

Technical Memorandum

Significant Nutrient Point Sources in the Fairlee Creek Watershed

EPA requires that TMDL allocations account for all significant sources. This technical memorandum identifies, in detail, the significant surface water discharges of nutrients and biological oxygen demand (BOD) substances to the system in question. The two nutrients, total nitrogen (TN) and total phosphorus (TP), are addressed by the TMDLs for Fairlee Creek. Modeling input information is provided for simulating all potentially significant point sources as discrete discharges. These are conceptual values that are within the TMDL thresholds for each nutrient. They represent viable individual allocations to each point source. Maryland expressly reserves the right to allocate the TMDLs among different sources in any manner that is reasonably calculated to achieve water quality standards.

TMDLs are being established in the Fairlee Creek watershed for both low flow and average annual conditions. Tables 1A and Table 1B provide modeling information for low flow TMDLs for TN and TP respectively. These are supplemented by Table 1C, which provides additional modeling information attributed to each point source for the low flow TMDL calculation.

Table 1A
Loads Attributed to Significant Point Sources for Low Flow Nitrogen TMDL^a

Source Name	Permit Number	TN Load <i>lb/month</i>	Flow <i>mgd</i>	Concentration <i>mg/l</i>
Great Oak Landing	MD0024945	21	0.009	9.4
Future Allocation		85	--	--

- a. This case corresponds to model scenario 3.

Table 1B
Loads Attributed to Significant Point Sources for Low Flow Phosphorus TMDL^a

Source Name	Permit Number	TP Load <i>lb/month</i>	Flow <i>mgd</i>	Concentration <i>mg/l</i>
Great Oak Landing	MD0024945	11	0.009	5.1
Future Allocation		17	--	--

- a. This case corresponds to model scenario 3.

Table 1C
Additional Assumptions for Low Flow the TMDL^a

Great Oak Landing		
CBOD	<i>kg/d</i>	1.33
DO	<i>mg/l</i>	6.0
Chlorophyll <i>a</i>	<i>kg/d</i>	0.00265
NH₃	<i>kg/d</i>	1.19
ON	<i>kg/d</i>	0.260
NO₂	<i>kg/d</i>	0.138
PO₄	<i>kg/d</i>	0.375
OP	<i>kg/d</i>	0.0679
Flow	<i>m³/s</i>	0.00061
Total Nitrogen	<i>kg/d</i>	1.59
Total Phosphorus	<i>kg/d</i>	0.443

- a. This case corresponds to model scenario 3.
b. 2.2 kg = 1 lb

The loadings, concentrations, and flows represented in the above tables are for illustrative purposes only. Actual effluent limits and related permit conditions will be established at the time of permit issuance or renewal and will be based upon conditions present at that time, as reflected in populations projections, infrastructure needs as defined in County Comprehensive Water and Sewer Plans, and appropriate concentrations and loadings needed to address impairments of the water quality limited segments identified by this TMDL and the applicable 303(d) list. The total of load reductions from all sources will, however, remain the same as the subtotals and grand totals reflected on the charts. Point source loadings, flows, and concentrations placed in permits will be based upon the information listed above as well as that provided during the permit adjudication process.

Tables 2A and Table 2B provide modeling information for average annual TMDLs for TN and TP respectively. These are supplemented by Table 2C, which provides additional modeling information attributed to each point source for the average annual TMDL calculation.

Table 2A
Loads Attributed to Significant Point Sources for Average Annual Nitrogen TMDL^a

Source Name	Permit Number	TN Load <i>lb/year</i>	Flow <i>mgd</i>	Concentration <i>mg/l</i>
Great Oak Landing	MD0024945	260	0.009	9.5
Future Allocation		1,020	--	--

- a. This case corresponds to model scenario 4.

Table 2B
Loads Attributed to Significant Point Sources for Average Annual Phosphorus TMDL^a

Source Name	Permit Number	TP Load <i>lb/year</i>	Flow <i>mgd</i>	Concentration <i>mg/l</i>
Great Oak Landing	MD0024945	140	0.009	5.1
Future Allocation		200	--	--

a. This case corresponds to model scenario 4.

Table 2C
Additional Assumptions for Average Annual TMDL^a

Great Oak Landing		
CBOD	<i>kg/d</i>	1.33
DO	<i>mg/l</i>	6.0
Chlorophyll <i>a</i>	<i>kg/d</i>	0.00265
NH₃	<i>kg/d</i>	1.19
ON	<i>kg/d</i>	0.260
NO₂3	<i>kg/d</i>	0.138
PO₄	<i>kg/d</i>	0.375
OP	<i>kg/d</i>	0.0679
Flow	<i>m³/s</i>	0.00061
Total Nitrogen	<i>kg/d</i>	1.59
Total Phosphorus	<i>kg/d</i>	0.443

- a. This case corresponds to model scenario 4.
b. 1 kg = 2.2 lbs

The loadings, concentrations, and flows represented in the above tables are for illustrative purposes only. Actual effluent limits and related permit conditions will be established at the time of permit issuance or renewal and will be based upon conditions present at that time, as reflected in populations projections, infrastructure needs as defined in County Comprehensive Water and Sewer Plans, and appropriate concentrations and loadings needed to address impairments of the water quality limited segments identified by this TMDL and the applicable 303(d) list. The total of load reductions from all sources will, however, remain the same as the subtotals and grand totals reflected on the charts. Point source loadings, flows, and concentrations placed in permits will be based upon the information listed above as well as that provided during the permit adjudication process.