Appendix E: Responsiveness Summary to Public Comments

Authors of Written Comments on the first Draft Upper Little Miami River TMDL Report:

#	Date Received	Name	Organization
	1/26/01	**Public notice given for the first draft of the Upper Little Miami River TMDL report**	
1	1/30/01	Dave Beach	Director of Public Works, Beavercreek, Ohio
2	2/22/01	James Brueggeman, P.E.	Director, Sanitary Engineering Department, Montgomery County, Ohio
3	2/23/01	Thomas McCrate, P.E.	City Engineer, Xenia, Ohio
4	2/26/01	Ronald Volkerding, P.E.	Deputy Directory, Office of Sanitary Engineering, Greene County, Ohio
5	3/2/01	Jeff Skelding	Water Policy Manager for the Ohio Environmental Council
6	4/25/01	Thomas McCrate, P.E.	City Engineer, Xenia, Ohio
7	4/26/01	John Saraga	Mayor, City of Xenia
8	5/1/01	Ralph Harper	President, Greene County Board of Commissioners
9	5/7/01	Charles Curran Don Lucas Vicki Pegg	Board of County Commissioners, Montgomery County, Ohio
10	6/25/01	George Voinovich	United States Senator, Ohio
11	6/27/01	David Hobson	United States Congressman, 7th District, Ohio
12	6/27/01	Carl Grubb Jeanne Nydegger Dick King	Sugarcreek Township Trustees
13	9/19/01	Charles Curran Don Lucas Vicki Pegg	Board of County Commissioners, Montgomery County, Ohio

Responses to Comments:

1. Comment: Ohio EPA should allow sufficient time for and cooperate with an in depth review of the project. [2, 4, 6, 8, 9, 12, 13]

Response: Ohio EPA has delayed issuance of the TMDL until a review of the science underlying the project was complete (organized and funded by the public wastewater treatment facilities). The review is now complete and the second draft has been released. However, Ohio EPA is facing obligations to USEPA to complete this document, which will also make resources available for the other TMDL projects. This particular project is already twelve months behind schedule (in large part to accomodate this review request) and needs to be completed in the near future. A substantial portion of the historic federal funds provided to the Agency, as well as new funds specifically slated for TMDL development, are tied to making adequate progress in completing

TMDLs.

2. **Comment:** The Ohio EPA should conduct a thorough error and sensitivity analysis of the process employed for deriving the TMDLs. [2, 4]

   Response: An error and sensitivity analysis was employed for deriving the TMDLs. A portion of this analysis was presented to the stakeholder workgroup in December 2000.

3. **Comment:** The design flows in Table 7 are not representative of future conditions. [2]

   Response: The design flows in Table 7 are the flows that the facilities are currently designed or are currently designing for.

4. **Comment:** A cost/benefit analysis is recommended to properly prioritize the recommended restoration measures. [2]

   Response: Ohio EPA agrees that a cost/benefit analysis is a recommended step in selection of restoration measures. Ohio EPA would endorse such an analysis should the stakeholders wish to perform one.

5. **Comment:** The Ohio EPA asked that the report be reviewed in the absence of the implementation plan. The two must be considered together. [3] We are concerned about this lack of an implementation plan and the future of Ohio's TMDL program. [5]

   Response: Ohio EPA agrees that an implementation plan is crucial to the report. The Stakeholders Workgroup and Ohio EPA are proceeding to complete a draft implementation plan. The first draft of the Upper LMR TMDL Report (January 2001) was issued in order that Ohio EPA meet its obligations to the USEPA with regard to timeliness of the reports. The second draft of the report does include an implementation plan. Please refer also to the response to comment 11.

6. **Comment:** Ohio EPA is imposing its view on the stakeholder workgroup more than seeking a consensus. [3]

   Response: Ohio EPA is somewhat surprised at the commenter's perspective on the Stakeholders Workgroup. City of Xenia representatives, particularly Gary Johnson, have been very much involved in this part of the process. Mr. Johnson coordinated the efforts of a subcommittee of the Stakeholders Workgroup looking at the effects of septic systems on water quality in the Upper Little Miami River watershed. The recommendations of this subcommittee are an important part of the draft Implementation Plan. Ohio EPA has and will continue to strive for consensus on important issues in the TMDL process. At the request of the stakeholders, the Agency funded a private, professional facilitator to provide nonpartisan assistance in conducting the Workgroup meetings. It has not been our intention to impose our viewpoint on the Workgroup. However, it is the Agency's responsibility to identify water quality impairment and causes of that impairment. Through the TMDL process, we hope the stakeholders will assume the responsibility of developing restoration strategies and implementation plans to resolve

the impairment.

7. **Comment:** The majority of the loads are generated by nonpoint sources yet Ohio EPA is focusing on the WWTPs because they have the authority to do so. [2, 3, 9]

   Response: Ohio EPA cannot agree that a focus on the wastewater treatment plants for point source load reductions is merely a result of Ohio EPA's expressed authority over such pollutant loads. The Upper Little Miami River watershed is impacted by both point and nonpoint pollutants. Ohio EPA anticipates an implementation plan involving both point and nonpoint nutrient load reductions. During Workgroup meetings, we have acknowledged that on an annual average basis, nonpoint sources contribute the majority of the nutrient loading. However, wastewater treatment plant effluent is the major contributor of nutrient loading to the Little Miami River during low stream flows. Low stream flows represent a critical stress for aquatic life. Therefore, the role that wastewater treatment plants plays during these periods cannot be ignored.

   Ohio EPA is aware that additional expense may be required for treatment. We can offer assistance in the financing of such facilities through low interest loans from Ohio EPA or other programs. We remain open to ideas on how to achieve the needed reductions.

8. **Comment:** Ohio EPA mandated a $9,000,000 upgrade to the City of Xenia's treatment facilities over the past 2 years. To suggest that our discharge limits may change significantly within a year of the upgrade is to say we spent the money without a clear goal. [3]

   Response: It is Ohio EPA's understanding that your recent treatment upgrades were primarily designed to provide additional capacity to accommodate growth. These projects were outlined in the City's 1996 facilities plan. While Ohio EPA endorses Xenia's planning for growth and played a role in permitting and funding for the new facilities, these expansions were not mandated by Ohio EPA. In regards to a change in your NPDES permit discharge limits, Ohio EPA informed the City several years ago (in writing) that any design for a treatment plant expansion must include provisions for nutrient removal. In addition, any required nutrient limits will be incorporated into a permit compliance schedule, giving the City a reasonable amount of time to evaluate their options in complying with the limits.

9. **Comment:** Deadlines for TMDLs around the state continue to be missed, including the deadline for the Upper LMR TMDL. [5]

   Response: Ohio EPA acknowledges that deadlines were missed. We have been in regular contact with USEPA's regional office to keep them apprized of our progress. There are several reasons for the delays of the four projects due to USEPA in 2000 including the Upper LMR TMDL:

   i. The projects have been used to "pilot" the 12-step TMDL process. Although all the pilot projects have been delayed to some extent, we have also learned much about scheduling, public participation, and technical aspects of TMDL projects.

What we have learned will help us meet future project schedules.

ii. Last fall, late in the process, we elected to formally public notice the draft TMDLs, which is not required under current federal rules. The 30-day notice period and the subsequent comment review, report revisions, and preparation of a responsiveness summary adds a minimum of 45 days to the time schedule that had not been anticipated.

iii. The public involvement efforts on all the projects took more time to solicit members and work with them to bring projects to completion. Specifically, the upper LMR TMDL project submittal was delayed at the request of the area public wastewater treatment facilities to allow for a review of the science underlying the project. This review is complete and a second 30-day public notice period is currently underway. A final submittal to USEPA is expected in early 2002.

iv. To help define expectations, we have been soliciting USEPA Region 5 comments at the same time that the draft TMDL documents are public noticed. Comments received have been constructive although not always within a convenient time frame. We are hopeful that attending to these comments will speed up the approval process.

10. Comment: The draft TMDL does not specify effluent limitations or a compliance schedule. [5]

Response: The second draft Upper LMR TMDL report includes both effluent allocations and a compliance schedule for them.

