



STATE OF DELAWARE  
DEPARTMENT OF NATURAL RESOURCES  
AND ENVIRONMENTAL CONTROL  
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Office of the  
Secretary

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**Secretary's Order No. 2005-W-0050**

**Re: Adopting Final Regulations to Establish Total Maximum Daily Loads for the Chesapeake Drainage Watersheds in Delaware of the Chester River, the Choptank River, Marshyhope Creek and the Pocomoke River**

Date of Issuance: **December 15, 2005**

Effective Date: **January 11, 2006**

Under the authority vested in the Secretary of the Department of Natural Resources and Environmental Control ("Department" or "DNREC") under 29 *Del. C.* §§8001 *et seq.*, 29 *Del. C.* §§10111 *et seq.* and 7 *Del. C.* §6010 (a), the following findings, reasons and conclusions are entered as an Order of the Secretary in the above-referenced rulemaking proceeding.

The proposed regulations under consideration are intended to protect and improve the water quality of the Delaware waters within the four Delaware watersheds of the following waters: Choptank River, Chester River, Marshyhope Creek and Pocomoke River. The Department conducted extensive testing and analysis, including applying approved and tested computerized water quality models, and developed Total Maximum Daily Loads ("TMDLs") for nitrogen, phosphorus and bacteria. These TMDLs were included in proposed regulations published October 1, 2005, in the *Delaware Register of Regulations*, after the Department conducted two public workshops and provided

opportunity for informal public comment. On October 27, 2005, a public hearing was held and the record remained open for public comment until October 31, 2005.

Based on the record of decision, including the public hearing record reviewed in the December 12, 2005 Hearing Officer's Report ("Report") attached as Appendix A hereto, I find and conclude that the proposed regulations are amply supported and are not arbitrary or capricious. I agree with the Report, which found that the proposed regulations set forth a reasoned basis to achieve the goal of improving the quality of waters within the four Delaware watersheds. The Department previously determined portions of these waters are impaired, that is, they failed to meet Delaware's water quality standards. The Report reviews and summarizes the record and recommends approval of the proposed regulations as final regulations without any substantive modifications. I adopt the Report as part of this Order, and include the following additional reasoning.

The final regulations are based upon sound scientific evidence, are consistent with state and federal law, and are a reasonable means to achieve improved water quality through reducing or capping levels of nitrogen, phosphorus and bacteria that are entering the waters from nonpoint sources in the watershed. The regulations will control all the nonpoint sources in the four watersheds by requiring that the release of these substances will be under the TMDLs. The Department has determined that the TMDLs reasonably define the maximum limits of potential pollution causing substances that should be allowed to enter the waters already determined to be impaired. Thus, these regulations will allow the TMDLs to be used to develop the pollution control strategies to enforce the TMDLs in order that the goal of cleaner water may be achieved.

The Report discusses the public comments, including extensive comments submitted by the Mid-Atlantic Environmental Law Clinic, which, if adopted, would delay the establishment of these TMDLs, or any TMDLs, at this time. I find that any delay in approving these regulations is contrary to the effort to improve the water quality. I agree that the proposed regulations should be approved and adopted as final regulations without any delay, particularly since the Department is subject to a consent order deadline.

The substance of the proposed regulations is found in Article 1 through 3 of each of the proposed regulations for the four watersheds. These articles set forth TMDLs that will either cap at baseline levels or reduce from base line levels the amount of nitrogen, phosphorus and bacteria that will enter and harm the water quality. There will be significant reduction in the level of these substances entering the waters once the TMDLs are enforced through pollution control strategies. Approval of these TMDLs will allow all of the impaired waters within the four watersheds to meet the Delaware water quality standards, which is an important goal for the Department to achieve.

In conclusion, the following findings and conclusions are entered:

1. The Department, acting through this Order of the Secretary, adopts the proposed regulation as final regulations, as set forth in the Appendix B to the Report, under 29 *Del. C.* §6010 (a) and pursuant to the federal Clean Water Act, 33 *U.S.C* §1251 *et seq.* and the United States Environmental Protection Agency's regulations pursuant to the Clean Water Act;

2. The issuance of the proposed regulations as final regulations will protect and improve the water quality of the Chesapeake Drainage Watersheds, as defined by elevation maps, and allow the pollution control strategies to be developed for the

watersheds that will result in improved water quality that meets Delaware's water quality standards;

3. The TMDLs that are approved by this Order were developed consistent with the applicable law and regulatory standards and are adequately supported by technical analysis in the record;

4. The Department provided adequate public notice of the proceeding and the public hearing in a manner required by the law and regulations, held a public hearing in a manner required by the law and regulations, and considered all timely and relevant public comments in making its determination;

5. The Department's proposed regulations, as published in the October 1, 2005, *Delaware Register of Regulations*, and set forth in Appendix B to this Order, were found by the Hearing Officer to be well-supported, not arbitrary or capricious, and are consistent with the applicable laws and regulations. I adopt the Report and hereby approve as final regulations the proposed regulations recommended for adoption by the Report; and that;

6. The Department shall provide written notice to the persons affected by the Order, as determined by those who participated in this rulemaking at either the public workshop or at the public hearing, including participation through the submission of written comments.

*[s/John A. Hughes](#)*

John A. Hughes  
Secretary

## **HEARING OFFICER'S REPORT**

TO: The Honorable John A. Hughes  
Secretary, Department of Natural Resources and Environmental Control

FROM: Robert P. Haynes, Esquire  
Hearing Officer, Office of the Secretary  
Department of Natural Resources and Environmental Control

RE: Proposed Regulations to Establish Total Maximum Daily Loads for the Chesapeake Drainage Watersheds in Delaware of the Chester River, the Choptank River, Marshyhope Creek and the Pocomoke River

DATE: December 12, 2005

### **I. BACKGROUND AND PROCEDURAL HISTORY**

The Department of Natural Resource and Environmental Control (“Department” or “DNREC”) held a public hearing commencing at 6:00 p.m. on October 27, 2005 at the University of Delaware’s Cooperative Research Center in Georgetown, Sussex County, Delaware. The hearing was held to consider public comments on the Department’s proposed regulations to establish Total Maximum Daily Loads (“TMDLs”) for the areas defined by the Delaware watersheds of the following surface waters: the Chester River, the Choptank River, the Marshyhope Creek and the Pocomoke River (hereinafter jointly referred to as “Chesapeake Drainage Watersheds”). These Chesapeake Drainage Watersheds represent the Delaware area of these surface waters that drain into the Chesapeake Bay, and are appropriately considered together in this single rulemaking proceeding.

The waters that drain into the Chester River originate on the western Delaware border near the Kent County and New Castle County boundary line to the north and near Hartly, Kent County to the south. The waters include Cypress Branch in New Castle County and Sewell Branch and Gravelly Run in Kent County. Together these waters drain approximately 103 square kilometers of land in Delaware. There are no active point source discharges in this watershed, which is bordered by the Sassafras River watershed to the north and the Choptank River

watershed to the south. This watershed has nine monitoring stations, which provided the water quality data from the 2001-2003 baseline period used in the computer model to develop the proposed TMDLs.

The waters that drain into the Choptank River originate along the western Delaware border near Hartley, Kent County to the north, and north of the Kent County and Sussex County boundary to the south. The surface waters, beginning from the north, include the Tappahanna Ditch, Culbreth Marsh Ditch and Cow Marsh Creek and other unnamed tributaries. Together these waters drain approximately 252 square kilometers of land in Delaware. There is no active point source discharge in this watershed, which is bordered by the Chester River watershed to the north and the Marshyhope Creek watershed to the south. This watershed has thirteen monitoring stations, which provided the water quality data from the 2001-2003 baseline period used in the computer model to develop the proposed TMDLs.

The Marshyhope Creek watershed is located along the western Delaware border near the Kent County and Sussex County boundary between the Choptank River watershed to the north and the Nanticoke River watershed to the south and it includes the Town of Farmington in its eastern area. The Marshyhope Creek watershed drains approximately 250 square kilometers of land in Delaware. There are no active point source discharges in this watershed, which has six monitoring stations that provided the water quality data from the 2001-2003 baseline period that was used in the computer model to develop the proposed TMDLs.

The Pocomoke River watershed is centrally located along the southern Delaware border with Maryland. The watershed's surface waters include Bald Cypress Branch, Gum Branch, Cow House Branch, and numerous unnamed tributaries and agricultural ditches that together drain approximately 92 square kilometers in Delaware. There are no active point source

discharges in this watershed, which has six monitoring stations that provided water quality data used in the computer model to develop the TMDLs.

