

Missouri  
Department of  
Natural Resources

DRAFT BRUSHY CREEK AND MUDDY CREEK TMDL  
PUBLIC COMMENTS

Public Notice  
Nov. 9 – Dec. 9, 2001

**Brushy Creek – WBID # 0859**  
**Muddy Creek – WBID #0855**

Pettis County, Mo.

Missouri Department of Natural Resources  
Water Protection Program  
PO Box 176  
Jefferson City, MO 65102-0176  
800-361-4827 / 573-751-1300

# MISSOURI COALITION FOR THE ENVIRONMENT

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December 6, 2001

Department of Natural Resources  
WPCP Planning Section  
P.O. Box 176  
Jefferson City, MO 65102-0176

RECEIVED  
DEC 10 2001  
WPCP

**Re: Brushy and Muddy Creeks TMDL**

Dear Sir or Madam:

The Missouri Coalition for the Environment submits the following comments on the draft TMDL for Brushy and Muddy Creeks in Pettis County, Missouri. The Coalition was assisted in formulating these comments by Barry Sulkin, a consultant on TMDL issues and former Chief of Enforcement and Compliance for the Tennessee Department of Environment & Conservation.

### *Non-Filterable Residue*

1. The selection of the Non-Filterable Residue (NFR) values chosen for the TMDL is not well explained - a daily maximum load of 732 lbs/day and daily maximum concentration of 35 mg/L from the Sedalia Central Sewage Treatment Plant (STP). It appears to be based on the quality of effluent the upgraded STP can produce, and not necessarily on what the streams need.
2. Since there is no numeric standard for NFR, it may be acceptable to estimate a target value based on judgment, but it should be explicitly stated that this is the approach taken. It appears that observations have been made since the STP upgrade and it was found that the discharge quality is mostly below 35 mg/L and the streams appear to be improved and meet the narrative standard. It should be noted that the STP NFR discharge since the upgrade is usually well below 35 mg/L and observations are likely not made at critical conditions for stream flows and other factors. Therefore, it is not known if water quality standards would be met under daily maximum load and critical conditions. While this is understandable and a common situation, observed conditions should somehow be scaled to TMDL conditions or otherwise account for such conditions.
3. In Section 2.4.3 of the TMDL document on page 12 it states that this is a phased TMDL. Our understanding of the meaning of a phased TMDL, consistent with EPA guidance, is that it should contain a larger, and explicit Margin of Safety (MOS) to account for the uncertainty or lack of available information, and that the TMDL or MOS

values can be adjusted in later phases as more information is obtained. In this case, there is essentially no identifiable MOS other than what is described as implicit. It may be safe to assume that the STP can usually meet the target value, but that is not the same as a MOS that protects the stream at critical conditions.

4. From the description it is also unclear how NFR is measured. In some discussions in the TMDL document, NFR is described as related to sewage sludge deposits, which would seem to be filterable solids, while in other places, such as on page 2 of the Information Sheet, it is described as being a measure of suspended algae. It is not clear why or how this would be adequately measured as non-filterable.

5. We concur with and support your explanation and emphasis on the requirement to address the daily maximum pollutant load as described in section 2.4.3 of the document on page 11. We agree that the TMDL is to be viewed as an acute maximum, and needs to be appropriately translated into permit limits for point sources. The method used in section 3.3.4 on pages 22-23 appears to be consistent with EPA's Technical Support Document (TSD) as referenced, and results in the TMDL target concentration value as the daily maximum permit limit of 35 mg/L and an associated monthly average permit limits of 17.4 mg/L.

6. The permit limit translations need a better explanation to address some items and to ensure that readers not familiar with the TSD protocol can follow the concept of what is being done. As stated above, it is unclear if the starting value of 35 mg/L is to be taken as what the streams need for daily maximum protection, and how the long term average (LTA) term relates to the other time units such as monthly and weekly average (how long is long term?). These calculations give permit limits for daily maximum and monthly average, but it is not explained how or if the weekly average is addressed. Steps 1 and 2 seem to basically go in a circle, converting the maximum daily limit (MDL) to the LTA, and then the LTA back to the same MDL value. Perhaps this is correct, but there seems to be something missing. It appears that it relates to the previously noted issue of this being based on the performance of the STP versus an allocation of the acceptable load that the streams can accept, and the implied assumption here that they are the same, and all of the load is allocated to the STP, thus making the waste load allocation (WLA) equal to the MDL, with no background or non-point source loads.