11. Comment: The implementation plan should: [5]
i. include specific timeframes for restoration and monitoring activities
ii. establish a target date for attainment of WQS
iii. include provisions for actions if the WQS are not yet attained at that time
iv. contain reasonable assurances for each action

Response: The current state of federal rules and guidance on implementation plans in TMDLs is awkward. But it is clear that USEPA will approve TMDLs under the current TMDL rules, not those promulgated in July 2000. Thus, specific implementation plans and reasonable assurances are not required for federal approval. We do acknowledge, however, that such plans are valuable and are working to develop them. The second draft Upper LMR TMDL report includes a draft implementation plan developed by the watershed improvement stakeholder group which strives to include all of the items mentioned in the comment.

12. Comment: The constituents in the Upper LMR watershed are being unfairly targeted by the Ohio EPA for TMDL development as there is only one other area in the state that has a TMDL initiative. [7]

Response: This is incorrect. In 2000, Ohio EPA had five TMDL projects underway and initiated four additional TMDLs across Ohio; in 2001, four more TMDL projects were begun,

and we have dozens more to deal with in the coming decade.

13. Comment: The TMDL is being mandated hastily with unrealistic and for the most part unattainable goals and requirements. [7, 8, 12]

Response: The goal of the TMDL is to attain WQS and bring the upper LMR watershed into compliance with state and federal regulations. The major factors impairing the watershed include an over abundance of nutrients, low levels of dissolved oxygen and poor aquatic life habitat. These three causes of impairment are the leading impairing causes in the State of Ohio; many TMDL projects and communities are and will be facing these same factors. Control of nutrients is not a new issue in the Little Miami. Ohio EPA had indications in 1995 (as a result of our 1993 stream survey) that phosphorus was having an unacceptable impact and shared that information with all the dischargers in the entire basin at that time. It was our recommendation that any wastewater treatment plants seeking to expand should consider future phosphorus removal requirements as part of the design. In the intervening years, Agency staff have accumulated additional data that demonstrates more clearly a linkage between nutrients and biological impacts. The data from our 1998 survey of the Little Miami was similar to 1993 and supports these conclusions. The main requirement of the TMDL for publicly owned treatment works is a total phosphorus limit of 1 mg/l. This limit is enforced for all major publicly owned treatment works in the Lake Erie basin; obviously, they are attainable. Further, the facilities have 3 years to acheive a 1 mg/l total phosphorus concentration in their effluent.

14. Comment: Ohio EPA should delay issuance of new discharge permits to allow for exploration and development of alternative approaches by the municipalities. [7, 8, 9, 12]

Response: Ohio EPA has delayed issuance of new discharge permits to allow for continued review and discussion of alternatives. The proposed permit language allows flexibility for how the municipalities can reduce their point source share of the total phosphorus loads and allows a substantial amount of time to do so which biulds in more time for such exploration. However, there is a low-flow condition where the municipal wastewater treatment plants are the majority of the load and this condition needs to be protected for. Therefore, there is a basic need for reduction of phosphorus at the treatment plants. The permits strive to achieve a reasonable, achievable reduction of total phosphorus at the plants. Further, the National Academy of Sciences (NAS) has indicated in their recent review of the national TMDL program, scientific uncertainty is a reality within all water quality programs that can not be entirely eliminated. Further, the report recommends that we should move forward with decision-making and implementation of the TMDL program while taking reasonable efforts to reduce uncertainty. The proposed permit requirements allow for reasonable efforts to reduce uncertainty while moving forward with decision-making and implementation by allowing a 10 year effectiveness time period, including monitoring requirements, including flexible load reduction options while still requiring basic industry-standard phosphorus reductions at the treatement plants.

15. Comment: I hope that during the lengthy process of establishing reduced pollution levels, you will

work with the Ohio communities affected by the TMDL regulation to provide background material and briefing information about the implementation process. [11]

Response: The Ohio EPA has worked with the upper LMR communities and has provided background and briefing information. Tables 13a and 13b of the Upper LMR TMDL report (2nd draft December 2001) detail the meetings and the general meeting topics through October 2001. These workgroup meetings including Ohio EPA representation continue to meet on a monthly basis to progress on the implementation plan.

Authors of Written Comments on the Second Draft Upper Little Miami River TMDL

#	Date Received	Name	Organization
12/4/01 - Public notice given for the second draft of the upper Little Miami River TMDL report			
1	12/13/01	Eric Partee	Executive Director - Little Miami Incorporated
2	1/4/02	Paul Brock, P.E.	Poggemeyer Design Group, Inc
3	1/8/02	John Fisher	Executive Vice President - Ohio Farm Bureau
4	1/10/02	Keith Dimoff	Clean Water Program Manager - Ohio Environmental Council
5	1/10/02	Deborah Feldman	Montgomery County Administrator
6	1/11/02	James Brueggeman, P.E.	Director, Sanitary Engineering Department, Montgomery County, Ohio
7	1/11/02	Theodore Boggs	Vorys, Sater, Seymour and Pease LLP
8	1/11/02	Gary Johnson	Office of Public Service Director - Xenia, Ohio
9	1/11/02	Ronald Volkerding, P.E.	Deputy Directory, Office of Sanitary Engineering, Greene County, Ohio
10	1/11/02	Larry Cole	Superintendent, Wasterwater Treatment, Greene County, Ohio
11	2/1/02	Dave Beach	Director of Public Works, Beavercreek, Ohio
12	2/4/02	Ronald Volkerding, P.E.	Deputy Directory, Office of Sanitary Engineering, Greene County, Ohio
13	2/4/02	Eric Partee	Executive Director - Little Miami Incorporated
2/4/02 - Sixty day public notice period ends.			
14	2/5/02	Theodore Boggs	Vorys, Sater, Seymour and Pease LLP

Responses to Comments:

1. Justification for the in-stream total phosphorus criteria in relation to restoring Exceptional Warmwater Habitat conditions is desired. [1, 4]
   This justification is described in the document *Association Between Nutrients, Habitat, and the*

Aquatic Biota of Ohio Rivers and Streams available for download at http://www.epa.state.oh.us/dsw/document_index/docindx.html. A brief description is also included in Appendix C of the TMDL report.

2. Justification is desired for current in-stream levels of TP. [1, 4]

   The most current information available is summarized in Table 9 of the report *Total Maximum Daily Loads for the upper Little Miami River* available for download at http://www.epa.state.oh.us/dsw/tmdl/ulmr_1201.html.

3. Justification is desired for data/modeling description which supports the break out between point and nonpoint loads, particularly during critical low periods. [1, 4]

   A discussion of the modeling used is available in chapter 4 and appendix A of the TMDL report referenced above.

4. Justification is desired for projected in-stream TP levels with the proposed 1 mg/l limit on dischargers. [1, 4]

   The QUAL2E model predicts a 0.32 mg/l total phosphorus concentration at the bottom of the study area during average summer conditions if the POTWs are discharging at median flow and a total phosphorus limit of 1 mg/l. This includes an accounting for some NPS improvements by decreasing the incremental inflow phosphorus concentration and by decreasing the benthic contribution of phosphorus.

5. Justification is desired for waiting 10 years before requiring the lower TP limit on dischargers. [1, 4, 13]

   The appropriate in-stream nutrient concentration that will support an Exceptional Warmwater community can only be approximated. There is no total phosphorus water quality criteria, and there is a suite of factors that affect this appropriate concentration including habitat issues. Further, the effects of NPS best management practices are not well documented at this point. Therefore, an adaptive management approach is appropriate to use in this case which allows for the project to move forward despite some of the uncertainties associated with it. The ten years will allow NPS actions to be implemented and the effects of reduced phosphorus loads and improved habitat to be better known.

6. What is the appropriate timing for the next TSD report and/or additional monitoring of stream health? [1, 4]

   The appropriate timing for the next full scale biological survey of this watershed and the associated TSD report will be when significant actions in the watershed have been implemented and other indicators of improvements (such as reduced algal blooms) have been observed. However, monitoring of the stream needs to continue. Ohio EPA hopes the TMDL workgroup will develop a monitoring plan in conjunction with the implementation plan to further define the monitoring needs and assign responsibilities and time lines to carry forth such monitoring.

7. The 30-day public comment period ending on January 4, 2002 is too short given the holiday season. An extension to February 4, 2002 is requested. [1, 4]

   The public comment period was extended through February 4, 2002.