The proposed regulations are required pursuant to federal regulatory program established by the federal Clean Water Act, *Clean Water Act, 33 U.S.C. §§1251 et seq., as amended*, and federal regulations administered by the federal Environmental Protection Agency (“EPA”). The federal program requires the states to: 1) study their surface waters and develop regulations establishing water quality standards; 2) list waters not meeting the standards on the State’s 303(d) list; 3) monitor water quality data, assess and model the data to develop TMDLs that are designed to improve impaired waters in order that they may meet the water quality standards; and 4) establish a pollution control strategy to implement the TMDLs and enforce the improvement of impaired water’s quality until they meet the standards. Pursuant to this regulatory framework, the Department, on July 11, 2004, adopted regulations known as the *State of Delaware Surface Water Quality Standards* (“Standards”), which established the water quality standards for all of the state’s surface waters, including those within the Chesapeake Drainage Watershed. The Standards designated the waters’ beneficial uses, and established the water quality parameters necessary to support the designated uses.

The next regulatory step under the Clean Water Act’s regulation was for the Department to determine the existing water quality of the surface waters. On February 25, 2005, the Department issued its comprehensive report entitled ‘*Delaware’s 2004 Combined Watershed Assessment Report (305(b)) and Determination for the Clean Water Act Section 303(d) List of Waters Needing TMDLs*,’ This report determined that the waters within the Chesapeake Drainage Watershed were below the *Standards* for nitrogen, phosphorous, and enterococcus bacteria. Consequently, Department undertook a specific study of the four watersheds in order to develop TMDLs for them. The TMDLs, in turn, will be used by the Department to develop a

Pollution Control Strategy, which is the final regulatory step to control the pollution sources identified by the TMDLs. The end result of the federal and state regulatory process is that all the state's impaired waters will improve, ultimately to meet the water quality established by the *Standards*. The proposed regulations are proposed consistent with the terms of the 2000 Chesapeake Bay Agreement, which Delaware signed along with all other states and the District of Columbia within the Chesapeake Bay's watershed and the federal government. Thus, the means to improve water quality is through establishing appropriate TMDLs, and then enforcing the limits through an effective Pollution Control Strategy.

On March 7, 2005, Secretary of the Department, John A. Hughes, approved the Start Action Notice for these proposed regulations' rulemaking proceedings, and the Department notified all persons on the Department's list to receive such notices. On July 31, 2005, and August 14, 2005, the Department published notices in the Delaware State News and the News Journal of draft TMDLs which invited public comment and attendance at public workshops held on August 30, 2005, in Hartly, Kent County and September 1, 2005, in Georgetown, Sussex County. Based upon the public workshops, the Department did not propose any changes to the draft TMDLs.

On October 1, 2005, the Department published proposed regulations in the *Delaware Register of Regulations*, 9 Del. Reg. 529-31. I presided over a duly noticed public hearing on October 27, 2005, and the period for written public comments closed on October 31, 2005.

## II. SUMMARY OF THE PUBLIC HEARING RECORD

The public hearing record contains a twelve page verbatim transcript of the public hearing, and documents, marked as Exhibits (“Ex.”), which were admitted into the record as hearing exhibits. In addition, the Department’s Division of Water Resources, Watershed Assessment Section (“DWR”), provided additional information that I include in this record of decision.

Jennifer Volk, an Environmental Scientist with the Department, presented the following Department exhibits into the record: DNREC Ex. 1, a copy of the proposed regulations as published in the October 1, 2005 *Delaware Register of Regulations*; DNREC Ex. 2, the Department’s “*Total Maximum Daily Loads (TMDLs) Analysis for Chesapeake Drainage Watersheds: Chester River, Choptank River, and Marshyhope Creek*,” dated August 2005; DNREC Ex. 3, the Department’s “*Total Maximum Daily Loads (TMDLs) Analysis for Pocomoke River, Delaware*,” dated July 2005; DNREC Ex. 4, DNREC’s slide presentation at the August 30, 2005 and September 1, 2005 public workshops; DNREC Ex. 5, the *State of Delaware Surface Water Quality Standards*, as Amended July 11, 2004; DNREC Ex. 6, the *State of Delaware 2004 Combined Watershed Assessment Report (305(b)) and Determination for the Clean Water Act Section 303(d) List of Waters Needing TMDLs*, revised August 4, 2005; and DNREC Ex. 7, the *Consent Decree and Settlement Agreement in the case of the American Littoral Society & Sierra Club versus the EPA and others*.

A representative from the Maryland government made oral comments that the Department addressed at the hearing. The Mid-Atlantic Environmental Law Center (“MAELC”) presented written comments, and they will be included in the record as MAELC Ex. 1 and MAELC Ex. 2. In addition, the Department received written comments from the Positive Growth Alliance (“PGA”) that seeks to delay the implementation of any TMDLs and these comments

will be marked as PGA Ex. 1. The record also includes an e-mail from the Town of Bethany Beach that supports the proposed TMDLs, and this comment will be included as Bethany Beach Ex. 1.

### **III. DISCUSSION AND REASONS**

The Department's experts in the DWR, in a December 5, 2005 memorandum, provided technical advice in response to the public comments. This response notes some minor corrections to some of the documents in the record, but the public comments do not result in DWR recommending any change to the proposed regulations. I find that this memorandum, attached hereto as Appendix A, thoroughly addresses the public comments, and I incorporate the memorandum into this report to support the reasons for not adopting the public comments.

First, this Department has encouraged public participation well in advance of the public hearing, beginning with the start action notice and tributary action teams. The Department provided ample notice of the two public workshops and the public outreach efforts were far in excess of the level required by law.

The public comments the department received pursuant to the public hearing do not warrant any revisions to the proposed regulations. I find that the public hearing record includes considerable scientific evidence that demonstrates the reasons why the proposed regulations are appropriate and necessary to improve the water quality within the Delaware watersheds. The Department's experts provided extensive documentation of the underlying studies to show that they designed the proposed TMDLs in order to improve the water quality and that the improved water quality should meet the *Standards*. DWR's experts have conducted extensive research on the water quality and employed well-accepted computer modeling techniques in developing the proposed TMDLs.

The Department's analysis of the watersheds supports the proposed reductions to pollutants under the TMDLs' components, which are: 1) Waste Load Allocation ("WLA") for Point Sources, 2) Load Allocation ("LA") for Nonpoint Sources, and 3) Margin of Safety ("MOS"). DWR used EPA approved computer modeling, known as Qual2E and Qual2K, to develop the TMDLs, and these models have been accepted by other states and previously used in Delaware. The various monitoring stations were used for the water quality data in average and below normal water level conditions. The collected data from stream geometry and flow, non-point source loads, point source loads, boundary condition, initial water conditions and parameters and constants were reflected and the models were calibrated for the baseline to measure annual average conditions under the EPA approved methodology. The calibration process entailed comparing the model results to field data, and adjusting the parameters until there is an acceptable agreement between model and actual field results.

The result of the modeling produced proposed TMDLs components and TMDLs for nitrogen ("N"), phosphorus ("P") and bacteria for the watersheds. DWR's experts determined that the watersheds have no point source discharges, which means that all reductions in the pollutants would have to come from nonpoint sources. The MAELC comments dispute that there are no point sources, based upon the Department's on-line system that may not reflect an accurate assessment of the watershed's conditions and the presence of point sources.

The MAELC questions the margin of safety used in the modeling, but as DWR's response indicates, the federal regulations allow the use of implicit margins of safety based upon conservative assumptions in the models. These conservative assumptions included but are not limited to: 1) choosing a conservative option for estimating oxygen reaeration rate, 2) applying a conservative value for sediment oxygen demand, and 3) considering simultaneous occurrence of critical environmental conditions (such as low stream flow and high water temperature). Since

the above conservative assumptions were made during development of the Qual2E and Qual2K models for the waters, the use of an implicit margin of safety is consistent with the federal regulations and guidelines that the Department must follow under this federal regulatory scheme that Delaware is to administer.

I have considered the MAELC comments and the DWR response to them and find that the comments do not warrant any change to the proposed regulations. The MAELC comments do not provide any proposed regulation language, but question the underlying scientific research and data. The questions do not pose any information or fact to require revision of the proposed regulation. The TMDLs for the Chester River, Choptank River, Marshyhope Creek, and Pocomoke River Watersheds are required to be completed by December 31, 2005 pursuant to the Consent Decree and Settlement Agreement in *American Littoral Society & Sierra Club v. EPA et al. Civil No. 96-591 (D. Delaware)*. These proposed TMDLs are based on the site specific field observations and the best science available and, as required under Section 303(d) of the Clean Water Act, are designed to meet the applicable State of Delaware water quality standards. The proposed TMDLs are reasonable, adequately supported and should be approved in order to comply with the consent decree's timetable.

