Comment Response Document
Regarding the Total Maximum Daily Loads of Phosphorus and Sediments for Loch Raven Reservoir and Total Maximum Daily Loads of Phosphorus for Prettyboy Reservoir, Baltimore, Carroll and Harford Counties, Maryland

The Maryland Department of the Environment (MDE) has conducted a public review of the proposed Total Maximum Daily Loads (TMDLs) of Total Maximum Daily Loads of Phosphorus and Sediments for Loch Raven Reservoir and Total Maximum Daily Loads of Phosphorus for Prettyboy Reservoir. The public comment period was open from June 26, 2006 through July 25, 2006. MDE received three sets of written comments. In addition, two additional technical memoranda were made available for public comment from July 28, 2006 through August 11, 2006. MDE received one additional set of written comments.

Below is a list of commentors, their affiliation, the date comments were submitted, and the numbered references to the comments submitted. In the pages that follow, comments are summarized and listed with MDE's response.

List of Commentors

Author	Affiliation	Date	Comment Number
Jennifer Schaafsma	Maryland Department of Agriculture	July 19, 2006	1 through 6
Jennifer Sincock	U.S. Environmental Protection Agency	July 20, 2006	7 through 11
Gould Charshee on behalf of the members of the Reservoir Technical Group (RTG)	Baltimore Metropolitan Council	July 25, 2006	12 through 30
Jennifer Sincock	U.S. Environmental Protection Agency	August 3, 2006	31 through 32

Comments and Responses:

1. The commentor asks, "Why are we doing a TMDL on a low priority impairment when there are high priority listings that have not been addressed?"

Response: While the impairment may be nominally a "low" priority, the waterbodies in question serve as a source of drinking water for approximately 1.8 million people, and should not be viewed as unimportant. It also must be noted that many of the high priority listings, for example toxics, polychlorinated biphenyls (PCBs), and large, tributary-scale nutrient impairments, are very complicated projects, entailing long-term monitoring and modeling efforts. MDE has worked and continues to work on developing methods to address these and many other long-term projects. Furthermore, MDE has an ongoing collaborative partnership with the U.S. EPA's Chesapeake Bay Program and other states in the region to address listings in

the Chesapeake Bay. Lastly, as of 2006 and based on the 2004 303(d) list, MDE has addressed about 52% of all high priority listings, compared with about 33% of medium priority listings and 19% of low-priority listings.

2. The commentor asks why a sediment TMDL when the reservoir compares favorably with other reservoirs? The commentor continues that it has a low rate of sedimentation and that it is a manmade impoundment and sedimentation is, or should be expected. The commentor also states that the reservoir is surrounded by forest, which is the land use that contributes the least sediment. Dams cause scour and produce downstream sedimentation. The commentor continues that reducing the sediment load to the lake will not change the partitioning of the sediment by the flowing water. The commentor ends with areas of accumulation will still accumulate most of the sediment and might be better served by bio-engineered solutions that can redirect currents.

Response: The Loch Raven reservoir was listed as impaired by sediments in 1996; as such, MDE's TMDL Program is required to address the listing. The commentor is correct that, in terms of volumetric loss due to sedimentation, the reservoir compares favorably on a national level with other reservoirs, but these volumetric loss and retention statistics apply at the average level. As commentors from the Reservoir Technical Group point out (see Comment #19), volumetric loss at the local level is much greater, to the extent in fact that navigation by boat is no longer possible in some areas.

While the reservoir *per se* is surrounded largely by forest, the overall watershed is a mixture of forested, agricultural and developed land uses, the latter two of which yield sediment in much greater quantities than does forest. While it is indeed expected for impoundments to undergo sedimentation, the process is hardly to be considered desirable, and it may be reduced or delayed by reasonable and prudent management actions, such as those presumably arising as a consequence of implementing this TMDL. Regarding the commentor's assertions concerning the localized nature of sediment deposition and management thereof, it is expected that mitigation activities will be implemented in such a way as to maximize their effects at the localized level, much as does sediment deposition.