8. Reclassification of the South Branch of Caesar Creek to Exceptional Warmwater Habitat is unsupported by i) QHEI, ii) zero stream flow, and iii) "nonpoint" sources are not addressed. [2]

   The comments appear to be concerned with the impact of the designation on the Jamestown wastewater treatment plant. Note that the re-designation has previously gone through public notice and other rule making procedures and will be issued final in the near future. Also, the re-designation is specifically from river mile 4.0 to the mouth. The treatment plant discharges at approximately river mile 9.0. Finally, results from the1998 survey showed the following: IBI = 56, ICI = VG, and QHEI = 67. Those scores demonstrate full attainment of Exceptional Warmwater Habitat.

9. Why are the POTWs required to discharge a minimum of 7 mg/l dissolved oxygen when the minimum criterion is 5 mg/l? Why are ammonia nitrogen limits being required when ammonia nitrogen is no longer a problem in many of the segments? [8, 10]

   The applicable dissolved oxygen average criterion of 6 mg/l must be attained in-stream. The main effluent components that can be controlled to achieve this include carbonaceous biochemical oxygen demand (CBOD), ammonia-nitrogen, and dissolved oxygen. The proposed combination of limits is one workable balance between these three components. If the POTWs would prefer a different combination, one where the dissolved oxygen requirement was 5 mg/l minimum and 6.0 mg/l average, then either the ammonia-nitrogen limit or the CBOD limit or both would need to be reduced further to make up the difference. The POTWs may request this re-allocation if it is so desired. The ammonia-nitrogen is being reduced to attain the dissolved oxygen criteria not because of ammonia-nitrogen toxicity.

10. Why are phosphorus reductions at the POTWs being sought when Ohio EPA believes a high quality riparian corridor may decrease the adverse effects of nutrients? [9, 10]

    A high quality riparian corridor would be beneficial in multiple ways to the stream both in sequestering nutrients and in improving habitat. Ohio EPA is encouraging this by authorizing several 319 projects in the area and by allowing a point source/ nonpoint source trading option in the NPDES permits should the POTWs wish to exercise this option. However, the upper Little Miami River is effluent dominated during lower flow conditions. These conditions tend to occur when the system is particularly sensitive to phosphorus loads. Reductions in the point source phosphorus load are needed for this reason.

11. Page 58, third bullet of the TMDL report, states that NPDES Permits will include an option for modification should target levels of phosphorus be achieved however this seems to be in conflict with anti-degradation policies. [10]

    Ohio's Antidegradation rule provides for increases in permitted loads, given adequate justification and public review. The opener clause for permit modification has long been included in Ohio

permits. The strategy outlined specifically acknowledges this with regard to in-stream phosphorus levels. Even if the increase is considered a degradation under the rule, this type of increase would most likely meet the waiver provisions of OAC Rule 3745-1-05(D)(2)(b). Ohio EPA does not see the antidegradation rule as an impediment to modifying the NPDES permit in this case.

12. The summer phosphorus reporting window should be May to November like other parameters which have more stringent limits for the summer reporting period than the winter. [8, 10, 12]

    Ohio EPA has revised the proposed compliance period for total phosphorus to match the standard "summer" period (i.e., May - October).

13. The Cedarville WWTP cannot meet the proposed NPDES Permit limits until the facility reconstruction is completed. [10]

    Ohio EPA is aware of the status of the Cedarville WWTP with regard to compliance with effluent limitations. Greene County has submitted a Permit To Install application to Ohio EPA for the upgrade of this facility. We anticipate issuing the renewal NPDES permit draft concurrently with any Permit To Install. The renewal permit will include a compliance schedule allowing for construction.

14. The Sugarcreek WWTP will face much difficulty meeting the summer NPDES proposed ammonia limit until the facility is expanded. The solids processing facility adds heavy ammonia loading which exceeds the aeration capacity of the existing process equipment. [10]

    It is our understanding that design of improvements at this facility are underway. The renewal permit will include a compliance schedule allowing for construction.

15. Copper, mercury, and CBOD, should not be addressed in the POTW implementation plan. The GWLF model did not evaluate copper, mercury, and CBOD. [5]

    The implementation plan is a plan to address identified impairments. The Little Beaver Creek is being impaired in part due to metals as specified on Ohio's 303(d) list. In addition, the Little Miami River has a dissolved oxygen problem. Since Montgomery County contributes to these causes of impairment they can be addressed in the implementation plan which includes water quality based effluent limitations for the POTWs. This TMDL project was not solely based on GWLF, as discussed in the TMDL report. QUAL2E was used to determine the appropriate allocations of oxygen-related substances. In addition, the Permit Support Document for these NPDES permits describes the approach to allocating the copper and mercury load. Appendix F of the TMDL report details the information concerning the impairing causes particular to the Little Beaver Creek watershed.

16. How will the affect of future credit projects be evaluated? [5]

    If a POTW decides to pursue a credit project then the Ohio EPA and the POTW will need to agree on the details of the credit project. This would include how the effectiveness of the project will be estimated and measured. Appropriate and available tools and literature will be key to this evaluation.

17. Funding, studies, design and construction of improvements to achieve 1.0 mg/l phosphorus would require at least 5 years, not 36 months. [5]

    We believe that these limits can be achieved within 36 months, based on our experience with other wastewater treatment facilities.

18. Montgomery County is completing a state of the art septage receiving station, which will receive septage from the Little Miami Watershed and other watersheds. Credit should be given for this pollutant reduction. [5]

    Credit can be given for septage received from the Little Miami watershed.

19. There are several impairing causes to the Little Beaver Creek including habitat and urban runoff issues. In addition, nutrients were not included in the six pollutants identified as posing the greatest threat to aquatic health of the Little Beaver Creek as described in the Tetra-Tech report *Pollutant Load Analysis to Access Sources of Sediment and Water Column Toxicity in Little Beaver Creek, Ohio*. [6]

    Ohio EPA agrees that there are serious habitat issues in the Little Beaver Creek as explained in the TMDL report. Ohio EPA also recognizes that there are other impairing causes unique in the watershed to the Little Beaver Creek; this was why Ohio EPA sought assistance through USEPA (contractor Tetra-Tech) to investigate these additional causes of impairment in this subwatershed. However, this does not preclude that the Little Beaver Creek is a major source of nutrients to the Little Miami River mainstem and needs to be included in the load reductions in a global sense. Further, Tetra-Tech was contracted to investigate the impairing causes not covered in the larger watershed study. Therefore, they were not examining all of the impairing causes but instead were asked to specifically investigate the non-nutrient related toxicity issues only.

20. Pg 2; Par 3 "Little scrutiny and public notice was given to the decision to place the uLMR on the Clean Water Act 303(d)(1)(A) list..." [7]

    Ohio EPA is required under Section 303(d) of the Federal Water Pollution Control Act to identify waters in the state (the 303(d) list) which are currently threatened or impaired and may require TMDL development in order to meet WQS. In the uLMR watershed, seventeen waterbodies appeared on Ohio's 1998 303(d) list.

    It is Ohio EPA's position that the public notice provided with regard to the 303(d) list was sufficient, and furnished the public with prior notice and ability to furnish comments. In February 1998, Ohio EPA provided its draft 303(d) list to US EPA and noticed the list for a 30 day public comment period, including a public information meeting. In April 1998, a final 303(d) list, which incorporated revisions based upon responses received from US EPA and the public, was submitted to US EPA along with a Responsiveness Summary that addressed the comments that had been received. Additionally, this Responsiveness Summary was sent to each person who commented on the draft 303(d) list.

21. Pg 2; Par 3 "...the POTWs question..... whether reasonable criteria was followed for the initial [303(d)] listing." [7]

The comment seems to be focus on the fact, as correctly noted, that most of the segments of concern in the uLMR were listed because of non-attainment of the biological criteria. It is questioned whether this is appropriate because the biological criteria is "imprecise".

Ohio EPA believes that reliance on the biological criteria is appropriate based on two distinct considerations. First, such metrics are widely recognized as being superior to chemical specific standards for three reasons: they serve as an indicator of long-term, rather than instantaneous, water quality; they can indicate problems associated with parameters for which there is no chemical specific standard; and they can indicate problems associated with a combination of pollutants (or pollutants and other factors). Second, the biological criteria are part of Ohio's Water Quality Standards. Ohio is obligated to report on those stream segments that do not achieve these WQS (the 303(d) list).

