

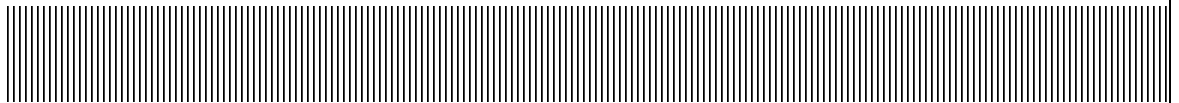


**Carroll County**  
Carroll County Water Demands and Availability

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# Appendix A

## Key Input Data to the Water Balance Assessment Tool





CARROLL COUNTY WATER BALANCE
TABLE A-1
MDE WATER APPROPRIATION PERMITS

Table with columns: WAPID, County, GorS, Owner, Average\_GPD, Max\_GPD, 2007Usage\_GPD, Aquifer Code, Aquifer Name, Remarks, Easting, Northing, MDE8Digit, u1t WSA. Contains 100 rows of permit data.



## CARROLL COUNTY WATER BALANCE TABLE A-1 MDE WATER APPROPRIATION PERMITS

WAPID	County	GorS	Owner	Average_GPD	Max_GPD	2007Usage_GPD	Aquifer Code	Aquifer Name	Remarks	Easting	Northing	MDE8Digit	u1t WSA
CL1991S102	CL	S	JACKSON, HERMAN S.	12,000	144,000	0	UGU	UNNAMED TRIBUTARY	FARM IRRIGATION	1357445	732667	02130806	Agricultural
CL1995G053	CL	G	CARROLL COUNTY GOVERNMENT	10,100	17,000	6,941	301L	UP. PELITIC SCHIST WISSAHICKON	NEW LOCATION FOR SECOND WELL	1299712	716531	02140304	Municipal Pleasant Valley
CL1981G026	CL	G	S & G CONCRETE CO.	10,000	12,000	323,714	301Q	WISSAHICKON FORMATION	CONCRETE PLANT	1342934	667460	02130907	Industrial
CL1990S049	CL	S	OAKMONT GREEN, INC.	10,000	40,000	12,268	MPR	MURPHY RUN	STORMWATER POND IRRIGATION - WELLS FEED INTO ALSO	1352136	716994	02130806	Agricultural
CL1965G013	CL	G	CARROLL COUNTY BOARD OF EDUCATION	10,000	15,000	4,203	301L	UP. PELITIC SCHIST WISSAHICKON	SOUTH CARROLL HIGH SCHOOL	1301071	647339	02130908	Industrial
CL1979S068	CL	S	THE SHELBURNE COMPANY	10,000	40,000	3,945	BEB	BEAR BRANCH	ZOYSIA NURSERIES-SOD FARM IRRIGATION	1276417	715749	02140304	Agricultural
CL2002G038	CL	G	SUN NURSERIES, INC.	10,000	150,000	3,828	300K	IJAMSVILLE FORMATION	NURSERY STOCK IRRIGATION - WELL	1310418	619749	02130908	Agricultural
CL1957G005	CL	G	DEVELOPMENT COMPANY OF AMERICA, LLP	10,000	15,000	933	301L	UP. PELITIC SCHIST WISSAHICKON	TEMPORARILY UNOCCUPIED	1332500	682878	02130907	Industrial
CL1997S021	CL	S	WEANT, CARL/TODD,	10,000	36,000	707	AAL	ALLOWAY CREEK	ALFALFA IRRIGATION FROM ALLOWAY CREEK	1260031	744705	02140303	Agricultural
CL1998G008	CL	G	MEDVED, JOSEPH, P	9,900	30,000	9,381	301L	UP. PELITIC SCHIST WISSAHICKON	IRRIGATION	1324417	690749	02130907	Agricultural
CL1967G008	CL	G	AT&T CORP.	9,800	12,700	7,695	301L	UP. PELITIC SCHIST WISSAHICKON	OFFICE AND COOLING TOWER	1337474	674418	02130907	Industrial
CL1977G054	CL	G	PLEASANT VIEW NURSING HOME	9,000	10,000	6,551	300L	IJAMSVILLE FORM.-MARBURG SCHIST	NURSING HOME INCREASE	1271095	614962	02130908	Industrial
CL2000G004	CL	G	SKW FARM, INC.	8,000	24,000	601	300L	IJAMSVILLE FORM.-MARBURG SCHIST	NURSERY IRRIGATION	1301102	723164	02140304	Agricultural
CL1963G004	CL	G	ASHLEY, MICHAEL, TODD	7,000	10,000	5,559	301L	UP. PELITIC SCHIST WISSAHICKON	ASHLEY'S TRAILER COURT	1296854	635388	02130908	Private
CL2002G005	CL	G	TOWN OF MANCHESTER	6,000	10,000	14,231	300L	IJAMSVILLE FORM.-MARBURG SCHIST	PARK RIDGE SBDN- 1 WELL FOR 27 LOTS	1341875	720354	02130907	Municipal Manchester
CL1989S002	CL	S	WESTMINSTER NATIONAL, LLC	5,200	21,000	0	BEB	BEAR BRANCH	GOLF COURSE IRRIGATION - SURFACE WATER	1308009	714141	02140304	Agricultural
CL1981S016	CL	S	CDJ DISTILLERY, LLC	4,900	15,000	1,061	UZP	UNNAMED TRIBUTARY	FIRE PROTECTION	1347057	667356	02130907	Industrial
CL2006G024	CL	G	MUDGETT FAMILY, LLC	1,000	1,800	0	301Q	WISSAHICKON FORMATION	10,000 SQ-FT RETAIL / OFFICE BUILDING	1344516	665517	02130907	Industrial
CL2006G023	CL	G	MUDGETT FAMILY, LLC	500	800	0	301Q	WISSAHICKON FORMATION	RITE - AID STORE, 8,700 SQ FT	1344460	665162	02130907	Industrial
CL1977S054	CL	S	THE TOWN OF NEW WINDSOR,	100	250,000	0	DIC	DICKENSON RUN	DICKENSON RUN-EMERG.	1285128	678718	02140304	Municipal New Windsor
<b>TOTAL GROUNDWATER</b>				<b>10,111,600</b>	<b>17,529,800</b>	<b>7,341,873</b>							
<b>TOTAL SURFACE WATER</b>				<b>11,030,300</b>	<b>22,174,000</b>	<b>4,524,860</b>							
<b>TOTAL</b>				<b>21,141,900</b>	<b>39,703,800</b>	<b>11,866,733</b>							



CARROLL COUNTY WATER BALANCE  
**TABLE A-2**  
**USGS ESTIMATES OF AGRICULTURAL WATER USAGE**

<b>Year</b>	<b>Irrigated Land (1000 acres)</b>	<b>Irrigation Withdrawals (Mgal/d)</b>	<b>Livestock Withdrawals Watering (Mgal/d)</b>	<b>Total Agricultural Usage (Mgal/d)</b>
1985	0.51	0.28	0.96	1.24
1990	0.52	0.20	0.77	0.97
1995	0.55	0.56	0.83	1.39
2000	0.39	0.31	0.81	1.12



# CARROLL COUNTY WATER BALANCE



## TABLE A-3

### TABLE 1 FROM MDE REPORT #26

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Number	Gauge Name	HGMR	Basin Area (sq.mi.)	Ratio (Bflow / Tflow)	Average	Drought 1-in-10 yr		Ratio Drought to Average	Drought of Record		1965	1966	1931	2002	7Q10	Period of Record			
						mean	Year		Mean	Year						Record	Prec.	Elevation	Slope
					(in)	(in)			(in)		(in)	(in)	(in)	(in)		(in)	ft msl	ft/mi	
660	Blackwater R (WVA)	APS	86.2	0.55	17.4	14.1	88	0.81	8.8	30	14.7	14.6	14.3	18.8	0.8	22-02	52	3250	6.1
766	Bear Creek	APS	48.9	0.66	16.8	12.7	65	0.76	10.2	69	12.9	11	-	16.2	0.6	65-02	48	2460	65.6
780	Casselman R.	APS	62.5	0.64	16.6	13.5	95	0.81	10.8	69	13.3	13	-	16.1	0.3	48-02	51	1620	28.1
4810	Brandywine Crk (PA)	PCR	287	0.7	13.2	8.4	65	0.64	7	31	8.4	7.9	7	7.2	2.8	12-02	45	470	14.5
4950	Big Elk Creek	PCR	52.6	0.66	11.7	7.5	41	0.64	6	2	6.6	6.1	-	6	2.6	33-02	44	398	17.9
5715	Yellow Breeches (PA)	MIX	216	0.82	14.9	10.2	69	0.68	8.4	2	10.1	9	-	8.4	5.3	55-02	42		
5800	Deer Creek	PCR	94.4	0.75	13.6	8	65	0.59	5.7	2	8	6.5	5.9	5.7	3.7	27-02	44.5	657	17.7
5820	Little Falls@Blue Mt	PCR	52.9	0.8	13.9	7.7	65	0.55	6.3	2	7.7	6.5	-	6.3	3.3	45-02	45	658	33.8
5830	Slade Run	PCR	2.1	0.81	12.6	6.1	63	0.53	5	66	7.1	5	-	-	1.3	48-80	46.1	591	2.6
5835	Western Run	PCR	59.8	0.78	12.2	6.8	65	0.56	4.9	2	6.9	5.4	-	4.9	2.5	45-02	45	544	24.5
5845	Little Gunpowder Falls	PCR	36.1	0.73	12.2	6.8	63	0.56	5.2	31	8	6	5.2	-	2.8	27-69	45	542	21.1
5875	S. Br. Patapsco R.	PCR	64.4	0.73	11.5	6.1	63	0.53	5.4	66	6.9	5.4	-	-	1.1	49-79	43	642	26.2
5893	Gwynns Falls V N	PCR	32.5	0.55	8.9	5.8	86	0.65	5.2	66	6.2	5.2	-	-	1.5	58-87	44.5	554	21
5910	Patuxent R. @Unity	PCR	34.8	0.72	11	6.1	66	0.55	4.9	2	7.5	6.1	-	4.9	1	45-02	42.5	589	28.2
5935	Little Pax R@Guilford	PCR	38	0.58	9	6.3	54	0.7	4.8	2	7.2	6.3	-	4.8	1.4	33-02	43	409	22.1
5950	Potomac R. @Steyer	APS	73	0.64	20.7	16.6	59	0.8	14.5	65	14.5	18.5	-	21.8	0.3	57-02	52.5	2850	30.5
5965	Savage River	APS	49.1	0.6	12.5	9.7	54	0.78	8.6	91	11.5	9.9	-	11.2	0.2	49-02	46	2510	65.1
5970	Crabtree Creek	APS	16.7	0.67	15.8	11.7	64	0.74	8.9	69	13.7	12	-	-	0.8	49-80	48	2501	137
6015	* Willis Creek	APS	247	0.62	11.3	7.7	36	0.68	5.5	30	8.8	7	7.6	8.5	0.7	30-02	42	1880	55
6115	Cacapon R (WVA)	VRS	677	0.57	6.7	3.7	38	0.55	2.8	69	5.9	3.7	3.4	5.6	0.8	23-03	36	1700	10.4
6145	Conococheque Creek	VRS	494	0.67	11.1	6.9	63	0.62	5.3	31	7.8	6.1	5.3	6.5	1.4	29-02	39.5	1050	11.2
6195	Antietam Creek S	VRC	281	0.85	11.4	7	34	0.61	4.3	31	6.3	5.6	4.3	5	2.8	29-02	40	781	10.8
6375	Catoctin Creek	BR	66.9	0.69	10.9	5.7	66	0.52	4.2	2	6	5.8	-	4.2	0.2	48-02	42.5	1110	47.5
6390	Monocacy R Bridgeport	ML	173	0.38	6.1	4	66	0.66	3	54	3.4	4	-	4.2	1.1	43-02	43.5	597	18.9
6395	Big Pipe Creek	PCR	102	0.64	9.6	5.2	63	0.54	4.1	2	4.6	4.7	-	4.1	1.1	48-02	43.5	625	12.8
6405	Owens Creek	BR	5.9	0.75	16.2	8.9	63	0.55	6.8	69	10.7	8.8	-	-	0.5	32-83	47.5	1460	202
6410	Hunting Creek	BR	18.4	0.72	14.1	8.1	63	0.57	6.6	54	8.7	8.2	-	-	1	50-91	46	1100	135
6425	Linganore Creek	PCR	82.3	0.69	9	5.2	54	0.58	4.6	59	6	5.6	-	-	1.1	35-71	42.5	576	19.2
6430	Monocacy R Jug Brdg	MIX	817	0.54	8.4	4.9	65	0.58	2.9	31	4.9	4.8	2.9	4.3	0.8	30-02	44	621	5.6
6435	Bennett Creek	PCR	62.8	0.68	10.1	5.9	59	0.58	4.3	2	-	-	-	-	1.5	49-02	41	468	23.8
6440	Goose Creek (VA)	MIX	332	0.6	7.8	4.3	66	0.55	1.2	31	6.6	4.4	1.2	3.9	0.1	30-02	40	660	8.3
6450	Seneca Creek	PCR	101	0.66	9.6	5.7	55	0.59	2.6	31	6.4	5.7	2.6	6.7*	0.9	31-02	41	468	15.1
6480	Rock Creek	PCR	62.2	0.58	8	5	63	0.63	2.3	31	5.1	5.4	2.3	3.9	0.5	30-02	43.5	387	12.6

**NOTES:**

**Computation of recharge available for use**

For each rock type in the twelve-digit basin you are interested in: compute the area in acres; select the 1-in-10 year drought recharge and 7-day 10-year low flow (7Q10) from Table 1; and compute the recharge available as:

$$[\text{Available Recharge}] = \{ [\text{Drought Recharge}] - [7\text{Q}10] \} * [\text{Area}] * (74.346)$$

Where: **[Available Recharge]** is the recharge available for all existing and proposed appropriations in a watershed in gallons per day;

**[Drought Recharge]** is the effective recharge during a 1 in 10 year drought in inches per year from column seven of Table 1;

**[7Q10]** is the 7-day 10-year low flow in inches per year;

**[Area]** is the area in acres and

**74.346** is a conversion factor changing acre-inches per year to gpd.

HMGR hydrogeomorphic region (USGS WRIR 98-4059, Bachman, et al., 1998)

- APS Appalachian Plateau Siliciclastic
- VR Valley and Ridge
- S Siliciclastic
- C Carbonate
- ML Mesozoic Lowland
- MIX Mixed

Then sum the recharge available for appropriation from all of the rock types within the twelve-digit watershed to obtain

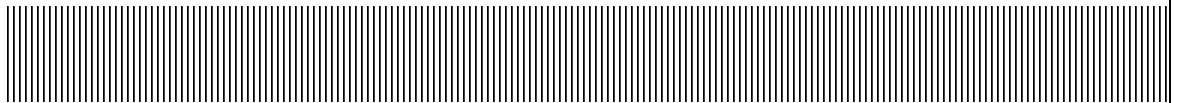


**Carroll County**  
Carroll County Water Demands and Availability

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# Appendix B

## Water Balance Assessment Tabular Results





# CARROLL COUNTY WATER BALANCE

## TABLE B-1

### Water Balance Assumptions

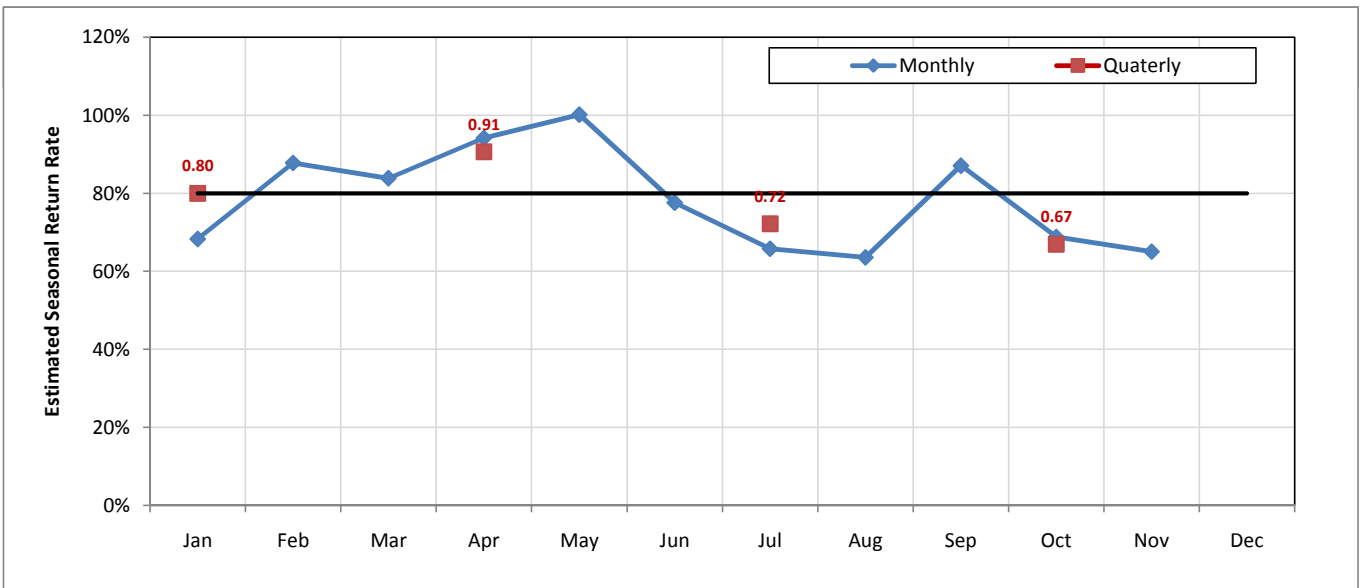


WATER AVAILABILITY	
<b>FLOWBY - SEASONAL EVALUATION BASIS</b>	
Basis	ANNUAL
Month	JUN
Period	1

FUTURE - BUILD OUT SCENARIO	
<b>GROWTH RATES</b>	
Industrial/Commercial	25 %
Agricultural	0 %
Relative Perviousness	100 %

WATER DEMAND	
<b>GENERAL</b>	
Appropriation Basis	AVG
Self Supplied Basis	2009 Well Data
Individual Water Demand	80 gpd/per
Household Water Demand	250 gpd/hh
Unallocated GW Percentage	100 %
WSA Proportion Basis	ALLOCATION
<b>COMMERCIAL/INDUSTRIAL</b>	
Served Commercial use rate	700 gpd/ac
Served Industrial use rate	800 gpd/ac
<b>AGRICULTURAL</b>	
Basis	MDE

WATER RETURNS	
<b>RETURN SWITCHES</b>	
Sewer Returns	ON
Septic Returns	ON
Agriculture Returns	OFF
Quarry Returns	ON
WWTP Return Rate	80 %
Com/Ind Return Rate	80 %
Septic Return Rate	80 %
Quarry Return Rate	95 %
Agricultural Runoff Rate	5 %
Agricultural Recharge Rate	10 %



- Notes:**
- Bramble Hills WSA merged with Westminster WSA for simplicity
  - Average return rates estimates based on Dec 2008 CMP Worksheet data
  - Seasonal return rate estimates based on reported 2008 DMR data



## CARROLL COUNTY WATER BALANCE TABLE B-2.1 Water Balance Summary



### EXISTING: REPORTED

WATERSHED				DEMANDS							MDE		SOURCE			Check	
NUM	NAME	HUC-8	AREA	SERVICED AREAS				SELF-SUPPLIED AREAS				TOTAL	Surface Water	Groundwater	TOTAL	[-]	
			[sq miles]	Residential	Commercial	Industrial	Subtotal	Residential	Industrial	Quarries	Agricultural	Subtotal	[GPD]	[GPD]	[GPD]	[GPD]	
				[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	
1	Conewago Creek	02050301	5.42	0	0	0	0	86,500	0	0	0	86,500	86,500	0	86,500	86,500	✓
2	Double Pipe Creek	02140304	164.77	902,644	15,538	326,312	1,244,494	2,041,500	16,030	2,472,162	252,925	4,782,616	6,027,110	139,907	5,887,204	6,027,110	✓
3	Liberty Reservoir	02130907	136.33	4,829,672	17,365	139,845	4,986,882	3,369,000	1,506,526	0	51,805	4,927,331	9,914,214	4,318,319	5,595,895	9,914,214	✓
4	Loch Raven Reservoir	02130805	0.93	251,469	16,385	0	267,855	58,250	0	0	0	58,250	326,105	0	326,105	326,105	✓
5	Lower Monocacy River	02140302	8.54	57,468	484	0	57,952	255,250	0	0	0	255,250	313,202	0	313,202	313,202	✓
6	Patapsco River L N Br	02130906	0.88	0	0	0	0	5,250	0	0	0	5,250	5,250	0	5,250	5,250	✓
7	Prettyboy Reservoir	02130806	32.85	82,913	12,813	0	95,726	738,250	0	0	54,875	793,125	888,851	12,268	876,583	888,851	✓
8	S Branch Patapsco	02130908	60.52	125,335	3,072	110,535	238,942	1,450,500	24,312	0	124,201	1,599,013	1,837,954	53,660	1,784,294	1,837,954	✓
9	Upper Monocacy River	02140303	42.38	274,035	6,953	78,261	359,249	334,750	61,765	0	707	397,222	756,471	707	755,765	756,471	✓
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>452.62</b>	<b>6,523,535</b>	<b>72,612</b>	<b>654,952</b>	<b>7,251,100</b>	<b>8,339,250</b>	<b>1,608,633</b>	<b>2,472,162</b>	<b>484,513</b>	<b>12,904,557</b>	<b>20,155,657</b>	<b>4,524,860</b>	<b>15,630,797</b>	<b>20,155,657</b>	<b>✓</b>

### EXISTING: PERMITTED

WATERSHED				DEMANDS							MDE		SOURCE			Check	
NUM	NAME	HUC-8	AREA	SERVICED AREAS				SELF-SUPPLIED AREAS				TOTAL	Surface Water	Groundwater	TOTAL	[-]	
			[sq miles]	Residential	Commercial	Industrial	Subtotal	Residential	Industrial	Quarries	Agricultural	Subtotal	[GPD]	[GPD]	[GPD]	[GPD]	
				[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	
1	Conewago Creek	02050301	5.42	0	0	0	0	86,500	0	0	0	86,500	86,500	0	86,500	86,500	✓
2	Double Pipe Creek	02140304	164.77	1,281,986	22,068	463,446	1,767,500	2,041,500	131,000	3,292,000	814,600	6,279,100	8,046,600	792,300	7,254,300	8,046,600	✓
3	Liberty Reservoir	02130907	136.33	7,375,617	26,520	213,564	7,615,700	3,369,000	1,540,200	0	132,400	5,041,600	12,657,300	6,764,900	5,892,400	12,657,300	✓
4	Loch Raven Reservoir	02130805	0.93	278,832	18,168	0	297,000	58,250	0	0	0	58,250	355,250	0	355,250	355,250	✓
5	Lower Monocacy River	02140302	8.54	76,357	643	0	77,000	255,250	0	0	0	255,250	332,250	0	332,250	332,250	✓
6	Patapsco River L N Br	02130906	0.88	0	0	0	0	5,250	0	0	0	5,250	5,250	0	5,250	5,250	✓
7	Prettyboy Reservoir	02130806	32.85	280,631	43,369	0	324,000	738,250	0	0	72,400	810,650	1,134,650	22,000	1,112,650	1,134,650	✓
8	S Branch Patapsco	02130908	60.52	2,178,416	53,402	1,921,182	4,153,000	1,450,500	82,300	0	147,800	1,680,600	5,833,600	3,441,100	2,392,500	5,833,600	✓
9	Upper Monocacy River	02140303	42.38	366,143	9,291	104,566	480,000	334,750	144,000	0	10,000	488,750	968,750	10,000	958,750	968,750	✓
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>452.62</b>	<b>11,837,981</b>	<b>173,461</b>	<b>2,702,758</b>	<b>14,714,200</b>	<b>8,339,250</b>	<b>1,897,500</b>	<b>3,292,000</b>	<b>1,177,200</b>	<b>14,705,950</b>	<b>29,420,150</b>	<b>11,030,300</b>	<b>18,389,850</b>	<b>29,420,150</b>	<b>✓</b>

### FUTURE: BUILDOUT

WATERSHED				DEMANDS							MDE		SOURCE			Check	
NUM	NAME	HUC-8	AREA	SERVICED AREAS				SELF-SUPPLIED AREAS				TOTAL	Surface Water	Groundwater	TOTAL	[-]	
			[sq miles]	Residential	Commercial	Industry	Subtotal	Residential	Industrial	Quarries	Agricultural	Subtotal	[GPD]	[GPD]	[GPD]	[GPD]	
				[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	[GPD]	
1	Conewago Creek	02050301	5.42	0	0	0	0	130,500	0	0	0	130,500	130,500	0	130,500	130,500	✓
2	Double Pipe Creek	02140304	164.77	2,758,274	99,009	896,908	3,754,191	3,119,000	20,037	3,090,202	252,925	6,482,164	10,236,355	1,448,946	8,787,409	10,236,355	✓
3	Liberty Reservoir	02130907	136.33	5,123,534	74,024	718,499	5,916,057	4,982,250	1,883,158	0	51,805	6,917,213	12,833,270	4,521,317	8,311,954	12,833,270	✓
4	Loch Raven Reservoir	02130805	0.93	445,961	22,145	99,261	567,366	59,500	0	0	0	59,500	626,866	0	626,866	626,866	✓
5	Lower Monocacy River	02140302	8.54	8,615	460	2,451	11,526	305,250	0	0	0	305,250	316,776	0	316,776	316,776	✓
6	Patapsco River L N Br	02130906	0.88	0	0	0	0	15,250	0	0	0	15,250	15,250	0	15,250	15,250	✓
7	Prettyboy Reservoir	02130806	32.85	231,836	9,103	0	240,939	1,082,250	0	0	54,875	1,137,125	1,378,064	12,268	1,365,796	1,378,064	✓
8	S Branch Patapsco	02130908	60.52	1,359,536	33,292	315,300	1,708,128	1,984,750	30,390	0	124,201	2,139,340	3,847,469	1,547,440	2,300,029	3,847,469	✓
9	Upper Monocacy River	02140303	42.38	327,095	27,263	128,361	482,719	564,250	77,207	0	707	642,163	1,124,883	707	1,124,176	1,124,883	✓
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>452.62</b>	<b>10,254,850</b>	<b>265,296</b>	<b>2,160,781</b>	<b>12,680,927</b>	<b>12,243,000</b>	<b>2,010,791</b>	<b>3,090,202</b>	<b>484,513</b>	<b>17,828,506</b>	<b>30,509,433</b>	<b>7,530,677</b>	<b>22,978,756</b>	<b>30,509,433</b>	<b>✓</b>





## CARROLL COUNTY WATER BALANCE TABLE B-2.2 Water Balance Summary



### EXISTING: REPORTED

WATERSHED			
NUM	NAME	HUC-8	AREA
			<i>[sq miles]</i>
1	Conewago Creek	02050301	5.42
2	Double Pipe Creek	02140304	164.77
3	Liberty Reservoir	02130907	136.33
4	Loch Raven Reservoir	02130805	0.93
5	Lower Monocacy River	02140302	8.54
6	Patapsco River L N Br	02130906	0.88
7	Prettyboy Reservoir	02130806	32.85
8	S Branch Patapsco	02130908	60.52
9	Upper Monocacy River	02140303	42.38
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>452.62</b>

