

FINANCING A COLLABORATIVE APPROACH TO WATER QUALITY IN THE OCTORARO CREEK WATERSHED

BACKGROUND



This document developed by the Environmental Finance Center and the Center for Regional Analysis offers a framework for understanding the drivers of investment, preliminary funding requirements, and capacity and sources of funding to implement BMPs in the Octoraro Creek Watershed. The watershed drains 208 square miles of land in southeastern Pennsylvania's Chester and Lancaster Counties and Maryland's Cecil County to the Susquehanna River and ultimately the Chesapeake Bay. It has roughly 6% impervious cover and 305 miles of streams, all of which are impaired.

KEY DRIVERS

There are three key drivers of water resource protection and restoration activities in the Octoraro Creek watershed.

(1) Stormwater: For urbanized areas, stormwater runoff is typically conveyed through municipal separate storm sewer systems (MS4s). Most local governments in Pennsylvania are small and only beginning to face MS4 obligations that mandate the installation of BMPs to address already developed areas. The MS4 program covers approximately 3,030 acres of urbanized area in the Octoraro Creek watershed across Chester and Lancaster Counties. Within the five-year permit period, MS4 municipalities are required to reduce total pollutant loads 10% for sediment, 5% for phosphorus and 3% for nitrogen. Given these requirements, stormwater regulations drive the treatment of 1,210 acres across MS4 municipalities in Chester and Lancaster County. This will involve local government and private property owners retrofitting existing development.

(2) TMDL: Chesapeake Bay TMDL obligations becomes embedded within municipal MS4 permits in Pennsylvania, and where permits are not applicable, the County holds responsibility. However, most of the Octoraro Watershed is not covered by a potential MS4 obligation (99% of the 67,450 acres in Lancaster County and 60% of the 44,730 acres in Chester County). As a result, while the TMDL is a strong driver, it requires engagement with private landholders – and particularly farmers. Agricultural land use represents anywhere from 60% to 85% of municipal acres in the watershed, and residential land use represents an additional 4% to 11%. Implementation of BMPs on agricultural lands often adversely impacts the bottom line of a farm enterprise, representing increased costs with little to no impact on the farm's profitability or production, so creative approaches are needed. Around 9,000 urbanized acres in the watershed that are covered by the TMDL and not stormwater drivers.

(3) Drinking Water Protection: The Octoraro Reservoir is approximately 620 acres and owned by the Chester Water Authority (CWA). The reservoir – or lake – is an important source of drinking water and recreational opportunity locally known for bass fishing, bird watching and boating, as well as its aesthetic value. Currently CWA estimates water quality problems have cost roughly \$5.4 million from 2001 to 2018 arising from switching water sources, electricity (for pumping), and lost capacity payments. It is not clear how much pollutant reduction is needed to avoid these costs. However, were these funds diverted to diffuse restoration and BMP practices on surrounding agricultural land, it would fund treatment of 500 to 1000 acres of agricultural land per year. With an average farm parcel of 63 acres, 8 to 16 farm parcels could be engaged.

FINDINGS

Nearly \$7 million per year is needed to address water quality in the watershed. This level of investment would treat 14,000 acres and remove 48,200 lbs of nitrogen per year. This cost estimate takes into account all three regulatory drivers, and recognizes that it requires participation from agricultural, municipal and private landholders.



- Given stormwater regulatory drivers, the level of funding required to treat approximately 1,210 acres across MS4 municipalities in Chester and Lancaster County is nearly \$425,000 per year, a cost estimate that reflects stormwater management achieved through retrofit of existing development by local government and private property owners.
- Approximately \$2.7 million is needed to treat around 9,000 urbanized acres that are unlikely to be addressed by MS4 stormwater drivers
- Annual costs have fluctuated over this seven-year period, ranging from \$0.5 million to \$1.1 million per year. These costs reflect both the need to switch water sources and to treat water, and includes labor, electricity (for pumping), and lost capacity payments. It is not clear how much pollutant reduction is needed to avoid these costs. However, were these funds diverted to diffuse restoration and BMP practices on surrounding agricultural land, it would fund treatment of 500 to 1000 acres of agricultural land per year, and with an average farm parcel of 63 acres, 8 to 16 farm parcels could be engaged.

Driver	Acres	Target reduction	Lbs of TN Removed	Total Cost (\$/yr)	Overlap with other drivers?
Stormwater	1,210	3%	1,415	\$425,500	<i>Limited.</i> MS4 program applies to limited number of municipalities due to low population density and dominant rural landscape.
TMDL	9,000	3%	9,060	\$2,716,400	<i>Yes – with Source water</i> With a focus on agricultural land, direct overlap with source water protection. <i>Limited – with Stormwater</i> For developed land, limited overlap with MS4 driver and municipalities having low population density and rural.
Source Water	3,770	45%	37,720	\$3,772,000	<i>Yes – with TMDL</i> With focus on agricultural land, direct intersection with TMDL drivers
Total	13,980	n/a	48,200	\$6,913,900	

Figure 1 Financing needs across water quality drivers in the Octoraro Creek watershed.