3. The commentor asks why is the Department using the 1997 Census of Agriculture? The commentor states that there is a 2002 edition online that shows a 10.4% decrease in farmland in Baltimore County compared to 1997. The commentor continues that it would be more accurate to assume that by 2006 there might be 10% less again, than to assume that the trend would reverse. The commentor ends by stating that EPA says to use the most recent available data.

Response: MDE built much of this project on an existing, peer-reviewed watershed model that was calibrated for the period of 1992-1997. That model used land use data from Maryland Department of Planning (MDP) and U.S. Agricultural Census from 1997. The model is not attempting to simulate 2006 conditions. The answers to this comment are explained in further detail in "Modeling Framework for Simulating Hydrodynamics and Water Quality in the

Prettyboy and Loch Raven Reservoirs, Gunpowder River Basin, Maryland", which was made available by request throughout the public comment period. TMDL development requires the *consideration* of all readily available data; using any dataset is contingent upon those data being applicable and appropriate, not just recent.

4. The commentor asks why there is an animal waste category; what animal numbers is the Department using; and are they wildlife, pets or livestock? The commentor states that with nutrient management plans, animal waste is used to fertilize cropland and pasture in quantities that can be taken up by crops with minimal environmental impact. The commentor continues that soil and manure testing assures that phosphorus will not be likely to leach. The commentor states that it is not legal to let stored manure leak to the surface water to the ground water. The commentor ends by stating that wild animals have greater access to the reservoirs than livestock.

Response: As a source, animal waste refers to the nutrients lost in runoff during periods in which animals are in confined areas. For each animal type, the duration of the year that they spend in confinement is estimated. From the size of animal population and their period in confinement, the animal waste is calculated. Please see Palace et al. (1998), Chesapeake Bay Watershed Model Application and Calculation of Nutrient and Sediment Loadings Appendix H: Tracking Best Management Practice Nutrient Reductions in the Chesapeake Bay Program, (http://www.chesapeakebay.net/search/pubs.htm) for additional details.

The animals in question are livestock and poultry, including beef and dairy cattle, hogs, sheep, horses, chickens, turkeys, broilers and layers. The primary source of animal populations was the U. S. Agricultural Census. Information from the University of Maryland's Department of Agricultural Engineering was used to distribute the animal population to modeling segments.

A mass balance of animal waste is accounted for in the modeling framework. Waste is either deposited in pasture or applied to cropland. The loss of nutrient in stored waste is also taken into account. Nutrient losses from animal wastes occur primarily in runoff and in erosion of particulates from the surface. See "Modeling Framework for Simulating Hydrodynamics and Water Quality in the Prettyboy and Loch Raven Reservoirs" (Interstate Commission on the Potomac River Basin [ICPRB], 2006) for more details on tracking animal populations and animal wastes, the calculation of manure acres, and the application of manure to crops.

5. The commentor states that there is no explanation for the step between land uses and contributions to phosphorus and sediment. The commentor continues that other TMDLs show more sediment per acre from impervious urban land than from high till cropland. The commentors ends with shallow septic systems may be contributing P(hosphorus).

Response: As above, the nutrient exports from the various land use categories in the model are reasonable, comparable with other similar modeling efforts and were previously reviewed and vetted by a broad peer group. It is unlikely that septic systems are contributing meaningfully to

phosphorus entering the reservoirs, given the distances involved and the known propensity for phosphorus to bind with sediments.

6. The commentor references the Assurance of Implementation Section and states that in the past the Department has mentioned programs that address water quality issues such as: Maryland Agricultural Water Quality Cost-Share Program (MACS), Low Interest Loans for Agricultural Conservation (LILAC) and Maryland Agricultural Land Preservation Easement (MALPH). The commentor requests that these be included. The commentor continues with having a law that says you have to do it is not the same as having a program that is already implementing restoration activities.