### [CONTINUED]

RETURNS							ON	SOURCE			Check
WWTPs	Industry	Septic-Res	Septic-NonRes	Agricultural	Quarries	TOTAL	Surface Water	Groundwater	TOTAL	Check	
<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[-]</i>	
0	0	71,000	0	0	0	71,000	0	71,000	71,000	✓	
2,553,821	0	1,491,200	25,800	37,939	1,715,000	5,785,821	4,268,821	1,517,000	5,785,821	✓	
231,770	1,046,702	2,770,600	104,600	7,771	0	4,153,673	1,278,473	2,875,200	4,153,673	✓	
367,719	0	3,400	200	0	0	371,319	367,719	3,600	371,319	✓	
0	0	192,200	4,600	0	0	196,800	0	196,800	196,800	✓	
0	0	3,200	0	0	0	3,200	0	3,200	3,200	✓	
240,661	0	587,600	11,800	8,231	0	840,061	240,661	599,400	840,061	✓	
1,988,161	0	1,071,600	20,400	18,630	2	3,080,163	1,988,163	1,092,000	3,080,163	✓	
407,055	0	238,800	6,000	106	0	651,855	407,055	244,800	651,855	✓	
5,789,187	1,046,702	6,429,600	173,400	72,677	1,715,002	15,153,891	8,550,891	6,603,000	15,153,891	✓	

### EXISTING: PERMITTED

WATERSHED			
NUM	NAME	HUC-8	AREA
			<i>[sq miles]</i>
1	Conewago Creek	02050301	5.42
2	Double Pipe Creek	02140304	164.77
3	Liberty Reservoir	02130907	136.33
4	Loch Raven Reservoir	02130805	0.93
5	Lower Monocacy River	02140302	8.54
6	Patapsco River L N Br	02130906	0.88
7	Prettyboy Reservoir	02130806	32.85
8	S Branch Patapsco	02130908	60.52
9	Upper Monocacy River	02140303	42.38
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>452.62</b>

RETURNS							ON	SOURCE			Check
WWTPs	Industry	Septic-Res	Septic-NonRes	Agricultural	Quarries	TOTAL	Surface Water	Groundwater	TOTAL	Check	
<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[-]</i>	
0	0	71,000	0	0	0	71,000	0	71,000	71,000	✓	
3,327,290	104,800	1,491,200	25,800	122,190	1,715,000	6,664,090	5,147,090	1,517,000	6,664,090	✓	
296,310	1,232,160	2,770,600	104,600	19,860	0	4,403,670	1,528,470	2,875,200	4,403,670	✓	
464,000	0	3,400	200	0	0	467,600	464,000	3,600	467,600	✓	
0	0	192,200	4,600	0	0	196,800	0	196,800	196,800	✓	
0	0	3,200	0	0	0	3,200	0	3,200	3,200	✓	
457,360	0	587,600	11,800	10,860	0	1,056,760	457,360	599,400	1,056,760	✓	
6,745,000	65,840	1,071,600	20,400	22,170	2	7,902,842	6,810,842	1,092,000	7,902,842	✓	
466,400	115,200	238,800	6,000	1,500	0	826,400	581,600	244,800	826,400	✓	
11,756,360	1,518,000	6,429,600	173,400	176,580	1,715,002	21,592,362	14,989,362	6,603,000	21,592,362	✓	

### FUTURE: BUILDOUT

WATERSHED			
NUM	NAME	HUC-8	AREA
			<i>[sq miles]</i>
1	Conewago Creek	02050301	5.42
2	Double Pipe Creek	02140304	164.77
3	Liberty Reservoir	02130907	136.33
4	Loch Raven Reservoir	02130805	0.93
5	Lower Monocacy River	02140302	8.54
6	Patapsco River L N Br	02130906	0.88
7	Prettyboy Reservoir	02130806	32.85
8	S Branch Patapsco	02130908	60.52
9	Upper Monocacy River	02140303	42.38
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>452.62</b>

RETURNS							ON	SOURCE			Check
WWTPs	Industry (NPDES)	Septic-Res	Septic-NonRes	Agricultural	Quarries	TOTAL	Surface Water	Groundwater	TOTAL	Check	
<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[-]</i>	
0	0	91,800	12,600	0	0	104,400	0	104,400	104,400	✓	
4,017,641	16,030	2,157,600	336,400	37,939	2,935,692	9,463,363	6,969,363	2,494,000	9,463,363	✓	
262,554	1,506,526	3,664,400	358,600	7,771	0	5,792,080	1,769,080	4,023,000	5,792,080	✓	
592,550	0	45,600	2,800	0	0	640,950	592,550	48,400	640,950	✓	
0	0	222,600	21,400	0	0	244,000	0	244,000	244,000	✓	
0	0	10,600	1,600	0	0	12,200	0	12,200	12,200	✓	
375,293	0	804,800	100,200	8,231	0	1,280,293	375,293	905,000	1,280,293	✓	
3,683,066	24,312	1,440,400	147,800	18,630	0	5,295,578	3,707,378	1,588,200	5,295,578	✓	
1,390,885	61,765	364,000	87,400	106	0	1,904,050	1,452,650	451,400	1,904,050	✓	
10,321,989	1,608,633	8,801,800	1,068,800	72,677	2,935,692	24,736,914	14,866,314	9,870,600	24,736,914	✓	



**CARROLL COUNTY WATER BALANCE  
TABLE B-2.3  
Water Balance Summary**



**EXISTING: REPORTED**

WATERSHED			
NUM	NAME	HUC-8	AREA
			<i>[sq miles]</i>
1	Conewago Creek	02050301	5.42
2	Double Pipe Creek	02140304	164.77
3	Liberty Reservoir	02130907	136.33
4	Loch Raven Reservoir	02130805	0.93
5	Lower Monocacy River	02140302	8.54
6	Patapsco River L N Br	02130906	0.88
7	Prettyboy Reservoir	02130806	32.85
8	S Branch Patapsco	02130908	60.52
9	Upper Monocacy River	02140303	42.38
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>452.62</b>

**[CONTINUED]**

WATER RESOURCES						
Demand Surface Water	Flowby Surface Water	Total Requirement Surface Water	Estimated Storage	Available Groundwater	Surplus Groundwater	
<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[mgal]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>Avg. GPD</i>
NA	1,692,436	1,692,436	NA	1,392,239	1,376,739	
139,907	37,707,072	37,846,979	5,029	32,171,059	27,800,855	
4,318,319	42,672,450	46,990,769	3,534	35,012,921	32,292,226	
NA	288,987	288,987	NA	237,727	-84,778	
NA	2,057,587	2,057,587	NA	1,665,118	1,548,717	
NA	276,398	276,398	NA	209,640	207,590	
12,268	10,431,070	10,443,338	720	8,411,515	8,134,332	
53,660	18,109,302	18,162,962	1,497	14,398,786	13,706,492	
707	5,581,106	5,581,813	683	7,919,973	7,409,009	
4,524,860	118,816,408	123,341,268	11,463	101,418,979	92,391,182	

**EXISTING: PERMITTED**

WATERSHED			
NUM	NAME	HUC-8	AREA
			<i>[sq miles]</i>
1	Conewago Creek	02050301	5.42
2	Double Pipe Creek	02140304	164.77
3	Liberty Reservoir	02130907	136.33
4	Loch Raven Reservoir	02130805	0.93
5	Lower Monocacy River	02140302	8.54
6	Patapsco River L N Br	02130906	0.88
7	Prettyboy Reservoir	02130806	32.85
8	S Branch Patapsco	02130908	60.52
9	Upper Monocacy River	02140303	42.38
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>452.62</b>

WATER RESOURCES						
Demand Surface Water	Flowby Surface Water	Total Requirement Surface Water	Estimated Storage	Available Groundwater	Surplus Groundwater	
<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[mgal]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>Avg. GPD</i>
NA	1,692,436	1,692,436	NA	1,392,239	1,376,739	
792,300	37,707,072	38,499,372	5,254	32,171,059	26,433,759	
6,764,900	42,672,450	49,437,350	3,868	35,012,921	31,995,721	
NA	288,987	288,987	NA	237,727	-113,923	
NA	2,057,587	2,057,587	NA	1,665,118	1,529,668	
NA	276,398	276,398	NA	209,640	207,590	
22,000	10,431,070	10,453,070	721	8,411,515	7,898,265	
3,441,100	18,109,302	21,550,402	2,232	14,398,786	13,098,286	
10,000	5,581,106	5,591,106	686	7,919,973	7,206,023	
11,030,300	118,816,408	129,846,708	12,761	101,418,979	89,632,129	

**FUTURE: BUILDOUT**

WATERSHED			
NUM	NAME	HUC-8	AREA
			<i>[sq miles]</i>
1	Conewago Creek	02050301	5.42
2	Double Pipe Creek	02140304	164.77
3	Liberty Reservoir	02130907	136.33
4	Loch Raven Reservoir	02130805	0.93
5	Lower Monocacy River	02140302	8.54
6	Patapsco River L N Br	02130906	0.88
7	Prettyboy Reservoir	02130806	32.85
8	S Branch Patapsco	02130908	60.52
9	Upper Monocacy River	02140303	42.38
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>452.62</b>

WATER RESOURCES						
Demand Surface Water	Flowby Surface Water	Total Requirement Surface Water	Estimated Storage	Available Groundwater	Surplus Groundwater	
<i>[GPD]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>[mgal]</i>	<i>[GPD]</i>	<i>[GPD]</i>	<i>Avg. GPD</i>
NA	1,692,436	1,692,436	NA	1,392,239	1,366,139	
1,448,946	37,707,072	39,156,018	5,481	32,171,059	25,877,650	
4,521,317	42,672,450	47,193,767	3,562	35,012,921	30,723,967	
NA	288,987	288,987	NA	237,727	-340,739	
NA	2,057,587	2,057,587	NA	1,665,118	1,592,342	
NA	276,398	276,398	NA	209,640	206,590	
12,268	10,431,070	10,443,338	720	8,411,515	7,950,719	
1,547,440	18,109,302	19,656,742	1,787	14,398,786	13,686,958	
707	5,581,106	5,581,813	683	7,919,973	7,247,198	
7,530,677	118,816,408	126,347,085	12,232	101,418,979	88,310,823	



# CARROLL COUNTY WATER BALANCE TABLE B-3.1 Conewago Creek Water Balance



HUC-8 02050301  
Area 3,468 acres  
5.42 sq mi

## DEMANDS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>SERVICED</b>	0	0.0	0	0.0	0	0.0
Residential	0	0.0	0	0.0	0	0.0
Commercial	0	0.0	0	0.0	0	0.0
Industrial	0	0.0	0	0.0	0	0.0
<b>SELF-SUPPLIED</b>	86,500	100.0	86,500	100.0	130,500	100.0
Residential	86,500	100.0	86,500	100.0	130,500	100.0
Industrial	0	0.0	0	0.0	0	0.0
Quarries	0	0.0	0	0.0	0	0.0
Agricultural	0	0.0	0	0.0	0	0.0
<b>Total Demands</b>	<b>86,500</b>	<b>100.0</b>	<b>86,500</b>	<b>100.0</b>	<b>130,500</b>	<b>100.0</b>
Surface Water	0	0.0	0	0.0	0	0.0
Groundwater	86,500	100.0	86,500	100.0	130,500	100.0
<b>Total Demands</b>	<b>86,500</b>	<b>100.0</b>	<b>86,500</b>	<b>100.0</b>	<b>130,500</b>	<b>100.0</b>

## RETURNS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
WWTPs	0	0.0	0	0.0	0	0.0
Industry (NPDES)	0	0.0	0	0.0	0	0.0
Septic-Res	71,000	100.0	71,000	100.0	91,800	87.9
Septic-NonRes	0	0.0	0	0.0	12,600	12.1
Agricultural	0	0.0	0	0.0	0	0.0
Quarries	0	0.0	0	0.0	0	0.0
<b>Total Returns</b>	<b>71,000</b>	<b>100.0</b>	<b>71,000</b>	<b>100.0</b>	<b>104,400</b>	<b>100.0</b>
Surface Water	0	0.0	0	0.0	0	0.0
Groundwater	71,000	100.0	71,000	100.0	104,400	100.0
<b>Total Returns</b>	<b>71,000</b>	<b>100.0</b>	<b>71,000</b>	<b>100.0</b>	<b>104,400</b>	<b>100.0</b>

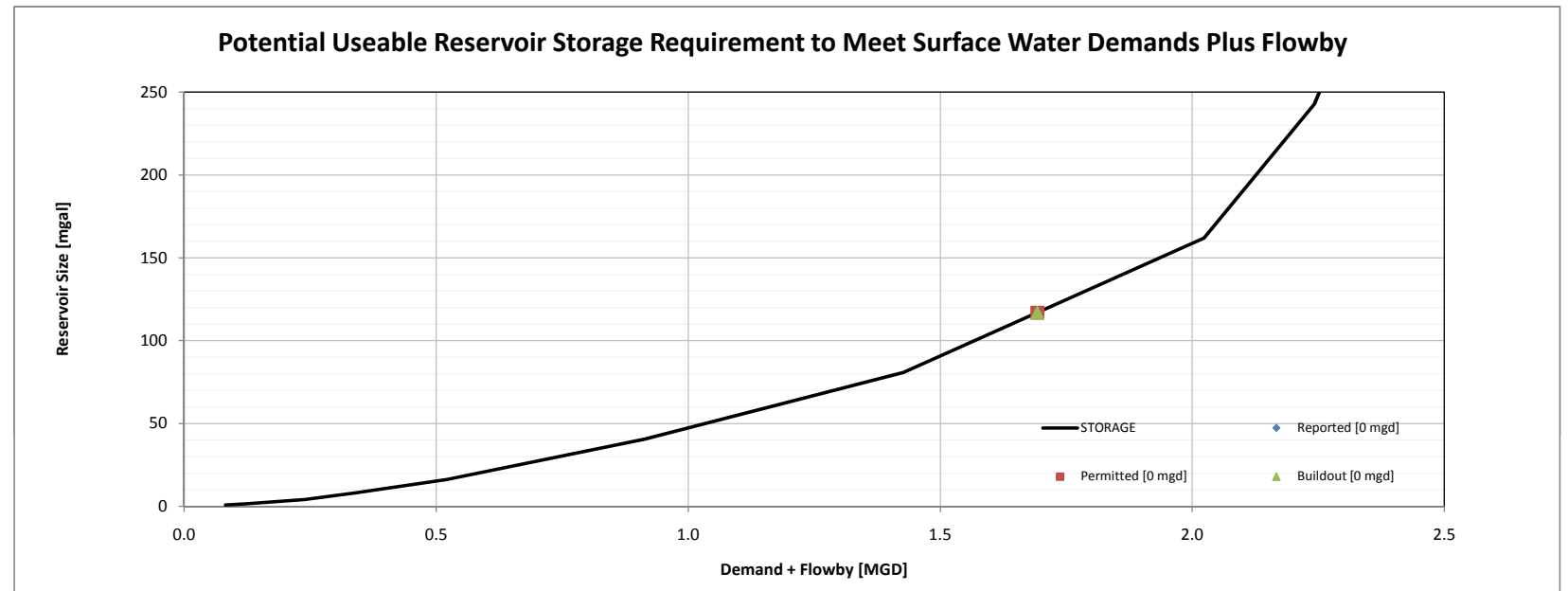
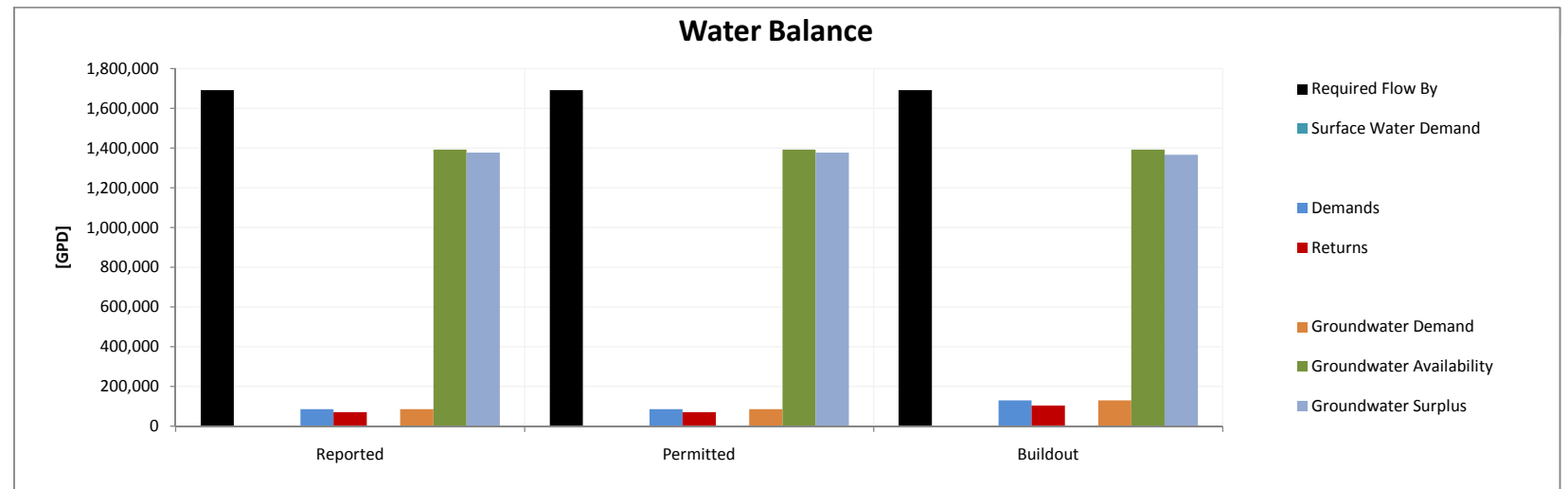
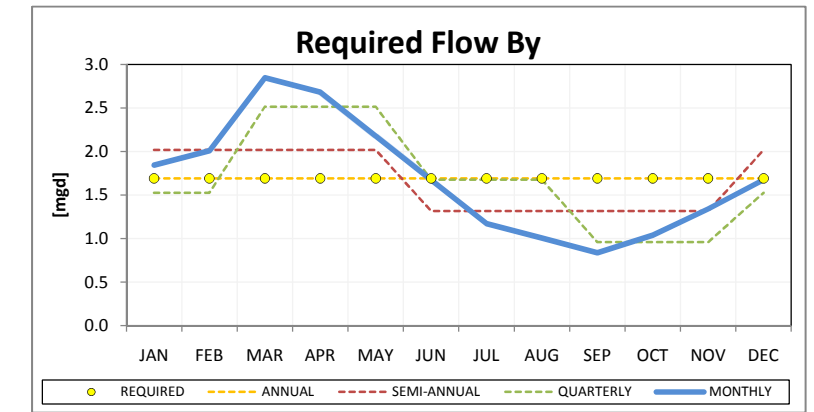
## WATER RESOURCES

SURFACE WATER	REPORTED		PERMITTED		BUILDOUT	
	NA	gpd	NA	gpd	NA	gpd
Demand	NA	gpd	NA	gpd	NA	gpd
Required Flow By	1,692,436	gpd	1,692,436	gpd	1,692,436	gpd
Total Requirement	1,692,436	gpd	1,692,436	gpd	1,692,436	gpd
Estimated Storage	NA	MGAL	NA	MGAL	NA	MGAL

GROUNDWATER	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
Availability	1,392,239	100.00	1,392,239	100.00	1,392,239	100.00
Demand	86,500	6.21	86,500	6.21	130,500	9.37
Returns	71,000	5.10	71,000	5.10	104,400	7.50
Surplus	1,376,739	98.89	1,376,739	98.89	1,366,139	98.13

ESTIMATED SEASONAL REQUIRED FLOW BY VALUES [MGD]

ID	MONTH	ANNUAL	SEMI-ANNUAL	QUARTERLY	MONTHLY		
1	JAN	1.69	SA2	2.02	Q3	1.53	1.84
2	FEB	1.69	SA2	2.02	Q3	1.53	2.01
3	MAR	1.69	SA2	2.02	Q4	2.51	2.85
4	APR	1.69	SA2	2.02	Q4	2.51	2.68
5	MAY	1.69	SA2	2.02	Q4	2.51	2.18
6	JUN	1.69	SA1	1.32	Q1	1.68	1.68
7	JUL	1.69	SA1	1.32	Q1	1.68	1.17
8	AUG	1.69	SA1	1.32	Q1	1.68	1.01
9	SEP	1.69	SA1	1.32	Q2	0.96	0.84
10	OCT	1.69	SA1	1.32	Q2	0.96	1.04
11	NOV	1.69	SA1	1.32	Q2	0.96	1.34
12	DEC	1.69	SA2	2.02	Q3	1.53	1.68
<b>SURFACE WATER FLOW BY</b>					<b>1.69</b>	<b>MGD</b>	





# CARROLL COUNTY WATER BALANCE TABLE B-3.2 Double Pipe Creek Water Balance



HUC-8 02140304  
Area 105,456 acres  
164.77 sq mi

## DEMANDS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>SERVICED</b>	<b>1,244,494</b>	<b>20.6</b>	<b>1,767,500</b>	<b>22.0</b>	<b>3,754,191</b>	<b>36.7</b>
Residential	902,644	15.0	1,281,986	15.9	2,758,274	26.9
Commercial	15,538	0.3	22,068	0.3	99,009	1.0
Industrial	326,312	5.4	463,446	5.8	896,908	8.8
<b>SELF-SUPPLIED</b>	<b>4,782,616</b>	<b>79.4</b>	<b>6,279,100</b>	<b>78.0</b>	<b>6,482,164</b>	<b>63.3</b>
Residential	2,041,500	33.9	2,041,500	25.4	3,119,000	30.5
Industrial	16,030	0.3	131,000	1.6	20,037	0.2
Quarries	2,472,162	41.0	3,292,000	40.9	3,090,202	30.2
Agricultural	252,925	4.2	814,600	10.1	252,925	2.5
<b>Total Demands</b>	<b>6,027,110</b>	<b>100.0</b>	<b>8,046,600</b>	<b>100.0</b>	<b>10,236,355</b>	<b>100.0</b>
Surface Water	139,907	2.3	792,300	9.8	1,448,946	14.2
Groundwater	5,887,204	97.7	7,254,300	90.2	8,787,409	85.8
<b>Total Demands</b>	<b>6,027,110</b>	<b>100.0</b>	<b>8,046,600</b>	<b>100.0</b>	<b>10,236,355</b>	<b>100.0</b>

## RETURNS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>WWTPs</b>	<b>2,553,821</b>	<b>44.1</b>	<b>3,327,290</b>	<b>49.9</b>	<b>4,017,641</b>	<b>42.5</b>
Industry (NPDES)	0	0.0	104,800	1.6	16,030	0.2
Septic-Res	1,491,200	25.8	1,491,200	22.4	2,157,600	22.8
Septic-NonRes	25,800	0.4	25,800	0.4	336,400	3.6
Agricultural	37,939	0.7	122,190	1.8	37,939	0.4
Quarries	1,715,000	29.6	1,715,000	25.7	2,935,692	31.0
<b>Total Returns</b>	<b>5,785,821</b>	<b>100.0</b>	<b>6,664,090</b>	<b>100.0</b>	<b>9,463,363</b>	<b>100.0</b>
Surface Water	4,268,821	73.8	5,147,090	77.2	6,969,363	73.6
Groundwater	1,517,000	26.2	1,517,000	22.8	2,494,000	26.4
<b>Total Returns</b>	<b>5,785,821</b>	<b>100.0</b>	<b>6,664,090</b>	<b>100.0</b>	<b>9,463,363</b>	<b>100.0</b>

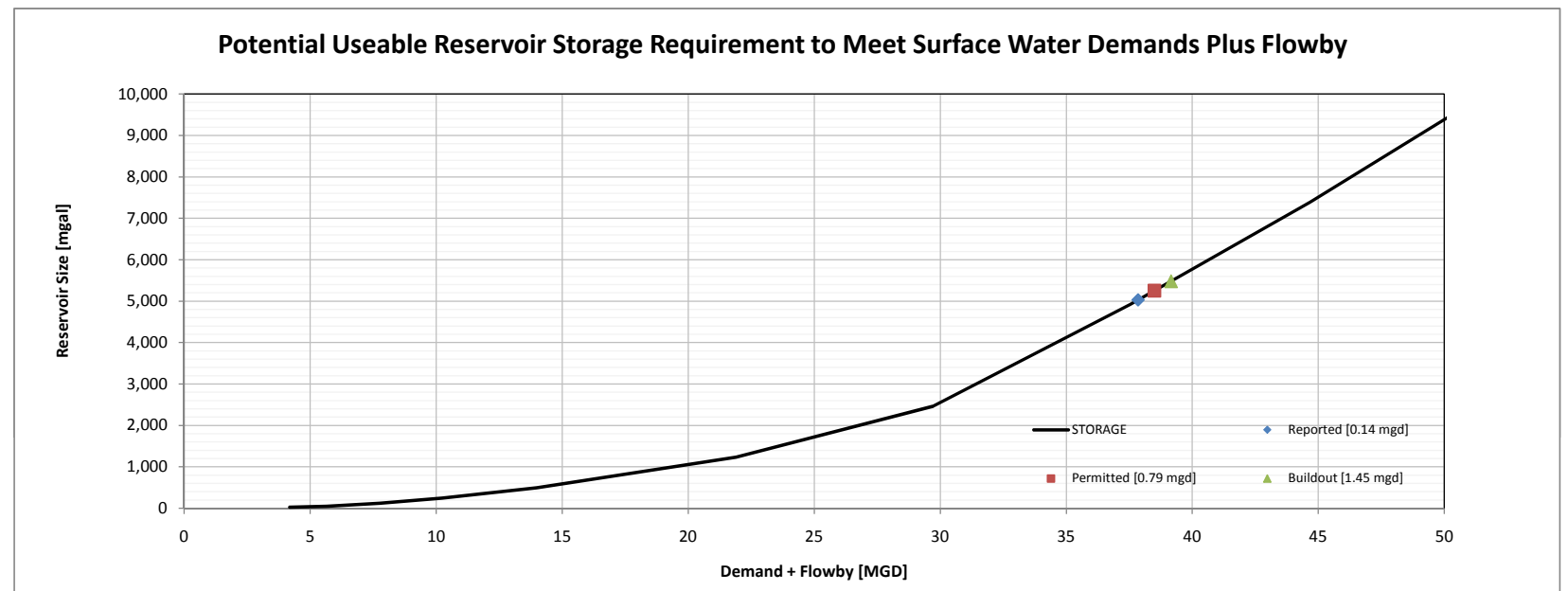
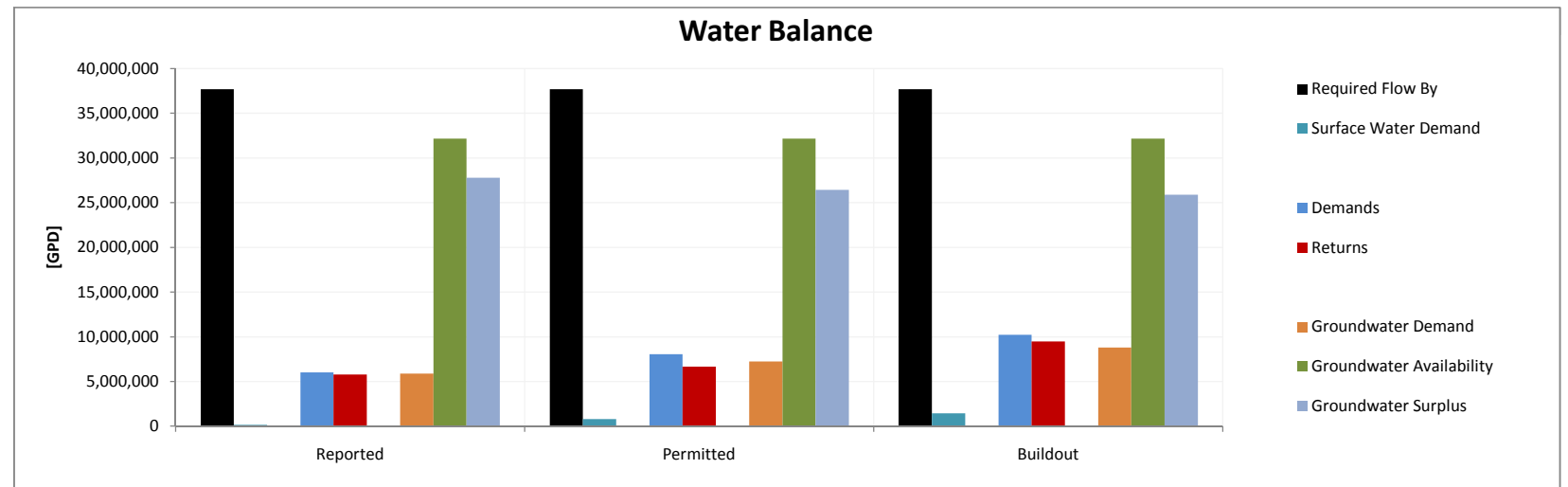
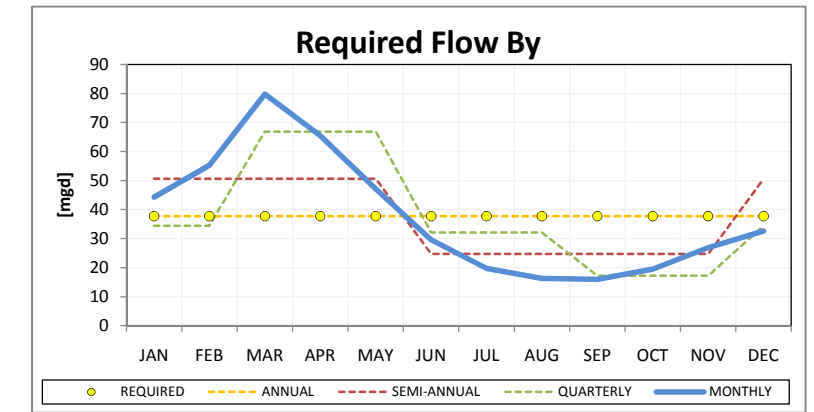
## WATER RESOURCES