I find that the proposed TMDLs are based upon the comprehensive research and expert judgment and that the proposed regulations are rational, will improve the environment and well supported in the record. I find that the public comments also do not support any amendment or other delay to the prompt approval of the proposed regulations as final regulations. This recommendation is based on the practical reality of having the TMDLs be approved as final regulations, which will then allow the Pollution Control Strategy to be developed based upon the established TMDLs. The Department may want to consider MAELC's comments in this and other TMDLs as possible future amendments. Regulations are always subject to review and

revision as warranted by better or newer information. Unfortunately, under the procedures for promulgating regulations, it is very difficult to amend a proposed regulation after a public hearing because any substantive amendment will trigger the need for another public hearing. *See Administrative Procedures Act, 29 Del. C. §§10118(c).*

I recommend certain small, non-substantive revisions, that clarify the title of sections in the proposed regulations, and these revisions are reflected with format markings, as required by the Delaware Register, in the proposed regulations in Appendix B.

#### **IV. RECOMMENDED FINDINGS AND CONCLUSIONS**

Based on the record developed, I find and conclude that the record supports approval of the proposed regulations, as set forth in Appendix B hereto, as final regulations. In conclusion, I recommend the Secretary adopt the following findings and conclusions:

- 1.) The Department has jurisdiction under its statutory authority to make a determination in this proceeding;
- 2.) The Department provided adequate public notice of the proceeding and the public hearing in a manner required by the law and regulations;
- 3.) The Department held a public hearing in a manner required by the law and regulations;
- 4.) The Department considered all timely and relevant public comments in making its determination;
- 5.) The Department's proposed regulations establishing TMDLs, as set forth in Appendix B hereto, are adequately supported, not arbitrary or capricious and are consistent with the applicable laws and regulations. Consequently, the proposed regulations in Appendix B should be approved as final regulations as promptly as possible, and be allowed to go into effect

ten days after publication in the next available issue of the *Delaware Register of Regulations*;  
and that

6.) The Department shall submit the proposed regulations as final regulations to the *Delaware Register of Regulation* for publication in its next available issue, and shall provide written notice to the persons affected by the Order approving the final regulations.

*s/Robert P. Haynes*

Robert P. Haynes, Esquire  
Hearing Officer

**Appendix A**  
**Division Response to Public Comments**

**MEMORANDUM**

TO: Robert P. Haynes, Esquire  
Hearing Officer, Office of the Secretary

FROM: Hassan Mirsajadi  
Samuel P. Myoda

THROUGH: Brad L. Smith  
John W. Schneider

DATE: December 5, 2005

*Section 1.01 SUBJECT: Division of Water Resources Response to Public Comments re Proposed Total Maximum Daily Loads Regulations for the Chester River, Choptank River, Marshyhope Creek, and Pocomoke River Watersheds*

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**INTRODUCTION AND BACKGROUND**

The Delaware Department of Natural Resources and Environmental Control (DNREC) has proposed Total Maximum Daily Loads (TMDLs) for nutrients, oxygen demanding materials, and bacteria for the Chester River, Choptank River, Marshyhope Creek, and Pocomoke River Watersheds. The proposed TMDLs establish the maximum amount of nutrients, oxygen demanding materials, and bacteria that can be discharged from nonpoint sources into the surface waters of the Chester River, Choptank River, Marshyhope Creek, and Pocomoke River and still maintain water quality standards and targets. The proposed TMDLs include Load Allocations (LAs) for nonpoint sources and a Margin of Safety (MOS). Since there are no point sources in the above watersheds, there are no Waste Load Allocations (WLAs) for point sources.

The Proposed Chester River, Choptank River, Marshyhope Creek, and Pocomoke River TMDLs were presented during two public workshops on August 30 and September 1, 2005. A public hearing was also held on October 27, 2005. The notices advertising the public workshop and hearing were published in two local and regional newspapers. In addition, notice of the public hearing and proposed regulations were published in October 1, 2005 issue of the Delaware Register of Regulations (Volume 9, Issue 4). The hearing record remained open until 4:30pm on October 31, 2005.

During the comment period, DNREC received comments regarding proposed TMDLs for the Chester River, Choptank River, Marshyhope Creek, and Pocomoke River Watersheds. The following table lists commenter's name, affiliation, the date the comment was received, and comment number. The comments and DNREC's responses follow.

**Article II. Comments re. Proposed Chester River, Choptank River, Marshyhope Creek, and Pocomoke River TMDLs**

<b>Commenter</b>	<b>Article III. Affiliation</b>	<b>Date Comment Received</b>	<b>Comment Number</b>	<b>Chester River, Choptank River, &amp; Marshyhope Creek</b>	<b>Pocomoke River</b>
Rich Collins	Positive Growth Alliance	10/27/05	1	X	X
Shanaka Abeywickrama	Maryland Department of the Environment	10/27/05	2	X	
Jennifer Murphy and David J. Jablonski	Mid-Atlantic Environmental Law Center	10/31/2005	3-15	X	
Jennifer Murphy and David J. Jablonski	Mid-Atlantic Environmental Law Center	10/31/2005	16-27		X

- 1. The Positive Growth Alliance requests that DNREC delay the implementation of the TMDLs for the above listed areas. We request that you wait until after the negotiations regarding the Inland Bays Pollution Control Plan with the Coalition is concluded.**

**Response:** Water quality monitoring performed by DNREC has shown that Chester River, Choptank River, Marshyhope Creek, and Pocomoke River are impaired by high levels of bacteria, nitrogen, and phosphorus, and low dissolved oxygen, and that the designated uses are not fully supported by water quality in these streams. Section 303(d) of the Federal Clean Water Act 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 TMDLs for pollutants or stressors causing the impairment.

The TMDLs for the Chester River, Choptank River, Marshyhope Creek, and Pocomoke River Watersheds are required to be completed by December 31, 2005 pursuant to the Consent Decree and Settlement Agreement in American Littoral Society & Sierra Club v. EPA et al. Civil No. 96-591 (D. Delaware). These proposed TMDLs are based on the site specific field observations and the best science available and, as required under Section 303(d) of the Clean Water Act, are designed to meet the applicable State of Delaware water quality standards.

Ongoing negotiations regarding the Inland Bays Pollution Control Strategy will have no impact on the load reduction requirements for these watersheds, which is the subject of these proposed regulations.

- 2. Our concerns are about the nutrient TMDLs especially for the Chester River and the Marshyhope Creek. Maryland doesn't have a nutrient, a titled nutrient criteria as such. We just have the 5 milligram per liter DO for all state waters, so, as far as we are concerned, especially for the Chester River, because we have a TMDL going on right now for the Chester River -- for the Marshyhope we already have a TMDL -- we would like to see that Delaware includes in the TMDLs some kind of documentation of proof that they are meeting the five-milligram per liter DO concentration right at the border of these rivers.**

**Response:** As required under Section 303(d) of the Clean Water Act, the proposed TMDLs for Chester River, Choptank River, Marshyhope Creek, and Pocomoke River are designed to meet the applicable State of Delaware water quality standards. In addition, they are designed to meet Maryland's dissolved oxygen standard at the state line.

- 3. Table 1-1 indicates the segments of the Chester River, Choptank River and Marshyhope Creek are impaired for nutrients and dissolved oxygen, but does not indicate whether these segments are impaired for bacteria. Chesapeake TMDL, p. 3. The Executive Summary states, the above listed segments "are impaired because elevated nutrient levels and low dissolved oxygen." Chesapeake TMDL, Executive Summary p. x. The section entitled, "Stream Water Quality Conditions and Water Quality Impairment", reviews the water quality monitoring data, which lead DNREC to list the segments as impaired for nutrients and dissolved oxygen, but does not discuss the rationale for proposing bacteria TMDLs for the impaired segments. Chesapeake TMDL, pp. 11-24. DNREC should clarify this apparent omission, and clearly state why it is proposing bacteria TMDLs, including a discussion of the water quality monitoring data as pertaining to bacteria.**

**Response:** Based on this commenter's suggestion, the above sections of the *Total Maximum Daily Loads (TMDLs) Analysis for Chesapeake Drainage Watersheds, Delaware: Chester River, Choptank River, and Marshyhope Creek* document have been modified to include discussion of bacteria impairments.