### ***BOD/DO***

1. Of primary concern with the BOD portion of the TMDL is that it does not appear that the correct time unit is being used consistently with the standard and the concept of TMDLs. The standard is not fully described in the information sheet in terms of time units, but in section 2.3.1 on page 9 of the document it is explained that it is a daily minimum of 5 mg/L. Thus it is similar to the discussion for NFR where the value is treated as an acute, and the applicable loading is directly translated to the daily maximum permit limit. In the case of DO, since it is a minimum, the appropriate loading of BOD would be taken as the daily maximum, and so set as the permit limit. Here it is being used as a weekly average load and limit, and thus inconsistent with the standard and the

way the NFR is addressed. It is suggested that this section of the TMDL be revised so that the daily maximum BOD loading capacity and permit limits are based on the daily minimum DO standard, and other permit limits for weekly and monthly averages are translated in accordance with the TSD as was done for NFR.

2. Also similar to the comment on NFR, it appears that the BOD target value of 10 mg/L is based more on what the upgraded STP was designed to and can achieve, rather than the capacity of the streams. This is indicated by the fact that the STP upgrade was done prior to the TMDL determination. This is not uncommon in light of the fact that TMDL requirements have been long neglected and are being done somewhat after the fact, rather than as a preliminary step to determining treatment and upgrade needs. It appears that in this case the BOD loading is more of a judgement decision based on limited modeling and data, rather than on a direct TMDL determination. This does not necessarily mean that the STP upgrade was inadequate and more is needed immediately, but rather that adjustments may be needed to the modeling, permitting, and construction (STP upgrade) programs so as to bring about consistency. As with the NFR, it may be that the loading is protective, but observations are not available at full permit load and critical stream conditions, so extrapolations (or scaling) of the data, along with an explicit MOS and monitoring are needed. It is suggested that throughout the TMDL document time units be given where any permit limits are stated (such as daily maximum, monthly average, etc.) and consistency be maintained as standards, field observations, and limits are discussed.

3. Also in the BOD portion of the TMDL it appears that no allocation is made to any background or sources upstream of the one STP. This is based largely on the assumed low or zero flow above the STP. However, it should be noted that there are other permitted dischargers and non-point sources in the watersheds that likely contribute loadings which can have residual effects even at low flow, and at times when there are some upstream flows near critical conditions, but not a zero upstream flow. Therefore it is suggested that some portion of the TMDL be given as a Load Allocation (LA) to account for other sources, rather than the currently proposed value of zero as given in Table 5 on page 16.

4. It does not appear that diurnal DO issues have been taken into consideration, especially considering that the standard is based only on the minimum, not an average. It may be that there is not an algae or diurnal issue, but there are some indications in the TMDL document to the contrary that need to be examined. The NFR problem in some sections is described as related to sewage sludge deposits, but on page 2 of the TMDL Information Sheet it mentions low DO and "...additional problems with green water due to excessive suspended algae...". Also, although time of day is not included, the data presented in the table in Appendix C.2 show considerable DO swings on the same day in some locations, both above and below the STP and including the 2001 readings. While this problem may be taken into account or have been eliminated, it is not explained. This is especially true considering the recent upgrades that would likely impact the 2001 data, and the upstream readings in terms of the need to account for non-point sources and background loads.