SURFACE WATER	REPORTED		PERMITTED		BUILDOUT	
	Value	Unit	Value	Unit	Value	Unit
Demand	139,907	gpd	792,300	gpd	1,448,946	gpd
Required Flow By	37,707,072	gpd	37,707,072	gpd	37,707,072	gpd
Total Requirement	37,846,979	gpd	38,499,372	gpd	39,156,018	gpd
Estimated Storage	5,029	MGAL	5,254	MGAL	5,481	MGAL

GROUNDWATER	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
Availability	32,171,059	100.00	32,171,059	100.00	32,171,059	100.00
Demand	5,887,204	18.30	7,254,300	22.55	8,787,409	27.31
Returns	1,517,000	4.72	1,517,000	4.72	2,494,000	7.75
Surplus	27,800,855	86.42	26,433,759	82.17	25,877,650	80.44

ESTIMATED SEASONAL REQUIRED FLOW BY VALUES [MGD]

ID	MONTH	ANNUAL	SEMI-ANNUAL	QUARTERLY	MONTHLY		
1	JAN	37.71	SA2	50.65	Q3	34.43	44.26
2	FEB	37.71	SA2	50.65	Q3	34.43	55.35
3	MAR	37.71	SA2	50.65	Q4	66.87	79.79
4	APR	37.71	SA2	50.65	Q4	66.87	65.47
5	MAY	37.71	SA2	50.65	Q4	66.87	47.11
6	JUN	37.71	SA1	24.70	Q1	32.15	29.61
7	JUL	37.71	SA1	24.70	Q1	32.15	19.72
8	AUG	37.71	SA1	24.70	Q1	32.15	16.29
9	SEP	37.71	SA1	24.70	Q2	17.24	15.98
10	OCT	37.71	SA1	24.70	Q2	17.24	19.46
11	NOV	37.71	SA1	24.70	Q2	17.24	26.87
12	DEC	37.71	SA2	50.65	Q3	34.43	32.56
<b>SURFACE WATER FLOW BY</b>					<b>37.71</b>	<b>MGD</b>	





# CARROLL COUNTY WATER BALANCE TABLE B-3.3 Liberty Reservoir Water Balance



HUC-8 02130907  
Area 87,251 acres  
136.33 sq mi

## DEMANDS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>SERVICED</b>	<b>4,986,882</b>	<b>50.3</b>	<b>7,615,700</b>	<b>60.2</b>	<b>5,916,057</b>	<b>46.1</b>
Residential	4,829,672	48.7	7,375,617	58.3	5,123,534	39.9
Commercial	17,365	0.2	26,520	0.2	74,024	0.6
Industrial	139,845	1.4	213,564	1.7	718,499	5.6
<b>SELF-SUPPLIED</b>	<b>4,927,331</b>	<b>49.7</b>	<b>5,041,600</b>	<b>39.8</b>	<b>6,917,213</b>	<b>53.9</b>
Residential	3,369,000	34.0	3,369,000	26.6	4,982,250	38.8
Industrial	1,506,526	15.2	1,540,200	12.2	1,883,158	14.7
Quarries	0	0.0	0	0.0	0	0.0
Agricultural	51,805	0.5	132,400	1.0	51,805	0.4
<b>Total Demands</b>	<b>9,914,214</b>	<b>100.0</b>	<b>12,657,300</b>	<b>100.0</b>	<b>12,833,270</b>	<b>100.0</b>
Surface Water	4,318,319	43.6	6,764,900	53.4	4,521,317	35.2
Groundwater	5,595,895	56.4	5,892,400	46.6	8,311,954	64.8
<b>Total Demands</b>	<b>9,914,214</b>	<b>100.0</b>	<b>12,657,300</b>	<b>100.0</b>	<b>12,833,270</b>	<b>100.0</b>

## RETURNS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
WWTPs	231,770	5.6	296,310	6.7	262,554	4.5
Industry (NPDES)	1,046,702	25.2	1,232,160	28.0	1,506,526	26.0
Septic-Res	2,770,600	66.7	2,770,600	62.9	3,664,400	63.3
Septic-NonRes	104,600	2.5	104,600	2.4	358,600	6.2
Agricultural	7,771	0.2	19,860	0.5	7,771	0.1
Quarries	0	0.0	0	0.0	0	0.0
<b>Total Returns</b>	<b>4,153,673</b>	<b>100.0</b>	<b>4,403,670</b>	<b>100.0</b>	<b>5,792,080</b>	<b>100.0</b>
Surface Water	1,278,473	30.8	1,528,470	34.7	1,769,080	30.5
Groundwater	2,875,200	69.2	2,875,200	65.3	4,023,000	69.5
<b>Total Returns</b>	<b>4,153,673</b>	<b>100.0</b>	<b>4,403,670</b>	<b>100.0</b>	<b>5,792,080</b>	<b>100.0</b>

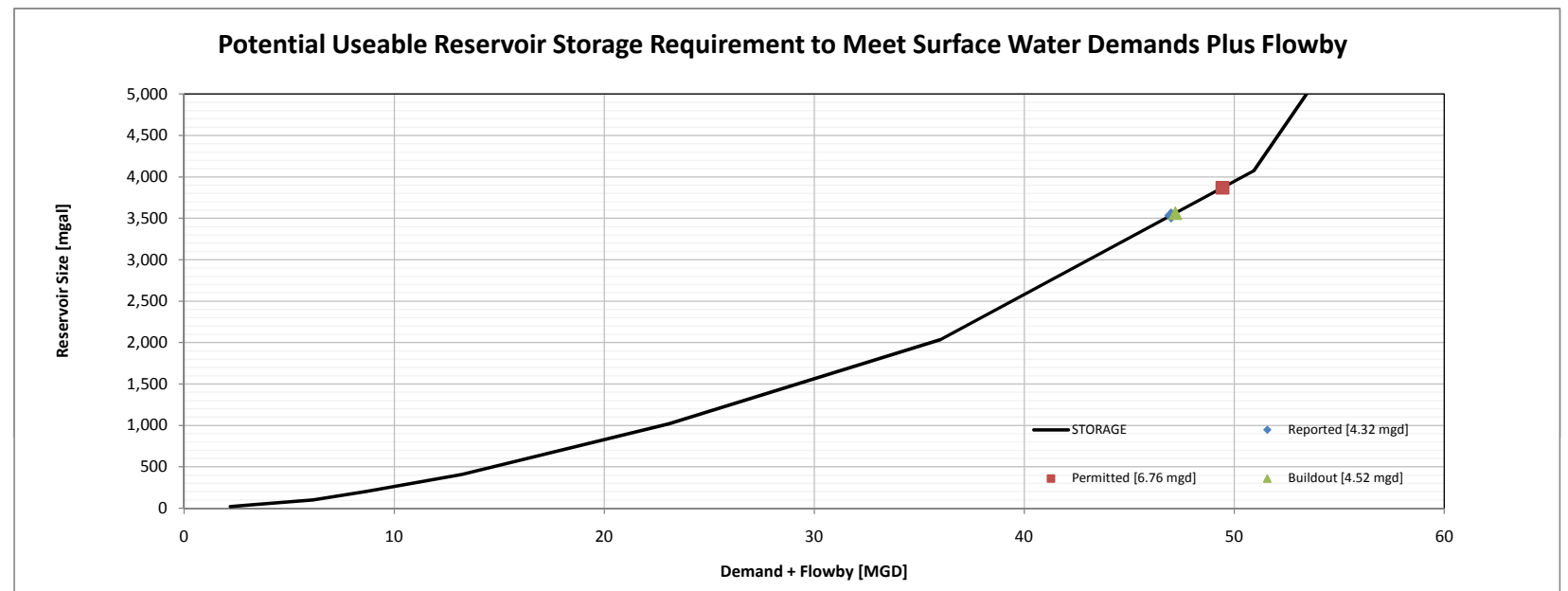
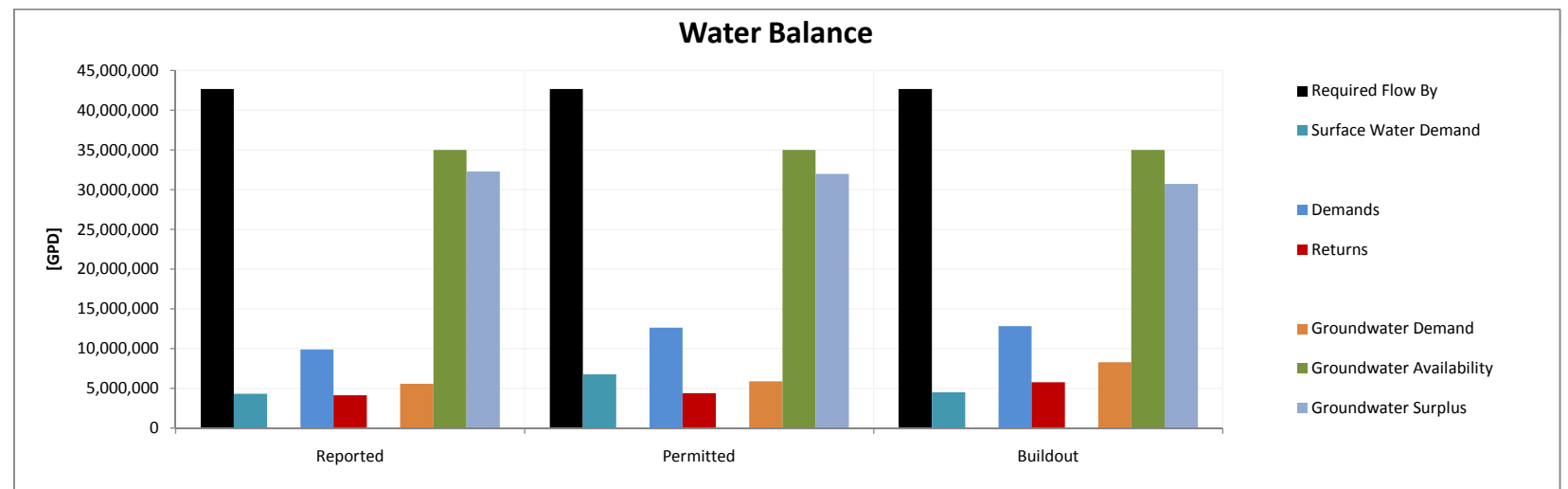
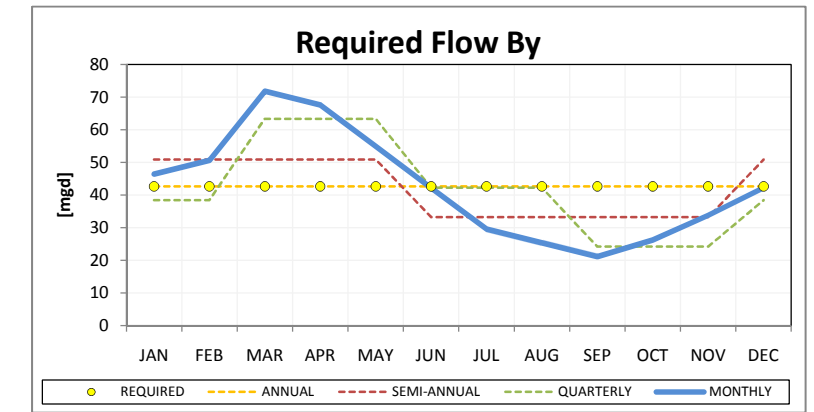
## WATER RESOURCES

SURFACE WATER	REPORTED	PERMITTED	BUILDOUT
Demand	4,318,319 gpd	6,764,900 gpd	4,521,317 gpd
Required Flow By	42,672,450 gpd	42,672,450 gpd	42,672,450 gpd
Total Requirement	46,990,769 gpd	49,437,350 gpd	47,193,767 gpd
Estimated Storage	3,534 MGAL	3,868 MGAL	3,562 MGAL

GROUNDWATER	GPD	%	GPD	%	GPD	%
Availability	35,012,921	100.00	35,012,921	100.00	35,012,921	100.00
Demand	5,595,895	15.98	5,892,400	16.83	8,311,954	23.74
Returns	2,875,200	8.21	2,875,200	8.21	4,023,000	11.49
Surplus	32,292,226	92.23	31,995,721	91.38	30,723,967	87.75

ESTIMATED SEASONAL REQUIRED FLOW BY VALUES [MGD]

ID	MONTH	ANNUAL	SEMI-ANNUAL	QUARTERLY	MONTHLY		
1	JAN	42.67	SA2	50.89	Q3	38.41	46.43
2	FEB	42.67	SA2	50.89	Q3	38.41	50.69
3	MAR	42.67	SA2	50.89	Q4	63.37	71.83
4	APR	42.67	SA2	50.89	Q4	63.37	67.60
5	MAY	42.67	SA2	50.89	Q4	63.37	54.92
6	JUN	42.67	SA1	33.26	Q1	42.26	42.25
7	JUL	42.67	SA1	33.26	Q1	42.26	29.59
8	AUG	42.67	SA1	33.26	Q1	42.26	25.38
9	SEP	42.67	SA1	33.26	Q2	24.26	21.17
10	OCT	42.67	SA1	33.26	Q2	24.26	26.22
11	NOV	42.67	SA1	33.26	Q2	24.26	33.79
12	DEC	42.67	SA2	50.89	Q3	38.41	42.20
<b>SURFACE WATER FLOW BY</b>					<b>42.67</b>	<b>MGD</b>	





# CARROLL COUNTY WATER BALANCE TABLE B-3.4 Loch Raven Reservoir Water Balance



HUC-8 02130805  
Area 592 acres  
0.93 sq mi

## DEMANDS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>SERVICED</b>	<b>267,855</b>	<b>82.1</b>	<b>297,000</b>	<b>83.6</b>	<b>567,366</b>	<b>90.5</b>
Residential	251,469	77.1	278,832	78.5	445,961	71.1
Commercial	16,385	5.0	18,168	5.1	22,145	3.5
Industrial	0	0.0	0	0.0	99,261	15.8
<b>SELF-SUPPLIED</b>	<b>58,250</b>	<b>17.9</b>	<b>58,250</b>	<b>16.4</b>	<b>59,500</b>	<b>9.5</b>
Residential	58,250	17.9	58,250	16.4	59,500	9.5
Industrial	0	0.0	0	0.0	0	0.0
Quarries	0	0.0	0	0.0	0	0.0
Agricultural	0	0.0	0	0.0	0	0.0
<b>Total Demands</b>	<b>326,105</b>	<b>100.0</b>	<b>355,250</b>	<b>100.0</b>	<b>626,866</b>	<b>100.0</b>
Surface Water	0	0.0	0	0.0	0	0.0
Groundwater	326,105	100.0	355,250	100.0	626,866	100.0
<b>Total Demands</b>	<b>326,105</b>	<b>100.0</b>	<b>355,250</b>	<b>100.0</b>	<b>626,866</b>	<b>100.0</b>

## RETURNS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>WWTPs</b>	<b>367,719</b>	<b>99.0</b>	<b>464,000</b>	<b>99.2</b>	<b>592,550</b>	<b>92.4</b>
Industry (NPDES)	0	0.0	0	0.0	0	0.0
Septic-Res	3,400	0.9	3,400	0.7	45,600	7.1
Septic-NonRes	200	0.1	200	0.0	2,800	0.4
Agricultural	0	0.0	0	0.0	0	0.0
Quarries	0	0.0	0	0.0	0	0.0
<b>Total Returns</b>	<b>371,319</b>	<b>100.0</b>	<b>467,600</b>	<b>100.0</b>	<b>640,950</b>	<b>100.0</b>
Surface Water	367,719	99.0	464,000	99.2	592,550	92.4
Groundwater	3,600	1.0	3,600	0.8	48,400	7.6
<b>Total Returns</b>	<b>371,319</b>	<b>100.0</b>	<b>467,600</b>	<b>100.0</b>	<b>640,950</b>	<b>100.0</b>

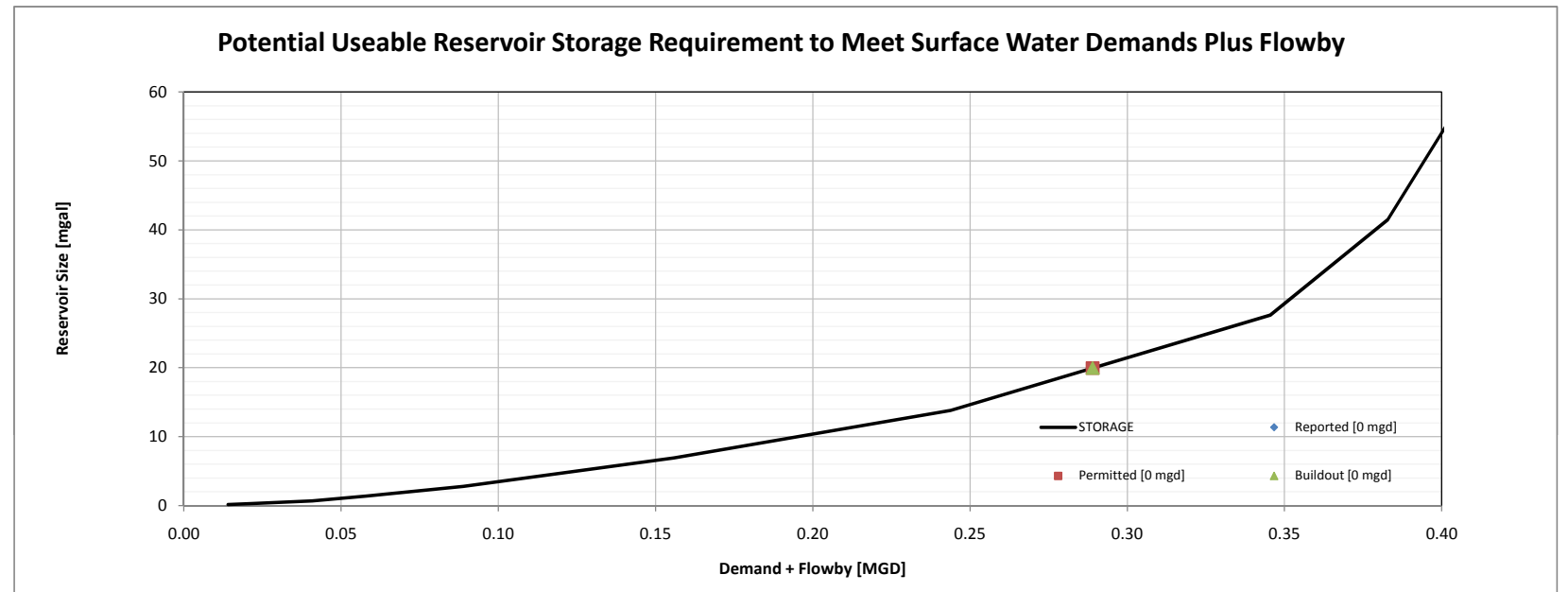
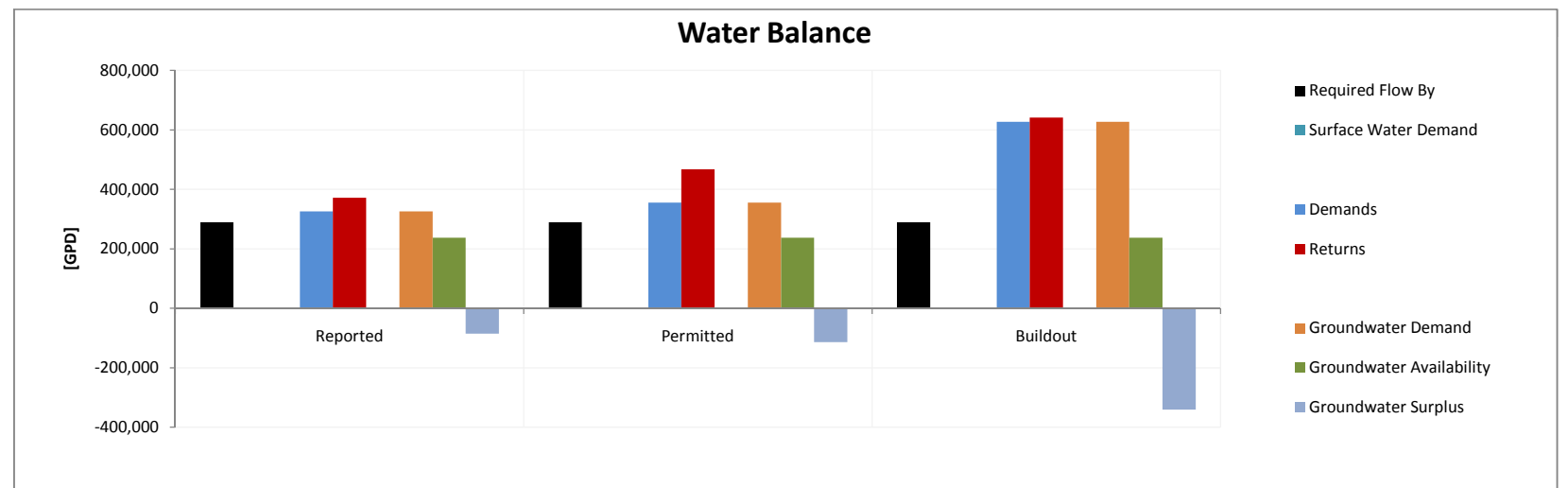
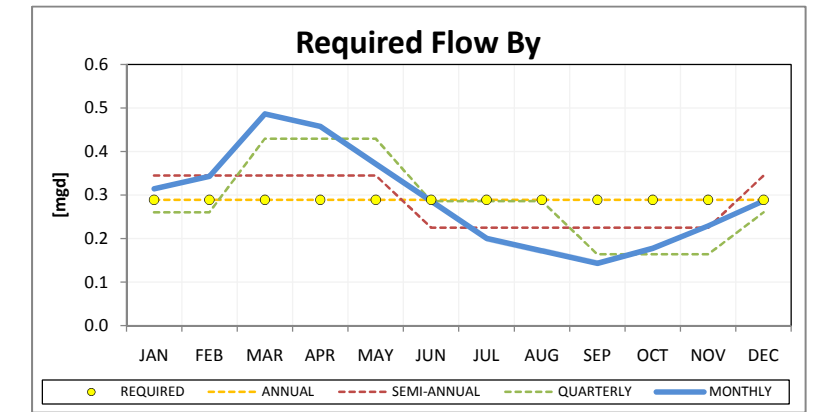
## WATER RESOURCES

SURFACE WATER	REPORTED		PERMITTED		BUILDOUT	
Demand	NA	gpd	NA	gpd	NA	gpd
Required Flow By	288,987	gpd	288,987	gpd	288,987	gpd
Total Requirement	288,987	gpd	288,987	gpd	288,987	gpd
Estimated Storage	NA	MGAL	NA	MGAL	NA	MGAL

GROUNDWATER	GPD		GPD		GPD	
	GPD	%	GPD	%	GPD	%
Availability	237,727	100.00	237,727	100.00	237,727	100.00
Demand	326,105	137.18	355,250	149.44	626,866	263.69
Returns	3,600	1.51	3,600	1.51	48,400	20.36
Surplus	-84,778	-35.66	-113,923	-47.92	-340,739	-143.33

ESTIMATED SEASONAL REQUIRED FLOW BY VALUES [MGD]

ID	MONTH	ANNUAL	SEMI-ANNUAL	QUARTERLY	MONTHLY		
1	JAN	0.29	SA2	0.34	Q3	0.26	0.31
2	FEB	0.29	SA2	0.34	Q3	0.26	0.34
3	MAR	0.29	SA2	0.34	Q4	0.43	0.49
4	APR	0.29	SA2	0.34	Q4	0.43	0.46
5	MAY	0.29	SA2	0.34	Q4	0.43	0.37
6	JUN	0.29	SA1	0.23	Q1	0.29	0.29
7	JUL	0.29	SA1	0.23	Q1	0.29	0.20
8	AUG	0.29	SA1	0.23	Q1	0.29	0.17
9	SEP	0.29	SA1	0.23	Q2	0.16	0.14
10	OCT	0.29	SA1	0.23	Q2	0.16	0.18
11	NOV	0.29	SA1	0.23	Q2	0.16	0.23
12	DEC	0.29	SA2	0.34	Q3	0.26	0.29
<b>SURFACE WATER FLOW BY</b>					<b>0.29</b>	<b>MGD</b>	





# CARROLL COUNTY WATER BALANCE TABLE B-3.5 Lower Monocacy River Water Balance



HUC-8 02140302  
Area 5,463 acres  
8.54 sq mi

## DEMANDS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>SERVICED</b>	<b>57,952</b>	<b>18.5</b>	<b>77,000</b>	<b>23.2</b>	<b>11,526</b>	<b>3.6</b>
Residential	57,468	18.3	76,357	23.0	8,615	2.7
Commercial	484	0.2	643	0.2	460	0.1
Industrial	0	0.0	0	0.0	2,451	0.8
<b>SELF-SUPPLIED</b>	<b>255,250</b>	<b>81.5</b>	<b>255,250</b>	<b>76.8</b>	<b>305,250</b>	<b>96.4</b>
Residential	255,250	81.5	255,250	76.8	305,250	96.4
Industrial	0	0.0	0	0.0	0	0.0
Quarries	0	0.0	0	0.0	0	0.0
Agricultural	0	0.0	0	0.0	0	0.0
<b>Total Demands</b>	<b>313,202</b>	<b>100.0</b>	<b>332,250</b>	<b>100.0</b>	<b>316,776</b>	<b>100.0</b>
Surface Water	0	0.0	0	0.0	0	0.0
Groundwater	313,202	100.0	332,250	100.0	316,776	100.0
<b>Total Demands</b>	<b>313,202</b>	<b>100.0</b>	<b>332,250</b>	<b>100.0</b>	<b>316,776</b>	<b>100.0</b>

## RETURNS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>WWTPs</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>
Industry (NPDES)	0	0.0	0	0.0	0	0.0
Septic-Res	192,200	97.7	192,200	97.7	222,600	91.2
Septic-NonRes	4,600	2.3	4,600	2.3	21,400	8.8
Agricultural	0	0.0	0	0.0	0	0.0
Quarries	0	0.0	0	0.0	0	0.0
<b>Total Returns</b>	<b>196,800</b>	<b>100.0</b>	<b>196,800</b>	<b>100.0</b>	<b>244,000</b>	<b>100.0</b>
Surface Water	0	0.0	0	0.0	0	0.0
Groundwater	196,800	100.0	196,800	100.0	244,000	100.0
<b>Total Returns</b>	<b>196,800</b>	<b>100.0</b>	<b>196,800</b>	<b>100.0</b>	<b>244,000</b>	<b>100.0</b>