Response: MDE has added these to the list of programs included in the Assurance of Implementation section. MDE appreciates MDA's support for funding and enforcement of implementation activities and laws.

7. The commentor requests that MDE send EPA the technical memorandum entitled, "Significant Nutrient and Sediment Point Sources in the Prettyboy and Loch Raven Reservoir Watersheds" for review. The commentor continues that reports referenced in the TMDL document should be made available to the public and EPA during the comment period.

Response: MDE inadvertently omitted the technical memoranda from the public review package, and we have sent both technical memoranda to stakeholders for a public review period extending through August 11, 2006. The report entitled "Modeling Framework for Simulating Hydrodynamics and Water Quality in the Prettyboy and Loch Raven Reservoirs, Gunpowder River Basin, Maryland," a very large and technical document, was provided to stakeholders on an as-requested basis. All other referenced documents are, as is customary for literature cited, available at major university libraries.

8. The commentor states that EPA has reviewed the draft modeling report by the Interstate Commission for the Potomac River Basin (ICPRB) and MDE that was sent by MDE. The commentor requests that EPA be sent the final modeling report when the TMDL is submitted for review and approval.

Response: MDE will provide the finalized modeling report to EPA as part of the submittal package.

9. The commentor requests that the baseline loads be provided in the TMDL report.

Response: This information has been added to the report as an appendix.

10. The commentor references Table 1 and Section 2.1.1 on page 3. The commentor states that the drainage areas listed in Table 1 appear to be inconsistent with those listed in Section 2.1.1 and there appears to be a typo in Table 1 for Loch Raven's Drainage Area to Reservoir of 303 mi^2 (193,1920 acres). The commentor requests a clarification.

Response: The number of acres in the Loch Raven Watershed should be 140,000 acres. The drainage area given in the text excludes the reservoirs themselves MDE will clarify this in the final document.

11. The commentor states that the "MinForest" symbols on Figures 13 and 14 on page 28 are not visible in black and white.

Response: MDE will clarify this in the final document.

12. The commentor states that the Reservoir Watershed Management Program has been in the business of trying to reach (and document progress towards) reduced phosphorus loading targets for the region's three water-supply reservoirs ever since the mid-1980s, so they have some idea of what works and what doesn't. Despite the appearance of precision suggested by the detailed data inputs to the new models (and the detailed outputs), we all must recognize that the new loading goals (the TMDLs) are still at best approximations of where we need to be.

Response: MDE appreciates the commentors' point that a TMDL modeling project by its very nature yields an estimation of the loads needed to meet water quality criteria. While every effort is made to achieve accuracy in baseline conditions, the most important component of the TMDL development process *per se* is the determination of the assimilative capacity of the receiving water body. Providing a broad outline for implementation is also part of the development process, but it must be understood that the details of achieving and documenting the implementation of the TMDL are beyond the scope of the TMDL development and documentation process. MDE remains confident that the watershed and lake models provide an accurate assessment of the reservoirs' assimilative capacity for total phosphorus, and, in the case of Loch Raven, sediment. Readers are encouraged to view the document, "Maryland's 2006 TMDL Implementation Guidance for Local Governments" (available at http://www.mde.state.md.us/Programs/ WaterPrograms/TMDL/implementation.asp#local).

13. The commentor states that the practical value of the completed models and the TMDLs lies in demonstrating how far we still need to go to protect the two lakes from eutrophication, and in suggesting what land uses or activities in each watershed are contributing relatively high proportions of the annual phosphorus and sediment loads reaching each lake. (The watershed model documents that phosphorus loads from point sources—essentially two municipal sewage plants--amount to less than 1% of the average annual phosphorus loadings entering each reservoir.) The commentor asks the following: are agricultural lands the biggest contributors of total phosphorus and sediment; how do the loads coming from farmland

compare to the contribution from stream channel erosion (scour); and to the contribution from impervious surfaces, such as those found at large commercial areas and employment centers?