- 4. DNREC identifies the land use activity for the Chester River Watershed as a whole, despite the fact, that DNREC is proposing TMDLs for only three specific segments located within the Watershed. Chesapeake TMDL, pp. 4-5. The MAELC believes DNREC should also identify the land use activity in each of the impaired segment's drainage area. This additional information would lead to a better understanding of the potential sources of pollution impacting each of the impaired segments, and thus lead to a more accurate TMDL proposal.**

**Response:** The land use information for the entire Chester River watershed is presented in graphical format in *Total Maximum Daily Loads (TMDLs) Analysis for Chesapeake Drainage Watersheds, Delaware: Chester River, Choptank River, and Marshyhope Creek* Report as general information. However, the loading rates used in the model are based upon land use contiguous to the specific segments in question.

- 5. DNREC identifies the land use activity for the Choptank River Watershed as a whole, despite the fact, that DNREC is proposing TMDLs for four specific segments located within the Watershed. Chesapeake TMDL, pp. 6-7. The MAELC believes DNREC should also identify the land use activity in each of the impaired segment's drainage area. This additional information will lead to a better understanding of the potential sources of pollution impacting each of the impaired segments, and therefore lead to a more accurate TMDL proposal.**

**Response:** The land use information for the entire Choptank River watershed is presented in graphical format in *Total Maximum Daily Loads (TMDLs) Analysis for Chesapeake Drainage Watersheds, Delaware: Chester River, Choptank River, and Marshyhope Creek* Report as general information. However, the loading rates used in the model are based upon land use contiguous to the specific segments in question.

- 6. DNREC identifies the land use activity for the Marshyhope Creek Watershed as a whole, despite the fact, that DNREC is proposing TMDLs for two specific segments located within the Watershed. Chesapeake TMDL, pp. 8-9. The MAELC believes DNREC should also identify the land use activity in each of these impaired segments' drainage areas. This additional information would lead to a better understanding of the potential sources of pollution impacting each of the impaired segments, and therefore lead to a more accurate TMDL proposal.**

**Response:** The land use information for the entire Marshyhope Creek watershed is presented in graphical format in *Total Maximum Daily Loads (TMDLs) Analysis for Chesapeake Drainage Watersheds, Delaware: Chester River, Choptank River, and Marshyhope Creek* Report as general information. However, the loading rates used in the model are based upon land use contiguous to the specific segments in question.

7. **The Chesapeake TMDL does not provide Marshyhope Creek with the special protection required by the SWQS for an ERES classified water. DNREC's SWQS identifies Marshyhope Creek as an ERES water, which requires "a level of protection . . . in excess of that provided most other waters of the State." Chesapeake TMDL, p. 11. DNREC, in an apparent contradiction to the SWQS incorporates Marshyhope Creek into a large, broad TMDL proposal that includes nine stream segments, seven of which are not designated as ERES waters. In addition, DNREC does not indicate what the current status of the pollution control strategy that the DNREC is required to develop per the ERES SWQS regulation for Marshyhope Creek. DNREC does not discuss why the special protection status of Marshyhope Creek has not prevented the Watershed from becoming impaired in the first place. The Chesapeake TMDL does not provide an implementation schedule, follow-up monitoring or anything specific to the pollution control strategies DNREC will put in place to achieve the pollution reductions called for in the Chesapeake TMDL. Overall, there is no indication that ERES waters of Marshyhope Creek have received any special consideration whatsoever. This is especially important in what is already a weakly developed TMDL.**

The MAELC believes DNREC should develop a separate TMDL proposal for Marshyhope Creek, with an identified pollution control strategy specific to Marshyhope Creek. This TMDL proposal will effectuate the intent of the SWQS, which identifies Marshyhope Creek as a "special natural asset of the State, [which] must be protected and enhanced for the benefit of present and future generations of Delawareans." Chesapeake TMDL, p. 11.

**Response:** As required under Section 303(d) of the Clean Water Act, the proposed TMDLs for Marshyhope Creek are designed to meet the applicable State of Delaware water quality standards. In addition, the Marshyhope Creek Watershed is modeled independent of other watersheds within the basin, more intensive monitoring has been and will continue to be carried out within the watershed, and a pollution control strategy will be developed reflecting the ERES designation as required in the State of Delaware Surface Water Quality Standards as Amended, July 11, 2004 section 5.6.1.2.

8. **DNREC states, as to identifying the sources of pollution that are impairing the Chesapeake Drainage Watersheds, "There are no active point sources discharging nutrients in the Chester River, Choptank River, or Marshyhope Creek Watersheds. All the sources of pollutants considered in this analysis are nonpoint sources." Chesapeake TMDL, p. 25. DNREC's pollution source assessment is fundamentally flawed for several reasons.**

DNREC states, "[t]here are no active point sources discharging nutrients" in the Watersheds, (Chesapeake TMDL, p. 25), but DNREC does not discuss the possibility that point sources discharges of dissolved oxygen consuming compounds or bacteria are present in the Watersheds. DNREC's source assessment should consider all of the pollutants that are impairing the Watersheds, not just the pollutants that are the most convenient to incorporate into a model.

A search conducted on DNREC's "Environmental Navigator 2.0"<sup>1</sup> database revealed the presence of the following facilities and sites that have the potential to discharge pollutants that are subject to the Chesapeake TMDL proposal:

#### Choptank River Watershed

- 32 animal operations,
- Four land development and erosion control sites,
- The Delaware Central Solid Waste Management Center,
- An unpermitted landfill/dump at the Leisure Haven Mobile Home Park, and
- A National Pollution Discharge Elimination System (NPDES) permitted wastewater discharge, also at the Leisure Haven Mobile Home Park.

#### Chester River Watershed

- Four poultry animal operation sites.

#### Marshyhope Creek Watershed

- 90 operational animal operations, and
- Five land development and erosion control sites.

Especially troubling is the potential presence of a NPDES permitted wastewater facility in the Choptank Watershed, in light of DNREC's statement that "[a]ll the sources of pollutants considered in this analysis are nonpoint sources." Chesapeake TMDL, p. 25. Although, it is unclear whether the Leisure Haven Mobile Home Park is still an active facility, it is clearly a point source discharge, which if still active needs to be included in the TMDL analysis and assigned a WLA. DNREC will have to clarify whether this facility is still an active discharge, and if so, why the facility is not included in the Chesapeake TMDL analysis.

Also of concern, is the presence of 126 animal operations in the Chesapeake Drainage Watersheds. These facilities were not included in the Chesapeake TMDL. EPA lists the following pollutants as potential impacts to surface water from animal feeding operations ("AFOs"), "Oxygen-demanding substances, ammonia, nutrients (particularly nitrogen and phosphorus), solids, pathogens, and odorous compounds."<sup>2</sup> The CWA defines a point source as, "any discernible, confined and discrete conveyance including but not limited to any . . . concentrated animal feeding operation . . . from which pollutants are or may be discharged." 33 U.S.C. § 1362 (14). If any AFOs meet the definition of "concentrated", then that operation would be a point source, according to the CWA. The MAELC believes that it is highly unlikely that of the 126 AFOs not one would qualify as a concentrated animal feeding operation ("CAFO"). If the animal operations do qualify as a CAFO, then those facilities are point source discharges, which need to be included in the TMDL analysis and assigned a WLA. The Chesapeake TMDL proposals are inadequate because they do not include an analysis of the 126 AFOs that are present in the Watersheds. At the very least, the DNREC needs to provide the public with the information regarding the AFOs so it can affectively assess the TMDLs.

The EPA guidance documents, *Protocol for Developing Pathogen TMDLs* and *Protocol for Developing Nutrient TMDLs* both indicate a two sentence source assessment, (Chesapeake TMDL, p 25) would not be adequate to accomplish the goal of the TMDL process. The EPA guidance document, *Protocol for Developing Pathogen TMDLs* states, “[a]ll possible sources of information should be consulted.”<sup>3</sup> The *Protocol for Developing Pathogen TMDLs* also envisions the use of other sources of information in developing the source assessment section of the TMDL, such as “public health agencies”, “literature and historical records searches”, phone and door to door surveys, “field reconnaissance” and “driving through the watershed.”<sup>4</sup> The EPA guidance document, *Protocol for Developing Nutrient TMDLs* states, “[s]ources of information that can be used to identify and document [nutrient sources] include land use maps, aerial photographs, local conservation organizations, tax maps, field surveys, and point source discharge permits.”<sup>5</sup> The Chesapeake TMDL two sentence source assessment is evidence that DNREC did not consult all possible sources or conduct any of the investigations the *Protocol for Developing Nutrient TMDLs* indicates is necessary for a TMDL analysis. DNREC apparently terminated their source assessment investigation after identifying that there were no point source discharges of nutrients in the Watersheds. This is in direct conflict with the applicable EPA guidance documents on developing TMDL source assessments, and as shown above not indicative of the actual sources of pollution present in the Watersheds.