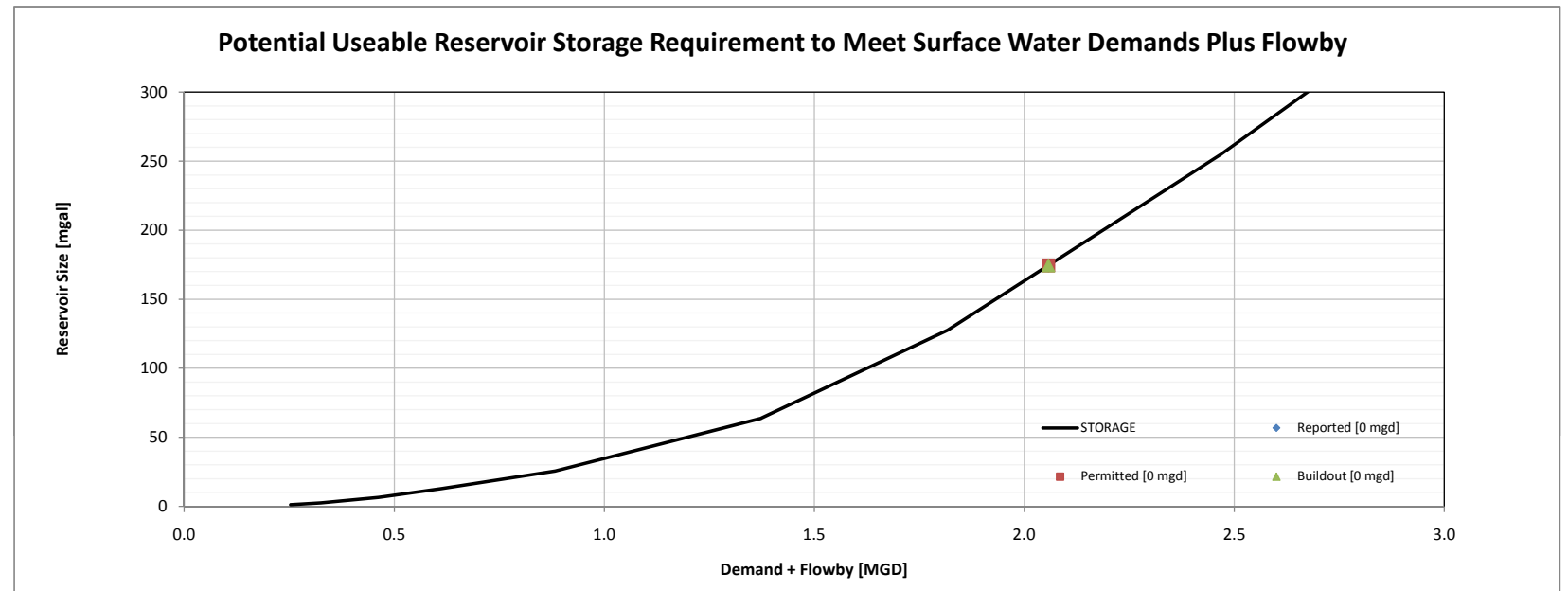
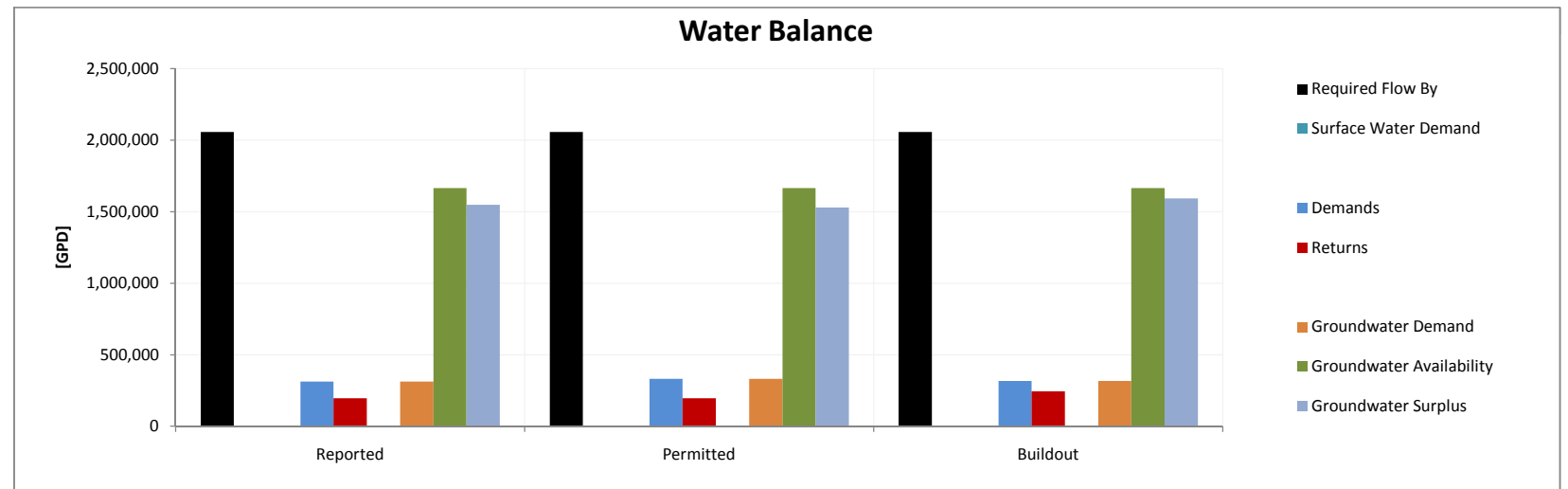
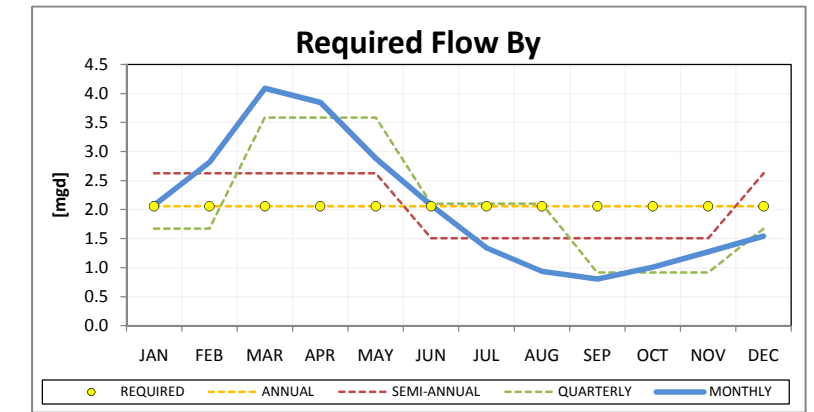
## WATER RESOURCES

SURFACE WATER	REPORTED		PERMITTED		BUILDOUT	
	NA	gpd	NA	gpd	NA	gpd
Demand	NA	gpd	NA	gpd	NA	gpd
Required Flow By	2,057,587	gpd	2,057,587	gpd	2,057,587	gpd
Total Requirement	2,057,587	gpd	2,057,587	gpd	2,057,587	gpd
Estimated Storage	NA	MGAL	NA	MGAL	NA	MGAL

GROUNDWATER	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
Availability	1,665,118	100.00	1,665,118	100.00	1,665,118	100.00
Demand	313,202	18.81	332,250	19.95	316,776	19.02
Returns	196,800	11.82	196,800	11.82	244,000	14.65
Surplus	1,548,717	93.01	1,529,668	91.87	1,592,342	95.63

ESTIMATED SEASONAL REQUIRED FLOW BY VALUES [MGD]

ID	MONTH	ANNUAL	SEMI-ANNUAL	QUARTERLY	MONTHLY		
1	JAN	2.06	SA2	2.63	Q3	1.67	2.08
2	FEB	2.06	SA2	2.63	Q3	1.67	2.82
3	MAR	2.06	SA2	2.63	Q4	3.58	4.09
4	APR	2.06	SA2	2.63	Q4	3.58	3.84
5	MAY	2.06	SA2	2.63	Q4	3.58	2.88
6	JUN	2.06	SA1	1.51	Q1	2.10	2.08
7	JUL	2.06	SA1	1.51	Q1	2.10	1.34
8	AUG	2.06	SA1	1.51	Q1	2.10	0.94
9	SEP	2.06	SA1	1.51	Q2	0.92	0.80
10	OCT	2.06	SA1	1.51	Q2	0.92	1.01
11	NOV	2.06	SA1	1.51	Q2	0.92	1.27
12	DEC	2.06	SA2	2.63	Q3	1.67	1.54
<b>SURFACE WATER FLOW BY</b>					<b>2.06</b>	<b>MGD</b>	





# CARROLL COUNTY WATER BALANCE TABLE B-3.6 Patapsco River L N Br Water Balance



HUC-8 02130906  
Area 565 acres  
0.88 sq mi

## DEMANDS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>SERVICED</b>	0	0.0	0	0.0	0	0.0
Residential	0	0.0	0	0.0	0	0.0
Commercial	0	0.0	0	0.0	0	0.0
Industrial	0	0.0	0	0.0	0	0.0
<b>SELF-SUPPLIED</b>	5,250	100.0	5,250	100.0	15,250	100.0
Residential	5,250	100.0	5,250	100.0	15,250	100.0
Industrial	0	0.0	0	0.0	0	0.0
Quarries	0	0.0	0	0.0	0	0.0
Agricultural	0	0.0	0	0.0	0	0.0
<b>Total Demands</b>	<b>5,250</b>	<b>100.0</b>	<b>5,250</b>	<b>100.0</b>	<b>15,250</b>	<b>100.0</b>
Surface Water	0	0.0	0	0.0	0	0.0
Groundwater	5,250	100.0	5,250	100.0	15,250	100.0
<b>Total Demands</b>	<b>5,250</b>	<b>100.0</b>	<b>5,250</b>	<b>100.0</b>	<b>15,250</b>	<b>100.0</b>

## RETURNS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
WWTPs	0	0.0	0	0.0	0	0.0
Industry (NPDES)	0	0.0	0	0.0	0	0.0
Septic-Res	3,200	100.0	3,200	100.0	10,600	86.9
Septic-NonRes	0	0.0	0	0.0	1,600	13.1
Agricultural	0	0.0	0	0.0	0	0.0
Quarries	0	0.0	0	0.0	0	0.0
<b>Total Returns</b>	<b>3,200</b>	<b>100.0</b>	<b>3,200</b>	<b>100.0</b>	<b>12,200</b>	<b>100.0</b>
Surface Water	0	0.0	0	0.0	0	0.0
Groundwater	3,200	100.0	3,200	100.0	12,200	100.0
<b>Total Returns</b>	<b>3,200</b>	<b>100.0</b>	<b>3,200</b>	<b>100.0</b>	<b>12,200</b>	<b>100.0</b>

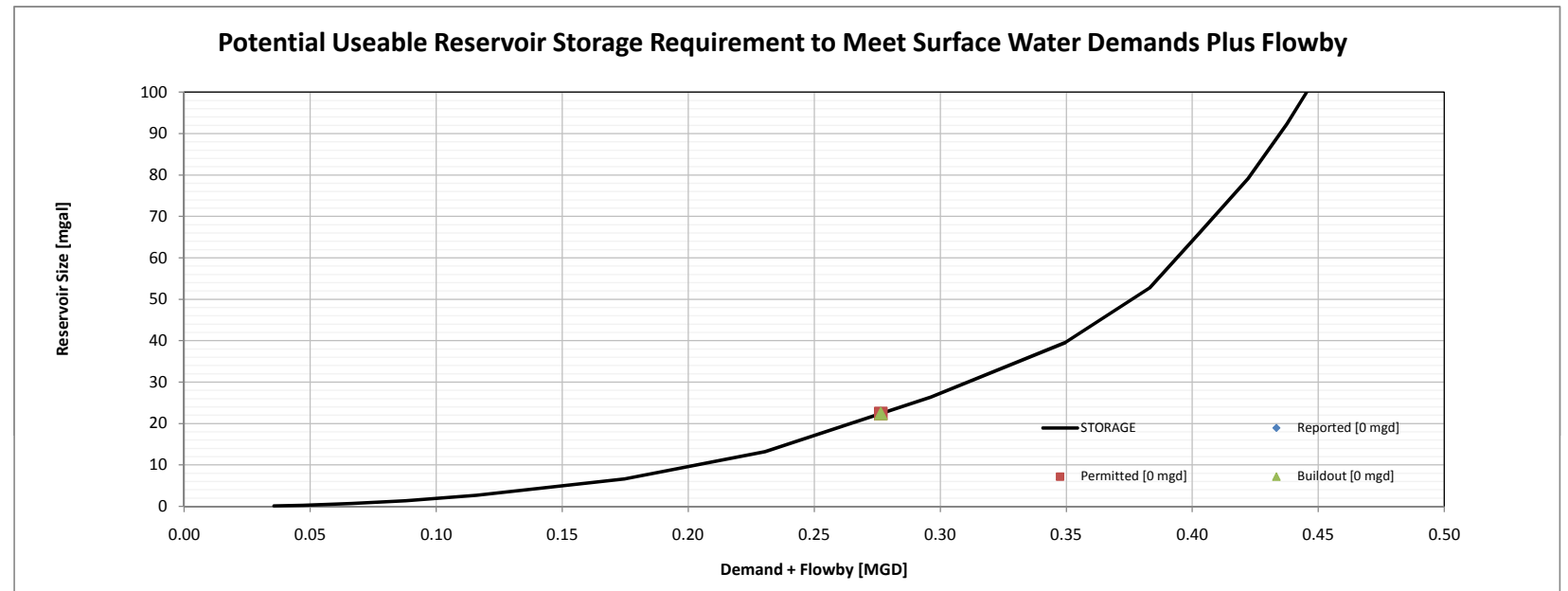
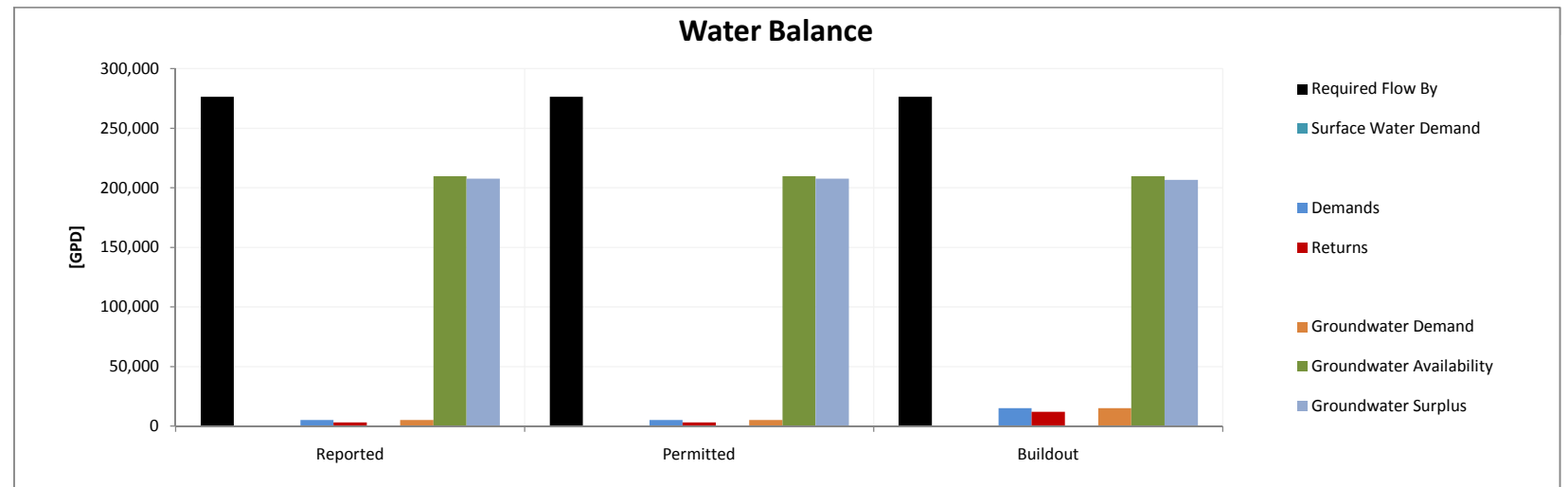
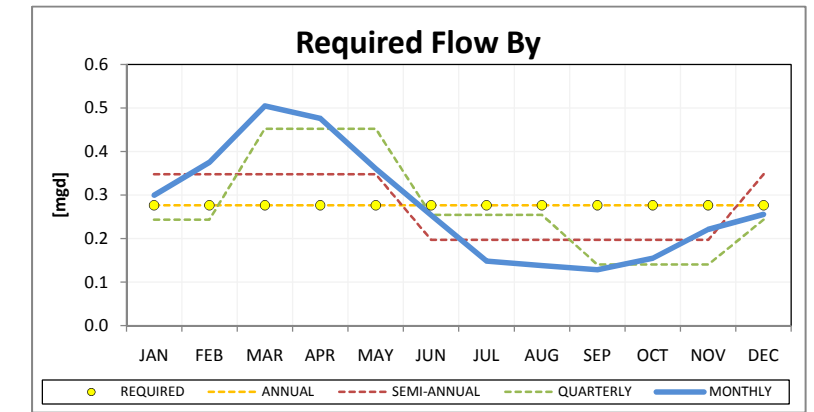
## WATER RESOURCES

SURFACE WATER		REPORTED		PERMITTED		BUILDOUT	
Demand	NA	gpd	NA	gpd	NA	gpd	NA
Required Flow By	276,398	gpd	276,398	gpd	276,398	gpd	276,398
Total Requirement	276,398	gpd	276,398	gpd	276,398	gpd	276,398
Estimated Storage	NA	MGAL	NA	MGAL	NA	MGAL	NA

GROUNDWATER		REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%	
Availability	209,640	100.00	209,640	100.00	209,640	100.00	
Demand	5,250	2.50	5,250	2.50	15,250	7.27	
Returns	3,200	1.53	3,200	1.53	12,200	5.82	
Surplus	207,590	99.02	207,590	99.02	206,590	98.55	

ESTIMATED SEASONAL REQUIRED FLOW BY VALUES [MGD]

ID	MONTH	ANNUAL	SEMI-ANNUAL	QUARTERLY	MONTHLY		
1	JAN	0.28	SA2	0.35	Q3	0.24	0.30
2	FEB	0.28	SA2	0.35	Q3	0.24	0.38
3	MAR	0.28	SA2	0.35	Q4	0.45	0.50
4	APR	0.28	SA2	0.35	Q4	0.45	0.48
5	MAY	0.28	SA2	0.35	Q4	0.45	0.36
6	JUN	0.28	SA1	0.20	Q1	0.25	0.25
7	JUL	0.28	SA1	0.20	Q1	0.25	0.15
8	AUG	0.28	SA1	0.20	Q1	0.25	0.14
9	SEP	0.28	SA1	0.20	Q2	0.14	0.13
10	OCT	0.28	SA1	0.20	Q2	0.14	0.15
11	NOV	0.28	SA1	0.20	Q2	0.14	0.22
12	DEC	0.28	SA2	0.35	Q3	0.24	0.26
<b>SURFACE WATER FLOW BY</b>					<b>0.28</b>	<b>MGD</b>	







# CARROLL COUNTY WATER BALANCE TABLE B-3.7 Prettyboy Reservoir Water Balance



HUC-8 02130806  
Area 21,024 acres  
32.85 sq mi

## DEMANDS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>SERVICED</b>	<b>95,726</b>	<b>10.8</b>	<b>324,000</b>	<b>28.6</b>	<b>240,939</b>	<b>17.5</b>
Residential	82,913	9.3	280,631	24.7	231,836	16.8
Commercial	12,813	1.4	43,369	3.8	9,103	0.7
Industrial	0	0.0	0	0.0	0	0.0
<b>SELF-SUPPLIED</b>	<b>793,125</b>	<b>89.2</b>	<b>810,650</b>	<b>71.4</b>	<b>1,137,125</b>	<b>82.5</b>
Residential	738,250	83.1	738,250	65.1	1,082,250	78.5
Industrial	0	0.0	0	0.0	0	0.0
Quarries	0	0.0	0	0.0	0	0.0
Agricultural	54,875	6.2	72,400	6.4	54,875	4.0
<b>Total Demands</b>	<b>888,851</b>	<b>100.0</b>	<b>1,134,650</b>	<b>100.0</b>	<b>1,378,064</b>	<b>100.0</b>
Surface Water	12,268	1.4	22,000	1.9	12,268	0.9
Groundwater	876,583	98.6	1,112,650	98.1	1,365,796	99.1
<b>Total Demands</b>	<b>888,851</b>	<b>100.0</b>	<b>1,134,650</b>	<b>100.0</b>	<b>1,378,064</b>	<b>100.0</b>

## RETURNS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>WWTPs</b>	<b>240,661</b>	<b>28.6</b>	<b>457,360</b>	<b>43.3</b>	<b>375,293</b>	<b>29.3</b>
Industry (NPDES)	0	0.0	0	0.0	0	0.0
Septic-Res	587,600	69.9	587,600	55.6	804,800	62.9
Septic-NonRes	11,800	1.4	11,800	1.1	100,200	7.8
Agricultural	8,231	1.0	10,860	1.0	8,231	0.6
Quarries	0	0.0	0	0.0	0	0.0
<b>Total Returns</b>	<b>840,061</b>	<b>100.0</b>	<b>1,056,760</b>	<b>100.0</b>	<b>1,280,293</b>	<b>100.0</b>
Surface Water	240,661	28.6	457,360	43.3	375,293	29.3
Groundwater	599,400	71.4	599,400	56.7	905,000	70.7
<b>Total Returns</b>	<b>840,061</b>	<b>100.0</b>	<b>1,056,760</b>	<b>100.0</b>	<b>1,280,293</b>	<b>100.0</b>

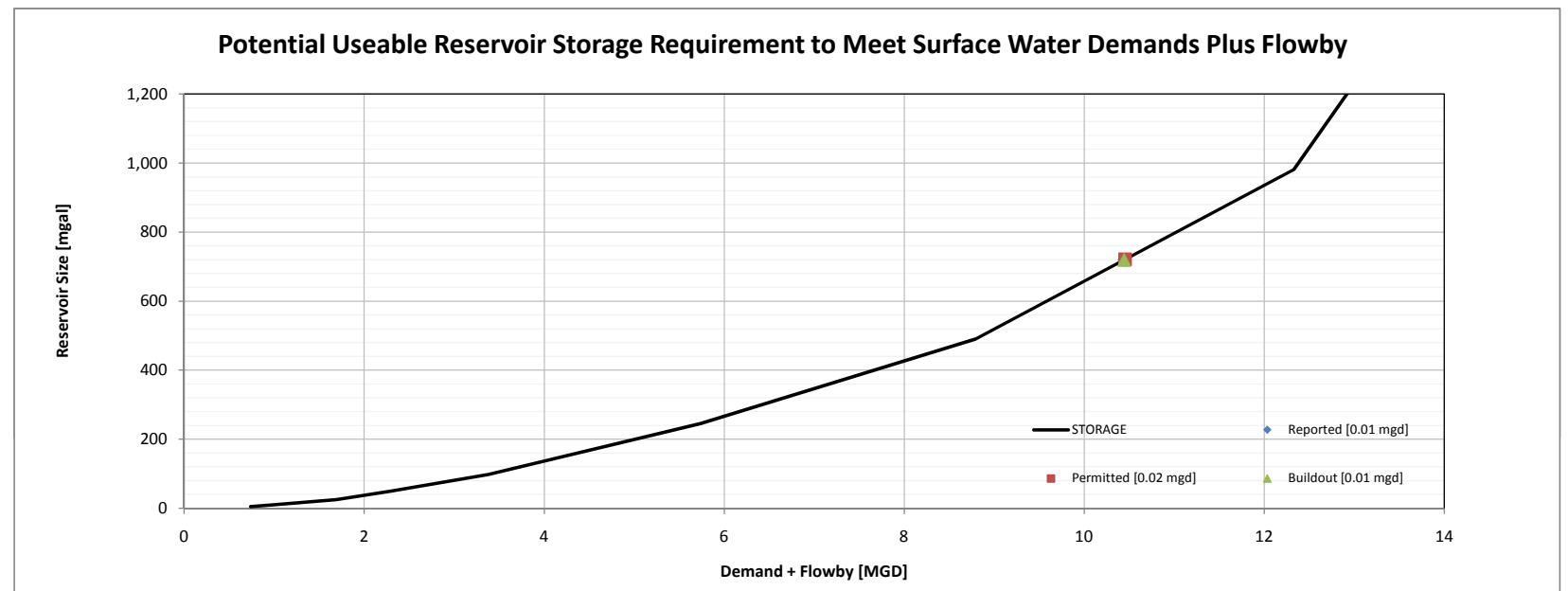
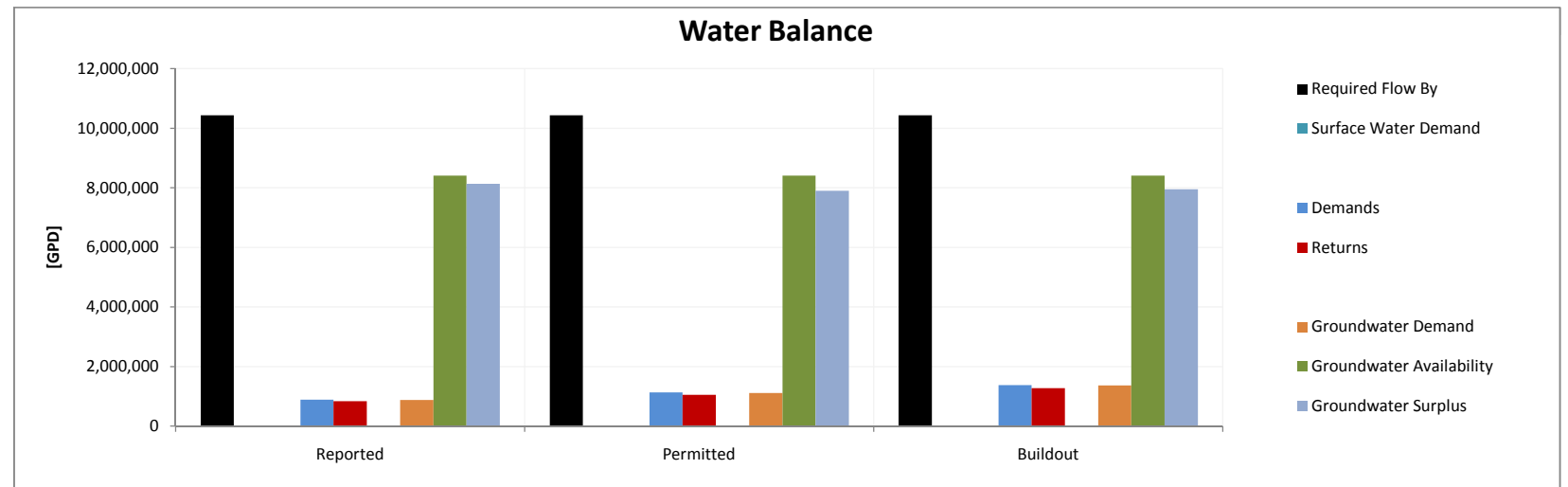
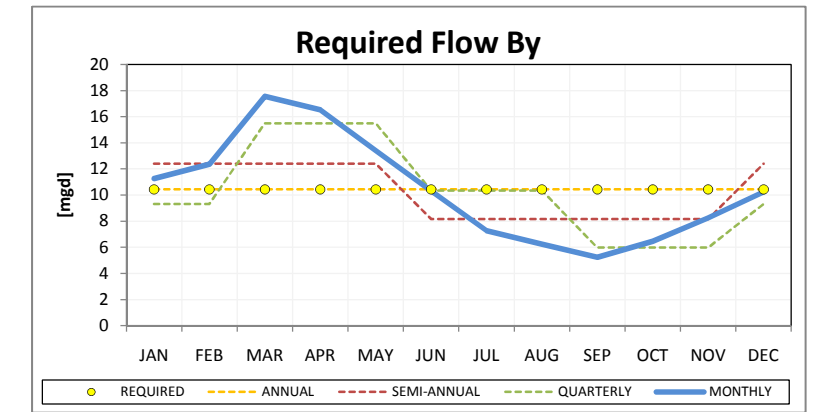
## WATER RESOURCES