22. Pg 2; Par 5 "The lack of authority over nonpoint sources is not an appropriate reason to unfairly target the POTWs for nutrient reduction." [5, 7, 8]

The structure of this comment implies two possible conclusions: the POTWs are being asked to carry a burden, in addition to their contribution, that is more properly attributed to nonpoint sources; or, that the POTWs are expected to deal with a problem to which they contribute little or nothing. Ohio EPA does not agree with either of these possible interpretations.

Ohio EPA acknowledges that there is little in the way of direct authority over the nonpoint sources. The pending implementation of the Phase 2 Storm water rules is the exception, as these Rules are expected to initiate some improvement in terms of urban runoff. However, as currently proposed in the TMDL, the POTWs are only being asked to comply with calculated effluent limits that are based on a 60% reduction of the POTW contribution. [See later comment regarding the issue of uniform reduction.] The figures used in the TMDL contemplate a similar reduction for the nonpoint sources. As such, there is no inequitable burden being placed on the point sources.

Ohio EPA believes that there are several factors which compel the implementation of these measures at the POTWs. First, the Little Miami River is an effluent dominated stream for much of its length; treated wastewater constitutes as much as 70% to 80% of the stream flow. During the driest period of the year (July to November), the cumulative impact of these discharges is the largest single influence on stream quality. Second, while the largest contributor of total phosphorus loading is the nonpoint sources, this can not be considered in isolation. Most of the nonpoint contribution occurs during a limited time period (spring to early summer) when fertilizers are being applied in both rural and urban settings and only in conjunction with rainfall. The point sources, on the other hand, discharge at a relatively steady rate throughout the year and are essentially the only source during low-flow periods. Third, the point sources contribute approximately 50% of the total load of ortho-phosphorus, which is the more readily assimilable form. Finally, the POTWs are a critical component when evaluating future conditions on the Little Miami. Development is proceeding at a rapid pace along the entire length of the river, which results in more wastewater and, as ground water is exploited more aggressively, less flow from other sources. The result is that the point sources will have an increasing influence on overall river quality.

23. Pg 2; Par 5 "Ohio EPA has not specifically identified the cause of any impairment, as the draft TMDL only identifies "sources" of nutrients." [7]

Tables 2 and 6 in the *Total Maximum Daily Loads for the upper Little Miami River* report specifically identify the causes of impairment per segment in this watershed.

24. Pg 2; Par 5 "The agency must demonstrate...that the... exceedance of... WQS are caused by... the POTWs before...public dollars are spent. This has not been done." [7]

The Ohio EPA QUAL2E model developed for this TMDL and reviewed, approved, and supported by the consulting firm hired by the POTWs clearly demonstrates that the POTWs can cause dissolved oxygen violations at current permitted levels.

25. Pg 3; Par 3 "Ohio EPA's reliance on just a few data points from the uLMR segment in the summer of 1998 for in-stream phosphorus concentrations to make judgements about the current level of P in the stream is unreasonable, arbitrary and capricious." [7]

Ohio EPA disagrees with this characterization of the fieldwork undertaken in support of this TMDL. The sampling and fieldwork conducted in the upper Little Miami River in the summer of 1998 was probably the most intense and extensive sampling effort undertaken in any Ohio watershed, before or since. As Ohio's stream monitoring is widely recognized as one of the most successful state programs, this work may also be some of the most extensive in the nation as a whole. While the data from 1998 is central to the calculations in this TMDL, the data from the 1993 stream survey, which showed values comparable to 1998, was also reviewed in this process.

26. Pg 3; Par 4 "The Associations Bulletin attempts to translate a narrative water quality standard for controlling nuisance growths of aquatic weeds and algae into a numeric standard by trying to demonstrate a cause and effect relationship between an exceedance of the biological criteria and P concentrations." Continuing in the next paragraph: "Ohio EPA is applying the guidance values on the POTWs as if they are applicable state WQS for P. ...The guidance values are not scientifically valid....[The] POTWs request that Ohio EPA provide the specific evidence which they are relying on to conclude that POTW discharges are violating these narrative criteria..." [7]

As we understand this comment, it is suggested that the narrative water quality standard regarding nuisance growths of aquatic weeds and algae (OAC Rule 3745-1-04 (E)) is somehow being applied to the biological criteria. This is not the case. The narrative criteria and the biological criteria are both distinct parts of the water quality standards and it is unnecessary to translate one into the other.

The Associations report develops the thesis that nutrients directly and indirectly affect the aquatic communities in streams, thereby affecting the biological criteria. This occurs through trophic cascade, and algal respiration and decomposition, respectively; a condition also denoted by eutrophication. The report also discusses the role of habitat as a mediator between nutrient concentrations and effects on trophic levels. These effects of nutrients and eutrophication on the aquatic community are not currently addressed in the water quality standards, however, states are

required to have nutrient water quality standards in place by 2004. The Associations report develops ranges of acceptable concentrations of nutrients using the reference site-percentile approach suggested in USEPA's Nutrient Guidance document, and further stratifies concentration ranges by stream size, ecoregion and aquatic life use designation, and provides guidance on factoring in habitat quality to afford the maximum level of flexibility when developing target values for streams undergoing a TMDL. By contrast, the USEPA reference range for the Level III Eastern Corn Belt Plain suggests a stream concentration of 0.06 mg/l TP.

Ohio EPA does not assert that nuisance conditions exist in the Little Miami River in the reach downstream from the confluence with Beaver Creek. However, the Ohio EPA does assert, and has demonstrated, as outlined in the LMR Technical Support Document, that biological impairment does exist in this reach, and has observed wide fluctuations in dissolved oxygen consistent with eutrophication. Ohio EPA has not applied the guidance values as if they were WQS; if this had been done the effluent limits proposed in the TMDL report for POTWs would be significantly more stringent. The guidance values have been used to address one of the causes affecting biology in the system, not as absolute levels that must be attained.

27. Pg 3; Par 4 "The use of this "guidance value" to establish a TMDL, which is used in turn as the basis for an enforceable NPDES permit limit, ... Is unreasonable and unlawful." [7]

Ohio EPA believes that this usage of the Associations Bulletin and the subsequent development of effluent limits is neither unreasonable nor unlawful. As is noted in subsequent comments, one of the guiding principles of water pollution control is to protect aquatic life and many of the promulgated water quality standards are based on values calculated to protect aquatic life. The biocriteria are also part of the water quality standards and are intended to serve as a measure of whether aquatic life is indeed being protected. With regard to the upper Little Miami River, problems within the aquatic community have been identified and documented. In Ohio EPA's opinion a reasonable connection between the in-stream concentrations of nutrients and the identified aquatic life problems has been adequately demonstrated.

28. Pg 3; Par 5 "...the entire TMDL may be a rule which is required to be adopted pursuant to the Ohio rulemaking statute." [7]

It is Ohio EPA' s position that the TMDL is not a rule.

29. Pg 4; Par 2 "Is Ohio EPA concluding that the POTWs are causing the violations just because they are a "source" of the pollutant? Without evidence specifically linking the POTWs as the cause of the exceedances or "impairment", it would be inappropriate and unfair to impose the primary burden of reductions on the POTWs through enforceable NPDES permit limits. Please explain how the Agency interpreted the data, observations, and other evidence to conclude that the POTWs are causing in-stream water quality criteria for DO and ammonia-nitrogen to be violated." [7]

See the LMR Technical Support Document (TSD) for a discussion of water quality exceedances observed in water quality grab samples and continuous dissolved oxygen monitoring (i.e., Datasondes).

The Ohio EPA QUAL2E model developed for this TMDL and reviewed, approved, and supported by the consulting firm hired by the POTWs clearly demonstrates that the POTWs are causing DO violations at current permitted levels. The ammonia limits proposed by the TMDL are to help correct this DO sag to which the POTWs contribute. Further, there have been numerous meetings and discussions concerning this model, its development and its results; please refer to Tables 13a and 13b of the upper LMR TMDL report for specifics. The POTW representatives have been at all of these meetings; therefore, Ohio EPA is unsure what is meant by the assertion that there has been very little discussion on how Ohio EPA linked the POTW discharges to the violations of the in-stream DO.