Response: As a share of the total load, agricultural is by far the largest source of total phosphorus and sediment, accounting for over three-quarters of the total phosphorus load to Prettyboy Reservoir and over half the phosphorus and sediment load to Loch Raven Reservoir. In contrast, while scour accounts for about one-quarter of the sediment load to Loch Raven Reservoir, it accounts for only about 2% of the phosphorus load to the reservoirs. On a per acre basis, total phosphorus loading rates from impervious land range from 2.66 to 3.28 lbs/acre/year, comparable to loading rates for conventional till agriculture, which ranges from 1.64 to 3.41 lbs/acre/year. There are fewer acres of impervious land than cropland, however, so the contribution to total load is less. Loading and allocations by land use (and jurisdiction) are available as an appendix to the document. Please also note the response to comment #17.

14. The commentor states that the RTG believe that the Hydrological Simulation Program Fortran (HSPF) watershed model for the Gunpowder above the reservoirs should be unambiguous in representing the loads coming from the various major land uses, to such an extent that we can rely on the model results to help us set priorities for our collective cleanup and restoration efforts in the watersheds.

Response: No model, by its very nature, can be completely unambiguous, if that term is to imply the elimination of uncertainty. MDE believes that the models are sufficiently accurate in representing loads from the land and in representing the in-lake response. The Department hopes that the modeling can help local jurisdictions and stakeholders in the development of reservoir cleanup and restoration efforts, and believes that to be the case. MDE appreciates the RTG's interest in working to implement the reservoir TMDLs.

15. The commentor states that the "urban" or "developed" category of land cover applied in the HSPF watershed model seems to be overly broad. It includes land uses ranging from high-density commercial/industrial lands (as in Hunt Valley) to relatively low-density residential areas (perhaps even 3-acre lots). The commentor provides as an example, Baltimore County staff report that the County's database recognizes about 25% of the Loch Raven watershed as "developed", while the method you used put "developed" areas at 35% of the same watershed. In the Modeling Framework report, which supports the TMDL report, Table 3.5-1 contains a number of mostly rural subwatersheds, such as nos. 50, 70 and 90, which have been assigned unrealistically high percentages of "urban" land area.

    The commentor states that the discrepancy in 1997 land use between the Maryland Department of Planning data and the values used in the HSPF watershed model needs to be resolved. Based on the supporting documentation in the Modeling Framework report, this discrepancy appears to arise from the use of the Farm Services Agency (FSA) data to get accurate cropland information. The report explains that any difference between the FSA and the Maryland Department of Planning (MDP) cropland acres was assigned to the "pervious

urban" category, thereby inflating the "urban" component of watershed land use by ~75%. A review by Baltimore County staff of the 2002 MDP land use data layer and 2005 aerials found that the MDP data does not underestimate the urban component to this extent. The cropland differences could be due to crop acres lying fallow, horse pasture not picked up by the FSA, forest cover included in the MDP crop acres, or other discrepancies.

The commentor continues that in reviewing the 2002 MDP land use data for the Loch Raven watershed, Baltimore County staff came up with a total of 139,578 acres within the county, with 24.3% designated as urban, 36.9% as agriculture and 38.7% forested.

The commentor states that it would seem that the assignment of the correct major land cover types and their respective extent in each watershed is necessary to correctly prioritize among the source categories for TMDL implementation planning.

