



Missouri  
Department of  
Natural Resources

HICKORY CREEK TMDL  
EPA COMMENTS

TMDL submitted to EPA  
June 8, 2010

**Hickory Creek**  
**WBID # 0442**

Daviess County, Mo.

Missouri Department of Natural Resources  
Water Protection Program  
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## Hoke, John

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**From:** Adkins.Tabatha@epamail.epa.gov  
**Sent:** Tuesday, July 20, 2010 3:09 PM  
**To:** Hoke, John  
**Subject:** Comments on Hickory Creek

John,

Listed are the EPA comments on Hickory Creek. Thanks.

TJ

Table H (and 2008 303(d) List) has WBC - B as a beneficial use (missing from page one and section 3.1)

Citation to narratives appears incorrect. Should be 10 CSR 20-7.031(3).

No units on Design Flow for table 4 page 6.

Pg 5, Section 2.1, second paragraph, Wording is confusing, CGC Creek Farm outfalls not located in Hickory Creek watershed but one monitoring site is located on Hickory Creek (outfall 15). Please clarify.

Section 3.5 references Trib to Hickory Creek rather than Hickory Creek.

Pg17, Explain implicit MOS. Need to elaborate on what those conservative assumptions/targets were.

Appendix C.3, pg 36, lists NFR data and TMDL allocations are in TSS.  
Citing NFR data without any explanation is confusing because NFR is never mentioned in the TMDL.

Appendix A-2 shows PSF monitoring data but the PS table does not list any as PSF facilities (found PSF NPDES permit number MO0118079 in the FRS database). Clarify why PSF is monitoring.

Ecoregion and EDU targets are not clearly visible. A table would aid in visibility. Along with this page 14 indicates that TSS EDU target is 10 mg/L. Please clarify if this is the proper target. Other recent TMDLs indicated the target to be 5.75 mg/L.

2. 0 Sourcing, pg 5 - no mention of illicit straight pipe discharges.

References: Missing EPA 2003a, USDA 2009, and Weather Underground 2006

Page 16. Figure 5 shows only one data point for TN. There should be several sample points according to Table A-2.

Page 17. Table 8. WLAs are not reflected in the table. It was stated that WLAs for the facilities will remain equal to existing permit limits; hence, the TMDL should not be equal to the LA.

Page 29. Appendix A. It would be best to re-write Appendix A to reflect the data used in the TMDL. The narrative provided in the appendix is a generic description of the modeling methodology. This should be more specific to the current application. For example, the plot showing the normalized flow duration curves and the corresponding table should be for the gages used to generate the synthetic FDC for the Tributary to Hickory Creek watershed. The plot of the relationship of sediment yield as a function of flow should be for the ecoregion data used in the TMDL.

Page 34. Table C.1. The table indicates different flow periods. It is not clear what common period of record was used in the deriving the synthetic flow duration for the

watershed. Please provide a graph of the normalized flow durations of the 4 USGS gages and the corresponding synthetic normalized flow duration (review of spreadsheet shows that different time periods were used; the synthetic flow duration should be developed using flow data from several gages using a common time period)

Page 35. Please provide plots of the ecoregion TN and TP load – flow relationships.

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## **EPA comments for the Hickory Cr. TMDL and Department response**

1. *Table H (and 2008 303(d) List) has WBC – B as a beneficial use (missing from page one and section 3.1)*

Whole Body Contact Recreation – Category B has been added as a beneficial use on page 1 and Section 3.1.

2. *Citation to narratives appears incorrect. Should be 10 CSR 20-7.031(3).*

The citation for Missouri's General (Narrative) Criteria has been edited to properly reference 10 CSR 20-7.031(3).

3. *No units on Design Flow for table 4 page 6.*

Appropriate units for design flow, million gallons per day (MGD), have been added to Table 4 on page 6 of the document.

4. *Pg 5, Section 2.1, second paragraph, Wording is confusing, CGC Creek Farm outfalls not located in Hickory Creek watershed but one monitoring site is located on Hickory Creek (outfall 15). Please clarify.*

The outfall located on Hickory Creek (Outfall #15) is a monitoring location and not a discharge point. Monitoring sites are assigned outfall numbers in the Missouri State Operating Permits for permitted CAFOs in order to report and track data and information collected at these sites.

5. *Section 3.5 references Trib to Hickory Creek rather than Hickory Creek.*

Reference to Tributary to Hickory Creek has been removed and replaced with Hickory Creek.

6. *Pg17, Explain implicit MOS. Need to elaborate on what those conservative assumptions/targets were.*

Additional language regarding the rationale for an implicit margin of safety has been included in the document. The margin of safety language is similar to that found in the approved Willow Branch TMDL.

7. *Appendix C.3, pg 36, lists NFR data and TMDL allocations are in TSS. Citing NFR data without any explanation is confusing because NFR is never mentioned in the TMDL.*

References to non-filterable residue (NFR) have been changed to total suspended solids (TSS) in the table.