30. Pg 4; Par 2 "Without evidence specifically linking the POTWs as the cause of the exceedances or "impairment", it would be inappropriate and unfair to impose the primary burden of reductions on the POTWs through enforceable NPDES permit limits." [7]

Ohio EPA disagrees with this statement; the POTWs have been linked with exceedances. Increased ammonia and decreased dissolved oxygen levels are most often the result of introduced organic material. Both are ephemeral - when the organic introduction is removed, both values recover quickly. A continuing problem indicates a continuing source of organic material. The principle and perhaps only continuing source, during low flow conditions, are the discharges from the POTWs. While Ohio appreciates that these proposed limits may entail additional treatment/expense, Ohio EPA is unaware of any credible alternative. Further, 40 CFR 122.44 (d) requires permit limitations on parameters which cause or contribute to an excursion from water quality standards.

31. Pg 4; Par 3 [7]

31.1 "Ohio EPA's data do not support their conclusion that nutrient enrichment... correlates to aquatic life use impairment..."

Total phosphorus is present in the LMR downstream from the dischargers in concentrations saturating to algal uptake rates. D.O. swings are evident in this reach and changes in the trophic structure of the fish community toward a higher relative abundance of omnivorous fishes and a loss of sensitive species are strong evidence for nutrient enrichment.

31.2 "Ohio EPA's target in-stream total phosphorus concentration (0.43 mg/l) [sic] is not adequately supported by the data."

The target concentration was proposed and discussed within the TMDL workgroup and is based on the references sited in the TMDL draft report. The in-stream total phosphorus target concentration is 0.17 mg/l not 0.43 mg/l. The current median in-stream concentration in the most downstream segment of the mainstem is 0.42 mg/l.

31.3 "Ohio EPA's methodology for developing the TMDL, and the proposed load reductions, is not consistent with the science of pollutant fate and transport."

The modeling approach was developed through consensus with the TMDL workgroup of which the POTWs were a major part. Further, QUAL2E and GWLF models are both USEPA approved models used in other approved TMDLs around the nation. QUAL2E is an industry standard. The consulting firm hired to review the modeling supported the QUAL2E model fully, and the disagreements on the GWLF model were not concerning fate and transport issues.

31.4 "Ohio EPA models were not utilized to support the TMDL development. Thus, seasonality, critical conditions, margins of safety, and in-stream nutrient processes have not been adequately considered in the TMDL."

The Ohio EPA models were utilized to support the TMDL development. Thus, seasonality, critical conditions, margins of safety, and in-stream nutrient processes were adequately considered in the TMDL. Further, if the POTWs are requesting an explicit safety factor, Ohio EPA is not opposed to incorporating this into the TMDL numbers to address their concerns.

31.5 "Ohio EPA's modeling approach for the GWLF is atypical and not adequately supported by additional analysis or data."

Ohio EPA disagrees with this statement. The approach for the GWLF is not atypical for a large subwatershed such as the upper Little Miami River. Ohio EPA has not seen evidence from the POTWs which supports this assertion as there has been no comparison of this project to other TMDL projects of this size which have used GWLF.

31.6 "Ohio EPA's implementation plan was developed without evaluating the effectiveness of multiple restoration scenarios. Furthermore, the implementation plan presented has not been adequately evaluated for its ability to meet the proposed TMDLs."

Please note that the implementation plan was developed by the TMDL stakeholder group, not Ohio EPA. This plan was developed using the evaluation of effectiveness of restoration scenarios; see Table 18 of the *Total Maximum Daily Loads for the upper Little Miami River* report. This table was distributed to the workgroup in December of 2000 before the work on the implementation plan proceeded. The current draft implementation plan has not been evaluated as it is draft and is expected to change. Once the implementation plan is close to being final it can be evaluated for its ability to meet the proposed TMDLs.

32. Pg 5; Par 2 "The proof of a quantitative relationship between phosphorus concentration and use impairment has not been adequately made. In particular, the correlative nature of the evidence in the Ohio EPA internal Associations Bulletin is based on circular logic that derives scores based from relationships with certain causative factors and those same causative factors." [7]

Biotic indices, like the IBI, are calibrated against a set of reference samples that set the expectations for component index metrics for a given stream size and ecoregion. The component metrics are themselves derived from the natural history, zoogeography, and ecology of the local fauna and are chosen to help identify various impacts (*e.g.*, omnivorous species respond positively to organic and nutrient enrichment, a relationship that is well documented by experimentation and observation). The composite index is then tested against a known environmental gradient to observe if the index scores adequately explain the range of variation within the environmental gradient, and individual metrics are compared against components of the environmental gradient to see if the metrics are responding to that gradient in a manner predicted *a priori* based on the natural history, zoogeography and ecology behind that metric.

In short, the pool of possible metrics for any biotic index are drawn from known ecological relationships, the least-impacted reference population of streams establishes the baseline expectation for metrics for a given ecoregion, and comparison to a known environmental gradient (a known gradient being one that occurs on a macro-scale, e.g., urban versus non urban, amount of wastewater loading, percent forested versus percent row crop) selects for metrics that best explain the observed, macro-scale variation. The outcome is an index that is sensitive to environmental disturbance that can be used to gauge the environmental impact of a given activity or pollutant on a stream relative to the reference condition. In this case total phosphorus concentrations were evaluated against a reference condition.

The only logical fallacy then becomes inferring cause-and-effect from correlation, and the only complete way around that is through direct experimentation. However, overwhelming empirical evidence, accounting for confounding factors, can make for a strong case (see Miltner and Rankin, Freshwater Biology 40: 145-158). The argument that employing a biotic index to gauge impacts is inherently tautological, is homologous to that for standardized test scores for students. For example standardized I.Q. tests were originally based on "advanced" or "excellent" students identified by their teachers; therefore, students subsequently tested who met those subjective criteria embodied by "advanced" or "excellent" tended to do better than students not meeting those

criteria, a result largely independent of innate intelligence. However, when those caveats are considered, standardized tests are effective at gauging student progress (see "Biology as Ideology" by Richard Lewontin). And the caveats that must be considered in either case are similar. For example, the index or test must be used to compare individuals from the same population to the population mean, and here the population must be carefully defined. Ohio EPA defines stream populations using the ecoregion and stream size approach and sets the expectation (i.e., mean) for the ecoregion and stream size against a subset of least impacted sites, an approach widely employed and accepted as documented in numerous peer-reviewed journal articles.

33. Pg 5; Par 3 [7]

33.1 "Nonpoint sources are mentioned several times as the source of most of the 'load' of phosphorus to the watershed."

As was acknowledged earlier, this is true. It was also noted that this can not be considered in isolation. Point sources are the major contributor to the low-flow load.

33.2 "All non-attainment of bio-criteria in the mainstem of the uLMR was shown in the upper reaches, which receives the smallest proportion of point source load." [7, 9]

The most significant non-attainment was indeed found in the upstream reaches, which also have the poorest habitat. However, wide-spread partial attainment was also observed downstream from the major point sources, where the habitat was far superior. Note that partial attainment indicates the stream is not meeting water quality standards and is, therefore, not attaining its designated use.

33.3 "The diel swings as discussed above occur upstream of most of the municipal POTWs." [7]

Diel swings, though not as pronounced as upstream, were recorded in the reach below the dischargers. The river is relatively large and reaerated by riffles in the reach below the POTWs, therefore swings should be negligible.

34. Pg 6; Par 1 "...none of the (D.O.) averages violated the EWH average of 6 mg/l and only 2 of 12 stations document values that did not meet the minimum criteria of 5 mg/l at all times." [7]

Both USEPA and this Agency view chemical exceedances as "tip-of-the-iceberg" phenomena, indicative of potentially larger problems, given that sampling can only capture a limited picture of overall stream conditions. Also, 2 of 12 stations not meeting the minimum criteria (17% exceedence), particularly in an Exceptional Warmwater Habitat stream, is two too many. Further, when the stream is modeled under conditions the criteria are designed to be protective of (this is not necessarily when the field data was collected) and the POTWs are at their current permitted levels, dissolved oxygen violations are predicted to occur downstream of the majority of the POTW discharge points.

35. Pg 6; Par 2 "The complexity of the interaction of biota, habitat, flow conditions, and riparian corridor results in a highly variable capacity for the stream to effectively utilize nutrients without adverse consequences to aquatic life...It is not clear that the nutrient limits will result in measurable improvement in aquatic life..." [7]

The river is not habitat limited in the reach downstream from the dischargers; the habitat in that reach is excellent, yet phosphorus concentrations exceed the assimilative capacity of the river, and the aquatic life use is not fully met. The major limiting factor, given the lines of evidence available to Ohio EPA, is excessive nutrients. Therefore reduced nutrient concentrations will result in measurable improvement in aquatic life.

