Table 10-2

Projected Phosphorus Loading from Septic System Focus Areas

FA	Area	Basin	Projected Flow (mgd)	P Load from New WWTP† (lbs/day)	P Load of Runoff from Developed Portions of Service Area (lbs/day)	P Load of Runoff from Undeveloped Portions of Service Area (lbs/day)
FA/SS/S1	North Brewster Road	Diverting	0.2744	1.14	0.93	0.03
FA/SS/S2	Lake Tonetta	Diverting	0.0592	0.25	0.10	0.01
FA/SS/S3	Peach Lake	East Branch	0.0411	0.34	0.09	0.00
		Total P Daily Load (lbs)	**2.89**	**1.73**	**1.12**	**0.04**
		Total P Annual Load (lbs)	**1054.85**	**631.45**	**408.80**	**14.60**

Note: †- Assumes new WWTPs in Septic Focus Areas within basins that are not 60-day restricted are surface discharging.

Table 10-3

Current and Projected Phosphorus Loads
WWTPs and Focus Areas

Source	Sanitary Phosphorus Load (lbs/yr)			Surface Runoff Phosphorus Load (lbs/yr)	
	Current	Projected		Current	Projected
		*Without Diversion**	*With Diversion*		
WWTPs & Service Areas	832.20	1120.55	0	492.75	547.50
Focus Areas	2069.55	919.80	288.35	1376.05	1741.05
Totals	**2901.75**	**2040.35**	**288.35**	**1868.80**	**2288.55 ******
Total Sanitary + Surface Runoff					
Total Current	**4770.55**				
Total Projected without Diversion	**4328.90*****				
Total Projected with Diversion	**2576.90******				

Notes: All current and projected (year 2030) phosphorus loading estimates are as calculated in the *Diversion Report*.

* - Assumes surface discharging WWTPs are built for Septic Focus Areas and subsurface discharging WWTPs are built for Commercial and High Density Residential Focus Areas, and existing WWTPs are upgraded according to the Watershed Regulations.

** - Total increase in phosphorus runoff load as a result of projected development is approximately 419.75 lbs/yr (2288.55 minus 1868.80).

*** - Upgrading existing WWTPs and constructing new WWTPs for the Focus Areas would decrease the phosphorus load by approximately 441.65 lbs/yr (4770.55 minus 4328.90) from current levels. This reduction takes into account the increase in non-point source loading due to projected development in Southeast.

**** - A flow diversion system would decrease the phosphorus load to the Croton Watershed by approximately 2193.65 lbs/yr (4770.55 minus 2576.90) from current levels. This reduction takes into account the increase in non-point source loading due to projected development in Southeast. The phosphorus load reduction presented in the Diversion Report assumed the diversion of all focus area flows. The reduction shown in this report assumes that only the flows from the WWTP service areas and failing septic areas would be diverted.

Table 10-4

Necessary Non-Point Phosphorus Reductions Assuming WWTP Upgrades

Reservoir	Phase II Basin Area (acres)	Phase II TMDL (lbs/yr)	Water Quality Limited for Phase II TMDL?	Non-Point Reductions Necessary to Meet Phase II TMDL (lbs/yr)	Affected Area † (acres)	Surface Runoff Load from Affected Area (lbs/yr) §	Pct. Runoff Load Reduction Necessary ‡
20 µg/l Phosphorus Guidance Value							
Middle Branch	13,640	2,093	Yes	450	2,007	1,225	37%
Bog Brook	2,350	827	No	None	N/A	N/A	N/A
East Branch	49,025	6,223	Yes	2,190	9,402	4,505	49%
Diverting	4,670	6,170	Yes	2,168*	1,510	1,125	100%**
Muscoot	47,864	20,720	Yes	4,690	N/A***	N/A***	N/A***
15 µg/l Phosphorus Guidance Value							
Croton Falls	10,823	7,861	Yes	1,299	1,839	1,194	100%**

Notes: †- Of the four land use types used to calculate TMDLs (urban, agricultural, forest, and water), it is assumed that non-point phosphorus reductions would only be implemented in urban and agricultural areas (the "Affected Area"). This column shows the total urban and agricultural areas in each reservoir basin according to the *Phase I TMDL Report*.