Response: MDE has addressed this discrepancy. In the initial stages of the watershed model development, MDE, recognizing the importance of agricultural land, sought to get the best possible estimate of cropland actually under cultivation. The Department still feels this need is important, and has been accomplished. The method, in summary using Farm Services Agency information to verify MDP land use data, resulted in a smaller subset of cropland, leaving a remainder that needed to be assigned to some land use category. MDE believes it is likely that some of the land in question had indeed shifted to low-density urban cover, some to forest cover, some to horse pasture, and some to various fallow or transitional agricultural cover. For modeling purposes, the land was parameterized in the same way as pervious urban land. This modeling approach has been used by the Chesapeake Bay Program, and is believed to provide a reasonable approximation of nutrient and sediment export from what is essentially a mixture of several categories of anthropogenically modified open land. This mixture should have been referred to as "mixed open" land use, and MDE regrets the confusion arising from our lumping it with true pervious urban land use. MDE believes that the parameterization of this "mixed open" land is representative and accurate, and there is no need to modify the watershed model or perform any additional modeling runs. However, MDE will change the documentation to accurately characterize the land as "mixed open." Again, this is consistent with prior efforts (e.g., Chesapeake Bay Program modeling), and acknowledges the shifting and uncertain nature of the land cover to which the commentors refer.

16. The commentor states that on land counted as residential development in the more rural areas, it is misleading to assign "typical" residential percentage imperviousness to such parcels. The Modeling Framework report is somewhat unclear about how loads from rural residential areas were handled. Section 3.5.0 states, "For modeling purposes, land categories were aggregated into five major groups: forest, agriculture, pasture, pervious urban and impervious urban." Yet Table 3.5-1, Gunpowder Basin Land Use by Model Segment, just shows a single column for "urban"—indicating no apparent distinction between pervious and impervious acres within each segment.

    The commentor states that this distinction is potentially important. Many rural parcels are developed leaving pre-existing forest areas intact. And rural residential development tends to

have disconnected impervious cover, with the runoff directed over pervious land (lawns, gardens and woods), resulting in infiltration, as opposed to the pattern in more highly urbanized residential land, where the impervious cover is directly connected to the hydrologic system via storm drains.

The commentor continues that according to Baltimore County staff, the total impervious area in Loch Raven watershed within the County is some 6,250 acres, based on a Geographic Information System (GIS) data layer for roads, parking lots and buildings that was developed from 1997 aerials. It appears that, to calculate the impervious cover for the Gunpowder HSPF watershed model, an average "percentage imperviousness" for each type of urban land use was assigned and the resultant impervious acreage calculated. The commentor states that the Modeling Framework report does not clearly state what acreages of impervious cover by segment were used in the HSPF model.

The commentor requests that if possible, the phosphorus loads from urban/developed lands should be allocated to *impervious* cover areas and to *pervious* cover areas for each watershed or each modeled segment. Given the high per-acre phosphorus loading rates usually associated with impervious cover, it is important to represent this feature of each watershed correctly.

Response: Impervious and pervious developed land uses were simulated separately in the HSPF model. Both pervious and impervious land were calibrated to the same target concentrations of total suspended solids (TSS) and total phosphorus (TP), based on monitoring data collected for Multiple Separate Storm Sewer System (MS4) permits in Maryland, but because runoff from impervious areas is more than an order of magnitude greater than from pervious areas, the loading rates for impervious land is an order of magnitude higher. Only the total load for developed land is reported in TMDL documentation.

MDP provided the percent impervious area of each Maryland 12-digit watershed in the Gunpowder Falls watershed. The percent imperviousness was then apportioned to the model segmentation using GIS. The total number of impervious acres represented in the model for the Baltimore County portion of the Gunpowder Falls watershed above Loch Raven Reservoir is 4,015 acres, which is somewhat less than calculated by the commentator but is comparable to the 4,445 acres estimated by the Chesapeake Bay Program for the Loch Raven Watershed in Baltimore County for the same period.

While pervious and impervious land were treated separately in the modeling parameterization, it is not possible at this point to separate the allocations. Refined knowledge of that nature is available at the local level and may be utilized during the implementation process.

17. The commentor states that the sediment loadings and total phosphorus (TP) loadings attributed to channel scour in the Modeling Framework report seem to be very low. The commentor presents an example: the Loch Raven watershed model attributes to channel scour 12% of the TP and 11% of the sediment delivered by Western Run. Baltimore City staff note that studies of watershed load generation in the literature indicate that scour can

account for more than 50% of the average annual load in a given stream. The commentor states that underestimating the contribution from stream scour, relative to other sources, could have implications for setting cleanup/restoration priorities.

