

Appendix B

Responsiveness Summary for the South Fork South Branch Potomac River, South Branch Potomac River, Including Lunice Creek, Mill Creek, and North Fork, and Anderson Run TMDLs

Introduction

EPA and WVDEP requested comments on a proposed TMDLs for the South Fork South Branch Potomac River, South Branch Potomac River, Including Lunice Creek, Mill Creek, and North Fork, and Anderson Run, West Virginia. The public comment period lasted from October 22, 1997 through January 9, 1998. EPA and WVDEP held a public meeting on the topic on November 19, 1997 in Moorefield, West Virginia.

EPA and WVDEP received written comments from twenty-five individuals. Below is a list of commenters and their affiliation, the date they submitted comments, and numbered references to the comments they submitted. In the pages that follow, we excerpted and summarized comments from the written we received and responded to each.

LIST OF RESPONDENTS

Organization	Author	Date	Comments
USDA, Natural Resources Conservation Services	William J. Hartmann	11/20/97	1-6
	Joseph Wilkins	11/24/97	7
Hardy County Rural Devl. Authority	Mallie J. Combs	11/20/97	8-13
WV Legislature, House of Delegates	Harold K. Michael	11/26/97	14-20
Hampshire County, Solid Waste Auth.	Evelyn V. Baker	11/24/97	21-22
	Rodney A. Branson	11/22/97	23-28
WV Department of Agriculture	Gus R. Douglass	11/25/97	29-34
Wampler Foods	David G. Frackleton	11/26/97	35-44
WV DEP - EE	Jack A. Fleshman	12/04/97	45
	Mary J. Keller	11/24/97	46-47
South Branch Watershed Association	Donna H. Reckart	12/05/97	48-57

Organization	Author	Date	Comments
Hester Industries	Thomas L. Widder	11/24/97	58-85
	Henry Kopple	12/04/97	86
	Craig Etchison	12/05/97	87
Hardy County Commission	J. Michael Teets Roger D. Champ George T. Leatherman, III	12/09/97	88-89
	Gary A. Irons	11/24/97	90
Potomac Headwaters Resource Alliance Inc.	Dr. Margaret C. Janes	12/26/97	91-104
WV Department of Agriculture	Gus R. Douglas	01/05/98	105
Downstream Strategies	Evan Hansen	01/05/98	106-109
	Donna H. Reckart	01/08/98	110-118
West Virginia Rivers Coalition	Pamela C. Moe-Merritt	01/08/98	119-127
WV Manufacturers Association	Karen Price	01/09/98	128-135
	Paul J. Harper	01/07/98	136-141
	Paul J. Harper	01/08/98	142-143
	Gary K. Wilson	12/31/97	144-145

1. Model projections are only as good as the input data. We assume the inventory base data used by the consultant is accurate. A better explanation of the source of the data would have helped determine accuracy.

Data sources, tables, and figures are provided in numerous locations throughout the TMDL documents and are listed in the references section. The scope of the study was to use as much available data as possible. It was beyond the scope of the study to independently verify the accuracy of such data.

2. The function of malfunctioning or improperly installed septic tanks to fecal bacteria levels appears from knowledge of the area be more significant than claimed. We recommend the WV Dept. Of Health be requested to better quantify this contribution.

The agencies acknowledge that information related to the location of malfunctioning and poorly operating septic tanks, as well as the presence of illegal direct discharges of untreated domestic sewage are largely unknown in the watershed. This lack of information is typical statewide. Efforts have been initiated by the West Virginia Department of Agriculture to identify direct discharges of untreated sewage in the affected watersheds. In the best interest to all concerned with water quality in the South Branch of the Potomac watersheds, any illicit discharges encountered will be referred to the local health department for compliance action. The DEP and EPA do not have regulatory authority to address malfunctioning septic systems unless they have the capacity to serve more than 20 persons per day. In the event a malfunctioning system of this capacity is discovered the OWR will invoke regulatory action under the Underground Injection Control Program. Regarding the significance of these sources in the overall bacterial loading in the affected watersheds the Agencies believe the modeling reasonably predicts that they are not significant when compared to the loadings from agricultural sources. Future monitoring efforts by the DEP and the WV Department of Agriculture will provide a better understanding of the bacterial loadings from septic systems. Agency information pertaining to Combined Sewer Overflows in the watershed was reviewed. CSO discharges were infrequent and data associated with the discharge flow and concentration was not sufficient to incorporate into the modeling efforts.

3. The USGS Water Quality Study (1994-95) noted throughout the reports was performed at the request and expense of NRCS. This funding should be noted in the reports

The source of funding for referenced reports has no bearing on the TMDL analysis.

4. Considerable poultry litter is purchased by non-poultry producing neighboring landowners for use on their farm fields. Many times this litter is mismanaged. Therefore, the location of poultry houses may not correctly project the poultry litter problems in a watershed.

This has been noted in the reports (e.g., page 2-6 in the South Branch TMDL report). "For this study, it was assumed that manure from poultry operations was applied within the sub-watershed in which the poultry house was situated. In practice, poultry manure may be transported to or imported from other sub-watersheds; or it may be moved completely out of the South Branch watershed. No information was available as to the specific manure management practices." In the absence of detailed information regarding litter management, spreading, and/or exportation, the poultry house numbers were used as a guide for litter available for disposal. In the future information gathered on litter disposal and related information on field application rates and practices could be used to refine specific subwatershed estimates or support estimates of effectiveness of management implementation.

5. Projections of a 36.1% to 50.6% reduction of fecal bacteria in the streams from agriculture sources appears high. Agriculture is a contributor, but field reviews identify other sources also (septic tanks, etc.).

Both point and nonpoint sources were represented in the model for the South Branch Potomac TMDLs. The three major nonpoint source categories that were addressed in this study were forest land (based on the wildlife populations within the study areas for duck, geese and deer populations), agricultural lands and urban areas (based on literature values) and other background

sources. Contribution of human waste from leaking septic tanks were considered in all the TMLDs in the South Branch Potomac.

6. A large part of the projected reduction in fecal bacteria coming from farm operations should be realized upon completion of the ongoing PL-534 land treatment project. This voluntary program focuses on reducing fecal bacteria contamination of rivers and tributaries in the Potomac Headwaters.

The water quality data used in the development of the models was collected during the 1994 through 1996 period. The PL-534 land treatment project was initiated in January, 1997. As noted during the public meeting, there has already been considerable work initiated as a result of the PL-534 project, which was not reflected in the TMDL study. Therefore, some reductions in bacteria loading could quite possibly have already been realized. Continued implementation of the PL-534 project with additional federal and state cost sharing and loan funds, in conjunction with voluntary landowner installation of necessary practices, should result in achievement of the target reductions.

7. At the public meeting of 11/19/97 a statement was made that wildlife is not a problem in river pollution. I disagree! Our summers are dry and the herds of wildlife - mainly over-populated deer - roam the woods leaving droppings. In winter the snow softens the droppings and they wash off the steep mountains into the rivers in wet weather streams. A tremendous acreage drains in all at once.

At the 11/19/97 public meeting it was stated that wildlife were taken into account in the analysis. This is also indicated in each of the TMDL reports.

8. The information that has been identified by DEP to use as the TMDL for the South Branch of the Potomac and several tributaries is in great error. Only the agriculture and poultry industry were identified in this TMDL program study report. No other non-point sources were included in the program document, therefore municipal sewer plants, wildlife, especially our high volume deer, geese and raccoon population, individual septic systems, etc. were not included.

Both point and nonpoint sources were represented in the model for the Potomac TMDLs. The three major nonpoint source categories that were addressed in this study were forest land (based on the wildlife populations within the study areas for duck, geese and deer populations and other background sources), agricultural lands and urban areas including septic systems (based on literature values).

9. Please be aware that Hardy County and the South Branch of the Potomac and tributaries has made great progress in regards to water quality since your proposed TMDL program 1990-91 data. This is 1997 and many progressive activities have been pursued with positive results.

See response to Comment #6.

10. West Virginia is ranked 33rd in all chicken production and 17th in broiler production. The states ranked in front of West Virginia include: Arkansas, Georgia, Alabama, North Carolina, Mississippi, Texas, Maryland, Delaware, Virginia, California, Oklahoma, Missouri, South Carolina, Florida, Tennessee and Pennsylvania. Moreover, there are different uses and benefits of poultry litter. Uses include: Grasslands as natural fertilizer, sale of litter to other landowners, litter sale to litter brokers, composting, beef cattle feed, mushroom growing and fish food.

The TMDL study reflects impacts from agricultural sources in the South Branch Potomac and selected tributaries, possibly including but not limited to poultry production. This comment implies that West Virginia's median national ranking in poultry production would somehow negate the potential for poultry production to contribute to the adverse water quality impacts indicated by actual data. DEP cannot accept that premise. DEP acknowledges the potential beneficial uses of poultry litter and will continue to work with its agriculture agency partners to promote alternative uses.

11. The West Virginia Poultry Association helped develop nutrient management voluntary guidelines for producers and those involved with the poultry industry. West Virginia has more than adequate land acreage available in the counties with poultry concentrations for grass and crop land application. Increased volumes have not created a problem since demand exceeds supply.

The agencies acknowledge and applaud the efforts of the West Virginia Poultry Association's involvement in the development and promotion of nutrient management guidelines for the poultry industry. While overall adequate land acreage may exist for beneficial use of litter for grass and cropland application, that may not be the case in certain areas. In fact, the litter hotline has been an effective mechanism to identify landowners that need and want the litter not only in areas within the Potomac drainage but in other parts of the state as well. This indicates that there may not be a recognized demand for the litter in the area that it is generated and that in some areas supply may indeed exceed demand. A concerted effort must be made to link potential users with the product.

12. In order to achieve a fair model for TMDL for the South Branch of the Potomac and several of its tributaries, it is requested that 400 be used rather than 200. The acceptable level is 400 and this correction would alter your model tremendously.

The West Virginia state standard specifies that the maximum allowable level of fecal coliform for primary contact recreation shall not exceed 200 cfu/100 ml as a monthly geometric mean (based on not less than 5 samples per month). The fecal coliform content also shall not exceed 400 cfu/100 mL (individual observation on a day) in more than 10 percent of all samples taken during any one month. The dynamic modeling performed for the TMDL produces output continuously. This continuous output is a substantially larger amount of information than the limited number of samples normally taken in a month. Model results were compared to the 200 cfu/100 mL as a monthly geometric mean standard, which is representative of the overall condition of the stream and is less stringent than the 400 cfu/100 mL standard.

13. A TMDL should not be established for the South Branch of the Potomac and several tributaries at this time. Current data that is available does not include non-point sources. Establishment of a TMDL program at this time based upon 1990-91 data targeting ONLY the agriculture and poultry industry is not a good use of West Virginia resources and could result in a legal challenge. Revisions to an outdated and flawed TMDL program in 2001 will continue to be an established 1997 flawed TMDL program.

The commenters request that a TMDL program not be established for the South Branch and its tributaries at this time can not be granted. The timetable is dictated by the consent decree and requires that seven TMDLs be completed for 1997 and the deadline has been extended to February 20, 1998. TMDLs for the South Branch and its five tributaries account for six of these seven. There is neither time nor resources to replace these six TMDLs.

The commenter states that current data does not include nonpoint sources. While the data does not explicitly include numbers for each source at each location, it does contain values of fecal coliform at each sampling site. That information was used to calibrate the water quality model. The model is a computer program which calculates the distribution and movement of pollutants within the modeled system. Nonpoint sources were included in the model and the model was calibrated so that the contributions from all sources match the available observed data. Data used as input values for the modeling effort was generated from samples taken from March 1994 through August of 1997. 1991 was the year selected as a representative year for rainfall. Once the model was calibrated, simulations were run using the 1991 rainfall data. Agriculture appeared to be targeted because the model showed that, during the times when water quality criteria were being violated, agricultural sources were the dominant contributor. This is during high flow conditions and particularly when the water is rising. During other times, other sources may be the dominant contributor of bacteria, but at those times the water quality criteria was not being violated.

See also responses to comments 41 and 58.

14. The information used by Tetra Tech is not only outdated but appears to be seriously flawed. It was obvious in the public meeting that they had not done sufficient research in obtaining "numbers" on which to base their model. Numerous inaccuracies were pointed out and their response was, "if you have more accurate information please let us know." Inaccurate data in - inaccurate conclusions out!

