaned Low Flow	Removed Debris	Trimmed Fence	Cleared Berm	Tar Riser
3/25/2009	Back River	164	X							
6/16/2009	Back River	164	X		X		X	X		
10/28/2009	Back River	164	X							
11/25/2009	Back River	164								
12/28/2009	Back River	164	X							
11/18/2009	Back River	170	X							
3/10/2009	Back River	230		X		X		X	X	
2/25/2009	Back River	381		X			X	X	X	
7/22/2009	Back River	533			X	X		X		
7/22/2009	Back River	534		X	X			X		
6/17/2009	Back River	553		X	X	X	X	X		
6/17/2009	Back River	554		X	X	X	X	X		
6/23/2009	Back River	624		X	X	X	X	X		
10/ 6/2009	Back River	624		X		X	X	X		
6/27/2009	Back River	861			X			X		
8/11/2009	Back River	1007			X			X		
6/23/2009	Back River	1200			X		X	X		
2/ 6/2009	Back River	1380	X							
4/13/2009	Back River	1380	X							
6/17/2009	Back River	1380	X	X			X	X		
8/18/2009	Back River	1380		X	X			X		
10/15/2009	Back River	1380	X							
10/15/2009	Back River	1547	X							
6/23/2009	Back River	1608		X			X	X		
3/17/2009	Back River	1983	X				X			
10/15/2009	Back River	1983	X							
6/16/2009	Back River	2300		X	X		X	X		
11/ 4/2009	Back River	2909	X	X	X		X	X		
9/15/2009	Back River	2915	X							
7/29/2009	Back River	3330		X	X		X	X		
12/ 3/2009	Bird River	205	X							
5/13/2009	Bird River	493					X			
11/ 9/2009	Bird River	493				X				
1/16/2009	Bird River	610	X							
12/15/2009	Bird River	874	X							
11/ 4/2009	Bird River	875		X	X		X	X		
12/28/2009	Bird River	875	X							
12/28/2009	Bird River	1260	X							
11/ 4/2009	Bird River	1548	X	X	X		X	X		
10/21/2009	Bird River	2886		X						
11/ 4/2009	Bird River	3067		X	X		X	X		
3/11/2009	Bird River	3272	X		X		X	X	X	
10/22/2009	Bird River	3313		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
3/11/2009	Bird River	3433	X		X		X	X		
11/ 2/2009	Bird River	3433		X	X		X	X		
1/ 5/2009	Gunpowder River	1167					X			
8/13/2009	Gunpowder River	1167	X							
11/24/2009	Gunpowder River	1167	X							
12/28/2009	Gunpowder River	1167	X							
3/16/2009	Gunpowder River	1422					X			
4/23/2009	Gunpowder River	1422					X			
12/11/2009	Gunpowder River	3032								
11/ 9/2009	Gunpowder River	3436								
7/28/2009	Gunpowder River	3595								
4/17/2009	Gwynns Falls	27				X	X			
6/25/2009	Gwynns Falls	33		X				X		
2/20/2009	Gwynns Falls	39		X	X	X	X	X		
6/26/2009	Gwynns Falls	39		X	X	X	X	X	X	
9/28/2009	Gwynns Falls	44		X	X	X	X	X		
2/17/2009	Gwynns Falls	46	X	X	X	X	X	X	X	
11/23/2009	Gwynns Falls	58		X	X	X	X	X		
6/25/2009	Gwynns Falls	110		X	X	X	X	X		
3/24/2009	Gwynns Falls	190			X	X	X	X	X	
1/23/2009	Gwynns Falls	191		X	X	X	X	X	X	
6/11/2009	Gwynns Falls	219						X		
3/20/2009	Gwynns Falls	226	X				X			
9/ 3/2009	Gwynns Falls	226		X	X	X	X	X		
6/17/2009	Gwynns Falls	232		X	X	X	X	X	X	
6/15/2009	Gwynns Falls	238	X	X	X	X	X	X		