Response: The loads attributed to land use categories are edge-of-stream (EOS) loads, which are the loads that are input into the major river reaches explicitly represented in the model. EOS loads for sediment are the product of edge-of-field (EOF) losses and a sediment delivery ratio (SDR), which is the ratio of EOF loads to the total reach load. The SDR is implicitly applied to solid-phase and particulate phosphorus, which is transported with sediment. The sediment and phosphorus loads attributed to channel scour is determined as the difference between the total in-stream load in the reach and the EOS load. EOS loads, however, may incorporate scour from river reaches not represented in the model, since the SDR only sets the ratio of total reach load to EOF loads, and does not explicitly represent the dynamic, long-term processes governing sediment transport. Detailed knowledge of a subwatershed is necessary to determine, in any particular case, whether sediment and phosphorus loads are best controlled by addressing EOF loads, scour in small tributaries, or some other aspect of the sediment transport process. Where appropriate, streambank stabilization and restoration are effective and creditable elements of sediment and phosphorus reduction; inconsistencies among models, literature and other methods of estimating the relative contribution of scour do not change this.

18. The commentor states that the Modeling Framework report is unclear about how the various models handle the retention of TP loads by Prettyboy Reservoir and the release of loads from Prettyboy to Loch Raven via the Gunpowder Falls. The accuracy of this aspect of the models is a potentially critical issue.

Response: The CE-QUAL-W2 Model of Prettyboy Reservoir maintains a mass balance of flows and constituents, including TP and TSS. As part of the simulation, the W2 model calculates both the flow and the concentrations of constituents leaving the reservoir. On this basis, daily loads of TP and other constituents were calculated and used as inputs into the HSPF simulation of the Gunpowder Falls watershed below Prettyboy Reservoir. The long-term retention of phosphorus through settling and deposition of solid-phase organic and inorganic phosphorus was simulated in the W2 model.

19. The commentor states that the main TMDL report, Section 2.2.8, cites the results of a 1999 US Geological Survey (USGS)/Maryland Geological Survey (MGS) study of sedimentation in Loch Raven which estimated that, over its life, the reservoir had lost storage volume by an average 0.13% of its original capacity per year. The commentor states that this average rate is misleading, because it does not include the sediment, which had accumulated (volume unknown) in the section north of the Warren Road Bridge, an area that is no longer navigable by a small boat.

Response: Volumetric retention and loss are metrics of assessment of sedimentation that are widely used in reservoirs, and it makes sense to use these metrics in discussion when the information is available. The commentors are correct in their statement that the average does not

capture the localized effects of sediment deposition. However, it should also be noted that any sediment reduction controls implemented would have a similarly more profound benefit at the localized level than on average. See also response to comment #2.

20. The commentor states that in the main TMDL report, excessive eutrophication of the reservoirs (which is viewed as an impairment of the designated uses under Maryland regulations) is associated with periodically high levels of chlorophyll *a*. Section 3.0 of the TMDL report indicates that MDE is using 10 parts per billion (ppb) chlorophyll *a* (a 30-day moving average concentration) and 30 ppb (the instantaneous maximum) as "endpoint" thresholds to indicate unacceptable chlorophyll *a* levels in the lakes. The commentor continues that in Section 2.2.7, it is reported that the chlorophyll *a* levels in both reservoirs exceed the 10 ppb criterion "frequently, but not regularly" and the 30 ppb maximum standard is exceeded infrequently. Based on Table B-4 (Appendix B), there were 9 samples above the 30 ppb level out of a total of 312 samples (3%). The commentor states that it seems unlikely that a zero percent exceedance number is realistically achievable. The commentor requests a discussion regarding the correct use of chlorophyll *a* data and the regulatory limits--whether reaching the point where zero samples exceed these thresholds is required for compliance--be added to Section 3.0 of the main report.