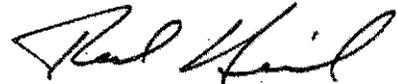
*Ammonia*

1. We support the handling of ammonia to address both the acute and chronic components of the standards. As with the other parameters, translations to permit limits need to be consistent and stated in terms of time units (daily maximum, averages) so it is clear.
2. Ammonia is of concern both for its direct toxic impacts, as well as its oxygen demand as it degrades. It appears that both of these concerns are addressed, but the later may need some clarification. It is our understanding that the BOD analysis for the TMDL incorporated ammonia by handling this as Total BOD rather than CBOD, and includes the ammonia or nitrogen oxygen demand. However, the acute targets for Ammonia given in Table 4 on page 11 look a bit high on their face if presumed as daily maximum permit limits, especially the summer value of 16.5. It should be made clear whether the maximum allowable ammonia is taken into account in terms of its impact on meeting the DO standard as well as toxicity.
3. While not specified, it is presumed that the acute would relate to the daily maximum permit limit, but no such limit is given for the permit. The discussion in section 3.2.6 on pages 17 and 18 provide only summer and winter weekly average permit limits. It is not clear how these values were derived from the standards and TMDL determinations, or as with the other parameters, it is based on what the STP can achieve. It is requested that this be clarified in the same manner as suggested for the other parameters using the TSD methods for deriving permit limits, and maintaining consistency with the units of measure for time.

Thank you for considering our comments. Please call if you would like to discuss any of the issues raised herein.

Very truly yours,

  
Bea Covington *by ETH*  
Executive Director

  
Edward J. Heisel  
Senior Law & Policy Coordinator

*Comments + DNR  
responses*



Bob Holden, Governor • Stephen M. Mahfood, Director

# DEPARTMENT OF NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL QUALITY  
P.O. Box 176 Jefferson City, MO 65102-0176

December 19, 2001

Ms. Bea Covington  
Mr. Edward J. Heisel  
Missouri Coalition for the Environment  
6267 Delmar Boulevard, 2-E  
St. Louis, MO 63130

Dear Ms. Covington and Mr. Heisel:

Thank you for reviewing the Brushy and Muddy Creek TMDL and taking the time to comment. The following responses correspond by number with the comments provided by the Missouri Coalition for the Environment.

#### Non-Filterable Residue (NFR)

1. Yes, the daily maximum was based on the nature of the treatment facility and Discharge Monitoring Reports (DMRs) data from that facility. There are no numeric standards for NFR and recent visits to the facility revealed no objectionable bottom deposits. The stream appears to be meeting the general criteria in the standards; therefore, it is valid (logical, prudent) to calculate a number that is tied in with the facility's present permit limits. The facility has been upgraded and it is thought that the improvements in the stream (a 65% reduction in NFR over pre-upgrade data) are a direct result of those upgrades.
2. We recognized the potential problem with the 35 mg/L criterion. Wording has been included in the TMDL to clarify the situation. We believe the post implementation monitoring will further clarify whether this criterion is appropriate and protective.
3. We believe the implicit Margin of Safety as stated in Section 3.3.5 is protective of the stream at critical conditions. Again, the scheduled monitoring will substantiate or refute this and adjustments will be made if necessary.
4. NFR is the same thing as Total Suspended Solids (TSS) and is measured in the same way. It includes organic and mineral solids. This will be clarified in the TMDL. There is a discrepancy between the Information Sheet and the TMDL. In reviewing the low flow studies there is no mention of "green water," so the Information Sheet will be corrected.
5. Missouri will continue to calculate daily loads and include corresponding monthly averages in permits.

6. The length of time covered in the long term average (LTA) is the extent of the available DMR data, in this case about 18 months. The fact that the waste load allocation (WLA) came out the same as the original concentration is not circular reasoning, but rather a factor of the calculated coefficient of variation (CV) and the chosen percentile (99<sup>th</sup>). A weekly average was not calculated because the Technical Support Document (TSD) recommends using monthly averages and daily maximums. Weekly averages were not suggested. This will be stated in the TMDL.