‡- This column shows the percentage of the existing non-point (surface runoff) phosphorus load from urban and agricultural areas that must be removed from the reservoir basin in order for the reservoir to meet its Phase II TMDL. These values were calculated by dividing the required non-point reductions (column 5 of this table) by the non-point phosphorus load from urban and agricultural areas (column 7 of this table).

§-Surface runoff loads calculated using Phase II phosphorus export coefficients.

*- The total phosphorus runoff load to the Diverting Reservoir Basin is less than this value.

**- Controlling surface runoff from urban and agricultural areas would not reduce phosphorus enough to meet the TMDL. Other controls are needed.

***- Data not available.

Table 10-5

Necessary Non-Point Phosphorus Reductions Assuming Flow Diversion

Reservoir	Phase II Basin Area (acres)	Phase II TMDL (lbs/yr)	Water Quality Limited for Phase II TMDL?	Non-Point Reductions Necessary to Meet Phase II TMDL (lbs/yr)	Point Source * Load Removed by Diversion (lbs/yr)	Net Non-Point Reductions Necessary (lbs/yr)	Affected Area † (acres)	Surface Runoff Load from Affected Area (lbs/yr) §	Pct. Runoff Load Reduction Necessary ‡
20 µg/l Phosphorus Guidance Value									
Middle Branch	13,640	2,093	Yes	450	336	114	2,007	1,225	9%
Bog Brook	2,350	827	No	None	77	N/A	N/A	N/A	N/A
East Branch	49,025	6,223	Yes	2,190	880	1,310	9,402	4,505	29%
Diverting	4,670	6,170	Yes	2,168**	818	1,350**	1,510	1,125	100%***
Muscoot	47,864	20,720	Yes	4,690	376	4,314	N/A****	N/A****	N/A****
15 µg/l Phosphorus Guidance Value									
Croton Falls	10,823	7,861	Yes	1,299	1,285	14	1,839	1,194	1%

Notes: †- Of the four land use types used to calculate TMDLs (urban, agricultural, forest, and water), it is assumed that non-point phosphorus reductions would only be implemented in urban and agricultural areas (the "Affected Area"). This column shows the total urban and agricultural areas in each reservoir basin according to the *Phase I TMDL Report*.

‡- This column shows the percentage of the existing non-point (surface runoff) phosphorus load from urban and agricultural areas that must be removed from the reservoir basin in order for the reservoir to meet its Phase II TMDL. These values were calculated by dividing the required non-point reductions (column 7 of this table) by the non-point phosphorus load from urban and agricultural areas (column 9 of this table).

§- Surface runoff loads calculated using Phase II phosphorus export coefficients.

*- Load removed assuming only the diversion of WWTPs.

**-The total phosphorus runoff load to the Diverting Reservoir Basin is less than this value.

***- Controlling surface runoff from urban and agricultural areas would not reduce phosphorus enough to meet the TMDL. Other controls are needed.