SURFACE WATER	REPORTED	PERMITTED	BUILDOUT
Demand	12,268 gpd	22,000 gpd	12,268 gpd
Required Flow By	10,431,070 gpd	10,431,070 gpd	10,431,070 gpd
Total Requirement	10,443,338 gpd	10,453,070 gpd	10,443,338 gpd
Estimated Storage	720 MGAL	721 MGAL	720 MGAL

GROUNDWATER	REPORTED	PERMITTED	BUILDOUT			
	GPD	%	GPD	%	GPD	%
Availability	8,411,515	100.00	8,411,515	100.00	8,411,515	100.00
Demand	876,583	10.42	1,112,650	13.23	1,365,796	16.24
Returns	599,400	7.13	599,400	7.13	905,000	10.76
Surplus	8,134,332	96.70	7,898,265	93.90	7,950,719	94.52

ESTIMATED SEASONAL REQUIRED FLOW BY VALUES [MGD]

ID	MONTH	ANNUAL	SEMI-ANNUAL	QUARTERLY	MONTHLY		
1	JAN	10.43	SA2	12.40	Q3	9.31	11.27
2	FEB	10.43	SA2	12.40	Q3	9.31	12.37
3	MAR	10.43	SA2	12.40	Q4	15.49	17.57
4	APR	10.43	SA2	12.40	Q4	15.49	16.52
5	MAY	10.43	SA2	12.40	Q4	15.49	13.42
6	JUN	10.43	SA1	8.16	Q1	10.34	10.33
7	JUL	10.43	SA1	8.16	Q1	10.34	7.26
8	AUG	10.43	SA1	8.16	Q1	10.34	6.25
9	SEP	10.43	SA1	8.16	Q2	5.98	5.25
10	OCT	10.43	SA1	8.16	Q2	5.98	6.46
11	NOV	10.43	SA1	8.16	Q2	5.98	8.24
12	DEC	10.43	SA2	12.40	Q3	9.31	10.23
<b>SURFACE WATER FLOW BY</b>					<b>10.43</b>	<b>MGD</b>	





# CARROLL COUNTY WATER BALANCE TABLE B-3.8 S Branch Patapsco Water Balance



HUC-8 02130908  
Area 38,736 acres  
60.52 sq mi

## DEMANDS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>SERVICED</b>	<b>238,942</b>	<b>13.0</b>	<b>4,153,000</b>	<b>71.2</b>	<b>1,708,128</b>	<b>44.4</b>
Residential	125,335	6.8	2,178,416	37.3	1,359,536	35.3
Commercial	3,072	0.2	53,402	0.9	33,292	0.9
Industrial	110,535	6.0	1,921,182	32.9	315,300	8.2
<b>SELF-SUPPLIED</b>	<b>1,599,013</b>	<b>87.0</b>	<b>1,680,600</b>	<b>28.8</b>	<b>2,139,340</b>	<b>55.6</b>
Residential	1,450,500	78.9	1,450,500	24.9	1,984,750	51.6
Industrial	24,312	1.3	82,300	1.4	30,390	0.8
Quarries	0	0.0	0	0.0	0	0.0
Agricultural	124,201	6.8	147,800	2.5	124,201	3.2
<b>Total Demands</b>	<b>1,837,954</b>	<b>100.0</b>	<b>5,833,600</b>	<b>100.0</b>	<b>3,847,469</b>	<b>100.0</b>
Surface Water	53,660	2.9	3,441,100	59.0	1,547,440	40.2
Groundwater	1,784,294	97.1	2,392,500	41.0	2,300,029	59.8
<b>Total Demands</b>	<b>1,837,954</b>	<b>100.0</b>	<b>5,833,600</b>	<b>100.0</b>	<b>3,847,469</b>	<b>100.0</b>

## RETURNS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>Total Returns</b>	<b>3,080,163</b>	<b>100.0</b>	<b>7,902,842</b>	<b>100.0</b>	<b>5,295,578</b>	<b>100.0</b>
WWTPs	1,988,161	64.5	6,745,000	85.3	3,683,066	69.5
Industry (NPDES)	0	0.0	65,840	0.8	24,312	0.5
Septic-Res	1,071,600	34.8	1,071,600	13.6	1,440,400	27.2
Septic-NonRes	20,400	0.7	20,400	0.3	147,800	2.8
Agricultural	18,630	0.6	22,170	0.3	18,630	0.4
Quarries	2	0.0	2	0.0	0	0.0
Surface Water	1,988,163	64.5	6,810,842	86.2	3,707,378	70.0
Groundwater	1,092,000	35.5	1,092,000	13.8	1,588,200	30.0
<b>Total Returns</b>	<b>3,080,163</b>	<b>100.0</b>	<b>7,902,842</b>	<b>100.0</b>	<b>5,295,578</b>	<b>100.0</b>

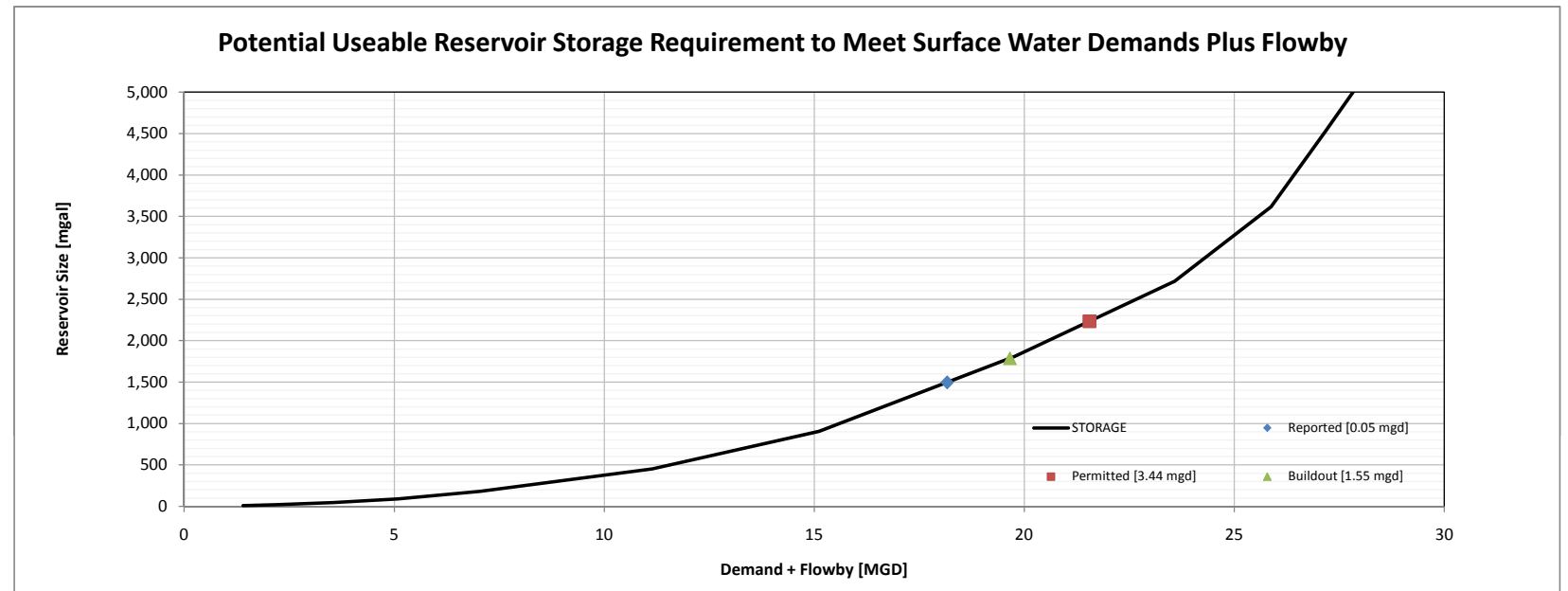
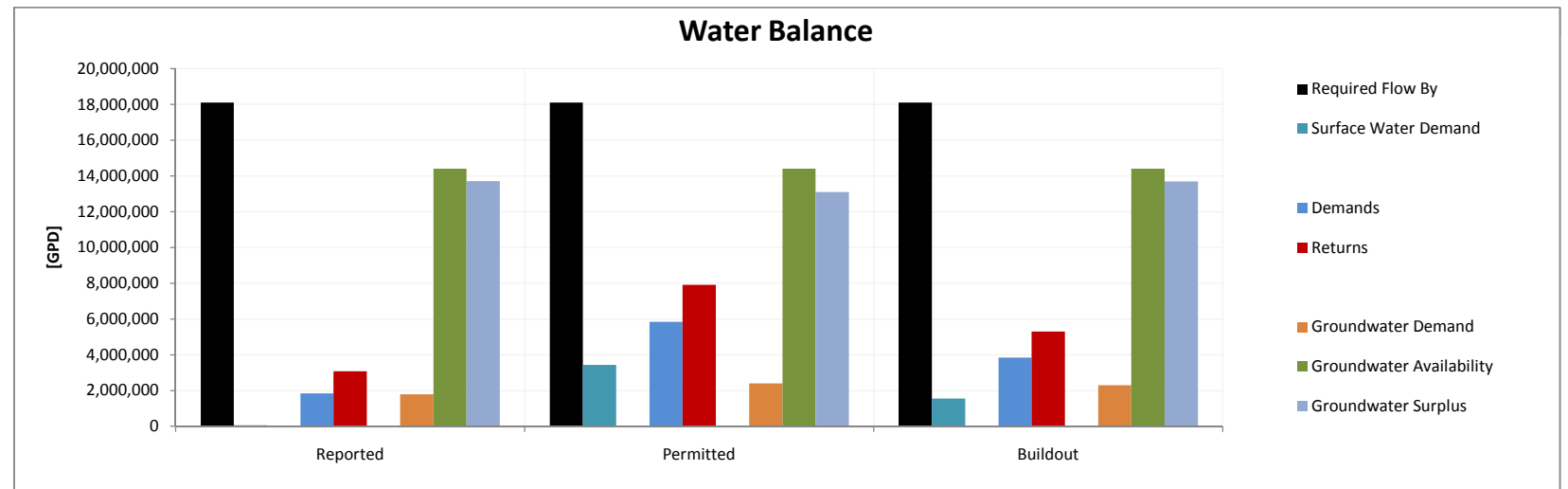
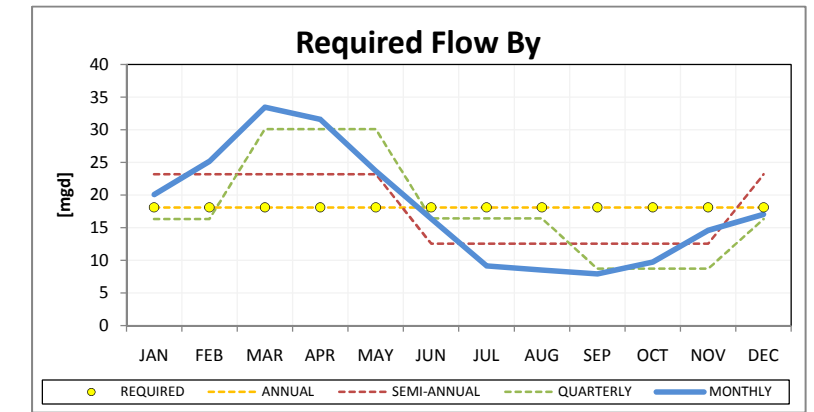
## WATER RESOURCES

SURFACE WATER	REPORTED		PERMITTED		BUILDOUT	
	Value	Unit	Value	Unit	Value	Unit
Demand	53,660	gpd	3,441,100	gpd	1,547,440	gpd
Required Flow By	18,109,302	gpd	18,109,302	gpd	18,109,302	gpd
Total Requirement	18,162,962	gpd	21,550,402	gpd	19,656,742	gpd
Estimated Storage	1,497	MGAL	2,232	MGAL	1,787	MGAL

GROUNDWATER	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
Availability	14,398,786	100.00	14,398,786	100.00	14,398,786	100.00
Demand	1,784,294	12.39	2,392,500	16.62	2,300,029	15.97
Returns	1,092,000	7.58	1,092,000	7.58	1,588,200	11.03
Surplus	13,706,492	95.19	13,098,286	90.97	13,686,958	95.06

ESTIMATED SEASONAL REQUIRED FLOW BY VALUES [MGD]

ID	MONTH	ANNUAL	SEMI-ANNUAL	QUARTERLY	MONTHLY		
1	JAN	18.11	SA2	23.21	Q3	16.35	20.05
2	FEB	18.11	SA2	23.21	Q3	16.35	25.19
3	MAR	18.11	SA2	23.21	Q4	30.07	33.43
4	APR	18.11	SA2	23.21	Q4	30.07	31.61
5	MAY	18.11	SA2	23.21	Q4	30.07	23.71
6	JUN	18.11	SA1	12.57	Q1	16.42	16.42
7	JUL	18.11	SA1	12.57	Q1	16.42	9.13
8	AUG	18.11	SA1	12.57	Q1	16.42	8.52
9	SEP	18.11	SA1	12.57	Q2	8.72	7.91
10	OCT	18.11	SA1	12.57	Q2	8.72	9.74
11	NOV	18.11	SA1	12.57	Q2	8.72	14.59
12	DEC	18.11	SA2	23.21	Q3	16.35	17.02
<b>SURFACE WATER FLOW BY</b>					<b>18.11</b>	<b>MGD</b>	





# CARROLL COUNTY WATER BALANCE TABLE B-3.9 Upper Monocacy River Water Balance



HUC-8 02140303  
Area 27,123 acres  
42.38 sq mi

## DEMANDS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>SERVICED</b>	<b>359,249</b>	<b>47.5</b>	<b>480,000</b>	<b>49.5</b>	<b>482,719</b>	<b>42.9</b>
Residential	274,035	36.2	366,143	37.8	327,095	29.1
Commercial	6,953	0.9	9,291	1.0	27,263	2.4
Industrial	78,261	10.3	104,566	10.8	128,361	11.4
<b>SELF-SUPPLIED</b>	<b>397,222</b>	<b>52.5</b>	<b>488,750</b>	<b>50.5</b>	<b>642,163</b>	<b>57.1</b>
Residential	334,750	44.3	334,750	34.6	564,250	50.2
Industrial	61,765	8.2	144,000	14.9	77,207	6.9
Quarries	0	0.0	0	0.0	0	0.0
Agricultural	707	0.1	10,000	1.0	707	0.1
<b>Total Demands</b>	<b>756,471</b>	<b>100.0</b>	<b>968,750</b>	<b>100.0</b>	<b>1,124,883</b>	<b>100.0</b>
Surface Water	707	0.1	10,000	1.0	707	0.1
Groundwater	755,765	99.9	958,750	99.0	1,124,176	99.9
<b>Total Demands</b>	<b>756,471</b>	<b>100.0</b>	<b>968,750</b>	<b>100.0</b>	<b>1,124,883</b>	<b>100.0</b>

## RETURNS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
WWTPs	407,055	62.4	466,400	56.4	1,390,885	73.0
Industry (NPDES)	0	0.0	115,200	13.9	61,765	3.2
Septic-Res	238,800	36.6	238,800	28.9	364,000	19.1
Septic-NonRes	6,000	0.9	6,000	0.7	87,400	4.6
Agricultural	106	0.0	1,500	0.2	106	0.0
Quarries	0	0.0	0	0.0	0	0.0
<b>Total Returns</b>	<b>651,855</b>	<b>100.0</b>	<b>826,400</b>	<b>100.0</b>	<b>1,904,050</b>	<b>100.0</b>
Surface Water	407,055	62.4	581,600	70.4	1,452,650	76.3
Groundwater	244,800	37.6	244,800	29.6	451,400	23.7
<b>Total Returns</b>	<b>651,855</b>	<b>100.0</b>	<b>826,400</b>	<b>100.0</b>	<b>1,904,050</b>	<b>100.0</b>

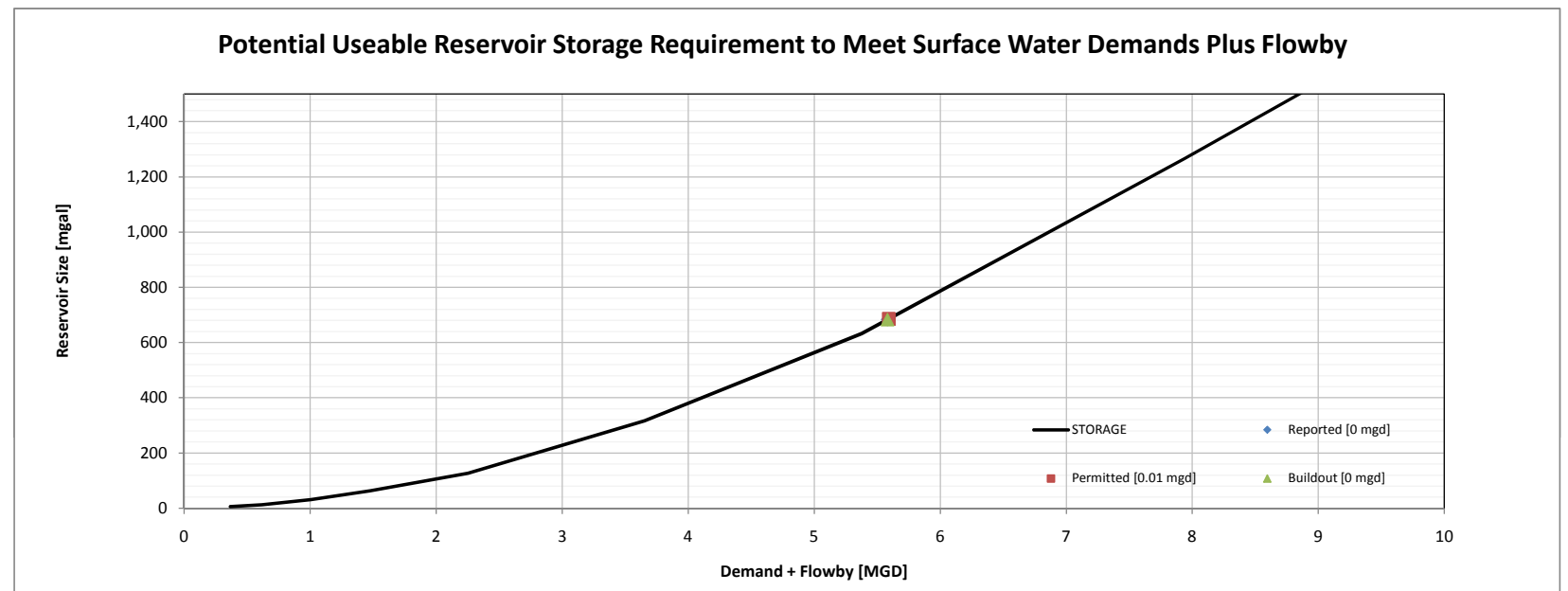
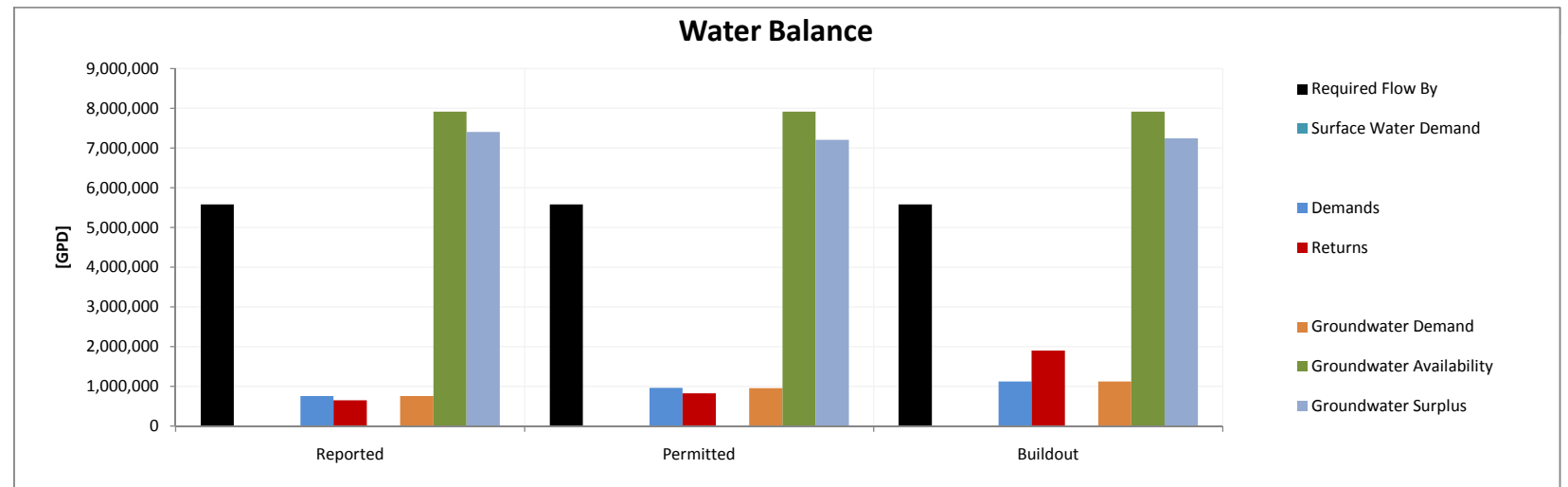
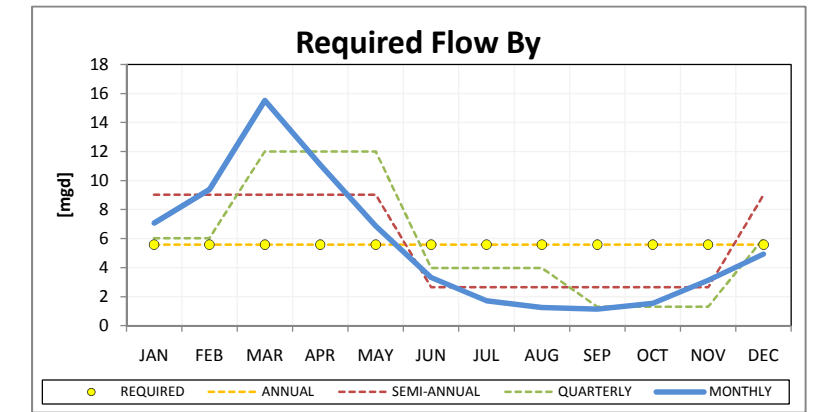
## WATER RESOURCES

SURFACE WATER	REPORTED		PERMITTED		BUILDOUT	
Demand	707	gpd	10,000	gpd	707	gpd
Required Flow By	5,581,106	gpd	5,581,106	gpd	5,581,106	gpd
Total Requirement	5,581,813	gpd	5,591,106	gpd	5,581,813	gpd
Estimated Storage	683	MGAL	686	MGAL	683	MGAL

GROUNDWATER	GPD		GPD		GPD	
	GPD	%	GPD	%	GPD	%
Availability	7,919,973	100.00	7,919,973	100.00	7,919,973	100.00
Demand	755,765	9.54	958,750	12.11	1,124,176	14.19
Returns	244,800	3.09	244,800	3.09	451,400	5.70
Surplus	7,409,009	93.55	7,206,023	90.99	7,247,198	91.51

ESTIMATED SEASONAL REQUIRED FLOW BY VALUES [MGD]

ID	MONTH	ANNUAL	SEMI-ANNUAL	QUARTERLY	MONTHLY		
1	JAN	5.58	SA2	9.01	Q3	6.03	7.06
2	FEB	5.58	SA2	9.01	Q3	6.03	9.38
3	MAR	5.58	SA2	9.01	Q4	11.99	15.52
4	APR	5.58	SA2	9.01	Q4	11.99	11.08
5	MAY	5.58	SA2	9.01	Q4	11.99	6.86
6	JUN	5.58	SA1	2.64	Q1	3.97	3.33
7	JUL	5.58	SA1	2.64	Q1	3.97	1.73
8	AUG	5.58	SA1	2.64	Q1	3.97	1.26
9	SEP	5.58	SA1	2.64	Q2	1.32	1.15
10	OCT	5.58	SA1	2.64	Q2	1.32	1.54
11	NOV	5.58	SA1	2.64	Q2	1.32	3.12
12	DEC	5.58	SA2	9.01	Q3	6.03	4.94
<b>SURFACE WATER FLOW BY</b>					<b>5.58</b>	<b>MGD</b>	





# CARROLL COUNTY WATER BALANCE TABLE B-3.10 Carroll County Water Balance



HUC-8 Total  
Area 289,678 acres  
452.62 sq mi

## DEMANDS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
<b>SERVICED</b>	<b>7,251,100</b>	<b>36.0</b>	<b>14,714,200</b>	<b>50.0</b>	<b>12,680,927</b>	<b>41.6</b>
Residential	6,523,535	32.4	11,837,981	40.2	10,254,850	33.6
Commercial	72,612	0.4	173,461	0.6	265,296	0.9
Industrial	654,952	3.2	2,702,758	9.2	2,160,781	7.1
<b>SELF-SUPPLIED</b>	<b>12,904,557</b>	<b>64.0</b>	<b>14,705,950</b>	<b>50.0</b>	<b>17,828,506</b>	<b>58.4</b>
Residential	8,339,250	41.4	8,339,250	28.3	12,243,000	40.1
Industrial	1,608,633	8.0	1,897,500	6.4	2,010,791	6.6
Quarries	2,472,162	12.3	3,292,000	11.2	3,090,202	10.1
Agricultural	484,513	2.4	1,177,200	4.0	484,513	1.6
<b>Total Demands</b>	<b>20,155,657</b>	<b>100.0</b>	<b>29,420,150</b>	<b>100.0</b>	<b>30,509,433</b>	<b>100.0</b>
Surface Water	4,524,860	22.4	11,030,300	37.5	7,530,677	24.7
Groundwater	15,630,797	77.6	18,389,850	62.5	22,978,756	75.3
<b>Total Demands</b>	<b>20,155,657</b>	<b>100.0</b>	<b>29,420,150</b>	<b>100.0</b>	<b>30,509,433</b>	<b>100.0</b>

## RETURNS

	REPORTED		PERMITTED		BUILDOUT	
	GPD	%	GPD	%	GPD	%
WWTPs	5,789,187	38.2	11,756,360	54.4	10,321,989	41.7
Industry (NPDES)	1,046,702	6.9	1,518,000	7.0	1,608,633	6.5
Septic-Res	6,429,600	42.4	6,429,600	29.8	8,801,800	35.6
Septic-NonRes	173,400	1.1	173,400	0.8	1,068,800	4.3
Agricultural	72,677	0.5	176,580	0.8	72,677	0.3
Quarries	1,715,002	11.3	1,715,002	7.9	2,935,692	11.9
<b>Total Returns</b>	<b>15,153,891</b>	<b>100.0</b>	<b>21,592,362</b>	<b>100.0</b>	<b>24,736,914</b>	<b>100.0</b>
Surface Water	8,550,891	56.4	14,989,362	69.4	14,866,314	60.1
Groundwater	6,603,000	43.6	6,603,000	30.6	9,870,600	39.9
<b>Total Returns</b>	<b>15,153,891</b>	<b>100.0</b>	<b>21,592,362</b>	<b>100.0</b>	<b>24,736,914</b>	<b>100.0</b>