#### BOD/DO

1. Staff applied a daily mean rather than the daily minimum in the modeling. To accurately assess the importance of the daily minimum, an automated DO data logger should be utilized to examine the whole 24-hour profile. A daily maximum of 10 mg/L BOD<sub>5</sub> (summer) and 20 mg/L (winter) will protect the stream from the daily DO mean dropping below 5.0 mg/L. Limits to protect the daily minimum of 5.0 mg/L were not developed.
2. The limits of 10 and 20 mg/L were derived from an earlier WLA using QUAL2E and are not performance based. Time units will be provided where permit limits are given.
3. Upstream flow is considered 0.0 cfs because the "natural" 7Q10 = 0.0. Streams are not classified based on design flows from POTWs (Public Operated Treatment Works) etc. The permitted facilities upstream of the impaired segment in Muddy were considered and deemed not to contribute to the BOD impairment (Section 1.4). Nonpoint runoff is likewise considered not to contribute to the impairment because the 7Q10 = 0.0 cfs. Additionally, since the facility upgrades were completed, Muddy Creek is meeting Water Quality Standards for DO.
4. There is no doubt algal and diurnal effects occur on the creeks, but there is no algae data to calibrate the model with. Instead, diurnal effects are taken into account by using a daily mean. The times that were used have been added to the data table (Appendix C.2) in a "time of day" column. The discrepancies between the Information Sheet and the TMDL have been addressed in #4 of the NFR comments.

#### Ammonia

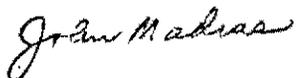
1. Done.
2. The 16.5 mg/L in question is not a permit limit or the Load Capacity (LC). It is the *instream* summer acute criterion from Missouri Water Quality Standards given as NH<sub>3</sub>N, not total ammonia. The WLA translates to permit limits of 2.5 mg/L NH<sub>3</sub>N summer, 3.5 mg/L winter.
3. Good catch. Section 3.2.6 should read that the summer and winter limits are daily maximums, as stated in the present permit, not weekly averages.

Ms. Bea Covington  
Mr. Edward J. Heisel  
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We appreciate the Missouri Coalition for the Environment's participation in the TMDL process and concern for the health of Missouri's water resources. If you have other questions or wish to discuss this further, please contact Anne Peery of the Planning Section at (573) 526-1426.

Sincerely,

WATER POLLUTION CONTROL PROGRAM



John Madras, Chief  
Planning Section

JM:apd



# MISSOURI DEPARTMENT OF CONSERVATION

## Headquarters

2901 West Truman Boulevard, P.O. Box 180, Jefferson City, Missouri 65102-0180  
Telephone: 573/751-4115 ▲ Missouri Relay Center: 1-800-735-2966 (TDD)

JERRY M. CONLEY, Director

**REPLY TO:** Columbia Research Center  
1110 S. College Ave.  
Columbia, MO 65201  
Telephone: 573/882-9880  
FAX: 573/882-4517

December 6, 2001

Sharon Clifford  
Water Pollution Control Program  
Missouri Department of Natural Resources  
PO Box 176  
Jefferson City, MO 65102-0176

RECEIVED  
DEC 10 2001

WPCP

Dear Ms. Clifford:

MDC field staff and I have reviewed the TMDL's for Brushy/Muddy Creek and Whetstone Creek on behalf of the department. We appreciate your staffs efforts on these draft documents and hope that our comments will benefit the process, final documents and eventually the streams. Specific comments follow below. Thank you for the opportunity.

### Whetstone Creek

There are no specific comments on this TMDL. We have no record of any fish kills from this segment of the creek.

### Brushy/Muddy Creek

I have provided copies of pollution reports and a summary for the watershed. I have spoken and met with both Gale Carlson and Chris Zell in the last few weeks pertaining to the history of impacts by permitted facilities in the Muddy Creek watershed. I am also including MDC documentation on the fish kill history for Muddy Creek as requested by Anne Peery.

The Tyson facility has had a significant impact on the creek in the last few years. It is my hope that oversight by EPA, following criminal charges against the company, has brought the facility into compliance. There is substantiated evidence that waste from the plant was, at one time, being discharged through the stormwater outfall. I would be happy to provide information and water quality data related to the investigation of the Tyson facility as it relates to the 303(d) listed segment from our files. Unfortunately, the case is still in preparation for trial by the U. S. Department of Justice, so I can not release the entire file at this time.