The Environmental Protection Agency and Tetra Tech, Inc., worked closely with the State agencies to get the most accurate information available and where site specific information was not available literature values were used. It is our goal to use the most accurate data available to use in the model. This is why during the public comment period we requested any additional information from the public.

15. The rivers on the WV 1996 303(d) list contain several that are higher in priority than any in the South Branch watershed. In fact, our highest rated stream is number 17 (Lunice Creek). Why was the South Branch watershed selected since by your own list there are obviously many others that are a greater problem?

A TMDL is a calculation of the loads in a water body which will allow it to return to compliance

with water quality standards, both narrative and numeric. The very fact that one has to calculate loads requires knowledge of the stream, the watershed, the land uses in the watershed, the cities and towns, and the problems associated with each. Many water bodies in the state have problems which are worse than those of the Blackwater River and the South Branch. Those are the seven water bodies for which adequate data was available to do TMDLs. Neither time nor resources were available to alter that fact when the consent decree was finalized with a deadline of less than one year remaining to complete seven TMDLs.
See also response to comment #10

16. Regarding the 303(d) list, we are not listed for actual violations, but potential violations. Why?

The South Branch was placed on the 1996 303d list based on data which WV DEP had showing that violations of the water quality criteria for fecal coliform were occurring in 11 to 25 percent of the samples.

17. Why are we using limited state resources in a watershed that has many, many plans in place to reduce pollution when there are many rivers in the state where nothing has been done?

Many of the state's waters have water quality problems or are in some way impaired. Much data exists on the states waters but much of it is old, unreliable or in some form which is not easily accessible. Both the state and EPA recognize this problem and have developed a strategy to deal with it called the watershed approach. In 1996, the Office of Water Resources began a monitoring program designed to evaluate all the waters of the state and collect data which would be useful for evaluating the health of each water body. The watersheds were placed into five groups and each group was scheduled for monitoring and sampling. Monitoring is conducted each summer using both biological and chemical methods which are standardized so that water bodies may be compared to one another and to others in the state. At the end of five years, a very large number of streams will have been evaluated and a much better picture of their relative health will be available. It is the intention of the OWR to use that and other data to prioritize the water bodies for scheduling of TMDLs.

18. The enclosed news item shows the possibility that heavy defoliation by gypsy moth caterpillars can cause significant increase in nitrogen discharge into our streams. Also, a new lab is to be opened by the Dept. Of Agriculture on January 1st in Hardy County. The lab will undertake a comprehensive water quality study which will provide up to date, accurate information to use as a benchmark for actual conditions of these streams

The South Branch of the Potomac River and five of its tributaries were placed on the 1996 303d list for violations of the water quality criteria for fecal coliform. Nitrogen was not a pollutant of concern in the TMDL because it has not been demonstrated that the South Branch is in violation of any water quality criteria for nitrogen or any of its compounds.

The West Virginia Division of Environmental Protection is working closely with the West Virginia Department of Agriculture in implementing its water quality study. The laboratory and the work proposed by the WVDA will hopefully provide validation and credibility to the efforts of the agriculture community as implementation of the PL-534 project progresses.

19. There are two large commercial composting operations in this area and in 1998 they will

be buying all available poultry litter to convert to a composted soil supplement. As a matter of fact, Loudoun Heights Mulch at Baker in Hardy County is now purchasing litter from growers in Virginia because they cannot obtain enough in the South Branch watershed!

See response to Comment #11. Evidently, in certain areas of the drainage demand does exceed supply.

20. While we realize the tremendous growth in the poultry industry in West Virginia, we also recognize the measures taken to be sure this growth doesn't negatively impact the water quality in the South Branch watershed.

See response to Comment #6. Again, the agencies recognize that significant work has already been accomplished in the South Branch Potomac drainage and encourages that work to continue.

21. In my opinion the South Branch River should be cleaned out and dredged. I believe this would help the problem.

The TMDL for the South Branch of the Potomac River is for violations of the water quality criteria for fecal coliform bacteria. WV DEP and EPA do not have any data, literature, or model results which would indicate that dredging would decrease the fecal coliform counts in the South Branch or any of its tributaries.

22. There needs to be some rules and regulations for the poultry industry. Some farmers do not follow the guidelines.

The West Virginia Division of Environmental Protection has been working closely with the agriculture community for almost 20 years on a voluntary effort to address agricultural water quality impacts. Significant progress has been made in that regard. The majority of the landowners respond cooperatively to their environmental responsibilities. For those who don't, the agency has the regulatory capability of enforcing violations of water quality standards. At this point, the agency has elected to strengthen its compliance strategy, as detailed in the recently developed Agriculture Position Paper, and does not intend to pursue agricultural rules and regulations.

23. TMDLs should not reflect any bias or prejudice towards any one source of fecal coliform, but should be an accurate inventory of potential sources. This is not the case with this document. Maps are shown of poultry houses and feedlots, but not homes, recreation facilities (camps, cabins, swimming areas, etc.), wildlife concentrations or other sources of potential contributors. The recommended solutions to solve the problems should also be as unbiased and cover all contributors to the problems instead of two (parking lot at WLR and agriculture) as indicated in the South Fork TMDL.

The TMDL is an allocation of loads based on calculations done in a model. All of the known loads were included in the model and data was used to account for the rest. Data shows that fecal coliform counts are highest at high flows. The model was calibrated using this data and scenarios

were run to determine the effects of reductions from each source on the concentrations in the river. The model included other sources such as failing septic systems, residential, point sources, wildlife and other background sources. Analysis showed that point sources did not significantly contribute to the high counts at high flow. Wildlife also did not contribute significantly. The primary source of the bacteria was runoff from agricultural lands. Agriculture was targeted for reductions, not because of a bias, but because of an analysis of the sources and their contribution to the actual problem. The data did show some local hot spots for fecal coliform which probably come from point source type discharges. Regulatory action, for dischargers which the DEP has authority over, will be undertaken as issues are encountered. See also the response to comment #2.

24. A real concern exists regarding the way this document addresses wildlife. First, it is very incomplete when it comes to species, just to mention a few that wasn't included: raccoon, opossum, rabbit, mink, muskrat, beaver, bear, non water fowl game and nongame, voles, mice, and the list goes on. All species in the watershed should have a value included representing their potential contributions. I also have concerns regarding the resource material used (Metcalf & Eddy 1995). I am sure this does not reflect the concentration of wildlife (especially deer) that we have in this area along our river corridors. The whitetail deer population has destroyed its habitat that existed away from agriculture and now depends on agriculture for survival. Representative studies do not reflect the agricultural dependency of deer where that concentration is in river valleys like ours.

Only the primary wildlife species for which information were readily available (deer, ducks, geese) were directly accounted for in the model. The calibration process for the forested region indirectly accounted for any other wildlife species present. The reference text (Metcalf & Eddy 1995) was not used to determine wildlife populations in the study area; it was used to determine the typical concentrations of fecal coliform bacteria associated with various animal species (i.e., duck, cow, chicken, turkey).

25. On average, today's house is designed for a flock of approx. 11,000 birds. If you add in the older houses the average population per house could drop substantially. The average house, once starting houses are eliminated from consideration, probably would average in the 7-8,000 range. I would envision as many as 1/3 or more of the total turkey houses being starting houses and should not have a population accessed to them at all. Fifteen thousand turkeys per house are just too many.

The total number of turkeys is small compared to the number of chickens (broilers and breeders). For example, in Table 2.1.4 on page 2-5 of the South Branch TMDL report, the total number of turkeys in South Branch watershed is 90,000 compared to over 6 million chickens. Using 11,000 turkeys per house instead of 15,000 per house would result in 66,000 turkeys. The net decrease in total poultry fecal coliform bacteria achieved by making this correction would be negligible (less than 0.2%) and would have no impact on the results of the study.

26. BMPs that are presently implemented should be reflected in these documents even though they may be very hard to quantify. You are indicating reduction of fecal coliform

by using BMPs and even state an amount of reduction, therefore we are eventually going to have to quantify the use of BMPs. Why not now?

The modeling study looked at large scale loadings from broad land use classifications. The baseline developed for the study does not explicitly account for all the benefits that may now and in the future reduce fecal coliform loadings in the river. This provides the opportunity for both recently implemented and future BMPs to be used toward reaching the reduction targets. In addition more comprehensive tracking of litter disposal practices, manure management programs, export of litter, and other livestock related BMPs would refine the more localized evaluation of potential loadings and management benefits. Follow-up monitoring can also be used to document improvements due to BMP implementation.

27. Litter that is being shipped or brokered out of the area needs to be incorporated in the calculations of this document.

Since it is not known how much litter is being exported or imported into the study area, such information cannot be incorporated into the calculations. This was due to the lack of specific information on litter disposal practices. Improved tracking information would be beneficial in identifying areas where significant exports may reduce fecal coliform loadings. In some cases this could be a consideration in meeting the agricultural portion of the loading reduction allocation.

28. Reduction, if required, needs to come from all contributors unless, of course, good sound environmental practices are already being implemented. It also seems apparent that each community should make the reduction decisions since those choices after the makeup of their community in the future and this does have that potential.

DEP has no argument with the statement that reduction needs to come from all contributors. Any reduction of bacteria levels in the South Branch or its tributaries indicates healthier conditions in the river. The TMDL, however, is targeted specifically toward reductions which bring the river into compliance with water quality standards. The results stated in the TMDL are what is needed to reduce fecal coliform concentrations to meet the criteria of 200 counts/100 mL geometric mean. Reductions from sources other than agriculture, although beneficial, are not predicted to be capable of achieving that goal. See also the response to comment #23 above.

29. Other sources which should have been considered as a means of pollution are: recreational camps; sewage systems; private systems (or lack thereof); wildlife (a more detailed study is needed. Pollution from this source is grossly underestimated).

Both point and nonpoint sources were represented in the model for the South Branch Potomac TMDLs. The three major nonpoint source categories that were addressed in this study were forest land (based on the wildlife populations within the study areas for duck, geese and deer populations and other background sources), agricultural lands and urban areas including septic systems (based on literature values of estimated failure rates). In regards to wildlife, the West Virginia Division of Natural Resources (DNR) provided estimates of the numbers of geese and ducks within the South Branch region typical of July 1 of any given year. The numbers of birds may vary with the season because of migratory patterns as well as birds moving in and out of the watershed. In addition, deer population was estimated from the Big Game Bulletin. The total deer populations can be estimated as about 10 times the number of buck killed during the hunting

season.

30. Such statements as on page 2-6, "poultry manure may be shipped to other sub-watersheds or may be moved completely out of South Fork watershed; however, no information was available as to the specific manure management practices" is not true. This is public knowledge and is included in West Virginia's Potomac Headquarters Water Quality Project which has been available for months.

Please provide a date for this reference. If it is the May 1996 report listed in the South Branch reference section (PHIWQO 1996), then it does not contain information on the amounts of poultry litter exported from the study area.

31. An extensive study needs to be done instead of a one-year or eighteen-month study that results only in assumption.

The TMDL study was developed using information generated by a 3-year study conducted by the U.S. Geologic Survey and sponsored by the U.S. Natural Resource Conservation Service. This study cost approximately \$300,000. Neither the U.S. Environmental Protection Agency nor the WVDEP has funds to support an additional study at this time.

32. All fifteen watersheds should not be condemned because of six sub-watersheds that have problems. Although several people think this will give more flexibility to the corrections, be most assured that the media and others will see the 43% and that will be all that is seen.

Understandably, the results of the study may be subject to various interpretations by the media and others. It is essential, therefore, that all parties work cooperatively to promote the successes already achieved in the area and to correct the problems that exist. It was not the intent of the study to condemn all watersheds in the drainage area. In fact, it is encouraging that only six sub-watersheds were identified as having problems. Apparently, the majority of the drainage is not being adversely affected.

33. The BMPs as stated in West Virginia's Potomac Headwaters Water Quality Project were never taken into consideration. How a report can be taken to be valid with an ending like this is scary.

Best Management Practices (BMPs) were not represented explicitly in the model. However, BMPs already in place during the representative period 10/1/1990-9/30/1991 are implicitly represented in the model. That is, calibration of the model for the representative period inherently requires consideration of everything in the watershed, including BMPs.

34. Additional data needed to refine the TMDL analysis for point source discharges in the South Fork included the daily flow rates, operating characteristics (i.e., constant or variable discharge), and effluent fecal coliform bacteria concentrations.