****- Data not available.

Table 10-8
Wastewater Treatment Expansion Options for WWTPs

No.	Name	SPDES Permitted Flow (mgd)	Basin	Basin Restriction†	Expansion Options for Surface Discharging Plant
1	Blackberry Hill Sanitary S.D.	0.0747	Diverting	Phosphorus	May be allowed if a 2:1 phosphorus offset is achieved by the expansion or as part of the 10% flow diversion credit.
2	Brewster Heights S.D. No. 1	0.1500	Diverting	Phosphorus	
3	Brewster High School	0.0150	East Branch	Phosphorus	
4	Henry H. Wells Middle School	0.0210	East Branch	Phosphorus	
5	Holly Stream Condominiums	0.0190	Muscoot	60-d and P*	May be allowed as part of the 10% flow diversion credit.
6	Hostel No. 1228 Welfare Road	0.0021	East Branch	Phosphorus	May be allowed if a 2:1 phosphorus offset is achieved by the expansion or as part of the 10% flow diversion credit.
7	Hunters Glen	0.0685	Middle Branch	Phosphorus	
8	I-684 Rest Area No. 45	0.0120	Muscoot	60-d and P*	May be allowed as part of the 10% flow diversion credit.
9	John F. Kennedy Elementary School	0.0110	East Branch	Phosphorus	May be allowed if a 2:1 phosphorus offset is achieved by the expansion or as part of the 10% flow diversion credit.
10	Mount Ebo Corporate Center	0.1600	East Branch	Phosphorus	
11	Reed Farms Condominiums	0.0500	Muscoot	60-d and P*	May be allowed as part of the 10% flow diversion credit.
12	Towne Centre	0.0200	Bog Brook	None**	May be allowed at this time.
13	Tracy Tertiary (Clock Tower)	0.0200	East Branch	Phosphorus	May be allowed if a 2:1 phosphorus offset is achieved by the expansion or as part of the 10% flow diversion credit.

Notes: †- Based on Phase II TMDLs using a 20µg/l (15mg for source water) reservoir phosphorus concentration guidance value.
*- 60-day and phosphorus restricted
**- Based on the Phase II TMDLs, using the 20µg/l phosphorus guidance value for the Bog Brook Reservoir, the Towne Centre WWTP is in a basin that *would not be* water quality limited for phosphorus.

Table 10-9
Wastewater Treatment Expansion Options for Focus Areas

Focus Area	Projected Flow † (mgd)	Basin	Basin Restriction ‡	Options for Constructing a New Surface Discharging WWTP
Septic Focus Areas				
FA/SS/S1	0.2744	East Branch	Phosphorus	May be allowed, but plant capacity must be sized only for the problem area.
FA/SS/S2	0.0592	Diverting	Phosphorus	
FA/SS/S3	0.1652	East Branch	Phosphorus	
High Density Residential Focus Areas				
FA/HDR/S2	0.0061	Bog Brook	None**	May be allowed at this time.
FA/HDR/S3	0.1499	East Branch	Phosphorus	May be allowed if a 3:1 phosphorus offset is achieved by the expansion*** or as part of the 10% flow diversion credit.
FA/HDR/S4	0.0173	Middle Branch	Phosphorus	
FA/HDR/S5	0.0095	Middle Branch	Phosphorus	
FA/HDR/S7	0.0248	Diverting	Phosphorus	
FA/HDR/S8	0.0085	Muscoot	60-d and P*	May be allowed as part of the 10% flow diversion credit.
Commercial Focus Areas				
FA/C/S1	0.2025	Bog Brook, East Branch	None**, Phosphorus	May be allowed at this time for section in Bog Brook basin. 3:1 phosphorus offset needed for section in East Branch basin.
FA/C/S2	0.0500	Bog Brook	None***	May be allowed at this time.
FA/C/S3	0.1855	East Branch	Phosphorus	May be allowed if a 3:1 phosphorus offset is achieved by the expansion*** or as part of the 10% flow diversion credit.
FA/C/S4	0.5440	Middle Branch	Phosphorus	
FA/C/S5	0.0290	Middle Branch	Phosphorus	
FA/C/S7	0.0045	Middle Branch	Phosphorus	
FA/C/S8	0.2520	Muscoot	60-d and P	May be allowed as part of the 10% flow diversion credit.
FA/C/S9	0.0020	Muscoot	60-d and P	
FA/C/S10	0.0010	Muscoot	60-d and P	

Notes: †- Based on the Putnam County Diversion Report planning year of 2030.
‡- Based on Phase II TMDLs using a 20µg/l (15µg for source water) reservoir phosphorus concentration guidance value.
*- 60-day and phosphorus restricted
**- Based on the Phase II TMDLs, using the 20µg/l phosphorus guidance value for the Bog Brook Reservoir, this Focus Area is in a basin that *would not be* water quality limited for phosphorus.
***- Under the phosphorus pilot program no more than three new WWTPs are to be constructed in Putnam County. The total maximum capacity for the three plants is 150,000 gpd.