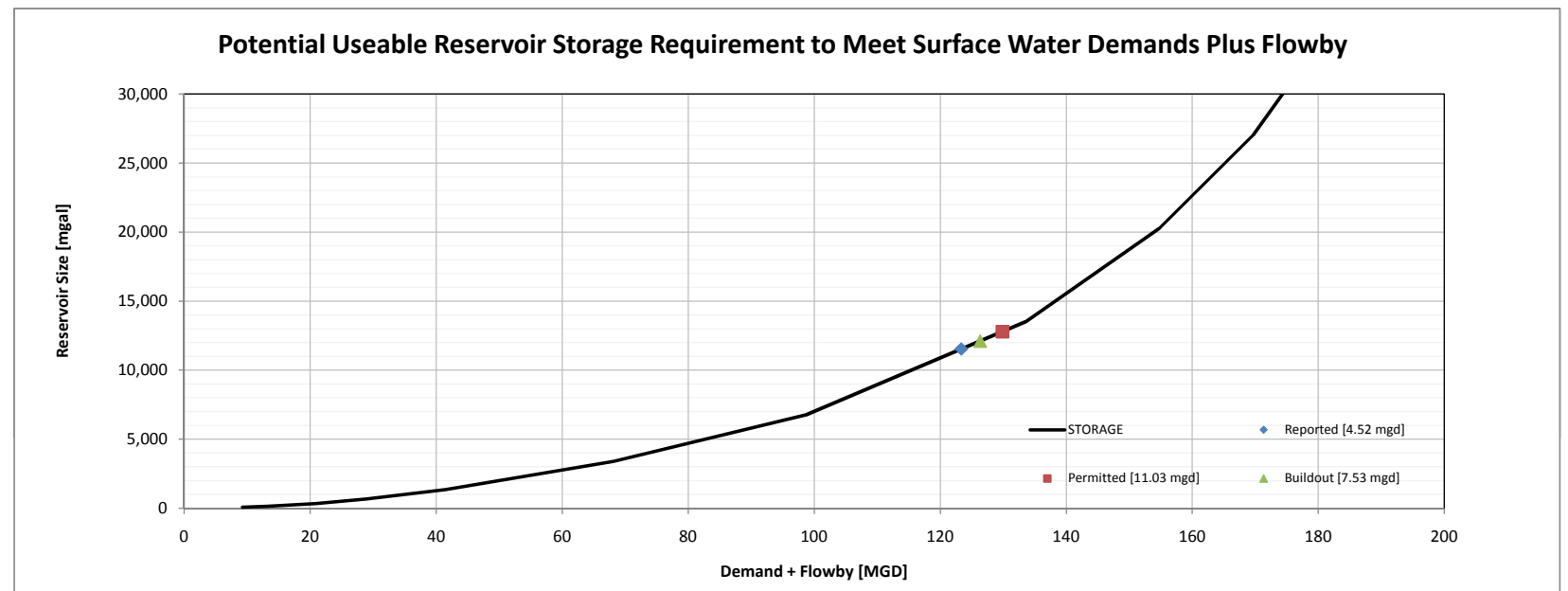
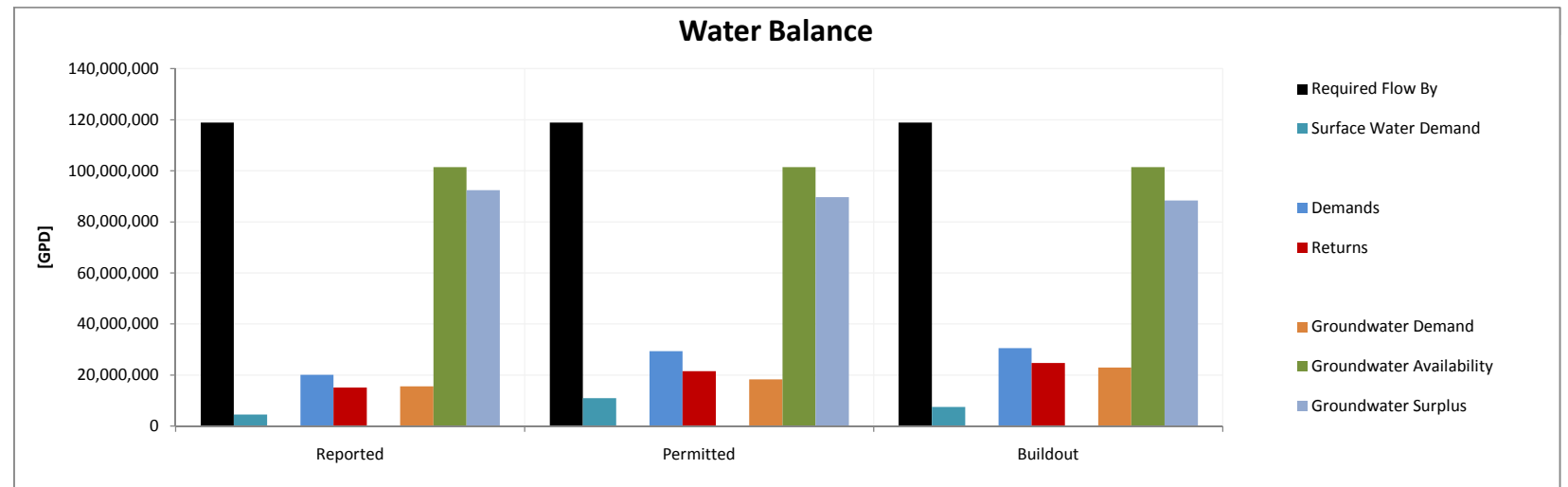
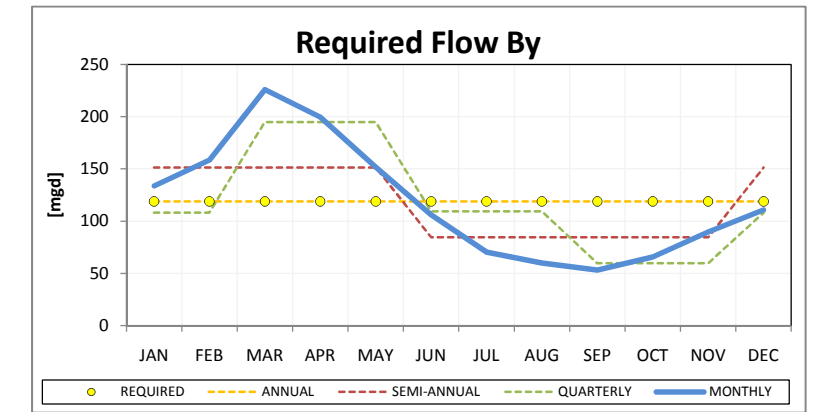
## WATER RESOURCES

SURFACE WATER	REPORTED		PERMITTED		BUILDOUT	
Demand	4,524,860	gpd	11,030,300	gpd	7,530,677	gpd
Required Flow By	118,816,408	gpd	118,816,408	gpd	118,816,408	gpd
Total Requirement	123,341,268	gpd	129,846,708	gpd	126,347,085	gpd
Estimated Storage	11,463	MGAL	12,761	MGAL	12,232	MGAL

GROUNDWATER	GPD		GPD		GPD	
	GPD	%	GPD	%	GPD	%
Availability	101,418,979	100.00	101,418,979	100.00	101,418,979	100.00
Demand	15,630,797	15.41	18,389,850	18.13	22,978,756	22.66
Returns	6,603,000	6.51	6,603,000	6.51	9,870,600	9.73
Surplus	92,391,182	91.10	89,632,129	88.38	88,310,823	87.08

ESTIMATED SEASONAL REQUIRED FLOW BY VALUES [MGD]

ID	MONTH	ANNUAL	SEMI-ANNUAL	QUARTERLY	MONTHLY	
1	JAN	118.82	SA2	151.50 Q3	108.23	133.61
2	FEB	118.82	SA2	151.50 Q3	108.23	158.52
3	MAR	118.82	SA2	151.50 Q4	194.78	226.07
4	APR	118.82	SA2	151.50 Q4	194.78	199.73
5	MAY	118.82	SA2	151.50 Q4	194.78	151.82
6	JUN	118.82	SA1	84.58 Q1	109.45	106.24
7	JUL	118.82	SA1	84.58 Q1	109.45	70.29
8	AUG	118.82	SA1	84.58 Q1	109.45	59.95
9	SEP	118.82	SA1	84.58 Q2	59.71	53.37
10	OCT	118.82	SA1	84.58 Q2	59.71	65.79
11	NOV	118.82	SA1	84.58 Q2	59.71	89.67
12	DEC	118.82	SA2	151.50 Q3	108.23	110.72
SURFACE WATER FLOW BY					118.82	MGD





# CARROLL COUNTY WATER BALANCE

## TABLE B-4.1

### WATER SERVICE AREAS



TOTAL REPORTED WITHDRAWALS																				
NUM	WATERSHED NAME	HUC-8	WATER SERVICE AREA										Total Service Areas		COUNTY-WIDE		WATER SERVICE AREAS		CHECK	
			Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Served Areas	Surface Water	Groundwater				
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	86,500	86,500	--	--	--	--
2	Double Pipe Creek	02140304	15,866	--	--	133,408	--	104,181	--	682,364	--	1,244,494	6,279,100	7,523,594	--	1,244,494	--	--	--	--
3	Liberty Reservoir	02130907	--	2,187,058	191,795	71,692	--	--	--	--	--	4,986,882	5,041,600	10,028,482	4,055,342	931,540	--	--	--	--
4	Loch Raven Reservoir	02130805	--	--	267,855	--	--	--	--	--	--	267,855	58,250	326,105	--	267,855	--	--	--	--
5	Lower Monocacy River	02140302	--	--	--	--	57,952	--	--	--	--	57,952	255,250	313,202	--	57,952	--	--	--	--
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	5,250	5,250	--	5,250	--	--	--	--
7	Prettyboy Reservoir	02130806	--	--	--	95,726	--	--	--	--	--	95,726	810,650	906,376	--	95,726	--	--	--	--
8	S Branch Patapsco	02130908	--	129,210	--	--	109,732	--	--	--	--	238,942	1,680,600	1,919,542	--	238,942	--	--	--	--
9	Upper Monocacy River	02140303	--	--	--	--	--	--	359,249	--	--	359,249	488,750	847,999	--	359,249	--	--	--	--
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>15,866</b>	<b>2,316,268</b>	<b>459,649</b>	<b>300,826</b>	<b>167,683</b>	<b>104,181</b>	<b>6,941</b>	<b>508,819</b>	<b>152,164</b>	<b>7,251,100</b>	<b>14,705,950</b>	<b>21,957,050</b>	<b>4,055,342</b>	<b>3,195,757</b>				

TOTAL PERMITTED WITHDRAWALS																				
NUM	WATERSHED NAME	HUC-8	WATER SERVICE AREA										Total Service Areas		COUNTY-WIDE		WATER SERVICE AREAS		CHECK	
			Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Served Areas	Surface Water	Groundwater				
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	86,500	86,500	86,500	--	--	--	--	--
2	Double Pipe Creek	02140304	20,000	--	--	134,000	--	196,100	10,100	103,000	208,300	1,767,500	6,279,100	8,046,600	139,100	1,628,400	--	--	--	--
3	Liberty Reservoir	02130907	--	4,200,000	283,000	113,700	--	--	--	--	--	7,615,700	5,041,600	12,657,300	6,200,000	1,415,700	--	--	--	--
4	Loch Raven Reservoir	02130805	--	--	297,000	--	--	--	--	--	--	297,000	58,250	355,250	--	297,000	--	--	--	--
5	Lower Monocacy River	02140302	--	--	--	--	77,000	--	--	--	--	77,000	255,250	332,250	--	77,000	--	--	--	--
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	5,250	5,250	--	5,250	--	--	--	--
7	Prettyboy Reservoir	02130806	--	--	--	324,000	--	--	--	--	--	324,000	810,650	1,134,650	--	324,000	--	--	--	--
8	S Branch Patapsco	02130908	--	3,995,000	--	--	158,000	--	--	--	--	4,153,000	1,680,600	5,833,600	3,300,000	853,000	--	--	--	--
9	Upper Monocacy River	02140303	--	--	--	--	--	--	480,000	--	--	480,000	488,750	968,750	--	480,000	--	--	--	--
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>20,000</b>	<b>8,195,000</b>	<b>580,000</b>	<b>571,700</b>	<b>235,000</b>	<b>196,100</b>	<b>10,100</b>	<b>583,000</b>	<b>208,300</b>	<b>14,714,200</b>	<b>14,705,950</b>	<b>29,420,150</b>	<b>9,639,100</b>	<b>5,075,100</b>				

BUILDOUT RESIDENTIAL DEMANDS																
NUM	WATERSHED NAME	HUC-8	WATER SERVICE AREA										Total Service Areas		COUNTY-WIDE	
			Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Served Areas		
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]		
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	130,500	130,500		
2	Double Pipe Creek	02140304	15,866	--	--	140,908	--	253,181	6,941	340,570	470,164	2,456,244	3,119,000	5,575,244		
3	Liberty Reservoir	02130907	--	2,261,058	338,545	89,692	--	--	--	--	--	5,439,632	4,982,250	10,421,882		
4	Loch Raven Reservoir	02130805	--	--	327,355	--	--	--	--	--	--	327,355	59,500	386,855		
5	Lower Monocacy River	02140302	--	--	--	--	96,702	--	--	--	--	96,702	305,250	401,952		
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	15,250	15,250		
7	Prettyboy Reservoir	02130806	--	--	205,000	178,476	--	--	--	--	--	383,476	1,082,250	1,465,726		
8	S Branch Patapsco	02130908	--	353,710	--	--	354,732	--	--	--	--	708,442	1,984,750	2,693,192		
9	Upper Monocacy River	02140303	--	--	--	--	--	--	842,999	--	--	842,999	564,250	1,407,249		
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>15,866</b>	<b>2,614,768</b>	<b>870,899</b>	<b>409,076</b>	<b>451,433</b>	<b>253,181</b>	<b>6,941</b>	<b>1,183,569</b>	<b>470,164</b>	<b>10,254,850</b>	<b>12,243,000</b>	<b>22,497,850</b>		



# CARROLL COUNTY WATER BALANCE

## TABLE B-4.2

### WATER SERVICE AREAS



BASIS ALLOCATION			PERMITTED SOURCE RATIO													Total Service Areas		COUNTY-WIDE	WATER SERVICE AREAS		CHECK
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Un-Serviced Areas	COUNTY-WIDE	Surface Water	Groundwater	CHECK				
			[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[-]				
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	0.59	0.29	--	--	✓			
2	Double Pipe Creek	02140304	100.00	--	--	23.44	--	100.00	100.00	17.67	100.00	26.63	12.01	42.70	27.35	1.44	32.09	✓			
3	Liberty Reservoir	02130907	--	51.25	48.79	19.89	--	--	--	--	--	73.37	51.76	34.28	43.02	64.32	27.90	✓			
4	Loch Raven Reservoir	02130805	--	--	51.21	--	--	--	--	--	--	--	2.02	0.40	1.21	--	5.85	✓			
5	Lower Monocacy River	02140302	--	--	--	--	32.77	--	--	--	--	--	0.52	1.74	1.13	--	1.52	✓			
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02	--	--	✓			
7	Prettyboy Reservoir	02130806	--	--	--	56.67	--	--	--	--	--	--	2.20	5.51	3.86	--	6.38	✓			
8	S Branch Patapsco	02130908	--	48.75	--	--	67.23	--	--	--	--	--	28.22	11.43	19.83	34.24	16.81	✓			
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	82.33	--	--	3.26	3.32	3.29	--	9.46	✓			
10	<b>Carroll County</b>	<b>TOTAL [gpd]</b>	<b>20,000</b>	<b>8,195,000</b>	<b>580,000</b>	<b>571,700</b>	<b>235,000</b>	<b>196,100</b>	<b>10,100</b>	<b>583,000</b>	<b>208,300</b>	<b>4,115,000</b>	<b>14,714,200</b>	<b>14,705,950</b>	<b>29,420,150</b>	<b>9,639,100</b>	<b>5,075,100</b>	<b>✓</b>			

PLANNED NEW SOURCES																		
			WATER SERVICE AREA										Total Service Areas		COUNTY-WIDE	WATER SERVICE AREAS		CHECK
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Un-Serviced Areas	COUNTY-WIDE	Surface Water	Groundwater	CHECK	
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[-]	
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	
2	Double Pipe Creek	02140304	--	--	--	--	--	--	--	1,153,846	--	--	1,153,846	--	1,153,846	--	✓	
3	Liberty Reservoir	02130907	3,200,000	--	--	--	--	--	--	--	--	--	3,200,000	--	3,200,000	--	✓	
4	Loch Raven Reservoir	02130805	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	
5	Lower Monocacy River	02140302	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	
7	Prettyboy Reservoir	02130806	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	
8	S Branch Patapsco	02130908	--	--	--	--	3,800,000	--	--	--	--	--	3,800,000	--	3,800,000	--	✓	
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓	
10	<b>Carroll County</b>	<b>TOTAL</b>	--	3,200,000	--	--	3,800,000	--	--	1,153,846	--	--	8,153,846	--	8,153,846	--	✓	

Liberty Res intake expansion      Gillis Falls Reservoir      Big Pipe Creek Intake

FUTURE SOURCE RATIO																		
			WATER SERVICE AREA										Total Service Areas		COUNTY-WIDE	WATER SERVICE AREAS		CHECK
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Un-Serviced Areas	COUNTY-WIDE	Surface Water	Groundwater	CHECK	
			[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[-]	
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	0.59	0.29	--	--	✓	
2	Double Pipe Creek	02140304	100.00	--	--	23.44	--	100.00	100.00	72.36	100.00	26.63	12.77	42.70	27.35	5.65	7.12	✓
3	Liberty Reservoir	02130907	--	64.94	48.79	19.89	--	--	--	--	--	73.37	47.30	34.28	43.02	41.11	6.19	✓
4	Loch Raven Reservoir	02130805	--	--	51.21	--	--	--	--	--	--	--	1.30	0.40	1.21	--	1.30	✓
5	Lower Monocacy River	02140302	--	--	--	--	1.91	--	--	--	--	--	0.34	1.74	1.13	--	0.34	✓
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	0.04	0.02	--	--	✓
7	Prettyboy Reservoir	02130806	--	--	--	56.67	--	--	--	--	--	--	1.42	5.51	3.86	--	1.42	✓
8	S Branch Patapsco	02130908	--	35.06	--	--	98.09	--	--	--	--	--	34.78	11.43	19.83	31.05	3.73	✓
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	27.64	--	--	2.10	3.32	3.29	--	2.10	✓
10	<b>Carroll County</b>	<b>TOTAL [gpd]</b>	<b>20,000</b>	<b>11,395,000</b>	<b>580,000</b>	<b>571,700</b>	<b>4,035,000</b>	<b>196,100</b>	<b>10,100</b>	<b>1,736,846</b>	<b>208,300</b>	<b>4,115,000</b>	<b>22,868,046</b>	<b>14,705,950</b>	<b>29,420,150</b>	<b>17,792,946</b>	<b>5,075,100</b>	<b>✓</b>



# CARROLL COUNTY WATER BALANCE

## TABLE B-4.3

### WATER SERVICE AREAS



FUTURE GROUNDWATER SOURCE RATIO			WATER SERVICE AREA												Total Service Areas		WATER SERVICE AREAS	
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Serviced Areas	Surface Water	Groundwater		
			[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]		
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
2	Double Pipe Creek	02140304	100.00	--	--	23.44	--	99.95	100.00	5.93	100.00	23.26	55.74	--	--	7.12		
3	Liberty Reservoir	02130907	--	--	48.79	19.89	--	--	--	--	--	24.76	13	--	--	6.19		
4	Loch Raven Reservoir	02130805	--	--	51.21	--	--	--	--	--	--	--	100	--	--	1.30		
5	Lower Monocacy River	02140302	--	--	--	--	1.91	--	--	--	--	--	100	--	--	0.34		
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
7	Prettyboy Reservoir	02130806	--	--	--	56.67	--	--	--	--	--	--	100	--	--	1.42		
8	S Branch Patapsco	02130908	--	6.10	--	--	3.92	--	--	--	--	--	11	--	--	3.73		
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	27.64	--	--	100	--	--	2.10		
10	<b>Carroll County</b>	<b>TOTAL [gpd]</b>	<b>20,000</b>	<b>695,000</b>	<b>580,000</b>	<b>571,700</b>	<b>235,000</b>	<b>196,000</b>	<b>10,100</b>	<b>583,000</b>	<b>208,300</b>	<b>1,976,000</b>	<b>5,075,100</b>			<b>22.19</b>		

FUTURE SURFACE WATER SOURCE RATIO			WATER SERVICE AREA												Total Service Areas		WATER SERVICE AREAS	
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Serviced Areas	Surface Water	Groundwater		
			[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]		
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
2	Double Pipe Creek	02140304	--	--	--	--	--	0.05	--	66.43	--	3.38	44.26	--	5.65	--		
3	Liberty Reservoir	02130907	--	64.94	--	--	--	--	--	--	--	48.60	86.91	--	41.11	--		
4	Loch Raven Reservoir	02130805	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
5	Lower Monocacy River	02140302	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
7	Prettyboy Reservoir	02130806	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
8	S Branch Patapsco	02130908	--	28.96	--	--	94.18	--	--	--	--	--	89.27	--	31.05	--		
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
10	<b>Carroll County</b>	<b>TOTAL [gpd]</b>	--	<b>10,700,000</b>	--	--	<b>3,800,000</b>	<b>100</b>	--	<b>1,153,846</b>	--	<b>2,139,000</b>	<b>17,792,946</b>		<b>77.81</b>	--		

BUILDOUT RESIDENTIAL WITHDRAWALS			WATER SERVICE AREA												Total Service Areas		COUNTY-WIDE	WATER SERVICE AREAS		CHECK
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Serviced Areas		Surface Water	Groundwater			
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	130,500	130,500	--	--	--	✓	
2	Double Pipe Creek	02140304	15,866	--	--	95,883	--	253,181	6,941	856,474	470,164	1,059,765	2,758,274	3,119,000	5,877,274	920,819	1,837,455	--	✓	
3	Liberty Reservoir	02130907	--	1,698,050	424,939	81,357	--	--	--	--	--	2,919,188	5,123,534	4,982,250	10,105,784	3,631,928	1,491,607	--	✓	
4	Loch Raven Reservoir	02130805	--	--	445,961	--	--	--	--	--	--	--	445,961	59,500	505,461	--	445,961	--	✓	
5	Lower Monocacy River	02140302	--	--	--	--	8,615	--	--	--	--	--	8,615	305,250	313,865	--	8,615	--	✓	
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	15,250	15,250	--	--	--	✓	
7	Prettyboy Reservoir	02130806	--	--	--	231,836	--	--	--	--	--	--	231,836	1,082,250	1,314,086	--	231,836	--	✓	
8	S Branch Patapsco	02130908	--	916,718	--	--	442,818	--	--	--	--	--	1,359,536	1,984,750	3,344,286	1,182,380	177,156	--	✓	
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	327,095	--	--	327,095	564,250	891,345	--	327,095	--	✓	
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>15,866</b>	<b>2,614,768</b>	<b>870,899</b>	<b>409,076</b>	<b>451,433</b>	<b>253,181</b>	<b>6,941</b>	<b>1,183,569</b>	<b>470,164</b>	<b>3,978,953</b>	<b>10,254,850</b>	<b>12,243,000</b>	<b>22,497,850</b>	<b>5,735,127</b>	<b>4,519,723</b>		✓	



# CARROLL COUNTY WATER BALANCE

## TABLE B-4.4

### WATER SERVICE AREAS



REPORTED COMMERCIAL DEMANDS			WATER SERVICE AREA										Total Service Areas		COUNTY-WIDE
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Serviced Areas	
			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--
2	Double Pipe Creek	02140304	--	--	--	--	--	--	--	9,869	5,669	--	15,538	--	15,538
3	Liberty Reservoir	02130907	--	--	6,551	--	--	--	--	--	--	10,815	17,365	--	17,365
4	Loch Raven Reservoir	02130805	--	--	16,385	--	--	--	--	--	--	--	16,385	--	16,385
5	Lower Monocacy River	02140302	--	--	--	--	484	--	--	--	--	--	484	--	484
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	--
7	Prettyboy Reservoir	02130806	--	--	8,860	3,953	--	--	--	--	--	--	12,813	--	12,813
8	S Branch Patapsco	02130908	--	3,072	--	--	--	--	--	--	--	--	3,072	--	3,072
9	Upper Monocacy River	02140303	--	--	--	--	--	--	6,953	--	--	--	6,953	--	6,953
10	<b>Carroll County</b>	<b>TOTAL</b>	--	<b>3,072</b>	<b>31,796</b>	<b>3,953</b>	<b>484</b>	--	--	<b>16,822</b>	<b>5,669</b>	<b>10,815</b>	<b>72,612</b>	--	<b>72,612</b>

REPORTED INDUSTRIAL DEMANDS			WATER SERVICE AREA										Total Service Areas		COUNTY-WIDE
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Serviced Areas	
			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--
2	Double Pipe Creek	02140304	--	--	--	--	--	42,155	--	--	148,389	135,767	326,312	--	326,312
3	Liberty Reservoir	02130907	--	82,086	35,816	--	--	--	--	--	--	21,943	139,845	--	139,845
4	Loch Raven Reservoir	02130805	--	--	--	--	--	--	--	--	--	--	--	--	--
5	Lower Monocacy River	02140302	--	--	--	--	--	--	--	--	--	--	--	--	--
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	--
7	Prettyboy Reservoir	02130806	--	--	--	--	--	--	--	--	--	--	--	--	--
8	S Branch Patapsco	02130908	--	84,837	--	--	25,698	--	--	--	--	--	110,535	--	110,535
9	Upper Monocacy River	02140303	--	--	--	--	--	--	78,261	--	--	--	78,261	--	78,261
10	<b>Carroll County</b>	<b>TOTAL</b>	--	<b>166,923</b>	<b>35,816</b>	--	<b>25,698</b>	<b>42,155</b>	--	<b>78,261</b>	<b>148,389</b>	<b>157,711</b>	<b>654,952</b>	--	<b>654,952</b>

BUILDOUT COMMERCIAL DEMANDS			WATER SERVICE AREA										Total Service Areas		COUNTY-WIDE
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Serviced Areas	
			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--
2	Double Pipe Creek	02140304	--	--	--	2,580	--	--	348	53,563	11,940	10,686	79,118	--	79,118
3	Liberty Reservoir	02130907	--	12,316	9,997	--	--	--	--	--	--	32,750	55,062	--	55,062
4	Loch Raven Reservoir	02130805	--	--	20,971	--	--	--	--	--	--	--	20,971	--	20,971
5	Lower Monocacy River	02140302	--	--	--	--	9,297	--	--	--	--	--	9,297	--	9,297
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	--
7	Prettyboy Reservoir	02130806	--	--	12,277	13,483	--	--	--	--	--	--	25,760	--	25,760
8	S Branch Patapsco	02130908	--	15,189	--	--	14,812	--	--	--	--	--	30,001	--	30,001
9	Upper Monocacy River	02140303	--	--	--	--	--	--	45,087	--	--	--	45,087	--	45,087
10	<b>Carroll County</b>	<b>TOTAL</b>	--	<b>27,505</b>	<b>43,245</b>	<b>16,063</b>	<b>24,109</b>	--	<b>348</b>	<b>98,650</b>	<b>11,940</b>	<b>43,436</b>	<b>265,296</b>	--	<b>265,296</b>