Point source discharges are assumed to be essentially in compliance with state regulations for

fecal coliform bacteria. More detailed information of variable flow discharges could be used in developing more refined estimates of localized conditions. However, point sources are a very minor component of the overall fecal coliform load to the study area. Please refer to Tables 2.2.2 and 2.2.3 on page 2-19 of the South Branch TMDL report. Based on the modeling analysis the fecal coliform load is about three to four orders of magnitude less than the Agriculture and Pasture load and about two orders of magnitude less than the Forest load.

35. Wampler is concerned about the development of TMDLs when there are no mechanisms for the adoption and implementation of these TMDLs especially with the emphasis on non-point sources that have not been adequately evaluated.

The Environmental Protection Agency and Tetra Tech, Inc., worked closely with the State agencies to get the most accurate information available and where site specific information was not available literature values were used. The three major nonpoint source categories that were addressed in this study were forest land (based on the wildlife populations within the study areas for duck, geese and deer populations and other background sources), agricultural lands and urban areas including septic systems (based on literature values). This TMDL will be implemented through the Division of Environmental Protection's nonpoint source program. Also, continued ambient monitoring in the South Branch has begun and committed to be continued by the West Virginia Department of Agriculture and should provide a good source of data to measure long term water quality progress. In addition, the State Soil Conservation Agency and the NRCS continue to monitor Best Management Practices and other activities under the PL-534 and other cost-share programs.

36. To appropriately enforce TMDLs there must be rule making and any rule making must be performed in accordance with the state Administrative Procedures Act. In this regard, the following questions are posed:

- 1) If TMDLs do not go through rule making, at what point can NPDES permit holders and even non nonpoint sources challenge the application of load allocations?
- 2) If TMDLs do go through rule making, how do other affected permit holders get their share of load allocations especially when new or existing sources want to expand in an area?

If such is the case, it is essential that sources be allowed to trade allocations without complicated actions of opening every source's permits.

The first round of TMDLs were developed by the United States Environmental Protection Agency and not the West Virginia Division of Environmental Protection. WVDEP simply cooperated in the work of the development of the TMDLs being issued by EPA. Thus, the question as to whether these TMDLs are a contested case, which can be contested to the WVDEP pursuant to W. Va. Code § 29A-5-1 to -5, or an appealable action, which can be appealed to the Environmental Quality Board pursuant to W. Va. Code § 22-11-21, does not arise

This TMDL is being issued by EPA pursuant to a Consent Decree and Settlement Agreement

resolving the litigation OVEC, et al. v. EPA, C.A. No. 2:95-0529, 2:96-0091, in which the plaintiffs contended that EPA was obligated to perform listing and TMDL development activities which plaintiffs alleged West Virginia had failed to conduct. The issuance of this TMDL is being done in conformity with the procedural requirements for such action prescribed by the applicable federal regulations, in particular their public participation requirements. In addition the Consent Decree and Settlement Agreement provide for procedures allowing for various opportunities for public participation in the listing and TMDL development process.

Beyond the public participation opportunities in the process of EPA's development of a TMDL, including this current public comment opportunity, which are prescribed by EPA regulations and those which are provided for in the Consent Decree, in any application of resultant wasteload allocations through a NPDES permit there are opportunities for challenges by the permittee to the terms and conditions of the West Virginia issued pollutant discharge permit, pursuant to state law governing the permitting process. Procedures for the application and issuance of a pollutant discharge permit are prescribed by West Virginia Code § 22-11-11. Pursuant to Section 22-11-21 of the West Virginia Code, any person aggrieved by the terms and conditions of a pollutant discharge permit may appeal to the Environmental Quality Board. Section 22B-1-6, and 7 prescribe the procedures to be followed by the appellant and by the Board in any such appeal. Section 22B-1-8 provides for the right of judicial review of any order ultimately issued by the Board after an appeal hearing, and the procedures for seeking that review.

There is no provision in the Consent Agreement or Settlement Agreement resolving OVEC et al. v. EPA addressing the appeal of TMDLs. There is a right of appeal of the terms and conditions of a permit issued by West Virginia, which might incorporate an effluent limitation derived from a wasteload allocation identified in the development of a TMD. In addition to the response to Comment # 109, the Agencies believe that the rights of other affected parties in an appeal process would be considered by the Environmental Quality Board. The specific process would be one of intervention.) In addition, the question of the appealability of a TMDL itself has been addressed in Dioxin/Organo Chlorine Center v. Clark, 57 F3rd 1517, (9th Circuit 1995).

37. The TMDLs for the South Branch area appear to have been written on very little data. How can other existing data be incorporated and how can new data be incorporated in the TMDLs?

In situations where data is highly limited future data gathering is recommended to support evaluation of compliance with water quality standards. The data can be used to support documentation that water quality standards have been achieved. In addition, should new information be collected which call the results of the original TMDL into question, the original TMDL modeling and analysis can be revised and reevaluated. In some cases this may result in the development of a new allocation and finally the development of a new TMDL. In many cases it is beneficial to track related information (i.e., BMP implementation, manure and livestock management) that can be used to support the case that progress is being made toward the TMDL goals.

The addition of more information at this point - in a piece-meal fashion - is unlikely to significantly change the results of the study. Since the data is limited the analysis was appropriately summarized at a broad scale. Although loading allocation targets were set the level of resolution was limited to watershed-scale groupings of all agricultural sources. This leaves a wide range of alternatives for the implementation of various types of BMPs and actions.

38. The TMDLs seem to be using inadequate assumptions both about the loads of the

nonpoint sources and about the expected reduction in stream levels as a result of improvements of nonpoint sources. It follows that if EPA has unreasonable expectations of the amount of loading from poultry farms, then they will also have unreasonable expectations of the results from BMPs on poultry farms. What happens five years from now when all poultry farms have covered litter and properly used litter and the levels of fecal coliform have not changed substantially? Will it be obvious that EPA did not make an adequate assessment or will they insist that the poultry farms have not done enough?

The assumptions made in the TMDL study were based on the best available information. The monitoring to be conducted by the WV Department of Agriculture will hopefully provide additional information over the next five years, which will guide the agencies participating in the implementation of the recommendations to direct efforts to where positive progress can be achieved. WVDEP and EPA will monitor the implementation progress and work with the agriculture community to insure that the target reductions are realized.

39. There seems to be a need for improved testing and improved testing methods to determine the actual sources of fecal coliform. The TMDLs for the South Branch and Anderson Run both assume that the ratio of fecal coliform to fecal streptococci indicate the likely source of bacterial contamination is from animal waste. This assumption is based on fecal coliform to fecal streptococci ratios measured under laboratory conditions. There is absolutely no evidence supporting the assumption that these ratios remain consistent or have not been diluted under dynamic stream monitoring conditions. It would be interesting if tests of DNA or other means could determine the actual source of fecal (cattle, poultry, human, or wildlife).

We concur that the FC/FS ratio not considered an accurate indicator of fecal coliform sources. In fact, the ratio discussion is included as background information only and is not used as the basis for subsequent modeling or allocation. There is a relatively new method called DNA-tagging which uses DNA from local wildlife to determine the in stream sources of fecal coliform bacteria. This method could conceivably be employed in the study area to determine the primary sources (i.e., deer, cow, poultry, human, etc.) of fecal coliform bacteria in various reaches of the receiving waters. The DNA-tagging method would be a more reliable indicator of the fecal coliform source than would the fecal coliform to fecal streptococci ratios. DNA testing is relatively expensive and would be difficult to implement at a high enough frequency to evaluate the various sources throughout the year and at multiple locations.

40. Is there even enough existing data (pre 1993) to adequately determine if poultry farm improvements or any other nonpoint source improvements are effective?

In 1989, West Virginia completed the Nonpoint Assessment of the entire state as required under Section 319 of the Clean Water Act. Over the past couple of years, significant water quality data has been collected through the NRCS funded USGS study, and the WVDEP Watershed Assessment Program work. Continued ambient monitoring in the South Branch has begun and committed to be continued by the West Virginia Department of Agriculture and should provide a good source of data to measure long term water quality progress. In addition, the State Soil Conservation Agency and the NRCS continue to monitor Best Management Practices and other

activities under the PL-534 and other cost-share programs.

41. I can certainly appreciate the need to do the "easiest" TMDLs first in order to satisfy the court, but it is essential to have in place a mechanism to revisit TMDLs to correct for haste now.

Both the DEP and EPA acknowledge the need to revisit TMDLs to correct for any uncertainties, or to incorporate new data as it becomes available. However, resources necessary to carry out revisits have not been allocated to either agency. Currently all available efforts are being used in the development of the initial TMDLs and national policy supports this action. As more streams are assessed, the candidate pool for TMDL development grows. Absent substantial increases in funding, unfortunately, the focus for the foreseeable future will be on development of initial TMDLs, using the best information available, with little chance for revision.

42. There is also the question of the actual need for some of the TMDLs. For example, if there is a stream that is not a public water supply or used for contact recreation, why is EPA even doing a TMDL for fecal? The same question if a stream were high in nitrates and not used as a public water supply, why bother doing a TMDL?

The South Branch was placed on the 1996 303d list based on data which WV DEP had showing that violations of the water quality criteria for fecal coliform were occurring in 11 to 25 percent of the samples. The South Branch Potomac and selected tributaries are designated for contact recreation and as a public water supply. 40 CFR §130.7 requires that a TMDL be developed to attain and maintain applicable water quality standards including narrative and numeric standards, this also includes designated uses.

43. If TMDLs are the wave of the future, it is important that the waterways be reclassified by their actual use (i.e., public water supply, contact recreation, etc.). That way only the essential TMDLs will be required, providing more resources.

The agencies agree that waterways should be properly classified allowing protection at the appropriate level. Currently the Bureau of Environment's Environmental Quality Board (EQB) is charged with designating a streams use. The EQB triennially reviews the stream use classifications and forwards its recommendations to the WV Legislature for approval. Upon legislative approval, the uses become law and the DEP is required to ensure that use based water quality standards are protected.

44. TMDLs should all be reopened in the event EPA completes writing guidance for them.

There has been guidance already developed by EPA on TMDLs. However, EPA does not have the flexibility to wait as more guidance is developed and to delay developing TMDLs. If the condition of a stream significantly changes or new information is available, the regulation does allow the TMDL to be modified. However, EPA cannot at this time guarantee that all TMDLs will be modified.

45. Page 1-3 notes that "It is important to understand that any BMPs implemented since 1991 are not explicitly accounted for in the model since their impact on loading rates is not

known due to lack of before and after monitoring.” Since the report is based on sampling performed in 1994 and 1995 and confirmed by additional sampling in 1996 and 1997 the quoted remark appears to be in error and should be removed. Similar statements regarding BOPS and the 1991 date appears on Page 2-17 and in other locations in these TMDL reports such as Page 3-3 and the Anderson Run TMDL report.

The modeling study looked at large scale loadings from broad land use classifications. The baseline developed for the study does not explicitly account for all the benefits that may now and in the future reduce fecal coliform loadings in the river. This provides the opportunity for both recently implemented and future BMPs to be used toward reaching the reduction targets. In addition more comprehensive tracking of litter disposal practices, manure management programs, export of litter, and other livestock related BMPs would refine the more localized evaluation of potential loadings and management benefits. Follow-up monitoring can also be used to document improvements due to BMP implementation.

46. I wonder if saturation by poultry corporations has not helped create unsafe water. Why shouldn't these businesses be required to develop means of litter and sludge disposal that is not harmful? If they cannot afford to devise modern technology, then let the federal government do it. We can afford to send men to the moon and give aid to half the nations on earth. We should use taxpayer's money to take care of our own problems.

WVDEP and EPA are working with the poultry integrators (businesses) and the producers to promote installation of practices to protect water quality. Many of the practices require significant capital investment that is difficult for the landowner to install. Federal and state cost-share funds are available to assist landowners and WVDEP has recently initiated a low interest loan program to supplement the costs.

47. I remind you the streams were so low this summer there was barely enough water to test.

WVDEP conducted water quality sampling in the South Branch Valley in August of 1996 and three times in 1997, June 3 and 4, July 15, and August 25 and 26. The August 96 and June 97 samples were done at high flow conditions and the July and August 97 samples were done at low flow conditions.

48. There was an overestimation of poultry litter production and application

The estimates of poultry litter and production are based on limited information on the location of poultry houses. More detailed tracking of poultry litter disposal locations and practices would be needed in order to improve the accuracy of litter application rates.