DNREC's source assessment does adequately consider the presence and extent of septic systems located within the respective Watersheds, and their effect on the water quality impairments currently at issue in the Chesapeake TMDL proposal. DNREC states the majority of the land use in the Chesapeake Drainage Watersheds is currently agriculture. Chesapeake TMDL, pp. 5, 7, 9. In addition, there is only one permitted wastewater NPDES facility in the Watersheds. This leads to the conclusion that the people living in the Watersheds are utilizing septic systems to treat and dispose of their domestic wastewater. DNREC states septic systems are a potential source of pollution within the Watershed, but beyond this statement, DNREC does not follow-up with any sort of an attempt to quantify the amount or locations of these septic systems.

An example of a source of information, which could be utilized in this analysis, is the source assessment section of the TMDL for the Christina River Watershed<sup>6</sup> drafted for DNREC by EPA. EPA utilized a DNREC Geographic Information System (GIS) database to estimate the number of septic systems in New Castle County, which was then used to estimate the nutrient load from those septic systems in the development of the TMDL. Although this is an estimate of the load of nutrients leading to the impairment of the Christina River, it is specific as to one of the potential sources as well as being specific to the impaired watershed. It also shows that DNREC has the data available to construct a more adequate source assessment as to the presence and extent of septic systems in the Chesapeake Drainage Watersheds.

A source assessment that is comprised of only two sentences is fundamentally inadequate to accomplish the goals of the TMDL process. The two sentence source assessment needs to be put in context to illustrate this point. DNREC is proposing TMDLs for nutrients, bacteria and low levels of dissolved oxygen for nine water segments contained in three different Watersheds, (one with an ERES designation). The area affected by the proposed TMDL will cover approximately 128 stream miles, across three counties in Western Delaware. Chesapeake TMDL, pp. 3, 4, 6, 8.

**DNREC's source assessment should include a more comprehensive analysis of the sources of pollution in the watershed. The sources of pollution in the watershed are the reason DNREC has continually listed these Watersheds as impaired, (1996, 1998, 2002 and 2004). Chesapeake TMDL, Executive Summary, p. x. DNREC will not be able to achieve the desired pollution loading reductions without a more comprehensive and in-depth source assessment, i.e. specifically identifying the sources of pollution in the Watersheds. The modeled loads of pollution impairing the Watershed and the subsequent proposed reductions are nothing more than theoretical estimates based on nothing concrete as to the reality of the problem in the Watershed. In addition, the Chesapeake TMDL does not discuss pollution control strategies or provide an implementation schedule. This combination leads to the inevitable conclusion that the TMDLs proposed by DNREC are inadequate and thus should be rejected. For the foregoing reasons, section 1.5 *Sources of Pollution* is inadequate. Therefore, the Chesapeake TMDL is inadequate.**

**Response:** There are no NPDES permitted point source discharges in the Chester River, Choptank River, and Marshyhope Creek Watersheds. The Leisure Haven Mobile Home Park is not a NPDES permitted facility. A complete listing of all NPDES facilities within the state can be found at: [www.dnrec.state.de.us/water2000/Sections/SurfWater/Library/NPDES\\_List.PDF](http://www.dnrec.state.de.us/water2000/Sections/SurfWater/Library/NPDES_List.PDF).

Within the three watersheds, there is only one animal feeding operation that is classified as a CAFO (Schiff Farms in the Choptank River Watershed). This facility is considered a zero discharge CAFO and therefore is not considered in the TMDL.

The Department used site specific surface water quality data to estimate all nonpoint source loads in the model and calibrated and verified the model to ensure that they were accurate. Thus, the loads from all nonpoint sources were considered in total in the TMDL.

- 9. This section states, “[t]he objective of the TMDL analysis for the Chesapeake [D]rainage [W]atersheds is to estimate the maximum amount of nutrient pollutants that the Chester River, Choptank River, and Marshyhope Creek can receive without violating water quality standards.” Chesapeake TMDL, p. 25. Inexplicably, there is no mention of the bacteria impairment within this statement, even though DNREC is proposing bacteria TMDLs for each of the identified segments.**

**Response:** Based on this commenter's suggestion, the above section of the *Total Maximum Daily Loads (TMDLs) Analysis for Chesapeake Drainage Watersheds, Delaware: Chester River, Choptank River, and Marshyhope Creek* document has been modified to include bacteria impairments.

- 10. It is the position of the Commentors that the Water Quality Model offered by DNREC is fundamentally flawed, and therefore should not be given any deference. The Water Quality Model is based on estimates of the pollution impairing the Watersheds. The Water Quality Model is not based on the actual sources of pollution present in the Watersheds, and therefore, does not adequately consider the actual pollution loading rates. The reductions called for by DNREC based on the results of the model runs are**

**purely theoretical and in no manner tied to the reality of the situation present. This is even more unacceptable because DNREC has the information available to properly assess the sources of pollution in the Chesapeake Drainage Watersheds.**

**Response:** DNREC disagrees with this comment and believes the proposed TMDLs for the Chester River, Choptank River, and Marshyhope Creek are adequate. The proposed TMDLs are established based on accurate assessments of water quality data, proper use of calibrated models, and other assessment tools, as well as consideration of all sources of pollution contributing to the water quality of the Chester River, Choptank River, and Marshyhope Creek. Finally, as required under Section 303(d) of the Clean Water Act (CWA) and its implementing regulations, the proposed TMDL is designed to achieve applicable water quality standards. Therefore, DNREC believes that the proposed Chester River, Choptank River, and Marshyhope Creek TMDLs are adequate.

**11. Section 1313 (d)(1)(c) of the CWA states, “[e]ach State shall establish . . . the total maximum daily load . . . at a level necessary to implement the applicable water quality standards with seasonal variations and a *margin of safety* which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.” 33 U.S.C. § 1313(d)(1)(c), emphasis added. “There are two basic methods for incorporating the MOS . . . [i]mplicitly incorporate the MOS using conservative model assumptions to develop allocations. In many cases, the MOS is incorporated implicitly. In these cases, the conservative assumptions that account for the MOS should be identified.”<sup>7</sup>**

**The implicit margin of safety is not adequate because DNREC does not identify all of the conservative assumptions used to construct the nutrients model. DNREC states, “[t]he Qual2E models were calibrated using conservative assumptions regarding reaction rates, pollutant loads, and other environmental conditions.” Chesapeake TMDL, p. 89. A complete identification of the conservative assumptions, including the “other environmental conditions” is needed to meet the regulatory implicit MOS requirement. This is especially so, because the TMDL analysis is precariously balanced on the weak foundation of a two sentence source assessment and the corollary fact that the pollutant loads are estimates not specific to the Watersheds. The Chesapeake TMDL should therefore be rejected because the MOS allocated in regard to the nutrient and dissolved oxygen TMDLs does not meet the regulatory requirements of the CWA.**

**Response:** Several conservative assumptions were made during development of the Qual2E Models for the Chester River, Choptank River, and Marshyhope Creek. These conservative assumptions included but are not limited to: 1) choosing a conservative option for estimating oxygen reaeration rates, 2) applying conservative values for sediment oxygen demand, and 3) considering simultaneous occurrence of critical environmental conditions (such as low stream flow and high water temperature). Since the above conservative assumptions were made during development of the Qual2E Models for the Chester River, Choptank River, and Marshyhope Creek, DNREC believes the use of an implicit margin of safety is justifiable.