Response: MDE used current narrative nutrient criteria at the time of development of the TMDL. In 2006, as part of the integrated 305(b) report and 303(d) listing, MDE proposed for public review a listing methodology encompassing a refinement of the nutrient criteria for impoundments. The proposed listing methodology specifies a mean of 10 µg/l during the growing season or other appropriate period of interest, with a 90^{th} percentile maximum of 30 µg/l. Pending approval by EPA, it is expected that in the future, assessment of impoundments in the State would be conducted in the context of the listing methodology. It should also be noted that the load reduction specified to meet the TMDL in the modeling work MDE conducted was driven by the 10 µg/l mean criterion, and not the 30 µg/l instantaneous criterion.

21. The commentor, referencing the main TMDL report, states that the average annual loads for sediment and total phosphorus (TP) entering Loch Raven and for TP entering Prettyboy during the 1992-1997 baseline period should be clearly stated. The commentor states that it would help the reader to understand how large a reduction is being called for in each case.

Response: This information has been added to the report as an appendix.

22. The commentor requests that Section 4.5 of the main TMDL report state the estimated 1992-97 average annual loads entering each reservoir from point sources and from NPS, as classified in Table 7, which presents TP allocations for each reservoir. The commentor states that this would help the reader to better understand the reductions called for in Table 7.

Response: This information has been added to the report as an appendix.

23. The commentor requests, if possible, the main report should estimate each county's 1992-97 average annual load contribution of total phosphorus and/or sediment to each reservoir. The commentor also asks if York County land use and loads are included in the HSPF model.

Response: This information has been added to the report as an appendix. York County loads are included in the model.

24. The commentor asks in defining the calibration scenario and the baseline scenario, the text of the main report should state clearly (if this is correct) that, in estimating urban nonpoint source (NPS) loads and agricultural NPS loads for 1992-1997, the best management practices (BMPs) already in place were accounted for. The commentor states that this is presumably the case, if MDE could get the simulated loads computed by the HSPF watershed model to come close to the observed/measured loads in the tributaries. (The Modeling Framework report does explain how certain agricultural BMPs were recognized in setting up the watershed model.)

Response: The modeling as conducted inherently captures the effects of BMPs in place during the calibration period, as explained in the modeling report. The reader should note that it is the *effect*, not the *presence,* of any BMPs that are captured, as the model was calibrated to data.

25. The commentor asks what date should be treated as the "cutoff point" for the definition of "baseline" land cover conditions and for the recognition of pre-existing BMPs? Perhaps the end of 1997?

Response: Baseline land cover conditions can probably be assigned as 1997, as that was the "date" of the MDP land use data that constitutes the bulk of the land cover as rendered in the modeling work. Regarding dating the BMPs, this is not a straightforward question with a specific answer, since, as described above in the response to Comment #4, the model captures the effects of existing BMPs at the time of calibration—*i.e.*, over a six-year period, not before and after a specific point in time.

26. The commentor states that the TMDL load allocation among the various sources is not clear from the two documents. A table giving the loads such as the one below would be valuable in assisting the local jurisdictions to develop implementation plans to achieve the TMDLs. There should be a table (similar to the one below) or chart allocating the loading goals for each watershed.

	Point Sources	Urban WLA	Agriculture	Forest	MOS
Carroll County	XX (lbs)	XX (lbs)	etc.		
Baltimore County	etc.				
Harford County					
York County					
Total Load					

The commentor also suggests that a second table should be added indicating the TMDL load reduction scenario, such as the one below.

	Point Source	Urban WLA	Agriculture	Forest	MOS
% Reduction	0%	15%	??	0%	
Carroll County	YY (lbs reduction)	YY (lbs reduction)	etc.		???
Baltimore County	etc.				
Harford County					
York County					
Total Load Reduction					

Response: This information has been added to the report as an appendix.