49. Volume of litter which was transported out of the area was not researched.

Several references were made to the studies failure to quantify the volume of poultry waste leaving the watershed via the brokerage services provided by the Poultry Litter Hotline and the private efforts of individual growers. DEP and EPA concede that the study does not accurately represent the volume of litter being exported out of the affected watersheds. The Poultry Litter Hotline, as it is currently structured, does not track where and if transactions are actually made.

The service merely connects buyers with sellers and makes known the amount of litter available from the seller who uses the Hotline's services. Recognizing the limitations of the Hotline information, it was impossible for the modelers to represent which operations were actually exporting litter out of the watershed. Regarding individuals who effect out of basin transfers of litter, no agency currently monitors this activity. The DEP and EPA strongly encourage the beneficial reuse of this product in areas where soils can benefit from nutrient enhancement, and believe that continued efforts in this area will decrease the amount of fecal coliform loading in the watershed. The Agencies applaud the efforts of the WV Department of Agriculture, and the State Soil Conservation Agency to support and operate nutrient management efforts, including the Poultry Litter Hotline.

50. Commercial composting facilities using ALL available litter were not considered.

See response to comment # 49.

51. Implementation of best management practices (litter sheds, composters, nutrient management plans) was not considered.

See page 2-21 of South Branch TMDL under Section 2.3.1 Incorporating a Margin of Safety: "The baseline year for calibrating NPSM for this TMDL was 1990-91. Any BMPs which have been implemented in the watershed since 1991 are not explicitly included in the model and the resulting allocation reductions should be adjusted in the next phase of this TMDL to reflect the effectiveness of these BMPs." In other words, additional in stream monitoring can be used to track compliance with water quality standards. Implementation of BMPs and tracking of manure management practices can be used to support achievement of the loading allocation.

52. Contribution of human waste from leaking septic tanks, combined sewer overflows (CSOs), sewage "straight-piped" to streams was not considered.

Contribution of human waste from leaking septic tanks were considered in all the TMDLs in the Potomac. Septic system discharges were quantified based on the population distribution, an assumed daily average discharge of 70 gallons per person per day, an assumed septic effluent concentration 10^4 cfu/100ml of effluent and a 2.5 % failure rate . Also see Response to Comment 2.

53. Package plants which are in non-compliance or not permitted were not considered.

Data on all permitted point source discharges, including package plants, in the affected watersheds was collected by DEP. DEP is not aware of any non permitted package plants in the South Branch watershed. Operation of a non-permitted package plant or violation of permit limits is an enforcement issue and need not be dealt with in the context of the TMDL. If you wish to report a sewage treatment plant which is operating illegally, please contact West Virginia DEP's Environmental Enforcement Division at 1356 Hansford St., Charleston WV 25301, phone 304-558-2497 or 1 Depot St., Romney, WV 26757, phone 304-822-3551.

54. Contribution of gypsy moth was not considered.

Fecal Coliform is measuring enteric bacteria coming from warm blooded animals. All insects are

cold blooded animals, so they do not produce enteric bacteria, the bacteria sampled in the South Branch. Therefore, bacteria from gypsy moths was not included as a loading source of fecal coliform in the South Branch Potomac.

55. Deer and geese population were underestimated.

Deer and geese populations were provided by WVDNR and are believed to be reasonable estimates unless other data can be presented indicating otherwise.

56. Raccoon population was not mentioned as being incorporated.

Racoons were not explicitly included in the TMDL reports but were implicitly included in the methodology used to calibrate the fecal coliform loads for forest land use.

57. Inaccurate and incomplete data used to formulate the computer model have resulted in an inequitable share of the blame being placed on agriculture. For example, the high levels of fecal coliform were not associated with high levels of nitrogen and phosphorus as would be expected with this type of agricultural run-off. Since bad data were used in a flawed computer model, bad assumptions were made which result in unreasonable demands being made upon the agricultural community in this area

A principal components analysis was performed by the USGS in their Stream water Quality report (Mathes 1995, p. 18-19). This analysis showed a statistically significant relation (at 95-percent confidence) between concentrations of fecal coliform bacteria and fecal streptococci and concentrations of nitrate in the streams sampled. This tends to corroborate the assumption that the source of fecal coliform bacteria is from agricultural areas. In addition, the Potomac Headwaters Report (PVSCD 1995) contains the following statements on page 22: "Although additional data is needed to verify bacteria sources, the ratios of fecal coliform to fecal streptococci indicate a nonhuman source. Also, graphical and statistical analysis of the data indicates a possible relation between bacteria concentration and the number of poultry houses and livestock feedlots."

Multiple sources were evaluated as part of the formulation for the model and subsequent analysis. Broadened data gathering and tracking would be beneficial in refining the specific loading characteristics in the watershed. Selective monitoring would assist in identifying and correcting potential hot spots such as leaking septic systems, direct discharges/straight pipes. Because of the limited data the TMDL was developed as a large scale allotment for reduction and provides the various components of a agricultural community with a wide range of options for addressing fecal coliform management.

58. DEP should consider de-listing the South Branch of the Potomac River. The available data do not support this listing and this TMDL and the subsequent actions will simply consume the DEP's limited funds. These funds could be better used by gathering sound data or preparing TMDLs on streams that are actually in violation of the applicable water quality standards.

DEP and EPA cannot support de-listing of the South Branch of the Potomac River and its tributaries for which TMDLs have been developed until such time that the TMDLs are approved

by EPA. The South Branch and selected tributaries all have had recorded violations of the states fecal coliform standard. Based on previous water sampling efforts in the area, water quality personnel in both agencies strongly believe that targeted sampling during rising water soon after a storm event in all of these watersheds would reveal fecal coliform concentrations substantially higher than the standard. Regulations provide the ability for agencies to list streams on the 303(d) list when there are actual repeated water quality violations occurring or the when the water body is threatened. A mixture of both of these reasons is why the DEP listed these water bodies on the 1996 303(d) list. The South Branch valley tourism and agricultural industries are vital to the local economy and the Agencies believe that the expenditure of funds to improve and protect the water quality resources of the South Branch Valley are well justified.

59. When TMDLs first came about, the former director of DEP, Dr. McCoy, assured various groups they would be developed in cooperation with the public. Public participation was supposed to include interaction on the listing of the streams, collection of pertinent data and input with regard to implementation. At this point, the public has not been involved in this process. Although the draft TMDLs constantly reference a lack of good data, no attempt has been made to solicit this information from the public or enlist their cooperation in its collection. Additionally, the draft TMDLs seem to contain foregone conclusions on TMDL implementation. It seems the commitment made by Dr. McCoy is not being upheld. Therefore, we suggest this TMDL and all subsequent TMDLs be promulgated as rules with legislative review. This will ensure public participation in a process that can profoundly affect us all.

Ideally, the TMDL process should involve involvement and participation by not only the public but also all affected stakeholders. Although the WVDEP was not directly involved in the deliberations surrounding the TMDL lawsuit, it did provide input in regard to potential state participation in the eventual resolution and future implementation of the results. During the deliberation, then Director McCoy, acting on advice of counsel and staff, indicated that TMDL development should and would be conducted in an open forum with input by all parties. That assurance was based on WVDEP's intent to use the Watershed Management Framework process, supported by water quality data generated by the Office of Water Resource's watershed assessment program. The Watershed Management Framework is composed of key state and federal agencies that have committed to sharing resources to collectively identify watersheds with water quality impairments and develop strategies to maintain, restore and protect them. Public and stakeholder involvement is critical to the successful development of those watershed strategies. While the original intent of this process was not to develop TMDLs, it would obviously lend itself to that result. Also, the Framework process requires a five-year cycle of assessment, priority selection, management plan development and implementation. Unfortunately, the consent decree, which was issued in June 1997, included a schedule, which did not reflect the Framework's deliberative process. Both WVDEP and EPA were required to identify TMDL streams, collect water quality data, develop models, and produce a TMDL report for seven streams within the June to November, 1997 time frame. The magnitude of the work involved in meeting that schedule did not allow as much time as we would have liked to involve the public and affected stakeholders. The public meeting held in Moorefield on November 19, 1997 provided the agencies with the opportunity to explain the TMDLs and solicit input on the results. While obviously this does not address the commentors concern regarding timely input, it does reflect the agency's attempt to involve the public within the time constraints imposed by the consent decree. In fact, the public comment period was extended from November through January 9, 1998 to provide the public with opportunity for comment and input in the finalization

of the TMDL studies. As already noted, the schedule imposed by the consent decree will make it difficult to provide the open forum for public input which the previous WVDEP administration, and indeed, the current Director, desire. However, the agency will strive to develop a strategy for stakeholder input in the future, which will respond to that essential need. In regard to TMDL implementation, the proposal recommends a continuation and enhancement of the programs that are already in place in the agricultural community. It is hoped that these efforts will achieve the recommended reductions without the need for more additional controls.

In regard to the proposal to promulgate the TMDLs as legislative rules, the agency contends that the TMDL in a planning tool which represents an assessment of impairment to water quality, an identification of the sources of that impairment and a strategy to achieve beneficial uses and water quality standards by distribution of the loadings among the various sources. This process includes both point and nonpoint source considerations and must be flexible enough to provide the agency, the affected industries and the public with the opportunity for deliberative input and interaction. While that may lend itself to the development of a structured process, and indeed the agency is contemplating developing such a strategy, it is not considered appropriate or expedient at this time to promulgate rules to that effect through the legislative process.

60. The water quality standard for fecal coliform is 200 cfu/100ml when based on a monthly average of 5 samples. When five samples are not available, the standard is not to exceed 400 cfu/100ml in ten percent of the samples taken. The USGS study used to determine stream impairment provided only one sample per month in those months samples were taken, but the standard used to make the impairment decision was 200 cfu/100ml. The data should be re-examined and compared to the appropriate standards to determine if these streams should really be listed.

The South Branch and the five tributaries were listed on the 1996 303d list and the TMDLs have been developed. In the process of developing the TMDLs, it was determined that certain reaches of these streams were, are, and are expected to continue to violate both water quality criteria for fecal coliform bacteria. DEP sees little to gain in going back a year and reevaluating the appropriateness of placing these streams on the 1996 303d list. DEP does, however, recognize the value in carefully scrutinizing each candidate for inclusion on the 1998 and future 303d lists. DEP is developing additional procedures for listing impaired water bodies. Also see the response to comments #58 and 111.

61. Although the documents repeatedly state there is insufficient data in the USGS study to use 200cfu/100ml as the standard, it is continuously, inaccurately applied to the data examined in the studies.

The West Virginia state standard specifies that the maximum allowable level of fecal coliform for primary contact recreation shall not exceed 200 cfu/100 mL as a monthly geometric mean (based on not less than 5 samples per month). The fecal coliform content also shall not exceed 400 cfu/100 mL (individual observation on a day) in more than 10 percent of all samples taken during any one month. The dynamic modeling performed for the TMDL produces output continuously. This continuous output is a substantially larger amount of information than the limited number of samples normally taken in a month. Model results were compared to the 200 cfu/100 mL as a monthly geometric mean standard, which is representative of the overall condition of the stream and is less stringent than the 400 cfu/100 mL standard. Also see response to comment # 111.

62. The TMDL consistently refers to a margin of safety. Why is there a need for a margin of safety in the model if the stream is only threatened and not actually violating the water quality standard?

CFR 40 § 130.7 requires that a margin of safety be used in the development of a TMDL to take into account any lack of knowledge the relationship between the effluent limitations and water quality data. There are two basic methods of incorporating a margin of safety: implicitly and explicitly. The margin of safety is incorporated implicitly into the modeling process by running a dynamic simulation to calculate the daily in stream fecal coliform values.

63. A primary invalid assumption in each of these TMDLs is the fecal contamination comes from animals. This assumption is based on the ratio of fecal coliform to fecal streptococcus. This method of differentiating human and animal sources of contamination could be especially misleading with regard to poultry wastes because these wastes accumulate over the life of the animals in the houses and then may be put in storage or spread. As fecal coliform and fecal streptococci have differential death rates based on a variety of stressors, the ratio could be skewed. Additionally, the 19th edition of *Standard Methods for the Examination of Water and Wastewater*, 1995, specifically states the FC/FS ratio cannot be recommended and should not be used as a means of differentiating human and animal sources of pollution. The ratio is considered unreliable because of variable survival rates of fecal streptococcus group species, the impact of disinfection of waste waters on the ratio, and the affect of the methods for enumerating fecal streptococci.