**12. The Chesapeake TMDL does not contain reasonable assurances that the proposed TMDLs can be met. DNREC promises to, “implement the requirements of this TMDL through the development of a Pollution Control Strategy.” Chesapeake TMDL, p. 89. DNREC does not describe this strategy in any manner. DNREC does not indicate when this strategy will be put into effect. In addition, DNREC does not provide for follow-up monitoring. In the case of the Marshyhope Creek, according to the SWQS, DNREC should have already developed a pollution control strategy.**

**On the EPA web page titled, "Overview of Current Total Maximum Daily Load - TMDL - Program and Regulations" EPA states, "States . . . should describe a plan for implementing load allocations for waters impaired solely or primarily by nonpoint sources, including . . . reasonable assurances that load allocations will be achieved, using incentive-based, non-regulatory or regulatory approaches."<sup>8</sup> The proposed nutrients and dissolved oxygen TMDLs are inadequate because the TMDLs do not provide an implementation schedule or provisions for follow-up monitoring. This, in addition to the two-sentence source assessment, leads to the conclusion that there is no reasonable assurance that DNREC can achieve the proposed reductions in the Watershed. This in turn, leads to the conclusion that the proposed Chesapeake TMDL is inadequate.**

**Response:** DNREC has adopted a strategy of promulgating TMDLs and implementing them with assistance from Tributary Action Teams after TMDL promulgation in order to meet the TMDL development timetable mandated under a Federal Consent Decree. The Department will continue that strategy for the Chester River, Choptank River, and Marshyhope Creek Watersheds. A Tributary Action Team will develop a Pollution Control Strategy and schedule for implementing the requirements of the TMDLs. More information about Delaware’s Tributary Action Teams is available online at the DNREC website.

DNREC conducts comprehensive monitoring of all the State’s surface waters, including the Chester River, Choptank River, and Marshyhope Creek, and will continue this effort in the future. Data collected for the Chester River, Choptank River, and Marshyhope Creek will be evaluated routinely to assess water quality conditions and monitor progress of TMDL implementation.

**13. It is the position of the MAELC that the bacteria analysis offered by DNREC is fundamentally flawed, and therefore should not be given any deference. The bacteria analysis is based on estimates of the pollution impairing the Watersheds. The bacteria analysis is not based on the actual sources of pollution present in the Watersheds, and therefore, do not adequately consider the actual pollution loading rates. DNREC’s purported pollution reductions based on results of the bacteria analysis are purely theoretical and are in no manner tied to the reality of the situation present in each of the Watersheds. This is the case even though DNREC has the information to properly assess the sources of pollution in the Chesapeake Drainage Watersheds.**

**Response:** The bacteria TMDLs for the Chesapeake Bay Drainage watersheds are based on site specific data reflecting local conditions and all sources of pollution. As required under

Section 303(d) of the Clean Water Act, the proposed bacteria TMDLs are designed to meet the applicable State of Delaware water quality standards.

- 14. The Chesapeake TMDL does not contain any reasonable assurance that the proposed bacteria TMDL can or will be met. The EPA has indicated, "States . . . should describe a plan for implementing load allocations for waters impaired solely or primarily by nonpoint sources, including . . . reasonable assurances that load allocations will be achieved, using incentive-based, non-regulatory or regulatory approaches."<sup>8</sup> DNREC does not provide any description in how they intend to attain the overall reductions in bacteria loading. DNREC does not provide an implementation schedule or provisions for follow-up monitoring. This, in addition to the two-sentence source assessment, leads to the conclusion that there is no reasonable assurance that DNREC can achieve the proposed reductions in the Watershed. Therefore, without a reasonable assurance that the proposed bacteria pollution reductions can be attained the TMDL proposal is inadequate and should be revised or rejected.**

**Response:** Please see response to comment number 12.

- 15. Section 1313 (d)(1)(c) of the CWA states, "[e]ach State shall establish . . . the total maximum daily load . . . at a level necessary to implement the applicable water quality standards with seasonal variations and a *margin of safety* which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." 33 U.S.C. § 1313(d)(1)(c), emphasis added. "There are two basic methods for incorporating the MOS . . . [i]mplicitly incorporate the MOS using conservative model assumptions to develop allocations, or [e]xplicitly specify a portion of the TMDL as the MOS."<sup>9</sup> DNREC does not include an explicit MOS or discuss how it incorporated an implicit MOS to develop the bacteria TMDLs, therefore the Chesapeake TMDL proposal is inadequate because it does not comply with the CWA.**

**Response:** As indicated in the TMDL Analysis document for the Chesapeake Drainage Watersheds, Delaware, the Source Tracking Adjustment Factor (STAF) will be incorporated in the development of the Pollution Control Strategy. Both an implicit and explicit margin of safety are included in the STAF, therefore, the flow duration approach utilized in this analysis includes an adequate margin of safety.

- 16. DNREC states, as to identifying the sources of pollution that are impairing the Pocomoke River Watershed, "[n]o NPDES facilities are located in the Delaware portion of the watershed. Therefore, all of the pollutants considered in this analysis are generated from nonpoint sources such as surface runoff from agricultural and urban land use activities, septic tanks, and groundwater discharges loaded with nutrients." Pocomoke TMDL, p. 10. DNREC's pollution source assessment is fundamentally flawed for several reasons.**

... In essence, there can be a point source discharge to a waterbody that is not a NPDES permitted facility.

... The Pocomoke TMDL proposal is inadequate because the TMDL proposal does not include an analysis of the 75 AFOs present in the Watershed.

...DNREC's source assessment should include a more comprehensive analysis of the sources of pollution in the watershed. The sources of pollution in the watershed are the reason DNREC has continually listed Pocomoke River as impaired, (1996, 1998, 2002 and 2004). Pocomoke TMDL, Executive Summary, p. vii. DNREC will not be able to achieve the desired pollution loading reductions without a more comprehensive and in-depth source assessment, i.e. specifically identifying the sources of pollution in the Watershed. Without specifically identifying the sources of pollution in the Watershed, the modeled loads of pollution impairing the Watershed and the subsequent reductions in pollution loads are nothing more than theoretical estimates based on nothing concrete as to the reality of the problem in the Watershed. In addition, the Pocomoke TMDL does not discuss pollution control strategies or provide an implementation schedule. This combination leads to the inevitable conclusion that the TMDLs proposed by DNREC are inadequate and thus should be rejected. For the foregoing reasons, section 1.5 Sources of Pollution is inadequate, and therefore the Pocomoke TMDL is inadequate.

**Response:** There are no NPDES permitted point source discharges in the Pocomoke River Watershed. The Department used site specific surface water quality data to estimate all nonpoint source loads in the model and calibrated and verified the model to ensure that they were accurate. Thus, the loads from all nonpoint sources were considered in total in the TMDL.

17. This section states, “[t]he objective of the TMDL analysis for Pocomoke River Watershed in Delaware is to estimate the total maximum amount of dissolved oxygen consuming compounds and nutrients that the Delaware portion of the Pocomoke River can receive without violating water quality standards.” Pocomoke TMDL, p. 10. Inexplicably, there is no mention of the bacteria impairment within this statement, even though according to Table 1-1 both the Pocomoke River and the Bald Cypress Branch are impaired by bacteria. Pocomoke TMDL, p. 2.

**Response:** Based on this comment, the *TMDLs Analysis for Pocomoke River Watershed, Delaware* report has been modified to include bacteria impairments.

18. DNREC does not clearly specify how they estimated the nonpoint pollution loads that were used as model input values to represent the pollution impairing the Pocomoke Watershed. DNREC states, “all of the pollutants considered in this analysis are generated from nonpoint sources.” Pocomoke TMDL, p. 10. It is clear, as shown above in the discussion of the source assessment, that DNREC did not adequately identify the non point sources of pollution or the potential non-permitted point source pollution discharges present in the Watershed. DNREC, also does not specify how they estimated the nonpoint pollution loads that are impairing the Watershed, instead choosing to litter the TMDL analysis with ambiguous references to “drainage areas were estimated using a GIS”, (Pocomoke TMDL, p. 15), “diffuse sources”, (Pocomoke TMDL, p. 19) and “[n]onpoint source loads were then estimated and adjusted based on available

water quality data”, (Pocomoke TMDL, p. 20). What is clear, is that there are at least 75 active AFOs in the watershed and the primary mechanism for treating and disposing of domestic wastewater in the Watershed is through septic systems. DNREC’s estimates of the pollution loads entering the Watershed, which are the causes of the continuing impairment, should be based on this reality. DNREC’s water quality model is inadequate because it is apparently based on estimated pollution loads and not based on data specific to the Watershed.

**Response:** The Department used site specific surface water quality data to estimate all nonpoint source loads in the model and calibrated and verified the model to ensure that they were accurate. Thus, the loads from all nonpoint sources were considered in total in the TMDL. As required under Section 303(d) of the Clean Water Act, the proposed Pocomoke River TMDLs are designed to meet applicable water quality standards.

