Amendment of the TMDLs for Nutrients for the Murderkill River Watershed

1.0 Introduction and Background

1.1 Intensive water quality monitoring performed by Delaware Department of Natural Resources and Environmental Control (DNREC) has shown that the waters of the Murderkill River and several of its tributaries and ponds are impaired as the result of low dissolved oxygen and high nutrients. Low concentrations of dissolved oxygen are harmful to fish, shellfish, and other aquatic life. With regard to nutrients (nitrogen and phosphorus), although they are essential elements for both plants and animals, their presence in excessive amounts causes undesirable conditions. Symptoms of nutrient overenrichment include frequent phytoplankton blooms, decreased water clarity, dissolved oxygen deficiency, alteration of composition and diversity of economically important native species of plants and animals, and possible human health effects.

1.2 A reduction in the amount of nutrients and oxygen consuming pollutants reaching the waters of the Murderkill River and its tributaries and ponds is necessary to reverse these undesirable impacts. These pollutants and nutrients enter the waters of the Murderkill River from point sources and nonpoint sources. Point sources are end-of-pipe discharges from municipal or industrial wastewater treatment plants. Nonpoint sources include runoff from agricultural and urban areas, septic tank effluent, and ground water discharges.

1.3 Section 303(d) of the Federal Clean Water Act (CWA) requires states to develop a list (303(d) List) of waterbodies for which existing pollution control activities are not sufficient to attain applicable water quality criteria and to develop Total Maximum Daily Loads (TMDLs) for pollutants of concern. A TMDL sets a limit on the amount of a pollutant that can be discharged into a waterbody and still protect water quality. TMDLs are composed of three components, including Waste Load Allocations (WLAs) for point source discharges, Load Allocations (LAs) for nonpoint sources, and a Margin of Safety (MOS) to account for uncertainties and future growth.

1.4 DNREC listed the Murderkill River and several of its tributaries and ponds on the Delaware's 1996, 1998, and 2000 303(d) Lists and developed and promulgated a Total Maximum Daily Load regulation for nitrogen, phosphorous, and 5-day Carbonaceous Biochemical Oxygen Demand (CBOD5) in 2005.

1.5 Since the promulgation of the 2005 TMDLs, a multi-year monitoring, research, and modeling study of Murderkill River Watershed by DNREC and other cooperating agencies and institutions concluded that new scientifically-based, site-specific dissolved oxygen criteria should be adopted for the tidal Murderkill River. This amendment of the 2005 TMDLs is to comply with this proposed site-specific dissolved oxygen criteria for the tidal Murderkill River

2.0 The Amended Total Maximum Daily Loads (TMDLs) Regulation for the Murderkill River Watershed, Delaware

Article 1. The total nitrogen waste load from the Kent County Facility shall be limited to 897 pounds per day. This load shall be expressed as annual average load in the National Pollutant Discharge Elimination System (NPDES) Permit for this facility.

Article 2. The total phosphorus waste load from the Kent County Facility shall be limited to 51 pounds per day. This load shall be expressed as annual average load in the NPDES Permit for this facility.

Article 3. The CBOD5 (5-day Carbonaceous Biochemical Oxygen Demand) waste load from the Kent County Facility shall be limited to 544 pounds per day.

Article 4. The nonpoint source nitrogen load in the entire watershed shall be reduced by 30 percent (from the 2007-2008 base-line). This shall result in a yearly-average total nitrogen load of 972.6 pounds per day.

Article 5. The nonpoint source phosphorus load in the entire watershed shall be reduced by 50 percent (from the 2007-2008 base-line). This shall result in a yearly-average total phosphorous load of 12.1 pounds per day.

Article 6. Based upon hydrodynamic and water quality model runs and assuming implementation of reductions identified by Articles 1 through 5, DNREC has determined that, with an adequate margin of safety, water quality standards and nutrient targets will be met in the Murderkill River and its tributaries and ponds.