We concur that the FC/FS ratio not considered an accurate indicator of fecal coliform sources. In fact, the ratio discussion is included as background information only and is not used as the basis for subsequent modeling or allocation.

64. Another significant invalid assumption is the assertion there is a correlation between high fecal coliform levels and high flow conditions, indicating non-point sources as the primary origin of fecal contamination. The TMDL documents provide no proof of a correlation, but make an assumption based on the loose association of high flow as compared to high fecal in a small number of sampling events undertaken by the WV DEP. In order to determine whether or not there is a correlation between these two parameters, actual fecal data from the USGS study should be plotted against actual flow from those sampling events or with a time series hydrologic curve for 1994-9. The resulting R value would prove or disprove the correlation.

A principal components analysis was performed by the USGS in their Stream water Quality report (Mathes 1995, p. 18-19). This analysis showed a statistically significant relation (at 95-percent confidence) between concentrations of fecal coliform bacteria and fecal streptococci and concentrations of nitrate in the streams sampled. This tends to corroborate the assumption that the source of fecal coliform bacteria is from agricultural areas. In addition, the Potomac Headwaters Report (PVSCD 1995) contains the following statements on page 22: "Although additional data is needed to verify bacteria sources, the ratios of fecal coliform to fecal streptococci indicate a

nonhuman source. Also, graphical and statistical analysis of the data indicates a possible relation between bacteria concentration and the number of poultry houses and livestock feedlots." Examination of the data collected by WVDEP in 1997 also shows an increase in fecal coliform concentration under higher flow conditions, although there are insufficient observations for statistical analysis. The modeling results, derived from loading characteristics from the individual land uses, corroborates the loading patterns under low flow and wet weather runoff conditions.

65. As noted in the 10/10/97 letter from the Soil Conservation Agency, the information provided by the Potomac Interagency Water Quality Office is based on "best guesses." Additionally, it is clear no real effort has been made to make an accurate count of litter storage areas or to include their potential impact.

The information provided by the PIWQO for litter storage areas was based on "windshield surveys" and may not be entirely accurate. More comprehensive tracking of litter storage, management, and application would be needed to develop more precise estimates for each subwatershed. The limited information was deemed sufficient to derive the large scale allocations for fecal coliform reductions.

66. The land distribution used in these documents seem to fail to take into account residential acreage. This category should be included to help quantify human contribution in each sub-watershed.

Residential areas were included in the TMDL analysis in the Urban land use category.

67. The studies' identification and quantification of fecal coliform from wildlife seems to be severely underestimated. As indicated in the Soil Conservation Service's letter of 10/10/97, the geese of the South Fork watershed do not migrate, and the estimated number of 180 geese is a severe underestimate. Also, estimating the deer population at ten times the number of buck killed during hunting season results in another severe underestimation. Additionally, there is no mention of road kill in the estimate of deer population, does the factor of ten take these animals into account? Finally, the discussion of wild animal populations in the area omits any estimate on raccoon population.

In their letter of 10/10/97, WVSCA stated that they estimate 1500-2000 geese in the South Fork watershed and provided several articles published in August and September 1997 from the Charleston Gazette as supporting material. Unfortunately, none of the articles provided any estimates of the geese population. Wildlife counts provided by WV Department of Natural Resources, based on 1997 site visit, place the number at approximately 200. The actual count may vary depending on the daily and seasonal movements followed by migratory geese. The WV count for geese was used for modeling purposes with a relatively high (per goose) loading rate for fecal coliform. Documentation of geese population on an average annual or seasonal basis would be needed to support update of the model and associated allocations.

Estimates of deer population are based on ten times the number of bucks killed during hunting season and does not include road kill. Including road kill would increase the estimated deer population (and fecal coliform load from deer) by about 10%. Referring to Table 2.8 in the South Fork TMDL report, an additional 10% fecal coliform load from deer would increase the potential

deer load from 1.04% to 1.14% of the total potential fecal coliform load from nonpoint sources in the watershed. This is an insignificant amount and would have no impact on the results of the study.

The racoon population was not explicitly included in the modeling, but was taken into account implicitly in the modeling process through calibration of fecal loadings for the forested land use.

68. The studies identification and quantification of the potential fecal contribution from human sources seems to be grossly underestimated. The WV DEP estimate of residents on septic systems used in these studies was probably based on the lack of public wastewater treatment systems, rather than actual knowledge of the presence of septic systems in the area. Population estimates are based on permanent residents and do not account for the numerous camps located throughout the watershed. These camps are also like to be "straight-piped" and should be considered. The septic system failure rate of 2.5% appears to be a severe underestimation for the state as a whole.

Estimates of septic system failure rate of 2.5% were obtained from a 1993 study for Hardy County by the National Small Flows Clearinghouse (NSFC 1993) and are believed to be appropriate for this TMDL. No information on "straight-pipes" was available in the study area.

69. Siting a lack of available data, the document assumes all manure from poultry operations is applied to agricultural land within the sub-watershed in which it is produced. According to local residents and poultry farmers, a substantial amount of litter is brokered out of the sub-watershed in which it is produced and even out of the main watershed. Information on this issue can be obtained through the Poultry Hotline and other sources.

See response to comment 49.

70. The location of poultry houses is irrelevant to the study if sludge is not stored on site. However, all the modeling is based on the location of these facilities.

Since no information was available on the import/export of poultry litter from various areas, it was assumed that all poultry litter produced within a subwatershed remained in that subwatershed.

71. The fecal load from poultry was partially based on information provided by the WV DEP on the average number of birds in each type of house. The number for turkeys is probably an overestimation because the study does not distinguish between starter houses and grow-out houses. A large percentage of the turkey houses in the watershed are probably starter houses. The turkeys are transported from these houses after 5-6 weeks to grow-out houses. As it stands, the study appears to double count the birds; once in the starter houses and once in the grow-out houses.

The total number of turkeys is small compared to the number of chickens (broilers and breeders). For example, in Table 2.1.4 on page 2-5 of the South Branch TMDL report, the total number of turkeys in South Branch watershed is 90,000 compared to over 6 million chickens. Reducing that

number by half would result in 45,000 turkeys. The net decrease in total poultry fecal coliform bacteria achieved by making this correction would be negligible (less than 0.5%) and would have no impact on the results of the study.

72. The documents assume a large portion of the fecal coliform is due to poultry wastes. As poultry wastes have high levels of nitrogen and phosphorus, these parameters would also be elevated in the streams if poultry litter was the source. Does this data show this correlation?

The TMDLs developed for the South Branch and its tributaries are for fecal coliform bacteria and not for nutrients. West Virginia does not have a phosphorus standard and the nitrogen criteria of 10 mg/l was not being violated according to the USGS study. Therefore a close examination of the bacteria to nutrient correlation was not undertaken for the South Branch and its tributaries. A separate study underway by the Pine Cabin Run Ecological Laboratory, on the neighboring Lost River, suggests that the nutrients are in the stream but are bound to sediments. Sample collections when streams are rising and the water is turbid do reveal increased in stream nutrient concentrations. Bacterial concentrations are also elevated during this flow condition.

73. The studies state the fecal coliform production used in the model is the potential load, not what actually goes to the stream, but no attempt is made to differentiate the stream availability of the fecal from various sources.

The potential load of fecal coliform was calculated for all land uses, point sources and septic systems. Then the model was calibrated with water quality observations. This methods serves to differentiate the streams availability between the various sources of fecal coliform.

74. The documents provide tables on the "potential fecal load." However, the models are run with fecal loading rates based on land uses that do not match the load tables. There is no clear explanation provided as to how the loading factors were derived or how they relate to the potential load tables. If the studies used literature values for the loading rates in the model, what are the potential loads used for?

See page 3-3 of the South Fork TMDL report for an explanation of how fecal loading rates were determined for agricultural and forest land uses in the modeling process. The allocation is based on the load estimated to be contributed to the streams from the various source categories. The model collects all the sources, considers decay of fecal coliform in the stream, and calculated the geometric mean of the fecal coliform concentration.

75. The studies list the reference for the fecal coliform production rate of deer as "best professional judgment estimate." What information was used to make this judgment?

The fecal coliform production rate for deer was assumed to be greater than that of a turkey but less than that of a beef cow, both rates which were available from the Metcalf & Eddy (1995) reference. The rate for deer was then determined by linear interpolation using the typical animal weights and their fecal coliform production rates. A beef cow was assumed to weigh 1400 lb, a turkey 25 lb, and a deer 125 lb. The "known" fecal coliform production rates for the beef cow and turkey were 5.4×10^9 and 0.13×10^9 cfu/day, respectively. The interpolation method gives a

rate of 0.5×10^9 cfu/day for deer.

76. Exceedences in the tables entitled, Existing Conditions-summary of Violations of 200cfu/100ml Standard appear to be based on single days and not a geometric mean for the month. The standard for comparative purposes should be 400 cfu/100ml; or the exceedences should be based on a geometric mean for each month and compared to 200 cfu/100ml and listed on a monthly basis.

Refer to Table 3.5 and the figure in Appendix A labeled "30-day geometric mean for fecal coliform bacteria South Fork Reach 1 in the South Fork TMDL report. The accedences computed by the model are based on the 30-day geometric mean which is a monthly measure and therefore should be compared to the 200 cfu/100mL standard. The figure indicates two instances in which the stream concentration in reach 1 exceeds the standard. The first instance lasts for 2 days, and the second instance lasts for 15 days, giving a total of 17 days in accedence of the standard.

77. As the majority of the BMPs implemented by the agricultural industry in these watersheds have been put into place since 1990-91, the allocation reductions are too high. Even though, as stated, the model may implicitly include them, the load reductions do not.

The margin of safety(MOS) part of the TMDL development process. There are basically two methods for incorporating the MOS. Implicitly incorporates the MOS using conservative model assumptions to develop allocations. And explicitly, specify a portion of the total TMDL as the MOS; use the remainder for allocations. The MOS was implicitly incorporated into this model. Any BMPs which have been implemented in the watershed since 1991 are not explicitly included in the model and the resulting allocation reductions should be adjusted in any future TMDL analysis to reflect the effectiveness of these BMPs. This was used as part the of MOS in the development of the TMDL.

78. The discussions of alternatives for waste load allocations includes no mention of the potential reduction of human contributors. It seems these studies have dismissed the human contribution of fecal coliform as insignificant based on erroneous assumptions when, in fact, it may be substantial.

A principal components analysis was performed by the USGS in their Stream water Quality report (Mathes 1995, p. 18-19). This analysis showed a statistically significant relation (at 95-percent confidence) between concentrations of fecal coliform bacteria and fecal streptococci and concentrations of nitrate in the streams sampled. This tends to corroborate the assumption that the source of fecal coliform bacteria is from agricultural areas. In addition, the Potomac Headwaters Report (PVSCD 1995) contains the following statements on page 22: "Although additional data is needed to verify bacteria sources, the ratios of fecal coliform to fecal streptococci indicate a nonhuman source. Also, graphical and statistical analysis of the data indicates a possible relation between bacteria concentration and the number of poultry houses and livestock feedlots."

79. Additionally, there is no mention of controlling the fecal from wildlife populations. These populations are at their current inflated numbers due to human wildlife

management. These management practices can be altered to reduce these populations

Human wildlife management decisions can work to control the number and type of differing kinds of wildlife. Decisions made regarding wildlife population control are at the discretion of the WV Division of Natural Resources and the WV Legislature. The DEP and EPA cannot support wildlife reductions as a means of achieving compliance with the bacteria standard as the modeling projects only a minimal contribution from this source to the bacteria loading in the South Branch Valley.

80. The document states future analysis should be subject to model sensitivity analysis based on alternative scenarios of wildlife activity. Why was the original document not subject to that same analysis?

Model sensitivity analysis can be performed for all types of inputs into the analysis including poultry litter application rates, septic systems failure rates, and wildlife numbers. The available data is typically used to develop a range of conditions which can be tested by the model. In most cases these was insufficient data available to define an appropriate range for sensitivity testing. Random variations of each input in a formal analysis of sensitivity was beyond the scope for this TMDL development activity.

81. In each document, it would be beneficial to see the measured versus predicted fecal value graphs like those done for flow. This would allow some verification. Is this data available?

The typical hydrologic year for the TMDL analysis was 1991 and the flows were calibrated using USGS stream gage data for that year. There was essentially no measured fecal coliform bacteria data for 1991, thus it is not possible to compare measured versus predicted fecal coliform bacteria in the same manner.