7/13/2009	Gwynns Falls	251		X	X	X	X	X	X	
9/15/2009	Gwynns Falls	251								
6/ 2/2009	Gwynns Falls	270	X	X	X	X	X	X	X	
12/ 2/2009	Gwynns Falls	270								
3/31/2009	Gwynns Falls	274	X							
4/13/2009	Gwynns Falls	274			X	X	X	X	X	
7/15/2009	Gwynns Falls	274		X	X	X	X	X	X	
3/16/2009	Gwynns Falls	276	X	X	X	X	X	X	X	
11/ 3/2009	Gwynns Falls	365			X					
5/12/2009	Gwynns Falls	408		X	X	X	X	X	X	
1/ 9/2009	Gwynns Falls	432	X	X	X	X	X	X	X	
9/28/2009	Gwynns Falls	629	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
10/28/2009	Gwynns Falls	629		X						
3/26/2009	Gwynns Falls	664			X	X		X	X	
5/19/2009	Gwynns Falls	849		X	X		X	X	X	
9/15/2009	Gwynns Falls	849		X	X	X	X	X		
2/ 9/2009	Gwynns Falls	870		X	X	X	X	X		
8/14/2009	Gwynns Falls	993	X	X	X	X	X	X	X	
9/14/2009	Gwynns Falls	996				X	X			
3/31/2009	Gwynns Falls	997	X							
1/15/2009	Gwynns Falls	998			X					
9/ 9/2009	Gwynns Falls	1073			X	X	X	X	X	
8/12/2009	Gwynns Falls	1112		X	X	X	X	X	X	
6/ 3/2009	Gwynns Falls	1115	X	X	X	X	X	X	X	
8/ 7/2009	Gwynns Falls	1190		X	X	X	X	X	X	
7/29/2009	Gwynns Falls	1191						X		
2/27/2009	Gwynns Falls	1277	X	X	X	X	X	X	X	
12/ 2/2009	Gwynns Falls	1278				X			X	
10/ 5/2009	Gwynns Falls	1444			X	X	X			
8/17/2009	Gwynns Falls	1446	X	X		X	X	X	X	
10/22/2009	Gwynns Falls	1462	X		X	X	X	X		
10/22/2009	Gwynns Falls	1463					X	X		
10/14/2009	Gwynns Falls	1464	X	X	X	X	X	X	X	
10/13/2009	Gwynns Falls	1465	X	X	X	X	X	X		
11/17/2009	Gwynns Falls	1601	X	X	X	X	X	X		
11/16/2009	Gwynns Falls	1602	X	X	X	X	X	X		
2/12/2009	Gwynns Falls	1651		X	X	X	X	X	X	
2/11/2009	Gwynns Falls	1652					X	X	X	
3/10/2009	Gwynns Falls	1666	X	X	X		X	X	X	
11/ 4/2009	Gwynns Falls	1708					X			
11/ 4/2009	Gwynns Falls	1715					X			
11/ 5/2009	Gwynns Falls	1716					X			
1/ 2/2009	Gwynns Falls	1727			X	X	X		X	
12/10/2009	Gwynns Falls	1754	X	X	X	X	X	X		
4/23/2009	Gwynns Falls	1755	X	X	X	X	X	X		
4/28/2009	Gwynns Falls	1819	X	X	X	X	X	X	X	
4/21/2009	Gwynns Falls	1846		X	X	X	X	X	X	
8/18/2009	Gwynns Falls	2016		X	X	X	X	X		
7/ 8/2009	Gwynns Falls	2067		X	X	X	X	X	X	
10/ 1/2009	Gwynns Falls	2127	X	X	X	X	X	X	X	
6/23/2009	Gwynns Falls	3269	X	X	X	X	X	X		
9/10/2009	Gwynns Falls	3269								
10/20/2009	Gwynns Falls	3389	X	X	X	X	X	X		
7/13/2009	Gwynns Falls	3440		X	X	X	X	X		
6/12/2009	Gwynns Falls	3459		X						
10/ 8/2009	Gwynns Falls	3478		X	X	X	X	X		
10/19/2009	Gwynns Falls	3522	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
6/23/2009	Gwynns Falls	3569			X	X	X	X	X	
2/23/2009	Jones Falls	62			X	X	X		X	
2/23/2009	Jones Falls	63			X	X			X	
2/20/2009	Jones Falls	64			X	X	X			
11/20/2009	Jones Falls	111				X				
1/12/2009	Jones Falls	112		X		X	X			
1/12/2009	Jones Falls	113		X		X	X			
6/24/2009	Jones Falls	113						X		