**19. DNREC states, “ Table 4-2 presents the proposed load allocations for total nitrogen and total phosphorous for the Pocomoke River watershed in Delaware.” Pocomoke TMDL, p. 32. Table 4-2 is entitled, “Results for the Pocomoke River Watershed Median Conditions model with TMDL Reductions Applied”. Pocomoke TMDL, p. 33. DNREC should correct this mistake and instead indicate the load reductions are listed in Table 4-3. Pocomoke TMDL, p. 32.**

**Response:** Based on this comment, the *TMDLs Analysis for Pocomoke River Watershed, Delaware* has been modified.

**20. DNREC does not assign a LA for the dissolved oxygen consuming compounds contributing to the low dissolved oxygen impairment observed within Pocomoke River. DNREC states, “[t]he objective of the TMDL analysis for Pocomoke River is to estimate the total maximum amount of dissolved oxygen consuming compounds and nutrients that Pocomoke River can receive without violating water quality standards.” Pocomoke TMDL, p. 10. DNREC does not then identify the total maximum amount of dissolved oxygen consuming compounds that Pocomoke River can receive without violating the water quality standards, and subsequently does not assign a LA for these pollutants. DNREC should state the total maximum amount of dissolved oxygen consuming compounds the Pocomoke River can receive without violating the water quality standards, and then assign a LA to these compounds, in accordance with their objective and scope statement. Without doing such the Pocomoke TMDL does not meet the definition of a TMDL.**

**Response:** Low dissolved oxygen concentrations in the Pocomoke River are caused by several parameters including nutrients (nitrogen and phosphorous), algae, biochemical oxygen demand (BOD), and fluxes from sediment. All of these factors are considered in the TMDL analysis for the Pocomoke River. This analysis shows that among the above factors, nutrients are the primary cause of low dissolved oxygen levels in the stream; hence, controlling nutrients is the most effective management action to ensure attainment of water quality standards in the Pocomoke River. In addition, any best management practices

utilized to control nutrient loading into the Pocomoke River will directly and indirectly result in the control of the other oxygen consuming substances.

- 21. ...The implicit margin of safety is not adequate because DNREC does not identify all of the conservative assumptions used to construct the nutrients model. DNREC states, “[t]he Pocomoke River Qual2K model was calibrated using conservative assumptions regarding reaction rates, pollutant loads, and other environmental conditions.” Pocomoke TMDL, p. 36. A complete identification of the conservative assumptions, including the “other environmental conditions” is needed to meet the regulatory implicit MOS requirement. This is especially so, because the TMDL analysis is precariously balanced on the weak foundation of a two sentence source assessment and the corollary fact that the pollutant loads are estimates not specific to the Watershed. The Pocomoke TMDL should therefore be rejected because the MOS allocated in regard to the nutrient and dissolved oxygen TMDLs does not meet the regulatory requirements of the CWA.**

**Response:** Several conservative assumptions were made during development of the Pocomoke River Qual2K Model. These conservative assumptions included but are not limited to: 1) choosing a conservative option for estimating oxygen reaeration rate, 2) applying a conservative value for sediment oxygen demand, and 3) considering simultaneous occurrence of critical environmental conditions (such as low stream flow and high water temperature). Since the above conservative assumptions were made during development of the Pocomoke River Qual2K model, DNREC believes the use of an implicit margin of safety is justifiable.

- 22. The Pocomoke TMDL does not contain reasonable assurances that the proposed TMDLs can be met because DNREC does not provide any indication that they currently have a strategy to implement the TMDL proposals. DNREC states, “BMPs are expected to achieve significant load reductions and meet the TMDL targets.” Pocomoke TMDL, p. 37. DNREC then promises that, “in association with local citizens groups and other affected parties, [DNREC] will develop a Strategy to implement BMPs and meet the TMDL targets.” Pocomoke TMDL, p. 37. DNREC does not describe this strategy in any manner. In addition, DNREC does not provide an implementation schedule or provisions for follow-up monitoring. On the EPA web page titled, "Overview of Current Total Maximum Daily Load - TMDL - Program and Regulations", EPA states, "States . . . should describe a plan for implementing load allocations for waters impaired solely or primarily by nonpoint sources, including . . . reasonable assurances that load allocations will be achieved, using incentive-based, non-regulatory or regulatory approaches."<sup>8</sup> The proposed nutrients and dissolved oxygen TMDLs are inadequate because the TMDLs do not provide an implementation schedule or provisions for follow-up monitoring. This, in addition to the two-sentence source assessment, leads to the conclusion that there is no reasonable assurance that DNREC can achieve the proposed reductions in nutrient or dissolved oxygen consuming compounds loading in the Watershed. This in turn, leads to the conclusion that the proposed Pocomoke TMDL is inadequate.**

**Response:** DNREC has adopted a strategy of promulgating TMDLs and implementing them with Tributary Action Teams assistance after TMDL promulgation in order to meet the TMDL development timetable mandated under a Federal Consent Decree. The Department will continue that strategy for the Pocomoke Watershed. A Tributary Action Team will develop a Pollution Control Strategy and schedule for implementing the requirements of the TMDLs. More information about Delaware's Tributary Action Teams is available online at the DNREC website.

DNREC conducts comprehensive monitoring of all the State's surface waters (including Pocomoke River) and will continue this effort in the future. Data collected for the Pocomoke River will be evaluated routinely to assess water quality conditions and monitor progress of TMDL implementation.

**23. DNREC does not discuss the water quality sampling data, which led it to list bacteria as an impairment in Pocomoke River. Pocomoke TMDL, pp. 5-6, 33-34. DNREC should provide the same level of detail in describing the water quality sampling data that led DNREC to list Pocomoke River as impaired for bacteria, as it did for nitrogen, phosphorus and low dissolved oxygen. The discussion of the proposed bacteria TMDL is a mere two pages long. DNREC should allocate more of its resources in developing a more substantial bacteria TMDL.**

**Response:** The summary bacteria data was included in the *TMDLs Analysis for the Pocomoke River, Delaware* report and the majority of the raw data was included in the appendixes. However, based on this comment, figures illustrating the raw data were added to the report and the appendix was expanded to include all raw data used in the technical analysis.

**24. DNREC does not provide a map to show its break down of Pocomoke River into "four ranges: the first, second, third and fourth quartile." Pocomoke TMDL, p. 33. This is important because DNREC is allocating its proposed 69.2% reduction in the bacteria loading among these quartiles. Pocomoke TMDL, p. 34. DNREC needs to define these four quartiles, so as to fulfill the public participation regulatory requirement. The public cannot adequately participate in the TMDL process if they are not provided a map defining the quartiles, in order to assess the logic of DNREC's proposed bacteria loading allocations.**

**Response:** Quartiles do not have a geographic component, they refer to flow ranges and therefore it is not appropriate to illustrate them on a map. The flow ranges that are included in each quartile are included in a table in the *TMDLs Analysis for Pocomoke River, Delaware* report.

**25. The Pocomoke TMDL does not contain a reasonable assurance that the proposed bacteria TMDL can or will be met. DNREC does not provide any description in how they intend to attain the overall 69.2% reduction in bacteria loading. DNREC does not provide an implementation schedule or a provision for follow-up monitoring in regards to the proposed bacteria TMDL. This, in addition to the two-sentence source**

assessment, leads to the conclusion that there is no reasonable assurance that DNREC can achieve the proposed reductions in bacteria loading to the Watershed. In addition, DNREC does not mention the bacteria TMDL within the discussion contained under the Section 6, "Discussion of Regulatory Requirements for TMDLs" on their rationale why the proposed TMDLs meet the reasonable assurance regulatory requirement. Pocomoke TMDL, p. 36. Therefore, without a reasonable assurance that the proposed bacteria pollution reductions can be attained in the Watershed the TMDL proposal is inadequate and should be rejected.

**Response:** See the responses to comments 22 and 23 above.

26. Section 1313 (d)(1)(c) of the CWA states, "[e]ach State shall establish . . . the total maximum daily load . . . at a level necessary to implement the applicable water quality standards with seasonal variations and a *margin of safety* which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." 33 U.S.C. § 1313(d)(1)(c), emphasis added. "There are two basic methods for incorporating the MOS . . . [i]mplicitly incorporate the MOS using conservative model assumptions to develop allocations, or [e]xplicitly specify a portion of the TMDL as the MOS." DNREC does not include an explicit MOS or discuss how it incorporated an implicit MOS to develop the bacteria TMDL, thus the TMDL proposal is inadequate because it does not comply with the CWA. Pocomoke TMDL, pp. 33-34.

**Response:** As indicated in the TMDLS Analysis for the Pocomoke River, Delaware, the Source Tracking Adjustment Factor (STAF) will be incorporated in the development of the Pollution Control Strategy. Both an implicit and explicit margin of safety are included in the STAF, therefore, the flow duration approach utilized in this analysis includes an adequate margin of safety.