82. The septic population column in Table 2.3 is blank.

The septic population in Table 2.3 in the South Fork TMDL report should read as follows:

Subwatershed Number	Septic Population
1	394
2	171
3	48
4	58
5	48
6	103
7	143
8	90
9	290
10	143

11	325
12	346
13	387
14	324
15	150
Total	3,020

83. The highest exceedence rate listed in Table 3.5 is in a sub-watershed with medium cattle and poultry densities. It would seem obvious agriculture is not the primary cause of fecal problems in this area. Consideration should be given to the non-agricultural factors contributing to this accedence.

Both point and nonpoint sources were represented in the model for the Potomac TMDLs. The three major nonpoint source categories that were addressed in this study were forest land (based on the wildlife populations within the study areas for duck, geese and deer populations and other background sources), agricultural lands and urban areas including septic systems (based on literature values). All the stream segments were divided into subwatershed as shown in table 3.5 of the report. For this particular subwatershed, although the densities of the cattle and poultry are medium that the agricultural land use in that subwatershed is great and thus resulted in the violations of the fecal coliform standards for that reach of the subwatershed.

84. There is no depiction of the calibration of fecal coliform values, no high flow or storm flow data and thus, no way to assess the validity of this model.

The model was calibrated the 1991 stream flow, literature values and monitoring for individual land use categories, and in-stream fecal coliform concentrations under representative flow conditions. In keeping with the phased approach to TMDL development, the model could be validated as additional data are collected as part of follow-up monitoring.

85. With respect to the South Branch Potomac River Watershed, the document shows some of the industrial sources in this area have permitted fecal limits well above 200 cfu/100ml and 400 cfu/100ml standard. Why is there no recommendation for reductions of these sources?

Permit limits for both industrial and municipal point sources in West Virginia are standardized at 200 colonies/100 mL on a monthly average basis and 400 colonies/100 mL as a daily maximum. Modeled values were higher because monitoring report data indicated that values had exceeded those limits. Violations of permit limits will be dealt with outside of the TMDL process. See also the response to comment #53 above.

86. It is my belief that the imposition of TMDLs for the area waterways is absolutely essential. There must be some standards with the power to take action if warranted. Voluntary action by the poultry people is not good enough. There are far too many

instances where Wampler and its producers do not live up to the BMP suggested by the industry.

The TMDL study and the recommendations are intended to achieve reductions in the bacteria loadings from agricultural sources. It is not an indictment of the poultry industry or a proposal to institute regulations. It is hoped that the implementation proposal will result in the bacteria reductions without the need for additional regulations.

87. Agriculture is the term used to describe the dominant source of pollution, which those of us who live here know means poultry farming. The waste from these farms must be controlled, and the technology is available to do that. Virginia faced this same problem some years ago, but through strict laws, they have protected the Shenandoah River. We must do the same. Of course, it will cost money. But we all know that whatever the costs are now, those costs will be much less than if we ignore the problem until the water in the South Branch is unusable.

See response to Comment #86.

88. The agriculture and poultry industries were the only considered discharge sources. In addition to an unfair target, even this information is in error based upon the wrong number of bird count, wrong number of poultry houses, etc. Much of the poultry litter produced in West Virginia actually leaves the entire West Virginia Potomac Watershed.

The Environmental Protection Agency and Tetra Tech, Inc., worked closely with the State agencies to get the most accurate information available and where site specific information was not available literature values were used. It is our goal to use the most accurate data available to use in the model.

The West Virginia Soil Conservation Agency (WVSCA) provide the "best guess" estimates of the number of poultry houses and animal feedlots within each of the subwatersheds with the exception of Pendleton County. For the subwatersheds in this county, the GIS maps in the Potomac Headwaters Report 1995 were used to estimate the number of poultry houses and feedlots.

For this study, it was assumed that manure from poultry operations was applied to agricultural land within the subwatershed in which the poultry house was situated. In practice, poultry manure may be shipped to other subwatershed or may be moved completely out of the watershed, however no information was available as to the specific manure management practices.

89. Overall non-point source information must be included in a factual study and in any TMDL program model. Your assistance is requested in supporting the ongoing efforts of this area and various agencies while delaying the proposed WV DEP TMDL program for the South Branch of the Potomac and tributaries until accurate and current information is available for model utilization. Failure to use current and accurate data in a TMDL program will have a major negative impact on Hardy County and all other West Virginia counties.

There has been guidance already developed by EPA on TMDLs. However, EPA does not have the flexibility to wait as more guidance is developed and to delay developing TMDLs. Our EPA guidance states that TMDLs should be developed based on available data, and this is what was

done on the Potomac. The most recent data available was used and new data was collected as time allowed to fill in essential data gaps. If the condition of a stream significantly changes or new information becomes available in the future, the regulation does allow the TMDL to be modified. However, EPA cannot at this time guarantee that all TMDLs will be modified.

90. I also am concerned about the rapid growth of the poultry industry which is located near the South Branch and several of its tributaries. I support the environmental groups that are targeting the polluters of the river and would like to see more stringent discharge regulations.

Thank you for your support in the development of the TMDL for the South Branch Potomac River. By following the TMDL process, states can establish water-quality based controls to reduce pollution from both point and nonpoint sources and restore and maintain the quality of their water resources.

91. While the TMDLs begin to outline the etiologies of the bacterial problems in the South Branch, they fall far short of providing a reasonable explanation that the TMDLs can and actually will be implemented. Relying on voluntary BMPs does not lead to a reasonable expectation that the targeted reductions will actually occur. But the toughest job of fully implementing nutrient management plans in an area where there are serious surpluses of manure is much more difficult to complete. We would like the EPA and WVDEP to explain why an all voluntary BMP program with farmers facing economic disincentives would be successful in West Virginia.

The implementation proposal does reflect a reliance on primarily voluntary compliance. It is hoped that the additional federal and state cost-share support, coupled with the availability of low interest loans, will encourage landowners to install appropriate practices and seek available technical assistance in their operations. Included in the proposal also, however, is the commitment on the part of the WVDEP to strengthen its compliance strategy by enforcing water quality violations against those landowners that choose not to take advantage of the opportunities for technical and financial assistance.

92. An assessment of BMPs is suggested in the TMDL proposal but there is no mechanism outlined to carry out or pay for water quality testing that will fairly evaluate the BMPs or the success of the phased TMDL approach. Without a clear plan for this follow-up testing and BMP assessment, the TMDLs will never achieve the goal of improving water quality.

The West Virginia Department of Agriculture has initiated a monitoring strategy in the drainage to collect water quality information which can be used not only to more accurately represent the existing conditions but to also track water quality improvements from BMP installation. The WVDEP does not have the resources to establish a monitoring network to follow-up on the progress of the TMDL but does intend to reassess the watersheds as part of its statewide watershed assessment cycle in the year 2001.

93. The lack of a viable implementation plan and a specific plan for follow-up testing and

BMP evaluation force us to call for a moratorium on the construction of new poultry houses in these watersheds until several actions take place. First, there needs to be an assessment of the ultimate capacity of the area to safely utilize poultry manure, other manure waste, other animal manures and industrial and municipal sewage sludge. Also, the integrators - Wampler, Rocco, Tyson, and Perdue - should agree to share the financial burden of environmental programs on individual poultry farms. Further, a viable implementation plan has to be formulated that can be expected to lead to targeted reductions in fecal coliform loads. Follow-up testing of TMDLs and BMPs is another area of concern requiring both formulation and funding. And finally, a strong market for litter has to be created and utilized, including economic incentives to farmers for shipping litter out of these watersheds.

The WVDEP does not have the authority to institute a moratorium on construction of new poultry houses. While an assessment of the capacity of the area to safely utilize the various wastes identified by the cementer would be beneficial, WVDEP does not have the resources necessary to undertake such a task. Currently, the agricultural agencies work with landowners to develop nutrient management plans for beneficial reuse of the majority of the products listed. WVDEP and EPA have discussed, with the integrators, the possibility of providing financial assistance to their producers for environmental practices and will continue that dialogue in the future. The implementation plan proposed by the agency should lead to realizing the targeted reductions. To track progress, the follow-up monitoring suggested is being coordinated with the WV Department of Agriculture. Finally, the agency agrees that a market for litter should be developed and will support local and/or agriculture agency efforts to promote the concept.

94. Other factors need to be considered because of their likely impact regarding bacterial loading in these watersheds among which are: amount of litter exported out of these watersheds; amount of municipal and industrial sludge that is land applied; and the effect of sheep and swine.

Better information on each of these factors would be useful for developing a more detailed TMDL analysis of the study area.

95. The model would be substantially improved by a better assessment of: the contribution of recreational users; the potential sanitary sewer leaks or overflows; the number of residential houses that directly discharge sewage into the streams; and the number of cattle in each watershed.

Leaking or overflowing sanitary sewers and residential houses that directly discharge into streams were not identified in the study area and therefore could not be included in the model. It was assumed that 2.5% of septic systems in the area are failing and this source was explicitly included in the model. The number of cattle was estimated by WVSCA for subwatersheds in Hardy and Grant counties, however, they were unable to provide estimates for Pendleton County. For those missing subwatersheds, a count of 50 head of cattle per feedlot was assumed for the modeling process. The contribution of recreational users was not considered.

96. With regard to agriculture and pasture sector, it is unclear whether FC loadings are under

or overestimated. Manure and litter exports are omitted from the analyses, but cattle populations appear to be underestimated and sheep and swine FC contributions are absent.

The Environmental Protection Agency and Tetra Tech, Inc., worked closely with the State agencies to get the most accurate information available and where site specific information was not available literature values were used. It is our goal to use the most accurate data available to use in the model.

97. FC loadings from the forest sector may be underestimated due to the omission of animals besides deer, geese, and ducks.

Fecal coliform contributions from wildlife were accounted for in the modeling process through calibration of fecal coliform loadings for the forested land use. Modeled fecal coliform values for the forested land use were calibrated to observed water quality data in Hawes Run, located in a completely forested watershed. This calibration involved both matching the modeled fecal concentrations at low flows with the background concentrations in the stream and augmenting the fecal loading rates based on wildlife density data. Thus, fecal contributions from deer, duck, and geese populations were explicitly calculated based on wildlife population data by county, while fecal contributions from all other wildlife sources were implicitly considered in the stream background concentrations.

98. The urban sector calculations are based on estimates and literature values, but the sector's FC loadings are so insignificant compared to other sectors that site-specific data are unlikely to result in a major change.

This is true, the South Branch Watershed has limited urban areas. As a result, the loading coming from the urban sector is insignificant compared to other sources of fecal coliform in the watershed.

99. FC contributions from land-applied sludge (i.e., municipal & industrial) are omitted due to lack of data. Currently available data should be used to assess the scale of this omission, and if significant, should be incorporated into the model.

In order to be incorporated into the model, the amount, dates of application, and fecal coliform concentration of the land-applied sludge must be known. Typically fecal coliform concentrations are low in land-applied sludge. If the data are available sludge could be included within the model. The potential significance could be evaluated first based on the fecal coliform concentration and magnitude of applications.

100. Depending on the number of houses that discharge directly to rivers without using septic systems, their FC loadings of untreated human waste may range from insignificant to significant. Loadings from recreationists or from leaking or overflowing sanitary systems are also underestimated, and additional data are required to determine by how much.

From the water quality data, land use information, and population statistics provided to and used by the modelers, it was determined that the potential bacteria impacts from human influences was

minimal. Further explanation of that reasoning is included in the body of the document. If the sources listed by the cementer are impacting the water quality, the monitoring proposed by the WV Department of Agriculture should reflect that. WVDEP does not have the resources to collect additional data to verify or refute the findings at this time.

101. Municipal and industrial point sources are generally well accounted for in the model and are insignificant compared to the calculated loadings for the agriculture and pasture sector. However, the use of average flows and FC concentrations for these sources smooths out potential variations in bacterial outflows, thus making these sources' potential responsibility for peak FC concentrations.

Since all fecal coliform analysis is based on the 30-day geometric mean, the use of daily flows and daily fecal coliform concentrations for point sources would not likely result in any appreciable difference in the final model results compared to the use of average flows and concentrations.

102. Although based on assumptions, FC loadings from failed septic systems are so small compared to other sectors that, even with site-specific data, this sector is unlikely to be a major FC source.