1/12/2009	Jones Falls	147		X		X	X	X		
5/21/2009	Jones Falls	169	X							
1/13/2009	Jones Falls	332		X	X	X	X	X		
1/14/2009	Jones Falls	333	X	X		X		X		
8/25/2009	Jones Falls	547		X	X	X		X		
8/25/2009	Jones Falls	548		X		X		X		X
9/ 9/2009	Jones Falls	912		X	X	X	X	X	X	
2/20/2009	Jones Falls	1881	X	X	X	X	X	X		
5/14/2009	Little Gunpowder	683				X				
5/26/2009	Little Gunpowder	1970	X							
10/21/2009	Little Gunpowder	2059		X	X		X	X		
6/ 3/2009	Little Gunpowder	2889			X					
2/18/2009	Loch Raven	38			X				X	
1/23/2009	Loch Raven	59	X	X	X	X	X	X	X	
2/23/2009	Loch Raven	66					X		X	
6/18/2009	Loch Raven	78			X		X			
10/23/2009	Loch Raven	78				X				
1/12/2009	Loch Raven	86		X	X	X	X	X	X	
6/22/2009	Loch Raven	156		X			X	X		
2/13/2009	Loch Raven	180								
6/22/2009	Loch Raven	180		X			X	X		
9/15/2009	Loch Raven	382	X		X		X	X		
12/16/2009	Loch Raven	382		X						
8/12/2009	Loch Raven	699			X				X	
9/ 2/2009	Loch Raven	1366			X	X	X	X	X	
4/22/2009	Loch Raven	1457	X	X		X		X		
10/ 1/2009	Loch Raven	2126	X	X	X	X	X	X	X	
9/30/2009	Loch Raven	2232			X	X				
9/30/2009	Loch Raven	2233			X	X				
3/16/2009	Loch Raven	2879					X			
12/10/2009	Loch Raven	2879		X			X	X		
6/24/2009	Loch Raven	2903						X		
9/22/2009	Loch Raven	2932								

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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/ 5/2009	Loch Raven	4589								
5/20/2009	Lower Gunpowder	340					X			
12/ 3/2009	Lower Gunpowder	340	X							
3/18/2009	Lower Gunpowder	393	X			X		X		
9/14/2009	Lower Gunpowder	393			X			X		
10/26/2009	Lower Gunpowder	393		X	X			X		
5/14/2009	Lower Gunpowder	473	X							
8/21/2009	Lower Gunpowder	517						X		
5/13/2009	Lower Gunpowder	525		X	X	X	X	X		
7/ 7/2009	Lower Gunpowder	525								
9/15/2009	Lower Gunpowder	525	X							
11/ 9/2009	Lower Gunpowder	525				X				
6/ 8/2009	Lower Gunpowder	557						X		
8/12/2009	Lower Gunpowder	557							X	
8/ 3/2009	Lower Gunpowder	571		X			X	X		
10/22/2009	Lower Gunpowder	728				X				
12/ 8/2009	Lower Gunpowder	729					X			
7/28/2009	Lower Gunpowder	811			X		X		X	
7/28/2009	Lower Gunpowder	815		X		X		X		
8/20/2009	Lower Gunpowder	815		X						
4/27/2009	Lower Gunpowder	845					X			
9/23/2009	Lower Gunpowder	845	X		X	X	X	X	X	
5/18/2009	Lower Gunpowder	850						X		
12/ 3/2009	Lower Gunpowder	1003	X							
5/14/2009	Lower Gunpowder	1155	X							
5/14/2009	Lower	1156	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
	Gunpowder									
9/15/2009	Lower Gunpowder	1233	X							
7/21/2009	Lower Gunpowder	1406		X			X	X		
10/19/2009	Lower Gunpowder	1407	X							
7/21/2009	Lower Gunpowder	1408	X	X			X			
10/19/2009	Lower Gunpowder	1408	X							
12/ 3/2009	Lower Gunpowder	1408	X							