27. In this section DNREC offers its rationale why it believes the Pocomoke TMDL is adequate under the current TMDL regulations. This section does not discuss the proposed bacteria TMDL in reference to the regulatory requirements. Pocomoke TMDL, pp. 33-34. DNREC should include its proposed bacteria TMDL within the discussion presented in section 6.0, as to whether the proposed bacteria TMDL meets the regulatory requirements.

**Response:** The *TMDLs Analysis for Pocomoke River, Delaware* report has been updated to clarify that Section 6.0 refers to all the requirements in the TMDL for both nutrients and bacteria.

**Appendix B**  
**Recommended Proposed Regulations**

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**Recommended Regulations**  
**Department of Natural Resources and Environmental Control**

**Division of Water Resources**

Statutory authority: 7 Delaware Code, Chapter 60

**Department of Natural Resources and Environmental Control**

**Division of Water Resources**

Statutory authority: 7 Delaware Code, Chapter 60

7410. Total Maximum Daily Loads (TMDLs) for Choptank River  
**[Watershed in] Delaware**

1. Introduction and Background

Water quality monitoring performed by the Department of Natural Resources and Environmental Control (DNREC) has shown that the Choptank River is impaired by high levels of bacteria, elevated levels of the nutrients nitrogen and phosphorous, and low dissolved oxygen, and that the designated uses are not fully supported by water quality in the stream.

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 or stressors causing the impairment. 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).

DNREC listed Choptank River on several of the State's 303(d) Lists and proposes the following Total Maximum Daily Load regulation for nitrogen, phosphorous, and Enterococcus bacteria.

2. Total Maximum Daily Loads (TMDLs) ~~Regulation~~ for the Choptank River **[Watershed in] Delaware**

Article 1. The nonpoint source nitrogen load in the entire watershed shall be capped at the 2001-2003 baseline level. This shall result in a yearly-average total nitrogen load of 1,359 pounds per day.

Article 2. The nonpoint source phosphorus load in the entire watershed shall be reduced by 40 percent from the 2001-2003 baseline level. This shall result in reducing the yearly-average total phosphorous load from 127 pounds per day to 75.9 pound per day.

Article 3. The nonpoint source bacteria load shall be reduced by 87.8% from the 1997 – 2005 baseline level. This shall result in reducing a yearly-mean bacteria load from 4.3E+11 CFU per day to 4.4E+10 CFU per day.

Article 4. Based upon water quality model runs and assuming implementation of reductions identified by Articles 1 through 3, DNREC has determined that, with an adequate margin of safety, water quality standards will be met in Choptank River.

Article 5. Implementation of this TMDL Regulation shall be achieved through development and implementation of a Pollution Control Strategy. The Strategy will be developed by DNREC in concert with the Tributary Action Teams, other stakeholders, and the public.

7411. Total Maximum Daily Loads (TMDLs) for ~~[the]~~ Marshyhope Creek ~~[Watershed in]~~ Delaware

1.0 Introduction and Background

Water quality monitoring performed by the Department of Natural Resources and Environmental Control (DNREC) has shown that the Marshyhope Creek is impaired by high levels of bacteria, elevated levels of nutrients nitrogen and phosphorous, and low dissolved oxygen, and that the designated uses are not fully supported by water quality in the stream.

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 or stressors causing the impairment. 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).

DNREC listed Marshyhope Creek on several of the State's 303(d) Lists and proposes the following Total Maximum Daily Load regulation for nitrogen, phosphorous, and Enterococcus bacteria.

2.0. Total Maximum Daily Loads (TMDLs) ~~[Regulation]~~ for Marshyhope Creek ~~[Watershed in]~~ Delaware

Article 1. The nonpoint source nitrogen load in the entire watershed shall be reduced by 20 percent from the 2001-2003 baseline level. This shall result in reducing the yearly-average total nitrogen load from 2,687 pounds per day to 2,148 pounds per day.

Article 2. The nonpoint source phosphorus load in the entire watershed shall be reduced by 25 percent from the 2001-2003 baseline level. This shall result in reducing the yearly-average total phosphorous load from 109 pounds per day to 78.1 pound per day.

Article 3. The nonpoint source bacteria load shall be reduced by 85.7% from the 1997 – 2005 baseline levels. This shall result in reducing a yearly-mean bacteria load from 1.1E+11 CFU per day to 1.6E+10 CFU per day.

Article 4. Based upon water quality model runs and assuming implementation of reductions identified by Articles 1 through 3, DNREC has determined that, with an adequate margin of safety, water quality standards will be met in Marshyhope Creek.

Article 5. Implementation of this TMDL Regulation shall be achieved through development and implementation of a Pollution Control Strategy. The Strategy will be developed by DNREC in concert with the Tributary Action Teams, other stakeholders, and the public.

## 7412. Total Maximum Daily Loads (TMDLs) for [the] Pocomoke River [Watershed in] Delaware

### 1.0 Introduction and Background

Water quality monitoring performed by the Department of Natural Resources and Environmental Control (DNREC) has shown that the Pocomoke River is impaired by high levels of bacteria, elevated levels of the nutrients nitrogen and phosphorous, and low dissolved oxygen, and that the designated uses are not fully supported by water quality in the stream.

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 or stressors causing the impairment. 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).

DNREC listed Pocomoke River on several of the State's 303(d) Lists and proposes the following Total Maximum Daily Load regulation for nitrogen, phosphorous, and Enterococcus bacteria.

### 2.0 Total Maximum Daily Loads (TMDLs) [Regulation] for the Pocomoke River [Watershed in] Delaware

Article 1. The nonpoint source nitrogen load in the entire watershed shall be reduced by 55 percent from the 1997-2003 baseline level. This shall result in reducing the yearly-median total nitrogen load from 226 pounds per day to 102 pounds per day.

Article 2. The nonpoint source phosphorus load in the entire watershed shall be reduced by 55 percent from the 1997-2003 baseline level. This shall result in reducing the yearly-median total phosphorous load from 13.5 pounds per day to 6.1 pound per day.

Article 3. The nonpoint source bacteria load shall be reduced by 69.2% from the 1997- 2005 baseline levels. This shall result in reducing a yearly-mean bacteria load from 4.2E+11 CFU per day to 1.3E+11CFU per day.

Article 4. Based upon water quality model runs and assuming implementation of reductions identified by Articles 1 through 3, DNREC has determined that, with an adequate margin of safety, water quality standards will be met in Pocomoke River.

Article 5. Implementation of this TMDL Regulation shall be achieved through development \_\_\_\_\_ and implementation of a Pollution Control Strategy. The Strategy will be developed by DNREC in concert with the Tributary Action Teams, other stakeholders, and the public.

| 7413. Total Maximum Daily Loads (TMDLs) for [the] Chester River [Watershed in] Delaware

1.0 Introduction and Background

Water quality monitoring performed by the Department of Natural Resources and Environmental Control (DNREC) has shown that the Chester River is impaired by high levels of bacteria, elevated levels of the nutrients nitrogen and phosphorous, and low dissolved oxygen, and that the designated uses are not fully supported by water quality in the stream.

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 or stressors causing the impairment. 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).

DNREC listed Chester River on several of the State's 303(d) Lists and proposes the following Total Maximum Daily Load regulation for nitrogen, phosphorous, and Enterococcus bacteria.

2.0 Total Maximum Daily Loads (TMDLs) [Regulation] for the Chester River [Watershed in] Delaware

Article 1. The nonpoint source nitrogen load in the entire watershed shall be capped at the 2001-2003 baseline level. This shall result in a yearly-average total nitrogen load of 708 pounds per day.

Article 2. The nonpoint source phosphorus load in the entire watershed shall be reduced by 40 percent from the 2001-2003 baseline level. This shall result in reducing the yearly-average total phosphorous load from 54.6 pounds per day to 32.3 pound per day.

Article 3. The nonpoint source bacteria load in the entire watershed shall be reduced by 75.6% from the 1997 – 2005 baseline levels. This shall result in reducing a yearly-mean bacteria load from 1.9E+11 CFU per day to 4.6E+10 CFU per day.

Article 4. Based upon water quality model runs and assuming implementation of reductions identified by Articles 1 through 3, DNREC has determined that, with an adequate margin of safety, water quality standards will be met in Chester River.

Article 5. Implementation of this TMDL Regulation shall be achieved through development and implementation of a Pollution Control Strategy. The Strategy will be developed by DNREC in concert with the Tributary Action Teams, other stakeholders, and the public.