Onsite septic systems are the predominant form of waste water treatment in the watershed. However, no information was readily available on specific locations of septic systems, septic tank densities, or failure rates. Septic system discharges were quantified based on the population distribution, an assumed daily average discharge of 70 gallons per person per day, an assumed septic effluent concentration 10^4 cfu/100ml of effluent and a 2.5 % failure rate.

103. Despite the shortcomings documented in this paper, the conclusions in the TMDL analyses are, nevertheless, basically sound. The agriculture and pasture sector is likely to be the most significant source of bacterial contamination and it is therefore reasonable to target this sector for the most stringent reductions. This is a heterogeneous sector, and restrictions should be fairly distributed among concentrated poultry and cattle operations, as well as pasture and cropping systems.

The agriculture and pasture sector was shown in the model to be the most significant source of fecal coliform, not the only source in the Potomac watershed. By allocating to the subwatershed level, it is believed to give more flexibility in implementing the TMDL and the reductions in the final TMDL.

104. Data should also be collected for other sectors that were omitted from the analyses, or for which data were based primarily on estimates and literature values. Specifically, future data should include: a count of sheep and swine in the six watersheds since their respective populations are significant and must be considered in the TMDL analyses; the amount of land-applied sludge (including FC data) in the watersheds has to be calculated; a survey of houses directly discharging into streams has to be conducted. If the number is in the thousands, then human FC contribution may become significant; and, frequency of sanitary sewer leaks and overflows, particularly FC concentrations in overflows.

Whether or not these additional data prove to be significant, their incorporation into the TMDL process will be helpful in that it will promote greater confidence in the recommendations and conclusions of the final TMDL reports.

Agreed, additional appropriate data will improve the TMDL analysis.

105. I consider the wildlife statistics provided by the WV Dept. Of Natural Resources to be seriously flawed. I request your support of our efforts with WVU for an independent study of ducks, geese, deer and other wildlife that may be contributing to the degradation of both Upper Blackwater and South Branch Potomac rivers. The cooperation of WVDEP and EPA is also solicited.

While the agencies respect the position of the commenter, the information provided by the WV Division of Natural Resources (WVDNR) was, and remains, the best data available upon which to base modeling decisions. Should an independent study be conducted to support the contention that wildlife impacts are more severe than currently estimated, the agency suggests that the WV DNR be included in the process. Neither the WVDEP nor the EPA has expertise in the area of wildlife population determinations.

106. Cattle population estimates seem to be low. I compared cattle populations in the TMDL report with US Census of Agricultural reports for Pendleton County by assigning sub-watersheds to counties (Table 6 in my report). According to this analysis, TMDL reports estimate about 5 thousand cattle in Pendleton County, while the agricultural census reports about 21 thousand in 1992. This discrepancy suggests that, at least for the sub-watersheds in Pendleton County, cattle populations are underestimated.

The head of cattle were estimated by WVSCA for subwatersheds in Hardy and Grant counties, however, they were unable to provide estimates for Pendleton County. For those missing Pendleton County subwatersheds, a count of 50 head of cattle per feedlot was assumed for the modeling process which may have been underestimated.

107. Sheep and swine are omitted from the TMDL analyses. The US Census of Agriculture reports about 14,000 sheep and 3,000 swine in Pendleton County alone. Potential fecal coliform production from these animals is significant (Table 8 of my report). Sheep and swine should be included in the analyses.

Inclusion of sheep and swine could have an impact on the analysis depending on the pasture management, manure collection, storage, and disposal patterns. Some documentation of practices would be necessary in order to incorporate sheep and swine in the analysis and evaluate the potential impact on fecal coliform loadings.

108. Litter and manure exports from sub-watersheds are also omitted. The scale of this omission could be minor or major, depending on volume of actual exports. Perhaps a rough estimate could be made to include these exports in the TMDL analyses.

Since it is not known how much litter is being exported or imported into the study area, such information cannot be incorporated into the calculations. This was due to the lack of specific information on litter disposal practices. Improved tracking information would be beneficial in identifying areas where significant exports may reduce fecal coliform loadings. In some cases this could be a consideration in meeting the agricultural portion of the loading reduction allocation.

109. Beside duck, geese and deer, other warm-blooded animals contribute fecal coliform to rivers. Some estimate of these animal populations and their fecal coliform production would be appropriate.

Fecal coliform contributions from wildlife were accounted for in the modeling process through calibration of fecal coliform loadings for the forested land use. Modeled fecal coliform values for the forested land use were calibrated to observed water quality data in Hawes Run, located in a completely forested watershed. This calibration involved both matching the modeled fecal concentrations at low flows with the background concentrations in the stream and augmenting the fecal loading rates based on wildlife density data. Thus, fecal contributions from deer, duck, and geese populations were explicitly calculated based on wildlife population data by county, while fecal contributions from all other wildlife sources were implicitly considered in the stream background concentrations.

110. Why is the South Branch being scrutinized and regulated above and beyond other streams and rivers in West Virginia since it is not listed as being the most polluted in the state?

The South Branch is not being scrutinized and regulated above other streams and rivers in the state. The selection of the South Branch for TMDL development was supported by several factors. Most importantly the river and selected tributaries were on the 1996 303(d) list which mandates TMDL development and water quality data in sufficient volume to develop the TMDL was available. The TMDL program although not new, is one which requires similar work to be done on all streams in the state which have use impairments over the next ten to fifteen years. The South Branch was not simply singled out, but was chosen to be one of the first streams in the state for this process to be applied to due to the availability of data, the modeling technology, and access to the modeling resources.

111. The water quality standard for fecal coliform is 200/cfu/100/ml when taking five samples on a monthly basis; however, five samples per month have not ever been taken and the standard should then be 400/cfu/100ml.

The Water Quality Standard referred to here is Title 46, Legislative Rule, Environmental Quality Board, Series 1, Requirements Governing Water Quality Standards. The criteria for fecal coliform bacteria appear in Appendix E. Section 8.12 states "Fecal Coliform: Maximum allowable level of fecal coliform content for Primary Contact Recreation (either MPN or MF) shall not exceed 200/100ml as a monthly geometric mean based on not less than 5 samples per month; nor to exceed 400/100 ml in more than ten percent of all samples taken during the month."

DEP interprets this to mean that both criteria apply. Additionally, there is increased flexibility by modeling the basin at the 200 cfu/100ml geometric mean standard. Use of the geometric mean allows exceeding of the 400 cfu/100 ml without causing an automatic violation of the water quality standards. For example:

Sample 1	450
sample 2	5000
sample 3	200
sample 4	5
sample 5	5

Geometric mean = 102.4 cfu/100 ml

In this instance, no violation of the 200 cfu/100 ml water quality is observed. If the 400 cfu/100 ml standard had been applied, two violations would have been observed.

112. Wildlife in the area was grossly underestimated and some wildlife were not even considered.

Fecal coliform contributions from wildlife were accounted for in the modeling process through calibration of fecal coliform loadings for the forested land use. Modeled fecal coliform values for the forested land use were calibrated to observed water quality data in Hawes Run, located in a completely forested watershed. This calibration involved both matching the modeled fecal concentrations at low flows with the background concentrations in the stream and augmenting the fecal loading rates based on wildlife density data. Thus, fecal contributions from deer, duck, and geese populations were explicitly calculated based on wildlife population data by county, while fecal contributions from all other wildlife sources were implicitly considered in the stream background concentrations.

113. Septic system failures and pipes running straight from homes to streams were also not taken into consideration.

Contribution of human waste from leaking septic tanks were considered in all the TMLDs in the Potomac. Septic system discharges were quantified based on the population distribution, an assumed daily average discharge of 70 gallons per person per day, an assumed septic effluent concentration 10^4 cfu/100ml of effluent and a 2.5 % failure rate. Specific information about pipes running straight from homes to streams was not available from the State. This is an area that needs to be investigated in the future.

114. We were even asked to submit more current data to your office within the comment period to be included in the report! Why were so many dollars spent on a flawed and inaccurate study which still does not provide accurate baseline data on the South Branch?

The Environmental Protection Agency and Tetra Tech, Inc., worked closely with the State agencies to get the most accurate information available and where site specific information was not available literature values were used. It is our goal to use the most accurate data available to use in the model. This is why during the public comment period we requested any additional information from the public.

115. Numerous best management practices are currently in place in Hardy County which were not even considered.

See page 2-21 of South Branch TMDL under Section 2.3.1 Incorporating a Margin of Safety:

"The baseline year for calibrating NPSM for this TMDL was 1990-91. Any BMPs which have been implemented in the watershed since 1991 are not explicitly included in the model and the resulting allocation reductions should be adjusted in the next phase of this TMDL to reflect the effectiveness of these BMPs." In other words, additional in stream monitoring and tracking of BMP implementation can be used to support achievement of the TMDL load allocation targets.

116. There are people interested in working together if there is a proven problem with the river. However, WHY should we be targeted when we wish to help provide good water quality? Seems to me that if we were not working together, the State would not have considered so strongly! Where are the incentives for watersheds to work together?

See Response to 110. Additionally the DEP and EPA have both worked diligently to foster development of, and provide support to, watershed associations. Time constraints imposed by the court order prohibited the agencies from taking full advantage of the resources and expertise of the watershed association(s) in the valley. The presence or absence of an association did not play role in selecting these watersheds for TMDL development in 1997. DEP and EPA encourage an active role by associations as the TMDL process moves from initial modeling and TMDL development to actual on the ground improvements which will enhance water quality. Associations can play a vital role in keeping the agencies abreast of where programs are working, where they are not, and can draw attention to activities which have been left out of the process. Incentives for watershed association are numerous and varied, but can be characterized as allowing local stakeholders to become more involved in seeing that streams and rivers in their area are managed to the degree possible with local interests in mind.

117. I was shocked at the filth and pollution in the river in Boone, Logan and Mingo counties. I was totally amazed to see such sites in West Virginia and furious that our South Branch River which is clear of debris and trash has been so scrutinized and unjustly targeted. I would appreciate an answer as to why this river is not being considered in your study since there obviously has to be problems associated with the debris.

Unfortunately the aesthetic qualities of a stream are not part of the TMDL process. Trash and litter is undeniably a major problem facing many of West Virginia's rivers, streams and lakes. Authority to regulate this type of visual pollution is in place, but enforcement is limited due to the number of officers and the difficulty in catching litterbugs. Until society as whole condemns this type of behavior and education regarding the improperness of depositing trash in stream out paces tradition, stream litter will remain a problem.

118. I am in OPPOSITION to the study and want to see more recent, accurate and structured samples taken to determine the baseline to be able to correct problems should they actually exist!

See response to Comment #31.

119. The current mode for making any reductions in bacterial loading has been placed almost entirely on the back of the local farmers via the desired practice of voluntary best management practices to reduce non-point source loading. Voluntary BMPs cannot be

viewed as the only solution to obtaining the targeted bacterial reductions.

See response to Comment #91.

120. Additionally, even if the farmers in the Potomac Headwaters were to fully comply with the voluntary BMPs there is not sufficient evidence that these rivers will in fact meet state water quality standards for fecal coliforms. While the draft TMDL document calls for an assessment of the BMPs, how is this going to be carried out? Who will do and pay for the water quality testing necessary to fairly evaluate BMPs and phased TMDL approach?

See response to Comment #38.

121. The draft TMDL fails to consider the land application of industrial and municipal sludge.

See page 2-21 of South Branch TMDL under Section 2.3.1 Incorporating a Margin of Safety: "The baseline year for calibrating NPSM for this TMDL was 1990-91. Any BMPs which have been implemented in the watershed since 1991 are not explicitly included in the model and the resulting allocation reductions should be adjusted in the next phase of this TMDL to reflect the effectiveness of these BMPs." In other words, additional in stream monitoring and tracking of BMP implementation can be used to support achievement of the TMDL load allocation targets.

122. The draft TMDL fails to consider the amount of litter exported from these watersheds. Records should be kept and this needs to be addressed in the final TMDL.

Improved tracking of litter storage, management, import/export, and application rates and location, is needed in order to revise the model. This is beyond the scope of the phased TMDL. Future tracking can be used to support meeting the allocation target or future revision of the TMDL.

123. The draft TMDL fails to consider the potential fecal coliform production from sheep and swine. Populations of these animals are shown in the US Census of Agriculture. They should be included in the final TMDL.