9/23/2009	Lower Gunpowder	1473		X	X			X		
12/ 1/2009	Lower Gunpowder	1473		X			X			
7/29/2009	Lower Gunpowder	1476		X	X		X			
10/19/2009	Lower Gunpowder	1476	X							
10/ 8/2009	Lower Gunpowder	1534			X				X	
9/24/2009	Lower Gunpowder	1535							X	X
10/21/2009	Lower Gunpowder	1535					X	X	X	
10/26/2009	Lower Gunpowder	1535	X		X			X		
5/21/2009	Lower Gunpowder	1634	X							
12/ 3/2009	Lower Gunpowder	1634	X							
3/23/2009	Lower Gunpowder	1635	X							
4/30/2009	Lower Gunpowder	1635	X							
8/20/2009	Lower Gunpowder	1764		X	X					
2/ 9/2009	Lower Gunpowder	1789					X			
4/21/2009	Lower Gunpowder	1789	X							
11/16/2009	Lower Gunpowder	1842		X				X		
7/28/2009	Lower Gunpowder	2028			X		X			
8/20/2009	Lower Gunpowder	2028	X	X						
7/21/2009	Lower	2032	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
10/29/2009	Gunpowder Lower Gunpowder	2032	X					X		
12/14/2009	Lower Gunpowder	3046				X				
10/29/2009	Lower Gunpowder	3238	X	X	X		X	X		
5/16/2009	Middle River	711			X		X			
8/12/2009	Middle River	711			X				X	
11/11/2009	Middle River	711								
3/25/2009	Middle River	950	X							
6/ 8/2009	Middle River	950	X							
10/15/2009	Middle River	950	X							
12/ 3/2009	Middle River	950	X							
4/28/2009	Middle River	4254					X			
7/ 9/2009	Middle River	4254								
9/ 3/2009	Middle River	4254								
11/17/2009	Middle River	4254								
5/28/2009	Patapsco	202		X	X	X	X	X	X	
7/20/2009	Patapsco	255	X	X	X	X	X	X	X	
12/29/2009	Patapsco	258								
3/18/2009	Patapsco	358			X	X	X		X	
3/19/2009	Patapsco	359				X	X		X	
8/ 3/2009	Patapsco	386				X	X	X		
7/28/2009	Patapsco	389	X		X	X	X	X	X	
8/ 4/2009	Patapsco	390		X	X	X	X	X	X	
5/22/2009	Patapsco	421	X	X	X	X	X	X	X	
4/ 7/2009	Patapsco	521			X					
6/22/2009	Patapsco	521								
2/17/2009	Patapsco	567			X	X	X	X	X	
4/30/2009	Patapsco	636	X	X	X	X			X	
1/16/2009	Patapsco	784		X	X	X	X	X	X	
7/23/2009	Patapsco	991			X	X		X	X	
7/21/2009	Patapsco	994		X	X	X	X	X	X	
7/22/2009	Patapsco	995		X	X	X	X	X	X	
1/ 9/2009	Patapsco	1189		X	X	X	X	X	X	
5/13/2009	Patapsco	1204		X	X	X	X	X	X	
9/ 1/2009	Patapsco	1430			X	X	X		X	
9/ 1/2009	Patapsco	1431		X	X	X	X	X	X	
10/ 5/2009	Patapsco	1431		X	X	X	X	X		
2/24/2009	Patapsco	1555	X	X	X	X	X	X	X	
9/21/2009	Patapsco	1560		X	X	X	X	X		
3/31/2009	Patapsco	1700	X							
11/ 2/2009	Patapsco	1700		X	X	X	X	X		
3/10/2009	Patapsco	1876	X			X		X		

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3/18/2009	Patapsco	1877	X	X	X	X	X	X	X	
10/30/2009	Patapsco	2228	X	X	X	X	X	X		
2/10/2009	Patapsco	2842	X	X	X	X	X	X	X	
12/ 1/2009	Patapsco	2917		X			X			
2/25/2009	Patapsco	3003	X	X	X	X	X	X	X	
3/11/2009	Patapsco	3006	X		X	X	X	X	X	
3/11/2009	Patapsco	3007	X	X						
2/27/2009	Patapsco	3575		X			X			
5/12/2009	Patapsco	4618					X			