8. *Appendix A-2 shows PSF monitoring data but the PS table does not list any as PSF facilities (found PSF NPDES permit number MO0118079 in the FRS database). Clarify why PSF is monitoring.*

It appears that PSF is mistakenly associated with these water quality data in the Department's water quality database. All occurrences of PSF in Table A.2. have been changed to CGC, Continental Grain Company, as the organization collecting the water quality data.

9. *Ecoregion and EDU targets are not clearly visible. A table would aid in visibility. Along with this page 14 indicates that TSS EDU target is 10 mg/L. Please clarify if this is the proper target. Other recent TMDLs indicated the target to be 5.75 mg/L.*

A table (Table 8) has been added to Section 3.5 of the document and presents TSS, TN, and TP target criteria used to develop the Hickory Creek TMDL. Staff have verified that the TSS target of 10 mg/L is appropriate and was provided by EPA Region 7 in the TSS LDC spreadsheets used for the TMDL. The TSS target was derived using USGS gaging station data collected in the ecological drainage unit (EDU) in which Hickory Creek is located.

It is important to note that ecoregions and ecological drainage units represent spatially different areas. Ecoregions at the Level III scale may cover several states, while ecological drainage units tend to be spatially smaller and the data represent water quality conditions within the defined area. Previous TMDLs may have contained similar nutrient ecoregion target values due to the impaired waters residing within the same ecoregion. TSS ecological drainage unit concentrations will vary based upon the USGS gaging station data used in the target analysis. This appears to be the difference between the 10 mg/L TSS target value used for the Hickory Creek TMDL and the 5.75 mg/L target value used for other TMDLs.

10. *2.0 Sourcing, pg 5 – no mention of illicit straight pipe discharges.*

Text addressing illicit straight pipe discharges has been added to the point source section of the document (Section 2.1).

11. *References: Missing EPA 2003a, USDA 2009, and Weather Underground 2006.*

The above listed references have been added to the document. EPA 2003a has been changed to USEPA 2003 for naming consistency and because no other EPA references are cited for that particular year.

- 12. Page 16. Figure 5 shows only one data point for TN. There should be several sample points according to Table A-2.*

Figure 5 has been revised to include five other available data points for total nitrogen (TN).

- 13. Page 17. Table 8. WLAs are not reflected in the table. It was stated that WLAs for the facilities will remain equal to existing permit limits; hence, the TMDL should not be equal to the LA.*

The facilities found in the Hickory Creek watershed are not expected to cause or contribute pollutants of concern to the impaired segment during critical low-flow conditions when the impairment is most severe. WLAs are not required for these facilities and loading is set equal to existing limits and conditions found in the facility operating permit. For this reason, the WLA portion of the TMDL has been set at zero in Table 9. Clarifying language has been added to Section 5 of the document.

- 14. Page 29. Appendix A. It would be best to re-write Appendix A to reflect the data used in the TMDL. The narrative provided in the appendix is a generic description of the modeling methodology. This should be more specific to the current application. For example, the plot showing the normalized flow duration curves and the corresponding table should be for the gages used to generate the synthetic FDC for the Tributary to Hickory Creek watershed. The plot of the relationship of sediment yield as a function of flow should be for the ecoregion data used in the TMDL.*

The language and figures found in Appendix B (Development of Suspended Sediment Targets using Reference Load Duration Curves) were provided to the Department by EPA Region 7 for use in the Hickory Creek and other Consent Decree TMDLs. The methods and procedures contained in the write-up were intended to be generic in nature and allow for expedited development of TMDLs using the reference load duration curve approach. However, the Department recognizes the benefit of re-writing Appendix B to reflect the data and information used in the Hickory Creek TMDL. To this end, Appendix B has been revised as requested.

- 15. Page 34. Table C.1. The table indicates different flow periods. It is not clear what common period of record was used in the deriving the synthetic flow duration for the watershed. Please provide a graph of the normalized flow durations of the 4 USGS gages and the corresponding synthetic normalized flow duration (review of spreadsheet shows that different*

*time periods were used; the synthetic flow duration should be developed using flow data from several gages using a common time period).*

The calculations and data used to develop the synthetic flow duration curve for the watershed were provided to the Department by EPA Region 7. Review of the spreadsheet shows that a period of record from October 1, 1989 until September 30, 2009 was used to derive the synthetic flow duration curve. This extended period of time allows the flow record to be of sufficient length to calculate reliable percentiles of flow (typically 20 years or more). If the period of record had not been extended, a much shorter period of record (10 years) would have been used to derive the synthetic flow duration curve. A shorter period of record would have yielded results that were less robust and contained greater uncertainty. As requested in the comment, a graph of the normalized flow durations for the four USGS gages and the corresponding synthetic normalized flow duration has been included in Appendix C.

*16. Page 35. Please provide plots of the ecoregion TN and TP load – flow relationships.*

The calculations and data used to develop the ecoregion TN and TP load – flow relationships were provided to the Department by EPA Region 7. As requested in the comment, graphs showing TN and TP load – flow relationships have been added to Appendix C.