36. Pg 6; Par 3 "Definition of a quantitative in-stream concentration target does not equate to a load limit." [7]

It does not necessarily equate; however, in a situation such as this, where in-stream concentrations are governed at low flow by an existing load, we believe that there is an equivalency.

37. Pg 7; Par 1 "The Association Bulletin does not quantitatively compare the relationship of stream loads to resultant concentrations, so it is impossible to make the statement that the converse process will be valid for the uLMR watershed." [7]

The Associations report does not begin with stream loads, but rather starts with the concentration, and works backward from the stream habitat to land use factors to improve the condition of the stream as whole, including reduced nutrient loads.

38. Pg 7; Par 2 Section 3.3 summarizes Ohio EPA's position that the point sources of Phosphorus are the major sources of nutrients during critical low flow periods. The statement is then made that the nonpoint sources provide the "predominant" source of nutrients on a yearly average basis. Ohio EPA seems to be assuming that the nutrients from these nonpoint sources are removed from the system and do not contribute to resultant nutrient concentrations in the stream during critical low flow. Several properties of biological systems exist which negate this assumption. Aquatic plants and algae rapidly take up phosphorus that is bioavailable in the system. Since phosphorus is generally less available in relation to demand (the definition of nutrient limitation) plants and animals have mechanisms to store and retain phosphorus where it is available. Those systems and sediment transport process combine to result in what has been termed nutrient spiraling. The important result of nutrient spiraling is that the transport of nutrients downstream is generally slower than the transport of water. The retention of nutrients clearly can result in high in-stream concentrations of nutrients at critical low flows that are derived from nonpoint source loads during high flows retained by the function of the stream and its biota. Although Ohio EPA included an informative summary of the nutrient spiraling concept in the Associations Bulletin, the Agency seems to ignore important results of applying that concept." [7]

If sediments act as a sink to recharge nutrient concentrations during low flow periods, then no

longitudinal pattern in TP concentration would be evident. The most dramatic example of this non-uniform distribution is the three-fold increase in phosphorus concentrations downstream of the confluence with Beaver Creek.

39. Pg 8; Pars 2-4 These paragraphs assert that the TMDL report alone does not provide full detail on the modeling and points out that the TMDL for phosphorus was not based on the QUAL2E model. [7]

The TMDL report provides a detailed description of the modeling approach as described in Appendix A; however, it does not claim to be a full stand alone documentation of the modeling process. A description of how phosphorus was modeled using QUAL2E was not included in the appendix as the phosphorus TMDL was not based on the QUAL2E model; although this was explored. The reason QUAL2E was not used to develop the phosphorus TMDL is because QUAL2E on its own could not quantify the nonpoint source loading of phosphorus and therefore could not develop a TMDL number for phosphorus.

40. Pg 8; Par 5 "Ohio EPA's rationale for selection of several input parameter values remains unclear. During the review of Ohio EPA's draft report, input files, and notes Malcolm Pirnie has found several inconsistencies between values recorded in the TMDL and those used in the actual model runs." [7]

Ohio EPA recognizes that the documentation for the modeling on this project was not easily understandable to an outside party. However, this should not be construed that the modeling itself was inconsistent or faulty based on a lack of clarity concerning the documentation. The inconsistencies cited by Malcolm Pirnie in their review appear to be based on the fact that there were software incompatibility issues, that some of the electronic files were versions that had been used after the model was calibrated to estimate effectiveness of various implementation actions (and therefore, the inputs did not match up with the calibration inputs), and that much of the documentation was made progressively as the model and the data developed. Ohio EPA notes that there was one inconsistency in the appendix that Malcolm Pirnie pointed out, not the several inconsistencies as stated above. The difficulty in understanding the modeling was generally worked out through discussions between Malcolm Pirnie and Ohio EPA, and the modeling results were able to be replicated.

41. Pg 8; Par 7 through Pg 9; Par 4 [7]

41.1 "Ohio EPA did not use "known" input, instead a weather file was generated. The generation of this weather file is unclear to Malcolm Pirnie, as it does not appear to be the average or median of the five weather stations Ohio EPA reported to have used in the model."

The weather file used for the GWLF modeling was the daily median of the "known" input from the five weather stations referenced above. The spreadsheet used to generate this was forwarded to Malcolm Pirnie so Ohio EPA is unsure as to why the generation of this file is unclear. The data from these five weather stations were used in a variety of ways in the model to determine which station or combination of stations would result in the best fit of the data. The median of all five weather stations produced the best fit between predicted results and observed data.

41.2 These paragraphs question the 'observed' flow data set Ohio EPA used to calibrate the GWLF model with. Briefly, these bullets object to the fact that a flow recording station was not established at the downstream end of the study area, and that the method used by Ohio EPA was very simplistic and did not take into account possible land use changes or hydrologic differences between points in the watershed.

Ohio EPA acknowledges that data manipulation and regression-based development of a flow data set is not the preferred method for obtaining a calibration data set. However, this situation where the flow data gage is not located at the bottom of the watershed is not uncommon. This problem was anticipated by the Ohio EPA staff and a level recorder was established at the downstream end of the watershed at the beginning of 1998. However, the level recorder was often disturbed and vandalized and the data was unreliable to use. Therefore, an alternate method was needed. Fortunately, a number of USGS flow gages were available in the watershed to develop such a calibration data set. The regression method used to develop a flow at the bottom of the study area was based on real data from 2 USGS gages in the study area and on drainage area differences. The lack of accounting for land use changes is a weakness with this method; however, a more rigorous method for estimating the flow at the downstream point of the watershed was not necessarily justified based on resource considerations and the ultimate affect of the GWLF model results on the TMDL process. The purpose of the GWLF model should be kept in mind. The GWLF model was used to estimate loads to the stream from primarily nonpoint sources. It is a scoping level tool that was not used in any way to mandate the percent reductions needed or set permit limits for either point or nonpoint sources. In this case, the decision on how to calculate this flow was tailored to the needs and resources of the project. Further, the estimation method used, while not the preferred method, is not arbitrary nor capricious, and it estimates the flow adequately for the intended purposes of the GWLF model.

42. Pg 9; Par 5 "Ohio EPA used in-stream water quality data and the US Army Corps of Engineers' FLUX procedure to develop 'known' estimates of nutrient loads in the runoff. Since the stream data includes in-stream processes that GWLF does not model, the comparison of these two data sets is invalid." [7]

Ohio EPA does not claim the GWLF model was calibrated for nutrient loads. No model inputs were adjusted as a result of the nutrient comparison exercise. Appendix A of the TMDL report makes the following statement (page A-23):

The model also predicts nutrient loads to the stream. It is difficult to calibrate the predicted modeled loads based on observed data because the actual ('observed') load to the stream is extremely difficult, if not impossible, to measure unless the modeled area is limited to a very small plot of land. However, a rough estimate of the actual load to the stream can be made by monitoring the load in the stream. The load in the stream is effected by in-stream process which GWLF would not incorporate; therefore, it is a rough estimate only, especially useful in measuring trends in the data as opposed to a strict calibration procedure.

Ohio EPA is open to any feasible means of collecting actual observed loading data to the stream for a 657 square mile watershed. However, no alternate ideas or methods for collecting adequate data have been forthcoming from the stakeholders or their representatives. The method used was feasible and in keeping with the intended purposes of the GWLF model and has been used in other

TMDL projects.