Improved tracking of litter storage, management, import/export, and application rates and location, is needed in order to revise the model. This is beyond the scope of the phased TMDL. Future tracking can be used to support meeting the allocation target or future revision of the TMDL.

124. The draft TMDL needs a better check on the number of cattle in each watershed. A comparison with the US Census of Agriculture should take place as there is a broad discrepancy between the TMDL and the Census numbers reported. This should be reconciled.

Improved tracking of litter storage, management, import/export, and application rates and location, is needed in order to revise the model. This is beyond the scope of the phased TMDL. Future tracking can be used to support meeting the allocation target or future revision of the

TMDL.

125. The draft TMDL needs a better assessment of the impact from recreational users. Is there an accurate estimate of users and is it significant?

Estimates of the recreational users and waste management could be incorporated as a source category. The magnitude of the source and potential impact is unknown.

126. The draft TMDL needs a better assessment of the impact of untreated human waste. How many homes discharge directly into the rivers and is it significant?

See Response to Comment 2.

127. Request a moratorium be placed on the construction of new poultry house and that it remain in effect until the following items are addressed: assess the carrying capacity of the area regarding the safe utilization of poultry and other animal manures, other poultry and animal wastes, and industrial & municipal sewage sludge; agreement of all integrators to share the cost of environmental programs on individual farms; the development of a feasible implementation plan; the development of a plan designed specifically for follow-up water quality testing to evaluate the success and validity of both the voluntary BMPs and TMDLs; and, the creation of a sustainable market for the excess litter.

Duplicate Comment to #93. See response.

128. The OWR should develop a procedural rule for the development of TMDLs.

See response to comment # 36.

129. The OWR can take the opportunity of the development of TMDLs for the Upper Blackwater and the South Fork to publicly outline, and receive comments and suggestions on, proposed procedures and agency methodology. It should begin anew on both the TMDLs, determining first whether TMDLs really are appropriate for the two rivers and, if so, what constitutes reasonable and equitable TMDLs. In redoing the TMDLs, EPA and OWR should take advantage of the work of a Federal Advisory Committee that has been charged with the monumental task of reviewing all aspects of the TMDL program on a national level, and providing advice and feedback on critical issues such as TMDL approval criteria, implementation, science, tools, training, schedules, pace, oversight and, perhaps most critically, public participation.

Current federal regulations only require the EPA to public notice the issuance of a draft TMDL, and that the Agency respond to the comments received. The DEP and EPA in an effort to go beyond the minimum requirements, while staying within the confines of the consent decree, elected to hold an informational meeting to explain the results of the draft TMDL study. The agencies agree that actual TMDL development has out paced the development of TMDL

implementation policy and procedure at both the state and federal level. A better process, the West Virginia Watershed Management Framework, is available for use and better allows for public input and involvement on water quality issues. However, the schedule developed for the Framework does not lend itself to TMDL development and implementation under the federal court ordered time frames. Resources are currently not available to redevelop TMDLs and in fact current national guidance requires TMDLs to be developed with available information even if data quality is less than optimal. The Federal Advisory Committee is grappling with many of the complex issues related to TMDL development and implementation, but the Agencies cannot benefit from on the committee's guidance until it becomes final.

130. The Upper Blackwater and South Fork TMDLs are *rules*. The WV Administrative Procedures Act, (WVAPA), defines a rule as “every regulation, standard or statement of policy or interpretation of general application and future effect...affecting private rights...” *W.Va. Code* Sect. 29A-1-2(I). Because the proposed TMDL addresses how pollutant loadings to the river will be managed, and specify the wasteload allocations and pollutant reductions that will be required to meet water quality standards, they are both “statements of policy” and “interpretation of general application and future effect” that affect private rights, and therefore are rules.

See response to comment # 36.

131. The Upper Blackwater and South Fork TMDLs are defined as *contested cases*. A contested case is defined as “a proceeding before an agency in which the legal rights, duties, interests or privileges of specific parties are required by law or constitutional right to be determined after an agency hearing...” *W.Va Code* Sect. 29A-1-2. The Upper Blackwater and South Fork TMDLs are just such proceedings, and accordingly appeals of the TMDL may be pursued in accordance with the WV PA.

See response to comment # 36.

132. The OWR needs to identify its objective criteria for listing streams on the 303(d) list. Explaining the standard for listing streams would allow interested parties to know what evidence or data are necessary to have a stream removed from the 303(d) list, and to present that information to the OWR in a form it can use. Other states have taken steps to standardize their 303(d) listing procedures, to arrive at a quantifiable basis for listing.

The criteria OWR uses for development of 303(d) lists has always been made available at the time the draft list is noticed for public comment. The opportunity for interested parties to respond to the presence or absence of a particular water body on the draft list is available. Many water body 303(d) listing decisions are obvious and without controversy. Others, regardless of the amount of guidance or policy available, require a degree of professional judgement to determine if the stream is not expected to meet water quality standards during the two year time-frame the list covers. Additionally, states are being encouraged to list streams as impaired, with lesser amounts of data supporting the impairment. This process calls attention to these streams and it is hoped that it will stimulate more data collection so the true degree of impairment can be better understood prior to potential TMDL development.

133. TMDL implementation should be flexible and toward that end OWR should not adopt a one-size-fits-all approach to determining and assigning WLAs. Sometimes restrictions should apply only during higher flows, such as when storm water is bringing the pollutants of concern into the stream at levels that violate water quality standards. At other times, WLAs should be in effect only during the low flow season.

The Agencies have attempted to make implementation of the South Branch TMDLs flexible. In general only categories of contributor's were considered, and the final recommendations do not detail the exact actions which much take place. The TMDL is merely a planning tool which provided guidance on the level of pollutant reduction which must occur for the stream to meet water quality standards. Allocations which are flow based can only be used in limited instances due to the agencies resources not being sufficient to determine compliance with established limits. Real time water quality management is also hindered by the current downsizing of the stream gaging network, which is crucial to real time water quality management decisions.

134. The OWR should list its schedule for TMDL development to allow sufficient time for interested parties to develop necessary information to assist in the TMDL process. OWR should publish, and publicize a schedule of TMDL projects at least three years in advance.

Current guidance for development of the 1998 303(d) list clearly sets forth that a proposed schedule for TMDL development must accompany the list when it is submitted to EPA for approval. This schedule is tentative as TMDL development will largely be controlled by the complexity of the TMDL and the available funding.

135. OWR/EPA should hold TMDL training sessions. Citizens including NPDES dischargers and other members of the regulated community would benefit from instruction in TMDL preparation and 303(d) list preparations. This might include, for example, seminars on the use of the BASINS computer model, guidance on clean sampling techniques, and criteria for placing streams on the 303(d) list. Such instruction would greatly aid many of those who will be affected by future TMDLs.

As the TMDL process matures, it would indeed be beneficial for the public and potentially affected industries to be provided a better understanding of how TMDLs are developed, the 303(d) listing process, and sampling and modeling techniques. This suggestion will be taken into consideration during the development of the stakeholder/public involvement strategy mentioned in the response to Comment #59.

136. Sufficient and accurate data have NOT been collected on the South Branch to determine the fecal coliform levels.

TMDL development in the South Branch watersheds was based largely on water quality data generated by the US Geological Survey, an agency with nationally recognized credentials in the collection, analysis, and interpretation of water quality data. More data is always preferred any time water quality decisions are made, but the current TMDL program and the federal court order

require the agencies to proceed with the information at hand.

137. Consideration was not given for the immense deer and geese population within the watershed.

In regards to wildlife, the West Virginia Division of Natural Resources (DNR) provided estimates of the numbers of geese and ducks within the South Branch region typical of July 1 of any given year. The numbers of birds may vary with the season because of migratory patterns as well as birds moving in and out of the watershed. In addition, deer population was estimated from the Big Game Bulletin. The total deer populations can be estimated as about 10 times the number of buck killed during the hunting season.

138. CBM practices by farmers were not taken into consideration.

See page 2-21 of South Branch TMDL under Section 2.3.1 Incorporating a Margin of Safety: "The baseline year for calibrating NPSM for this TMDL was 1990-91. Any BMPs which have been implemented in the watershed since 1991 are not explicitly included in the model and the resulting allocation reductions should be adjusted in the next phase of this TMDL to reflect the effectiveness of these BMPs." In other words, additional in stream monitoring and tracking of BMP implementation can be used to support achievement of the TMDL load allocation targets.

139. Sewage pipes flowing straight from homes to streams were not considered.

The information concerning sewage pipes was not available from the State. However the model did consider contribution from human waste as a source a fecal coliform. Contribution of human waste from leaking septic tanks were considered in all the TMLDs in the Potomac. Septic system discharges were quantified based on the population distribution, an assumed daily average discharge of 70 gallons per person per day, an assumed septic effluent concentration 10^4 cfu/100ml of effluent and a 2.5 % failure rate. Specific information about pipes running straight from homes to streams was not available from the State. This is an area that needs to be investigated in the future.

140. It was clearly stated that farmers would be penalized under this enforcement "to the fullest extent" although facts are not available to support that farmers are the only contributors! What about other individuals or institutions which may be contributing to the problem IF A PROBLEM REALLY EXISTS Farmers are being targeted unfairly!!

WVDEP has the regulatory authority to address violations of the state's water quality standards and will continue to use that authority as necessary for violations from whatever source. If the cementer construed statements made at the Moorefield public meeting regarding enforcement to single out farmers only, that was not intended.

141. I am in OPPOSITION to the study until accurate and sufficient data is collected and it is proven there really is a problem on the South Branch of the Potomac River.

See Response to Comment 136

142. We do not appreciate being informed that FARMERS will be prosecuted TO THE FULLEST EXTENT should they not adhere to the guidelines which the State will be requiring! No proof exists to blame farmers who have been in this area for centuries trying to make a living to support their families.

Again, the agency did not intend to single out farmers for enforcement nor did it intend to imply an extraordinary use of its authorities. The cementer's apparent concern regarding the phrase "to the fullest extent" is understandable but it should not be viewed as a threat. Generally, criminal and/or civil actions against violators result only after the agency has attempted and failed to resolve problems through cooperative means. At that point, the agency will exercise its authorities "to the fullest extent" to protect the resource.

143. Deer, geese, raccoon, gypsy moth population were either not taken into consideration or grossly underestimated. Poultry litter is being blamed for all of the problems which is ironic since I have to purchase litter from other farmers in my area since my chicken house does not provide a sufficient amount for fertilizer on my farm.

In regards to wildlife, the West Virginia Division of Natural Resources (DNR) provided estimates of the numbers of geese and ducks within the South Branch region typical of July 1 of any given year. The numbers of birds may vary with the season because of migratory patterns as well as birds moving in and out of the watershed. In addition, deer population was estimated from the Big Game Bulletin. The total deer populations can be estimated as about 10 times the number of buck killed during the hunting season. Also see response to comments # 27 and 54.

144. I am pleased that the problem has been identified, made public, and that solutions have been proposed. I am disturbed that the general public is just now becoming aware of the problem, such information having been available since 1994-95, perhaps before

WVDEP appreciates the obvious environmental concern of the cementer and the support expressed for the TMDL study and recommendations. In response to the comment regarding the lack of knowledge regarding the water quality situation by the general public, it is anticipated that the stakeholder strategy identified in the response to Comment #59 will include a mechanism to provide the public with more information as to the status of the state's waters.

145. I strongly support the efforts of the WVDEP and EPA to bring the South Branch Potomac River into compliance with the federal Clean Water Act. Take whatever action needs to be taken to reduce fecal coliform bacteria contamination to acceptable levels. I also herein request that the general public be regularly advised on the status of such efforts and the ongoing quality of the river's water for recreational use.

Thank you for your support in the development of the TMDL for the South Branch Potomac River. A mechanism for advising the general public on the status of the efforts of this TMDL will be considered in the development of the implementation plan for this watershed.

146. I was very disturbed at the Moorefield public meeting to hear a number of those present blame a significant part of the problem on wildlife such as deer, raccoon, etc. This is absurd! It seemed to me that the blame was cast everywhere except at the obvious - the exploding poultry and livestock (feeder lot) industries in the South Branch watershed.

DEP recognizes that depending upon your perspective, matters appear different. Arguments about such things can go on for decades without either side being convinced that they are wrong. The TMDL injects science and reason into the process. Ideally, a TMDL should be a scientific study which is aimed at allowing us to understand the processes which are causing the impairment, and points us in the direction of reducing the sources causing the impairment. The TMDLs for the South Branch begin that process.