I am concerned with the omission of Lamonte Lagoon as a contributor to BOD. We have had complaints from adjacent landowners for approximately the last 5 years about the discharge and operation of this facility. Concerns were again passed on to the Jefferson City Regional Office,

COMMISSION

STEPHEN C. BRADFORD  
Cape Girardeau

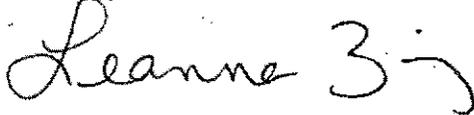
ANITA B. GORMAN  
Kansas City

CYNTHIA METCALFE  
St. Louis.

HOWARD L. WOOD  
Bonne Terre

DNR, this summer. An inspection by Scott Robinett, DNR, resulted in the issuance of a Notice of Violation. Problems with the facility have not been resolved and it continues to be out of compliance with no sign of resolution. Though Lamonte is well upstream and would be an insignificant addition of ammonia, I am still concerned about BOD additions by this facility. Impacts to the listed sediment would vary depending on stream conditions (temperature, flow, etc.). My observations of additional BOD input from Lamonte are only descriptive but the cumulative effects of these two facilities could be significant. Without data to contribute to the modeling, the only recommendation I can offer to the TMDL is an increase in the margin of safety as compensation until these two permitted facilities are found to be in compliance with their permits.

Sincerely,

A handwritten signature in cursive script that reads "Leanna Zweig". The signature is written in black ink and is positioned above the typed name.

Leanna Zweig  
Environmental Services Biologist

Enclosures

STATE OF MISSOURI  
DEPARTMENT OF NATURAL RESOURCES

Bob Holden, Governor • Stephen M. Mahfood, Director

DIVISION OF ENVIRONMENTAL QUALITY  
P.O. Box 176 Jefferson City, MO 65102-0176

December 12, 2001

Ms. Leanna Zweig  
Columbia Research Center  
Department of Conservation  
1110 South College Avenue  
Columbia, MO 65201

Dear Ms. Zweig:

Thank you for reviewing the Brushy/Muddy Creek TMDL and taking the time to comment on behalf of the Missouri Department of Conservation (MDC). Thank you also for the documentation on the fish kill history for Muddy Creek.

In response to MDC's comments that the Tyson and LaMonte facilities be considered in the TMDL, we offer the following:

The storm water discharges of the Tyson facility enter Muddy Creek above the impaired segment. This facility is not considered a contributor to the BOD impairment, though, because this TMDL does not apply to storm events. That is because the critical times for BOD are low flow conditions, when low dissolved oxygen levels that threaten the integrity of aquatic communities generally occur. Tyson's WWTP does not contribute to the BOD impairment because it discharges into a tributary to Little Muddy Creek, which in turn joins Muddy below the impaired segment.

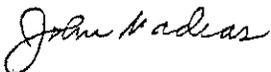
As noted in the TMDL, "LaMonte Lagoon is 16 miles away. This is significant because, even by conservative estimates that consider design flow and low-flow scenarios, the BOD would decay over that distance." Moreover, LaMonte's discharge is relatively small (0.17 cfs or 0.11 MGD). These two factors (distance and small discharge) are why LaMonte is not considered a contributor to the BOD impairment in Muddy Creek. LaMonte did, however, have three violations of their BOD limit this past summer. Inspection by this department concludes that there is no fault with lagoon design if they (there are two) are managed properly. The problem seems to be with the operator, or lack thereof. The city is currently under an Abatement Order to rectify the situation.

Ms. Leanna Zweig  
Page 2  
December 12, 2001

As always, MDC's participation in the TMDL process and concern for the health of Missouri's water resources is appreciated. If you have other questions or wish to discuss this further, please contact Anne Peery of the Planning Section at (573) 526-1426.

Sincerely,

WATER POLLUTION CONTROL PROGRAM



John Madras, Chief  
Planning Section

JM:apd