43. Pg 10; Par 4 "The proposed attainment of the TMDL does not address seasonality because it is only based on the GWLF model, which does not incorporate in-stream seasonal effects such as sediment-phase phosphorus deposition and release. To truly incorporate seasonality into the TMDL, GWLF model output must be input to the QUAL2E model so that seasonal changes, both on land and within the stream, can be included in the analysis." [7]

The loads to the stream are calculated based on daily precipitation data for ten years and seasonal land changes. Therefore, seasonality is incorporated into the TMDL calculation as required by USEPA guidance. The reduction needed to attain the TMDL is based on in-stream samples taken from June through October. The targets are based on primarily summer data because the critical condition for the biology is the summer when production is high. Therefore, winter inputs do not directly impair biology nor do we have applicable target levels to use with which to measure a winter in-stream response with. However, winter inputs may indirectly affect biology if these winter loads do not export and become incorporated into the system (sediments) for re-release during more critical seasons. Benthic dynamics of phosphorus were incorporated into the QUAL2E model; however, since Ohio EPA decided to not strictly apply the in-stream phosphorus target, the QUAL2E model was not used to allocate the total phosphorus load. The sediment-phase phosphorus deposition and release may only become important when an in-stream criteria is promulgated for phosphorus. Further, the benthic deposition and release may have a net change of zero over a daily time-scale and may be an insignificant source and/or sink when compared with seasonal runoff loads of total phosphorus.

44. Pg 10; Par 5 "...it is not clear how these (section 4.3 of the TMDL report) modeling-related conservative assumptions were incorporated in the phosphorus TMDL calculation. An explanation is requested." [7, 9]

Ohio EPA developed a number of TMDLs in this project, not just a total phosphorus TMDL. Section 4.3 discusses several implicit conservative assumptions in the modeling to account for a margin of safety. The conservative assumptions in the QUAL2E model relate to the dissolved oxygen 'TMDL'. The conservative assumptions for the total phosphorus TMDL are primarily in regards to the target development of phosphorus and in the needed reduction not in particular model assumptions. As stated previously, if the POTWs are requesting this, Ohio EPA is not opposed to incorporating an explicit safety factor in the TMDL numbers to address their concerns.

45. Pg 11; Par 2 [7]

45.1 "Fundamentally, the argument that a desired in-stream concentration reduction can be obtained with an identical percent reduction in pollutant load is not supported by the science of pollutant fate and transport. The argument may be valid for a controlled, finite set of conditions in the watershed system, but it is not valid, even on average, for the infinite combination of factors driving the fate and transport of Phosphorus in the real world."

The combination is not infinite when the low-flow concentration of phosphorus is driven by small number of identified sources. As is noted in subsequent comments (see comment 50), Ohio EPA has modified its position relative to an identical percent reduction in loading.

45.2 "...the report provides no quantitative basis to suggest that this reduction in Phosphorus load is in fact necessary to attain standards in all segments."

Ohio EPA has not said that a reduction in phosphorus load is necessary to attain standards in all segments as some segments (usually tributary segments) in the watershed are already fully attaining standards. However, a reduction in phosphorus load is needed basin-wide (in conjunction with other improvements) in order for the biocriteria to be achieved in the segments that are currently impaired. The quantitative basis for this has been discussed extensively and previously with the stakeholder group; the development of the targets is discussed in the Associations Bulletin and the application is discussed in the TMDL report.

45.3 "Ohio EPA notes that a more recent study 'found the Little Miami River to have elevated nutrient levels with a mean total phosphorus concentration of 0.24 mg/l'. This more recent data suggests that a much smaller in-stream Phosphorus reduction is required to meet Ohio EPA's current target of 0.17 mg/l."

The commenter is referring to the Ohio River Valley Water Sanitation Commission report published in April, 2001 entitled *Evaluation of Nutrient Loads and Sources in the Ohio River Basin*. The concentration of 0.24 mg/l was calculated from a monitoring station located much further downstream in the lower Little Miami River and is completely outside the upper watershed and the focus of this TMDL. The study cited above evaluates nutrient loads and sources in 12 major Ohio River sub-basins. It goes on to make the following statement 'Overall, point source loads represent less than 25 percent of the in-stream monitored load (to the Ohio River) with the exception of the Little Miami River, with almost a 63 percent point source load.' This highlights the fact that the Little Miami River is unquestionably nutrient enriched and, in comparison with all of the other Ohio River sub-basins, is highly influenced by point source loads. This confirms the findings of the uLMR TMDL.

46. Pg 12; Par 1 Please clarify where the monthly loads shown on pages 56 and 57 of the TMDL report come from. [7]

The loads were calculated using GWLF.

47. Pg 12; Par 2 The timely implementation of the actions presented in section 6.1.3 seems unlikely given the developmental pressures in the basin. [7]

The example restoration scenario presented in section 6.1.3 is only that - an example. It was developed for the stakeholder group prior to their work on the implementation plan to assist them in understanding both the magnitude of the changes needed and in knowing what areas would be the most effective to concentrate on. It is not the implementation plan itself nor were the actions included intended to necessarily be implemented.

48. Pg 12; Par 3: [7]

48.1 "...the POTWs ask why are there TMDL-based limits proposed for the parameters of Ammonia-N and CBOD?" [5, 7, 8, 10]

The TMDL report addresses reasons for non-attainment of WQS including both biocriteria and chemical criteria violations. The dissolved oxygen water quality criteria are currently being violated even at conditions not considered to be 'critical'. The QUAL2E model simulates low-flow critical conditions and predicts even further violations at existing permitted discharge levels. Therefore, ammonia-N and CBOD inputs especially during these low flow critical times must be reduced as these use up the in-stream dissolved oxygen as they transform.

48.2 "...what is the rationale for a 30-day average permit limit of 1.0 mg/l for Total P...?" [7, 8]

The 1.0 mg/l limit is a treatment-technology-based limit that can be achieved with routinely-used treatment methods (mostly chemical precipitation). When Ohio EPA determined that point sources contributed significantly to the enrichment impacts observed in the biological survey, this limit was included as the minimum reasonable effluent level that could be expected by treatment. Wastewater treatment plants in the Lake Erie Basin routinely achieve this level. Loading reductions beyond this level may be achieved more cost-effectively by methods other than treatment; for this reason, the additional loading reductions are specified in the compliance schedule of the permit, rather than in the effluent limits table.

48.3 "... [t]he use of the "1998 median effluent total phosphorus load" point as the base number from which reductions are proposed is unreasonable and unjustified. Why did Ohio EPA use this number...? The year 1998 was a drought year...very few data points.... Why did the Agency select the year 1998?"

Ohio EPA has reevaluated the use of this median value and the reductions calculated from the year 1998 and agrees that it may result in inequities in the obligations placed upon the different POTWs. Therefore, Ohio EPA has replaced the original method with a more equitable alternative which is incorporated into the current document. As to why the year 1998 was used, this was when the field work was done and stream data was collected. Agency staff are cognizant of whether they are dealing with a dry, wet, or "average" year and take that into account as much as possible, but the data that is available is what must be utilized.

49. Pg 12; Par 4 "Also, paragraph 4 of the proposed NPDES permit language is unclear. The POTWs request clarification on the language. What is the clause designed to do? Is the "allowable load" the same as "Xtp" in the formula on page 72?" What data source is being proposed for the 1998 median effluent total phosphorus load for this calculation? [7, 9]

The allowable load is the same as "Xtp" in the formula. The data source for the 1998 median effluent total phosphorus load is the March through November 1998 median phosphorus concentration for a given treatment plant (in mg/l) multiplied by the 1998 March-November median flow (in MGD) for that plant multiplied by the conversion factor of 3.785.

50. Pg 12; Par 5 "Has Ohio EPA taken into consideration where the P will go if it is taken out of the POTW discharges? Is the Agency concerned that the P will return to the stream through land application of the POTW biosolids?" [7, 10]

Land application of biosolids is similar to other agriculture fertilizer application practices. As such, the source of the nutrients is not the primary concern with respect to nutrient loss to waterways. Rather, it is the soil management practices utilized at the specific site that determines how much of the nutrients will remain in the field, and how much will run off.

51. Pg 13; Par 1 [7]

51.1 "Has Ohio EPA performed a cost benefit analysis on the implementation of the TMDL?"

No. The POTWs have presented their estimated costs of treatment for various permit limits.

51.2 "What is the regulatory status of this TMDL if approved?...will Ohio EPA public notice the USEPA approved TMDL?

As stated above, Ohio EPA does not regard the TMDL as a rule. The permits affected by the TMDL will be issued as Director's actions. As outlined in the draft TMDL, Ohio EPA has gone to great effort to provide the public with the opportunity to participate in the TMDL process (i.e., series of public Workgroup meetings, separate meeting with other interested parties, two public comment periods, etc.), and Ohio EPA does not plan to public notice the final (US EPA approved) TMDL.