# CARROLL COUNTY WATER BALANCE

## TABLE B-4.5

### WATER SERVICE AREAS



BUILDOUT INDUSTRIAL DEMANDS			WATER SERVICE AREA										Total Service Areas		COUNTY-WIDE
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Served Areas	
			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--
2	Double Pipe Creek	02140304	--	--	--	--	--	141,175	--	--	320,410	238,231	699,817	--	699,817
3	Liberty Reservoir	02130907	--	214,316	144,487	--	--	--	--	--	--	134,284	493,087	--	493,087
4	Loch Raven Reservoir	02130805	--	--	49,357	--	--	--	--	--	--	--	49,357	--	49,357
5	Lower Monocacy River	02140302	--	--	--	--	--	--	--	--	--	--	--	--	--
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	--
7	Prettyboy Reservoir	02130806	--	--	--	--	--	--	--	--	--	--	--	--	--
8	S Branch Patapsco	02130908	--	325,589	--	--	128,465	--	--	--	--	--	454,054	--	454,054
9	Upper Monocacy River	02140303	--	--	--	--	--	--	464,467	--	--	--	464,467	--	464,467
10	<b>Carroll County</b>	<b>TOTAL</b>	--	<b>539,905</b>	<b>193,843</b>	--	<b>128,465</b>	<b>141,175</b>	--	<b>464,467</b>	<b>320,410</b>	<b>372,515</b>	<b>2,160,781</b>	--	<b>2,160,781</b>

BUILDOUT COMMERCIAL WITHDRAWALS			WATER SERVICE AREA										Total Service Areas		COUNTY-WIDE	WATER SERVICE AREAS		
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Served Areas		Surface Water	Groundwater	CHECK
			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓
2	Double Pipe Creek	02140304	--	--	--	3,765	--	--	348	71,387	11,940	11,569	99,009	--	99,009	67,004	32,005	✓
3	Liberty Reservoir	02130907	--	17,862	21,101	3,195	--	--	--	--	--	31,867	74,024	--	74,024	38,973	35,051	✓
4	Loch Raven Reservoir	02130805	--	--	22,145	--	--	--	--	--	--	--	22,145	--	22,145	--	22,145	✓
5	Lower Monocacy River	02140302	--	--	--	--	460	--	--	--	--	--	460	--	460	--	460	✓
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓
7	Prettyboy Reservoir	02130806	--	--	--	9,103	--	--	--	--	--	--	9,103	--	9,103	--	9,103	✓
8	S Branch Patapsco	02130908	--	9,643	--	--	23,649	--	--	--	--	--	33,292	--	33,292	30,671	2,622	✓
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	27,263	--	--	27,263	--	27,263	--	27,263	✓
10	<b>Carroll County</b>	<b>TOTAL</b>	--	<b>27,505</b>	<b>43,245</b>	<b>16,063</b>	<b>24,109</b>	--	<b>348</b>	<b>98,650</b>	<b>11,940</b>	<b>43,436</b>	<b>265,296</b>	--	<b>265,296</b>	<b>136,647</b>	<b>128,649</b>	✓

BUILDOUT INDUSTRIAL WITHDRAWALS			WATER SERVICE AREA										Total Service Areas		COUNTY-WIDE	WATER SERVICE AREAS		
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Served Areas		Surface Water	Groundwater	CHECK
			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓
2	Double Pipe Creek	02140304	--	--	--	--	--	141,175	--	336,105	320,410	99,217	896,908	--	896,908	321,216	575,691	✓
3	Liberty Reservoir	02130907	--	350,619	94,582	--	--	--	--	--	--	273,299	718,499	--	718,499	531,671	186,828	✓
4	Loch Raven Reservoir	02130805	--	--	99,261	--	--	--	--	--	--	--	99,261	--	99,261	--	99,261	✓
5	Lower Monocacy River	02140302	--	--	--	--	2,451	--	--	--	--	--	2,451	--	2,451	--	2,451	✓
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓
7	Prettyboy Reservoir	02130806	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	✓
8	S Branch Patapsco	02130908	--	189,287	--	--	126,013	--	--	--	--	--	315,300	--	315,300	277,340	37,960	✓
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	128,361	--	--	128,361	--	128,361	--	128,361	✓
10	<b>Carroll County</b>	<b>TOTAL</b>	--	<b>539,905</b>	<b>193,843</b>	--	<b>128,465</b>	<b>141,175</b>	--	<b>464,467</b>	<b>320,410</b>	<b>372,515</b>	<b>2,160,781</b>	--	<b>2,160,781</b>	<b>1,130,227</b>	<b>1,030,554</b>	✓



# CARROLL COUNTY WATER BALANCE

## TABLE B-4.6

### WATER SERVICE AREAS



BUILDOUT WITHDRAWALS			WATER SERVICE AREA										Total Service Areas		COUNTY-WIDE		WATER SERVICE AREAS		CHECK
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Serviced Areas	Surface Water	Groundwater			
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]		
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	130,500	--	--	--		
2	Double Pipe Creek	02140304	15,866	--	--	99,648	--	394,356	7,289	1,263,966	802,515	1,170,550	3,754,191	6,482,164	10,236,355	1,309,039	2,445,152		
3	Liberty Reservoir	02130907	--	2,066,530	540,622	84,552	--	--	--	--	--	3,224,354	5,916,057	6,917,213	12,833,270	4,202,571	1,713,486		
4	Loch Raven Reservoir	02130805	--	--	567,366	--	--	--	--	--	--	--	567,366	59,500	626,866	--	567,366		
5	Lower Monocacy River	02140302	--	--	--	--	11,526	--	--	--	--	--	11,526	305,250	316,776	--	11,526		
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	15,250	15,250	--	--		
7	Prettyboy Reservoir	02130806	--	--	--	240,939	--	--	--	--	--	--	240,939	1,137,125	1,378,064	--	240,939		
8	S Branch Patapsco	02130908	--	1,115,647	--	--	592,481	--	--	--	--	--	1,708,128	2,139,340	3,847,469	1,490,390	217,738		
9	Upper Monocacy River	02140303	--	--	--	--	--	--	482,719	--	--	--	482,719	642,163	1,124,883	--	482,719		
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>15,866</b>	<b>3,182,178</b>	<b>1,107,988</b>	<b>425,139</b>	<b>604,007</b>	<b>394,356</b>	<b>7,289</b>	<b>1,746,686</b>	<b>802,515</b>	<b>4,394,904</b>	<b>12,680,927</b>	<b>17,828,506</b>	<b>30,509,433</b>	<b>7,002,001</b>	<b>5,678,926</b>		

EXISTING WATER SERVICE AREA ACREAGE			WATER SERVICE AREA										Total Service Areas		COUNTY-WIDE
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Serviced Areas	
			[acres]	[acres]	[acres]	[acres]	[acres]	[acres]	[acres]	[acres]	[acres]	[acres]	[acres]	[acres]	
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	3,468	
2	Double Pipe Creek	02140304	196	--	--	290	--	424	41	156	265	2,819	4,192	101,264	
3	Liberty Reservoir	02130907	--	4,738	548	322	--	--	--	--	--	3,758	9,366	77,884	
4	Loch Raven Reservoir	02130805	--	--	235	--	--	--	--	--	--	--	235	357	
5	Lower Monocacy River	02140302	--	--	--	--	301	--	--	--	--	--	301	5,161	
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	565	
7	Prettyboy Reservoir	02130806	--	--	546	430	--	--	--	--	--	--	976	20,048	
8	S Branch Patapsco	02130908	--	3,722	--	--	1,006	--	--	--	--	--	4,728	34,008	
9	Upper Monocacy River	02140303	--	--	--	--	--	--	858	--	--	--	858	26,265	
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>196</b>	<b>8,460</b>	<b>1,329</b>	<b>1,043</b>	<b>1,308</b>	<b>424</b>	<b>41</b>	<b>1,014</b>	<b>265</b>	<b>6,577</b>	<b>20,658</b>	<b>269,019</b>	

BUILDOUT WATER SERVICE AREA ACREAGE			WATER SERVICE AREA										Total Service Areas		COUNTY-WIDE
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Areas	Un-Serviced Areas	
			[acres]	[acres]	[acres]	[acres]	[acres]	[acres]	[acres]	[acres]	[acres]	[acres]	[acres]	[acres]	
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	3,468	
2	Double Pipe Creek	02140304	196	--	--	310	--	1,048	41	540	1,430	4,288	7,854	97,602	
3	Liberty Reservoir	02130907	--	5,260	1,063	351	--	--	--	--	--	4,256	10,930	76,321	
4	Loch Raven Reservoir	02130805	--	--	408	--	--	--	--	--	--	--	408	184	
5	Lower Monocacy River	02140302	--	--	--	--	453	--	--	--	--	--	453	5,010	
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	565	
7	Prettyboy Reservoir	02130806	--	--	1,213	836	--	--	--	--	--	--	2,050	18,975	
8	S Branch Patapsco	02130908	--	4,776	--	--	1,783	--	--	--	--	--	6,559	32,177	
9	Upper Monocacy River	02140303	--	--	--	--	--	--	2,781	--	--	--	2,781	24,342	
10	<b>Carroll County</b>	<b>TOTAL</b>	<b>196</b>	<b>10,036</b>	<b>2,684</b>	<b>1,498</b>	<b>2,235</b>	<b>1,048</b>	<b>41</b>	<b>3,321</b>	<b>1,430</b>	<b>8,544</b>	<b>31,035</b>	<b>258,643</b>	



# CARROLL COUNTY WATER BALANCE

## TABLE B-5.1 SEWER SERVICE AREAS



EXISTING WASTE WATER TREATMENT PLANT DISCHARGE RATIOS															
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Winfield	Total Service Areas	CHECK
			⊗	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	[-]
			[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--
2	Double Pipe Creek	02140304	--	--	--	--	--	100.00	100.00	--	100.00	91.00	--	46.11	
3	Liberty Reservoir	02130907	--	--	--	--	--	--	--	--	--	9.00	--	4.36	
4	Loch Raven Reservoir	02130805	--	--	100.00	--	--	--	--	--	--	--	--	5.72	
5	Lower Monocacy River	02140302	--	--	--	--	--	--	--	--	--	--	--	--	
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	
7	Prettyboy Reservoir	02130806	--	--	--	100.00	--	--	--	--	--	--	--	4.25	
8	S Branch Patapsco	02130908	--	100.00	--	--	100.00	--	--	--	--	--	100.00	31.36	
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	100.00	--	--	--	8.20	
10	<b>Carroll County</b>	<b>TOTAL</b>	--	2,086,625	577,125	428,667	1,075,000	59,500	4,143	826,364	142,075	4,882,838	1,000	10,083,336	⊙

PLANNED ADDITIONAL CAPACITY															
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Winfield	Total Service Areas	CHECK
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[-]
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--
2	Double Pipe Creek	02140304	--	--	--	--	--	314,500	--	--	800,000	600,000	--	1,714,500	
3	Liberty Reservoir	02130907	--	--	--	--	--	--	--	--	--	--	--	--	
4	Loch Raven Reservoir	02130805	--	--	--	--	--	--	--	--	--	--	--	--	
5	Lower Monocacy River	02140302	--	--	--	--	--	--	--	--	--	--	--	--	
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	
7	Prettyboy Reservoir	02130806	--	--	--	--	--	--	--	--	--	--	--	--	
8	S Branch Patapsco	02130908	--	600,000	--	--	625,000	--	--	--	--	--	--	1,225,000	
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	--	--	--	--	--	
10	<b>Carroll County</b>	<b>TOTAL</b>	--	600,000	--	--	625,000	314,500	--	--	800,000	600,000	--	2,939,500	⊙

NOTES

FUTURE DISCHARGE RATIO															
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Winfield	Total Service Areas	CHECK
			⊗	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	[-]
			[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--
2	Double Pipe Creek	02140304	--	--	--	--	--	100.00	100.00	--	100.00	91.98	--	48.86	
3	Liberty Reservoir	02130907	--	--	--	--	--	--	--	--	--	8.02	--	3.37	
4	Loch Raven Reservoir	02130805	--	--	100.00	--	--	--	--	--	--	--	--	4.43	
5	Lower Monocacy River	02140302	--	--	--	--	--	--	--	--	--	--	--	--	
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	
7	Prettyboy Reservoir	02130806	--	--	--	100.00	--	--	--	--	--	--	--	3.29	
8	S Branch Patapsco	02130908	--	100.00	--	--	100.00	--	--	--	--	--	100.00	33.69	
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	100.00	--	--	--	6.35	
10	<b>Carroll County</b>	<b>TOTAL</b>	--	2,686,625	577,125	428,667	1,700,000	374,000	4,143	826,364	942,075	5,482,838	1,000	13,022,836	⊙



# CARROLL COUNTY WATER BALANCE

## TABLE B-5.2

### SEWER SERVICE AREAS



EXISTING DISCHARGE															
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Winfield	Total Service Areas	CHECK
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[-]
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--
2	Double Pipe Creek	02140304	--	--	--	--	--	83,344	5,553	--	121,732	2,343,192	--	2,553,821	
3	Liberty Reservoir	02130907	--	--	--	--	--	--	--	--	--	231,770	--	231,770	
4	Loch Raven Reservoir	02130805	--	--	367,719	--	--	--	--	--	--	--	--	367,719	
5	Lower Monocacy River	02140302	--	--	--	--	--	--	--	--	--	--	--	--	
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	
7	Prettyboy Reservoir	02130806	--	--	--	240,661	--	--	--	--	--	--	--	240,661	
8	S Branch Patapsco	02130908	--	1,853,014	--	--	134,146	--	--	--	--	--	1,000	1,988,161	
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	407,055	--	--	--	407,055	
10	<b>Carroll County</b>	<b>TOTAL</b>	--	<b>1,853,014</b>	<b>367,719</b>	<b>240,661</b>	<b>134,146</b>	<b>83,344</b>	<b>5,553</b>	<b>407,055</b>	<b>121,732</b>	<b>2,574,962</b>	<b>1,000</b>	<b>5,789,187</b>	

EXISTING ALLOCATED DISCHARGE															
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Winfield	Total Service Areas	CHECK
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[-]
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--
2	Double Pipe Creek	02140304	--	--	--	--	--	156,880	8,080	--	166,640	2,995,690	--	3,327,290	
3	Liberty Reservoir	02130907	--	--	--	--	--	--	--	--	--	296,310	--	296,310	
4	Loch Raven Reservoir	02130805	--	--	464,000	--	--	--	--	--	--	--	--	464,000	
5	Lower Monocacy River	02140302	--	--	--	--	--	--	--	--	--	--	--	--	
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	
7	Prettyboy Reservoir	02130806	--	--	--	457,360	--	--	--	--	--	--	--	457,360	
8	S Branch Patapsco	02130908	--	6,556,000	--	--	188,000	--	--	--	--	--	1,000	6,745,000	
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	466,400	--	--	--	466,400	
10	<b>Carroll County</b>	<b>TOTAL</b>	--	<b>6,556,000</b>	<b>464,000</b>	<b>457,360</b>	<b>188,000</b>	<b>156,880</b>	<b>8,080</b>	<b>466,400</b>	<b>166,640</b>	<b>3,292,000</b>	<b>1,000</b>	<b>11,756,360</b>	

PROJECTED BUILDOUT DISCHARGE															
NUM	WATERSHED NAME	HUC-8	Bark Hill	Freedom	Hampstead	Manchester	Mount Airy	New Windsor	Pleasant Valley	Taneytown	Union Bridge	Westminster	Winfield	Total Service Areas	CHECK
			[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[gpd]	[-]
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	--
2	Double Pipe Creek	02140304	--	--	--	--	--	391,583	5,831	--	607,372	3,012,855	--	4,017,641	
3	Liberty Reservoir	02130907	--	--	--	--	--	--	--	--	--	262,554	--	262,554	
4	Loch Raven Reservoir	02130805	--	--	592,550	--	--	--	--	--	--	--	--	592,550	
5	Lower Monocacy River	02140302	--	--	--	--	--	--	--	--	--	--	--	--	
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	
7	Prettyboy Reservoir	02130806	--	--	--	375,293	--	--	--	--	--	--	--	375,293	
8	S Branch Patapsco	02130908	--	3,199,860	--	--	483,206	--	--	--	--	--	1,000	3,683,066	
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	1,390,885	--	--	--	1,390,885	
10	<b>Carroll County</b>	<b>TOTAL</b>	--	<b>3,199,860</b>	<b>592,550</b>	<b>375,293</b>	<b>483,206</b>	<b>391,583</b>	<b>5,831</b>	<b>1,390,885</b>	<b>607,372</b>	<b>3,275,409</b>	<b>1,000</b>	<b>10,321,989</b>	



# CARROLL COUNTY WATER BALANCE

## TABLE B-5.3

### SEWER SERVICE AREAS



EXISTING SEWER SERVICE AREA ACREAGE															
NUM	WATERSHED NAME	HUC-8	Bark Hill ✓ [acres]	Freedom ✓ [acres]	Hampstead ✓ [acres]	Manchester ✓ [acres]	Mount Airy ✓ [acres]	New Windsor ✓ [acres]	Pleasant Valley ✓ [acres]	Taneytown ✓ [acres]	Union Bridge ✓ [acres]	Westminster ✓ [acres]	Winfield ✓ [acres]	Total Service Areas ✓ [acres]	CHECK [-]
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	
2	Double Pipe Creek	02140304	--	--	--	242	--	343	41	155	281	3,316	--	4,378	
3	Liberty Reservoir	02130907	--	2,182	700	221	--	--	--	--	--	3,443	--	6,545	
4	Loch Raven Reservoir	02130805	--	--	342	--	--	--	--	--	--	--	--	342	
5	Lower Monocacy River	02140302	--	--	--	--	301	--	--	--	--	--	--	301	
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	
7	Prettyboy Reservoir	02130806	--	--	207	333	--	--	--	--	--	--	--	540	
8	S Branch Patapsco	02130908	--	3,336	--	--	1,006	--	--	--	--	--	164	4,506	
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	864	--	--	--	864	
10	<b>Carroll County</b>	<b>TOTAL</b>	--	<b>5,518</b>	<b>1,249</b>	<b>796</b>	<b>1,308</b>	<b>343</b>	<b>41</b>	<b>1,020</b>	<b>281</b>	<b>6,759</b>	<b>164</b>	<b>17,478</b>	✓

BUILDOUT SEWER SERVICE AREA ACREAGE															
NUM	WATERSHED NAME	HUC-8	Bark Hill ✓ [acres]	Freedom ✓ [acres]	Hampstead ✓ [acres]	Manchester ✓ [acres]	Mount Airy ✓ [acres]	New Windsor ✓ [acres]	Pleasant Valley ✓ [acres]	Taneytown ✓ [acres]	Union Bridge ✓ [acres]	Westminster ✓ [acres]	Winfield ✓ [acres]	Total Service Areas ✓ [acres]	CHECK [-]
1	Conewago Creek	02050301	--	--	--	--	--	--	--	--	--	--	--	--	
2	Double Pipe Creek	02140304	--	--	--	275	--	1,051	41	540	1,432	4,383	--	7,723	
3	Liberty Reservoir	02130907	--	3,587	947	287	--	--	--	--	--	3,796	--	8,617	
4	Loch Raven Reservoir	02130805	--	--	405	--	--	--	--	--	--	--	--	405	
5	Lower Monocacy River	02140302	--	--	--	--	453	--	--	--	--	--	--	453	
6	Patapsco River L N Br	02130906	--	--	--	--	--	--	--	--	--	--	--	--	
7	Prettyboy Reservoir	02130806	--	--	334	700	--	--	--	--	--	--	--	1,034	
8	S Branch Patapsco	02130908	--	4,640	--	--	1,783	--	--	--	--	--	164	6,587	
9	Upper Monocacy River	02140303	--	--	--	--	--	--	--	2,784	--	--	--	2,784	
10	<b>Carroll County</b>	<b>TOTAL</b>	--	<b>8,227</b>	<b>1,686</b>	<b>1,262</b>	<b>2,235</b>	<b>1,051</b>	<b>41</b>	<b>3,324</b>	<b>1,432</b>	<b>8,179</b>	<b>164</b>	<b>27,602</b>	✓

AREA RATIOS															
NUM	WATERSHED NAME	RATIO	Bark Hill [-]	Freedom [-]	Hampstead [-]	Manchester [-]	Mount Airy [-]	New Windsor [-]	Pleasant Valley [-]	Taneytown [-]	Union Bridge [-]	Westminster [-]	Winfield [-]	Total Service Areas [-]	CHECK [-]
	Existing SSA:WSA Ratio		--	0.65	0.94	0.76	1.00	0.81	1.00	1.01	1.06	1.03	1.00	0.85	
	Buildout SSA:WSA Ratio		--	0.82	0.63	0.84	1.00	1.00	1.00	1.00	1.00	0.96	1.00	0.89	
	Buildout to Existing SSA:WSA Ratio		--	1.26	0.67	1.10	1.00	1.24	1.00	1.00	0.95	0.93	1.00	0.95	

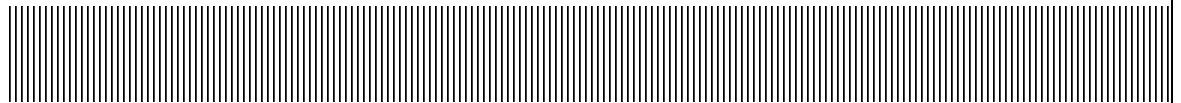


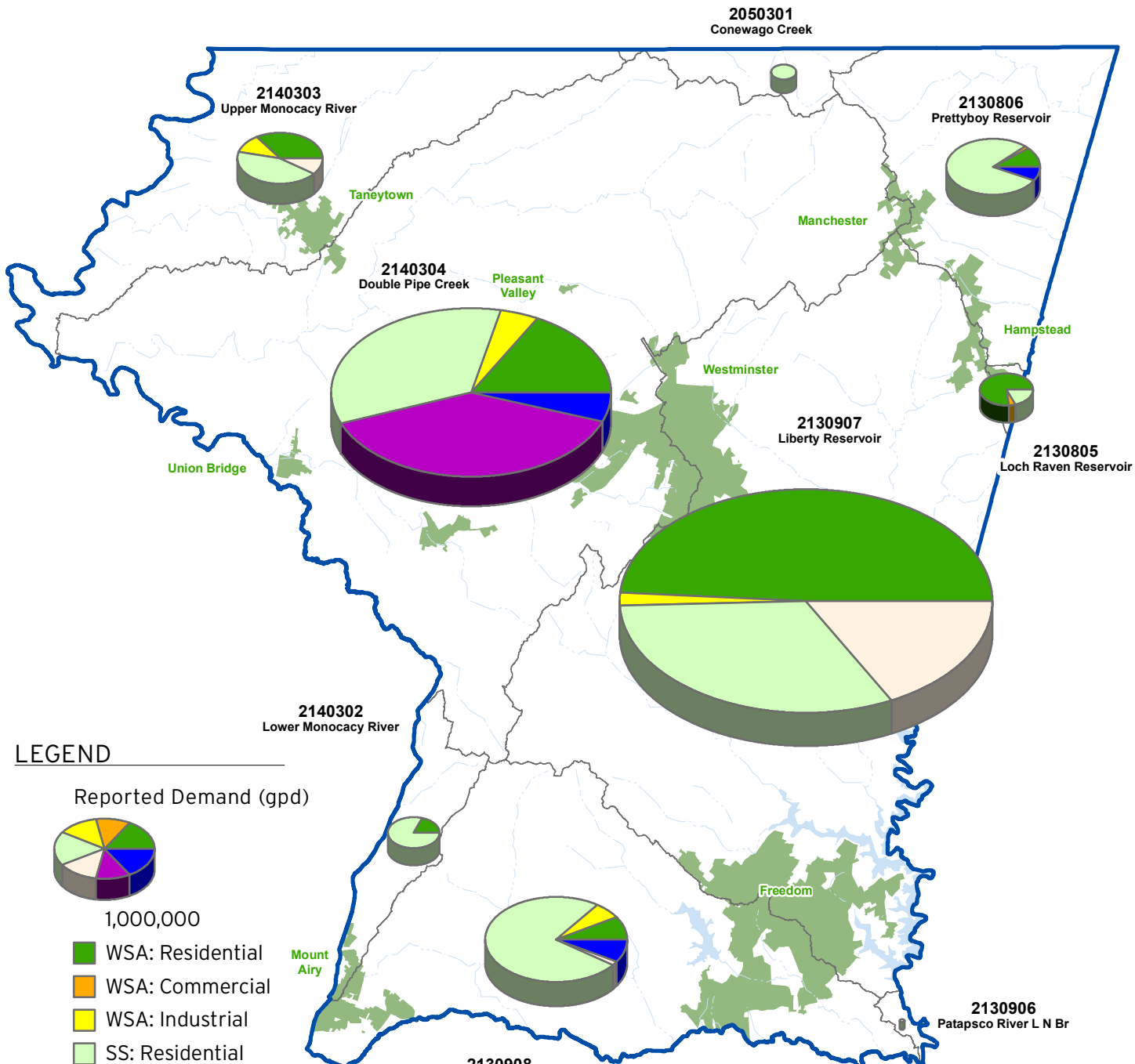
**Carroll County**  
Carroll County Water Demands and Availability

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# Appendix C

## Water Balance Assessment Graphical Results





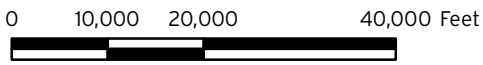
**LEGEND**

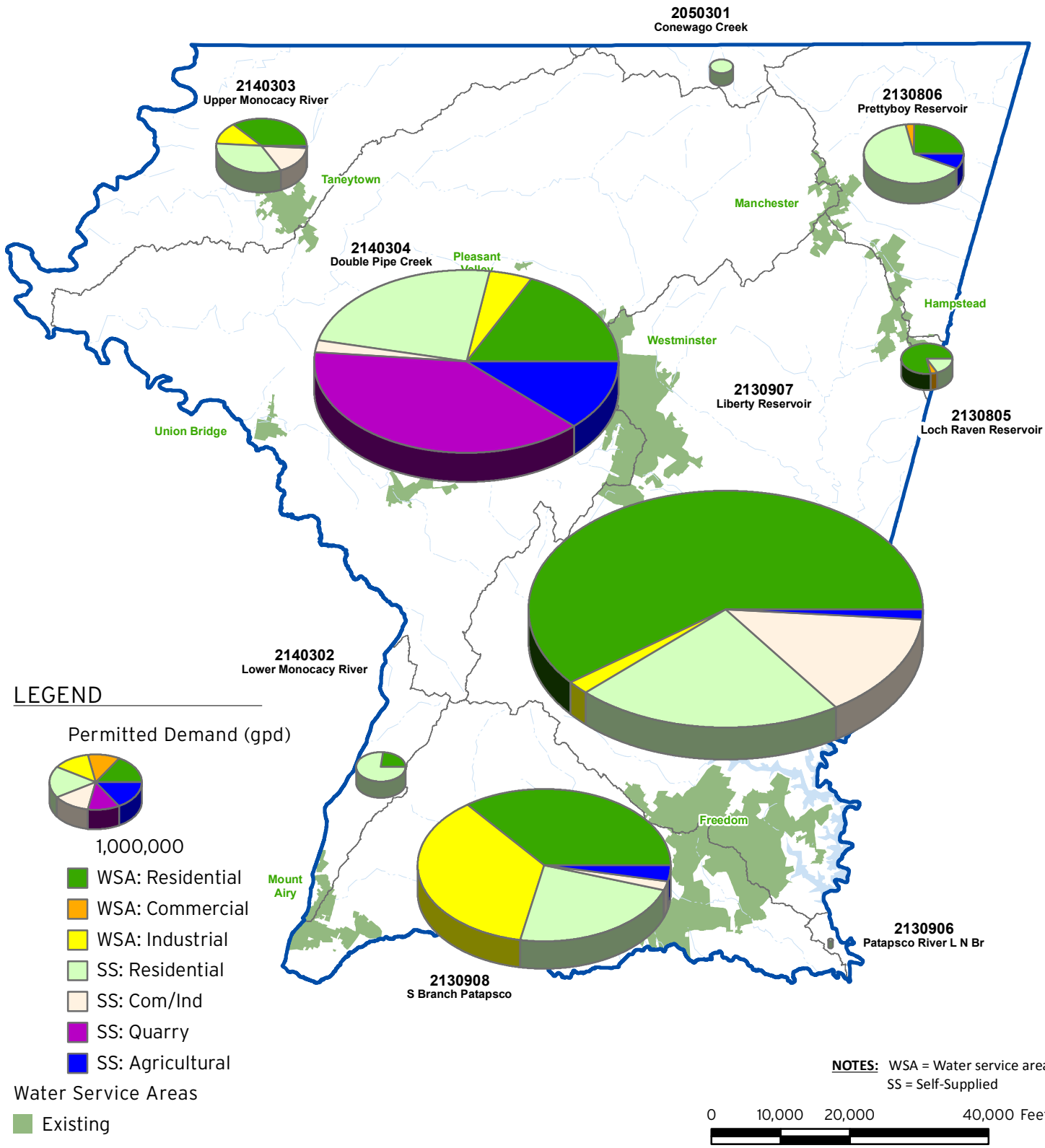
- Reported Demand (gpd)
- 
- 1,000,000
- WSA: Residential
  - WSA: Commercial
  - WSA: Industrial
  - SS: Residential
  - SS: Com/Ind
  - SS: Quarry
  - SS: Agricultural