27. The commentor requests that the main TMDL report provide some preliminary guidelines for how the local governments and cooperating agencies can go about documenting their progress towards the TMDLs since the 1992-97 "baseline" conditions. For example, do land use changes since the start of 1998 and agricultural and urban BMPs applied after 1997 count towards/against the needed total phosphorus and sediment load reductions?

    The commentor continues that under Section 5.0 of the main report ("Assurance of Implementation"), there should be a brief, general statement that changes in farming activity since, say, the end of 1997 (*e.g.*, reductions in the number of livestock operations/numbers of animals, reductions in total acreage being planted and fertilized, the installation of specific BMPs, the implementation of nutrient management plans, etc.), when properly documented, can be counted towards the requisite NPS phosphorus load reduction. (Land use changes or practices which would tend to *increase* phosphorus loads would have to be counted as well, heading in the "wrong direction".) There should be a similar statement about the installation of new or retrofitted urban stormwater BMPs since the end of 1997.

Response: A brief statement concerning the applicability/creditability of existing management practices or changes in land use since a certain point has been inserted. Going into much further detail enters the realm of an implementation plan, which is beyond the scope of the TMDL development process and documentation. Regarding the guidance that the commentors request, readers are encouraged to refer to MDE's document, "Maryland's 2006 TMDL Implementation Guidance for Local Governments."

28. The commentor states that Section 5.0 of the TMDL report correctly recognizes the key programs, studies and strategies that already are in place to try to protect the reservoirs. At the same time, this section should acknowledge the fact that not all current NPS control programs in the watersheds are adequately staffed and funded. Urban runoff mitigation in older suburban areas and technical assistance to farmers needing BMPs are two areas that

come to mind. The commentor ends by stating that unless key programs in these areas are strengthened, the TMDL goals probably cannot be met.

Response: MDE encourages the implementation of programs and practices as described by the commentors. MDE believes that the TMDL goals are reasonable and achievable. The commentors are also encouraged to view the document, "Maryland's 2006 TMDL Implementation Guidance for Local Governments."

29. The commentor requests that Section 5.0 discuss the possible future need to "cap" total phosphorus and sediment loads, if and when the TMDL goals are achieved. The commentor asks would existing programs and policies be sufficient to allow us to maintain the caps?

Response: The question of whether programmatic and other approaches to implementation of this TMDL will result in a lasting, permanent 'cap' to loads is a detailed implementation issue that is beyond the scope of this TMDL document. However, Maryland law, specifically the antidegradation clause, specifies that water bodies meeting standards do not degrade. This would apply to an instance in which a water body had been restored due to implementation of a TMDL.

30. The commentor states that despite the various concerns that they have raised with these comments, the members of the RTG want to recognize the long, hard effort that was carried out by MDE and its consultants to create and calibrate the several computer models, to run various scenarios, and to develop TMDL recommendations for Prettyboy and Loch Raven.

Response: MDE thanks the RTG members for their support and efforts in restoring and maintaining water quality in these reservoirs.

Comments from the Public Review of the Technical Memoranda:

31. The commentor states that Table 1B shows a total sediment WLA of 1,208 tons/year for the Loch Raven Reservoir but the TMDL report shows a total sediment WLA of 1,151 tons/year for the Loch Raven Reservoir on pages 35 & 37.

Response: The correct sediment WLA is 1,208 tons/yr. The entries on pages 35 and 37 have been corrected and numbers reconciled throughout the document.

32. The commentor references Table 1B shows permit number MD0000175 for Texas Quarry and asks is this the same permit as the limestone quarry and concrete production facility, LaFarge Mid-Atlantic and Imerys, discussed in the TMDL Report?

Response: It is the same permit. The facility is known officially as "LaFarge Mid-Atlantic and Imerys" in the permitting documentation, but referred to colloquially as "Texas Quarry."