51.3 Why didn't the Ohio EPA include the POTW's proposed TMDL Implementation Plan? [5, 7, 8] Why after six months Ohio EPA has yet to respond to the regulated community on this plan? [9]

The decision to not include the POTW's proposed implementation plan in the TMDL report was made based on reviewers comments that it was confusing when in the same report as the NPDES proposed language. The Ohio EPA will include the POTW proposal in the TMDL report. The Ohio EPA has discussed their proposal several times with the regulated community in various meetings. The POTW implementation plan was inadequate to address the POTW contribution to the impairment as noted by Ohio EPA and other stakeholders. This was made very clear to the POTWs at the TMDL stakeholder meetings. Further, verbal and written comments from the POTWs concerning NPDES issues have been discussed between the stakeholders and Ohio EPA and some of these comments have been incorporated into the Ohio EPA proposal.

52. Pg 2; Par 4 Why have constructed plant improvements and Best Management Practices (BMPs) not been used as a positive in the TMDL process, but used against the POTWs to set more stringent discharge limits? Paraphrased: Xenia and Ohio EPA agreed to plant design discharge limitations in advance. Glady Run dam area removed to improve stream flow not evaluated in TMDL development" [7]

Facility design discharge limitations are included in a Permit To Install. These design limitations cannot change for ten years according to Ohio Law (OAC 3745-33-04(C)(3)). NPDES permits

issued for those facilities with PTIs issued within ten years will reflect the design conditions specified in the PTI. With respect to dissolved oxygen, the TMDL individual wasteload allocations included in Table 17 reflect a model scenario which results in attaining the dissolved oxygen water quality standard. Adjustments to this model are possible and Ohio EPA may reevaluate the model inputs subsequent to watershed activities. The impact of the dam removal on water quality in Glady Run has not been evaluated nor previously explored with Ohio EPA or the stakeholder workgroup. However, the workgroup may want to incorporate this into the implementation plan.

53. Pg 2; Par 1 "...POTWs do not think it is fair, reasonable or lawful to impose NPDES phosphorus limits on the POTW discharges. There is no legal requirement to impose such limits on individual point sources discharges in the context of a TMDL." [13]

Establishment of effluent limitations for point source dischargers is clearly contemplated by Section 303(d) of the Clean Water Act. As stated previously, effluent dominated flow in the Upper Little Miami River (particularly acute during low flow periods) combined with nutrient enrichment conditions creates the necessity for such reductions by the wastewater treatment facilities. It is Ohio EPA's position that imposition of the NPDES phosphorus limits on the POTW discharges is both reasonable and lawful.

54. Pg 2; Par 1 "Instead Ohio EPA, without any serious stakeholder discussion or optimization process, has developed individual allocations for each POTW."

As stated in Section 5.0 of the draft report for this TMDL, public participation associated with this project began with the release of the 1995 Biological and Water Quality Study of the Little Miami River and Selected Tributaries Report. A stakeholder workgroup, established in June 2000, consisting of members with a wide range of knowledge, interests, and concerns regarding the uLMR has been actively involved in assisting Ohio EPA with the TMDL. Ohio EPA has included additional time in the NPDES permit compliance schedule for the POTWs to explore optimization options, and a request for permit modification can be made should new information arise from this process.

55. Pg 3; Par 2 "...the uLMR attains full aquatic life uses downstream of river mile 72 where the phosphorus concentrations are approximately 0.40 mg/l....These data suggest that a phosphorus concentration as high as 0.4 mg/l may significantly improve attainment status...". [13]

Ohio EPA does not assign causes and sources of impairment to specific waterbody segments based on correlations between chemical measures and observed aquatic life use impairment in a specific waterbody; rather, Ohio EPA uses multiple lines of evidence. Associations between aquatic life use status and patterns observed repeatedly over broad geographic areas are used as one line of evidence when applied to a specific waterbody. Another line of evidence is the expectation of a waterbody to meet its designated aquatic life use(s) based on the overall habitat quality of that waterbody compared to other waterbodies within the same ecoregion. In the case of the Little Miami River mainstem downstream from the confluence with Beaver Creek, that expectation is for Exceptional Warmwater Habitat, and that aquatic life use is not being *fully* met.

Because habitat is ruled out as an immediate limiting factor for this reach, other factors must be responsible for the observed impairment. One of those factors, as detailed in the 1998 TSD, is phosphorus.

56. Pg 4; Par 4 "...the increase in phosphorus loading with decreasing river flow that is observed downstream of Beaver Creek can not be attributed to POTW discharges. Rather, it is suggested that this increase in loading through the summer months is the result of phosphorus being release(d) from interstitial water in the sediments..." [13]

Ohio EPA cannot support the statement that the phosphorus loading increase downstream of Beaver Creek is not attributable to the POTWs since it is based on only five data points and associated estimated flows. Further, if the increased loading is coming from the sediments downstream of Beaver Creek then the POTWs are a likely major source of this phosphorus, and therefore, they would still be the source of the increased loading.

57. Pg 5; Par 2 Citations are requested for statements made on page 27 of the TMDL report. [13]

The citation for elevated phosphorus concentrations for the LMR compared to other waters within the ecoregion is the Associations Report, Appendix 1 (not printed, but available on the Web). The citation for lines of evidence supporting nutrients as the cause of impairment is the 1998 TSD which is also available on the Web at:
http://www.epa.state.oh.us/dsw/document_index/psdindx.html

58. Pg 5; Par 3 [13]

58.1 Why was the median statistic selected to represent various data?

Mean statistics, due to the way they are calculated, can be skewed by extreme values which cause inaccurate results. The median statistic is the actual observed center-most value. The determination of the median is unaffected by extremes and is independent of the type of distribution the data exhibit. The median is considered to be a more consistently accurate measure of the center of the distribution of large data sets than is the mean.

58.2 Did Ohio EPA evaluate the amount of oxygen demanding substances re-entering the water column during low flow from previous settled nutrient loads?

The amount of oxygen demanding substances re-entering the water column from previous settled nutrient loads would be minimal during low flow times as this is usually a function of water turbulence and agitation. However, a sediment oxygen demand component from collected field data was incorporated into the QUAL2E model to account for a benthic oxygen demand from this settled material.

58.3 Why were the point source flows set at the greater of either the design or median flow?

OAC Rule 3745-2-05(A)(4) requires that the effluent flow for POTWs be set at the average design flow unless there is reasonable evidence the actual effluent flow will differ significantly during the life of the permit. When a median flow exceeds the design capacity of the POTW there exists

reasonable evidence the design flow is no longer representative; therefore, an alternate representative flow measure was needed. Lacking further regulatory guidance or other evidence of a representative POTW discharge flow (such as a Permit to Install application requesting an increase in POTW plant capacity) the median flow value was selected to reflect the needs of the QUAL2E model which is based on typical or average conditions (where applicable).

59. Pg 6; Par 2 Was the median or the mean used in Figure 10 and why? [13]

    The median values were used. Please refer to the comment 58 response as to why the median statistic was used.

60. Pg 6; Par 3 In section 6.1.1.1, Ohio EPA sets forth the minimum elements for an approvable Implementation Plan. We would appreciate a citation to the regulations or source of the information. [13]

    Please refer to the following web page, which contains a fact sheet summarizing proposed revisions to 40 CFR Part 130, for the source of this information: http://www.epa.gov/owow/tmdl/tmdlfs.html. This format for the implementation plan was suggested to the workgroup as it was the most current data Ohio EPA had at the time the workgroup requested more details regarding what should be included in an implementation plan.

    The USEPA is proposing revisions to the TMDL regulations (40 CFR Part 130) for implementing state, territorial, authorized tribal, and USEPA responsibilities under Section 303(d) of the Clean Water Act. A final TMDL Rule was published in the Federal Register on July 13, 2000, but never implemented. USEPA is reconsidering the rule in light of continuing controversy. The final TMDL rule is expected in April 2003.

61. Why were the conclusions of the study *Pollutant Load Analysis to Assess Sources of Sediment and Water Column Toxicity in Little Beaver Creek* based on the amount of heavy metals in surface street runoff from a 1972 study? Is this still accurate given the advent of environmental regulations since then? [11]

    The heavy metal surface street runoff data used for the Little Beaver Creek study appears outdated. More recent and applicable data will be sought when a heavy metal TMDL is done for the Little Beaver Creek watershed.