Water Service Areas

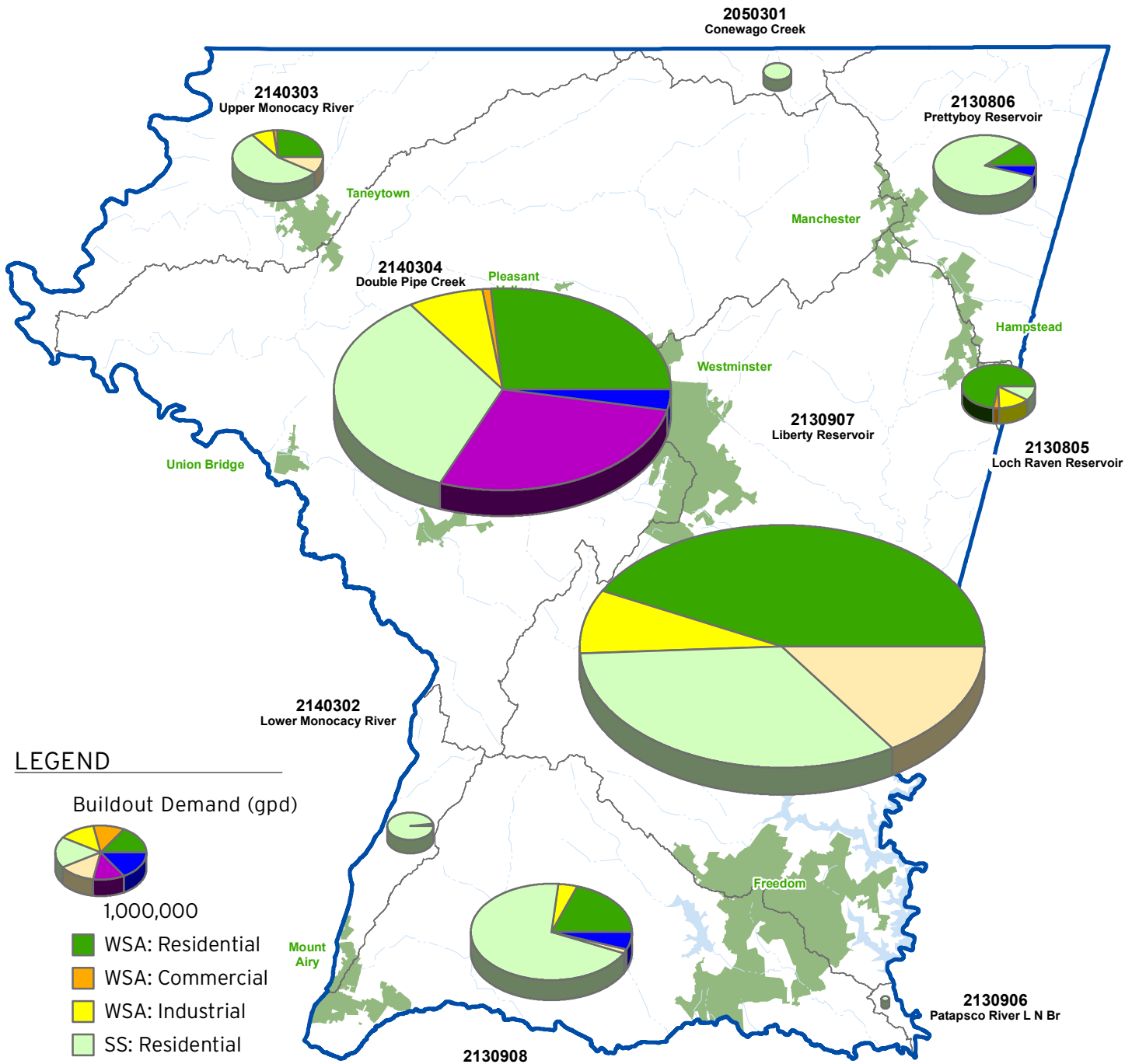
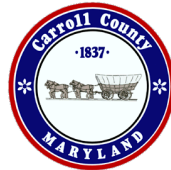
■ Existing

**NOTES:** WSA = Water service area  
SS = Self-Supplied

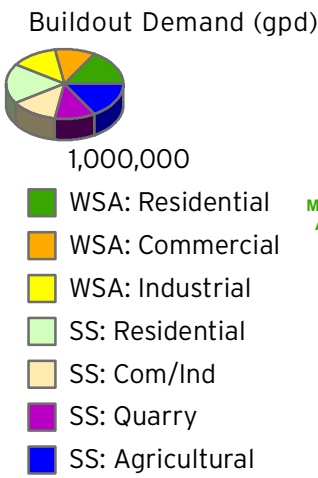








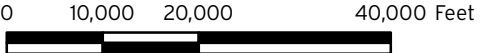
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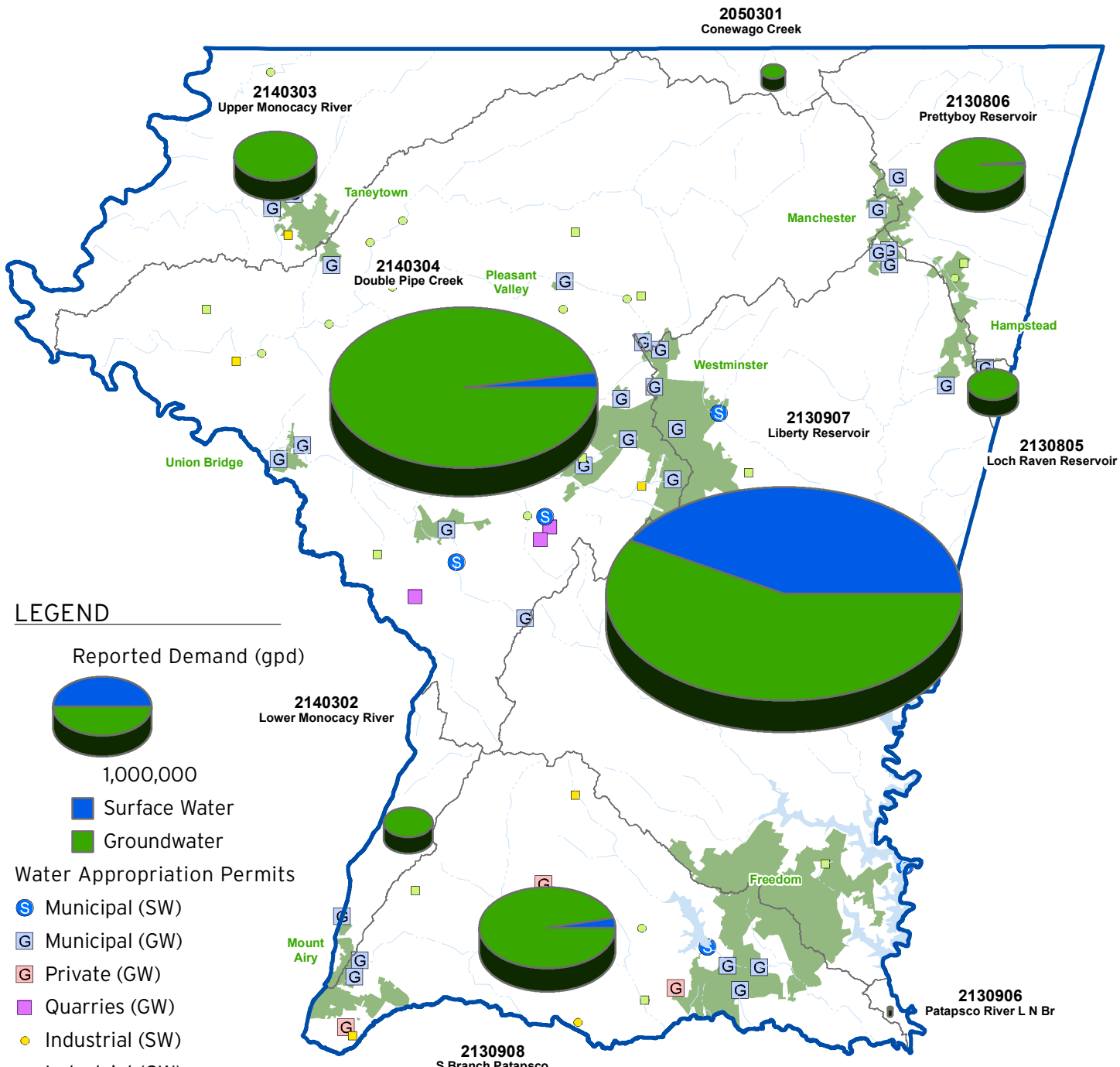


Water Service Areas

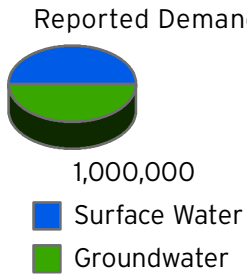
- Existing

**NOTES:** WSA = Water service area  
SS = Self-Supplied





**LEGEND**



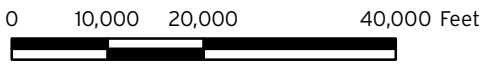
**Water Appropriation Permits**

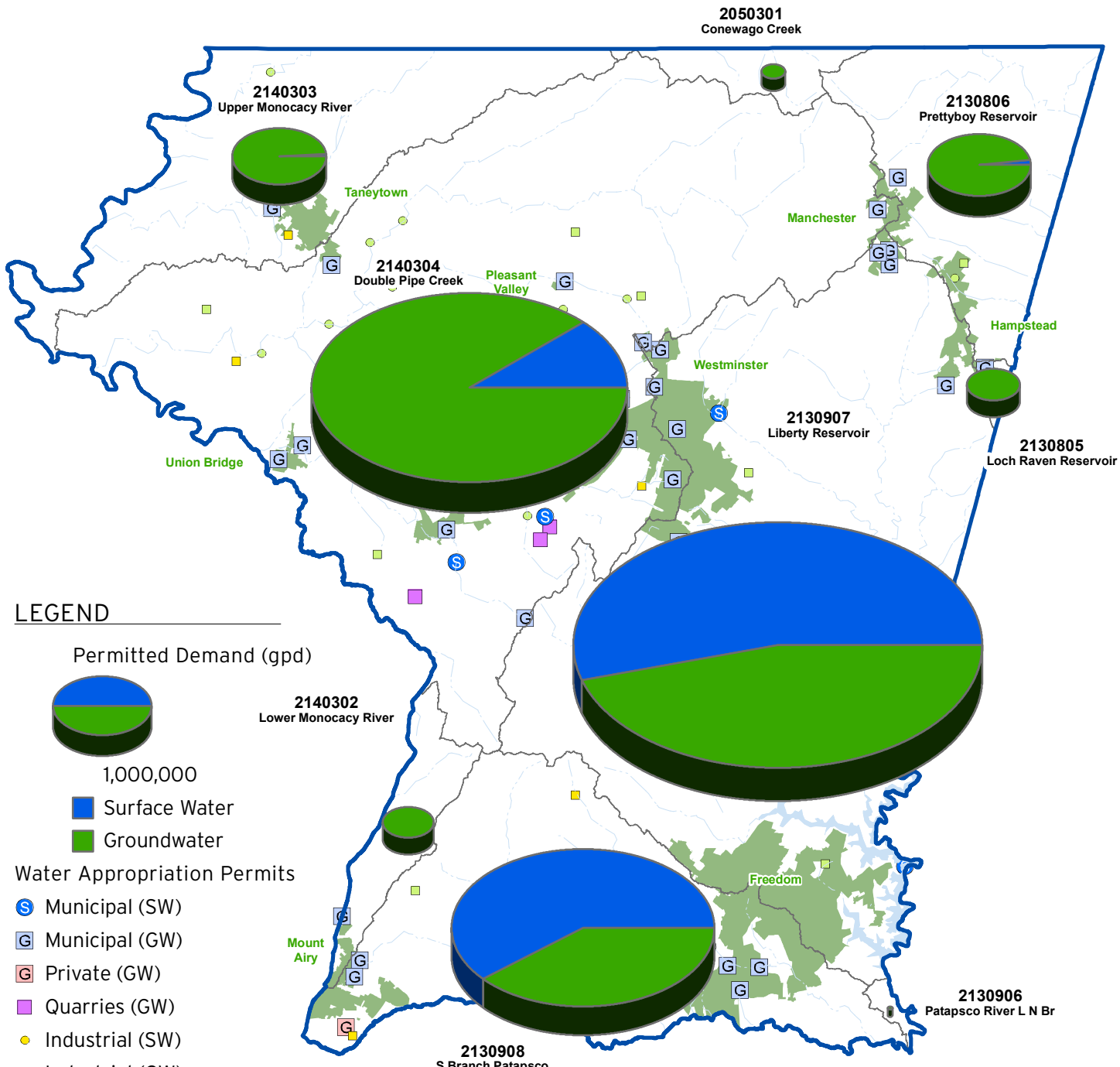
- Ⓢ Municipal (SW)
- Ⓜ Municipal (GW)
- Ⓜ Private (GW)
- Quarries (GW)
- Industrial (SW)
- Industrial (GW)
- Agricultural (SW)
- Agricultural (GW)

**Water Service Areas**

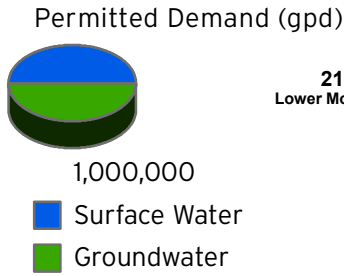
- Existing

**NOTES:** WSA = Water service area  
SS = Self-Supplied





**LEGEND**



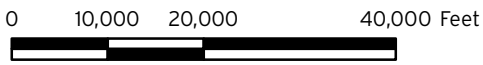
**Water Appropriation Permits**

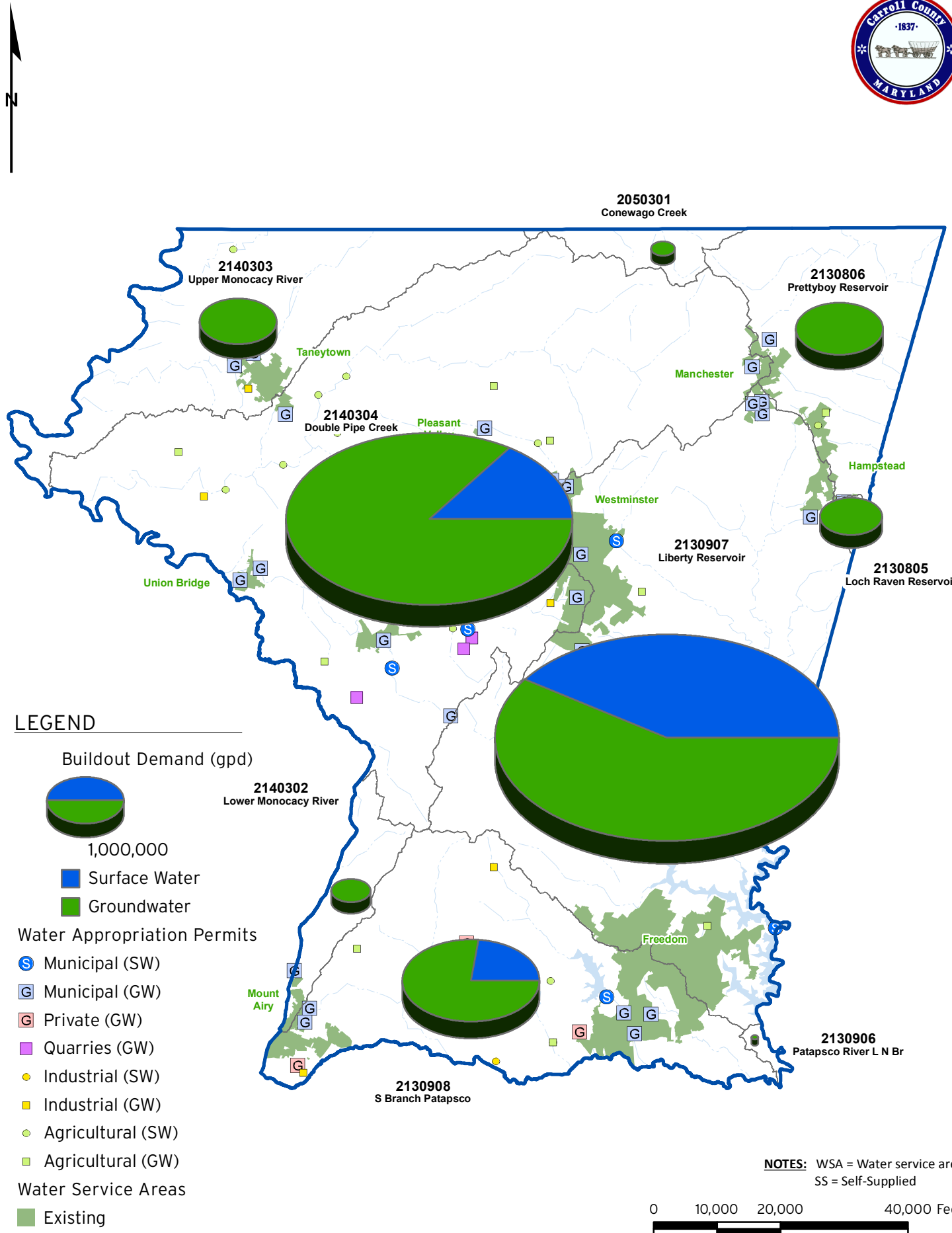
- S Municipal (SW)
- G Municipal (GW)
- G Private (GW)
- Q Quarries (GW)
- I Industrial (SW)
- I Industrial (GW)
- A Agricultural (SW)
- A Agricultural (GW)

**Water Service Areas**

- Existing

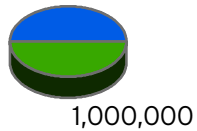
**NOTES:** WSA = Water service area  
SS = Self-Supplied





**LEGEND**

Buildout Demand (gpd)



Surface Water  
Groundwater

**Water Appropriation Permits**

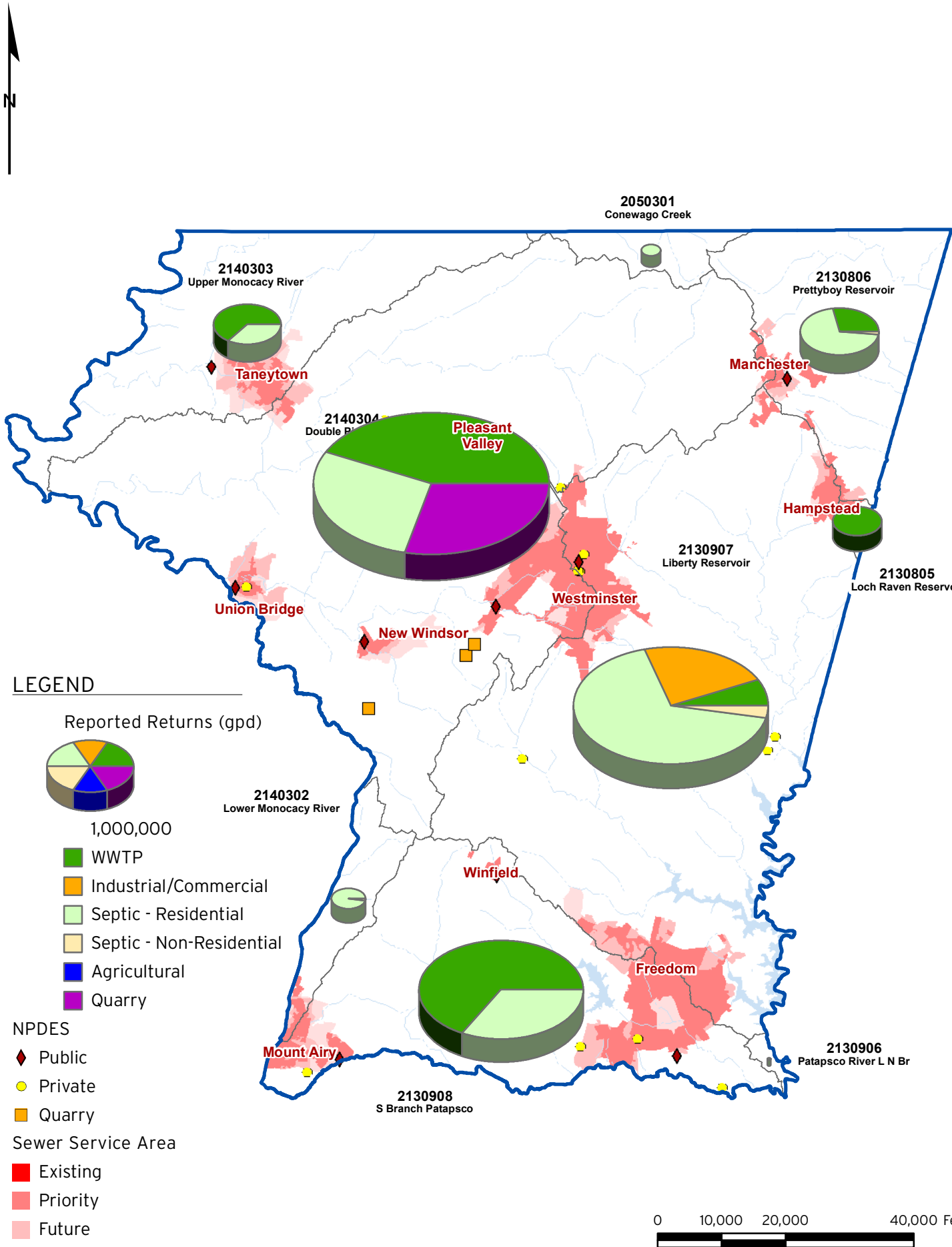
- Municipal (SW)
- Municipal (GW)
- Private (GW)
- Quarries (GW)
- Industrial (SW)
- Industrial (GW)
- Agricultural (SW)
- Agricultural (GW)

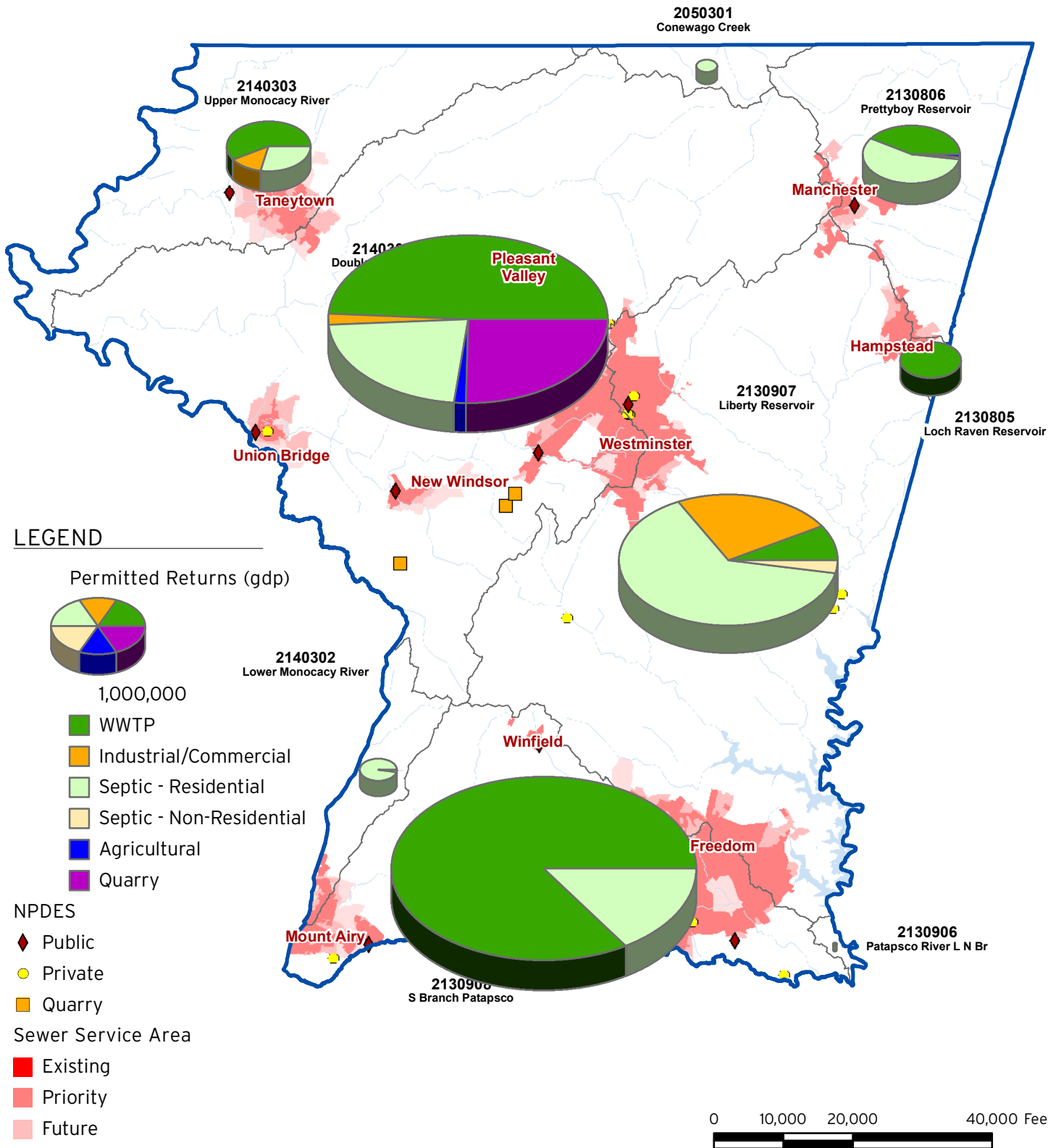
**Water Service Areas**

Existing

**NOTES:** WSA = Water service area  
SS = Self-Supplied

0 10,000 20,000 40,000 Feet







2050301  
Conewago Creek

2140303  
Upper Monocacy River

2130806  
Prettyboy Reservoir

Taneytown

Manchester

2140304  
Double Pipe Creek

Pleasant  
Valley

Hampstead

Union Bridge

2130907  
Liberty Reservoir

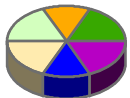
2130805  
Loch Raven Reservoir

New Windsor

Westminster

### LEGEND

Buildout Return (gpd)



1,000,000

- WWTP
- Industrial/Commercial
- Septic - Residential
- Septic - Non-Residential
- Agricultural
- Quarry

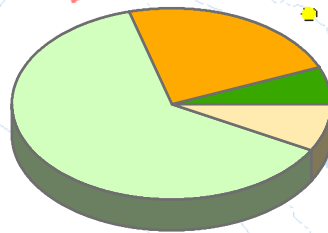
### NPDES

- Public
- Private
- Quarry

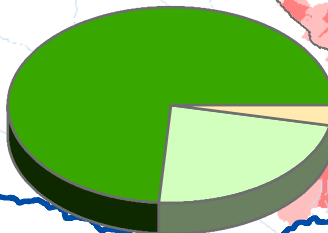
### Sewer Service Area

- Existing
- Priority
- Future

2140302  
Lower Monocacy River



Winfield



Freedom

Mount Airy

2130906  
Patapsco River L N Br

2130908  
S Branch Patapsco

0 10,000 20,000 40,000 Feet

