

TMDL: Jug Creek, Wisconsin
Effective Date:

DECISION DOCUMENT FOR THE APPROVAL OF JUG CREEK TMDL

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. Part 130 describe the statutory and regulatory requirements for approvable TMDLs. Additional information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation. Use of the term "should" below denotes information that is generally necessary for EPA to determine if a submitted TMDL is approvable. These TMDL review guidelines are not themselves regulations. They are an attempt to summarize and provide guidance regarding currently effective statutory and regulatory requirements relating to TMDLs. Any differences between these guidelines and EPA's TMDL regulations should be resolved in favor of the regulations themselves,

1. Identification of Waterbody, Pollutant of Concern, Pollutant Sources, and Priority Ranking

The TMDL submittal should identify the waterbody as it appears on the State's/Tribe's 303(d) list. The waterbody should be identified/georeferenced using the National Hydrography Dataset (NHD), and the TMDL should clearly identify the pollutant for which the TMDL is being established. In addition, the TMDL should identify the priority ranking of the waterbody and specify the link between the pollutant of concern and the water quality standard (see section 2 below).

The TMDL submittal should include an identification of the point and nonpoint sources of the pollutant of concern, including location of the source(s) and the quantity of the loading, e.g., lbs/per day. The TMDL should provide the identification numbers of the NPDES permits within the waterbody. Where it is possible to separate natural background from nonpoint sources, the TMDL should include a description of the natural background. This information is necessary for EPA's review of the load and wasteload allocations, which are required by regulation.

The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as:

- (1) the spatial extent of the watershed in which the impaired waterbody is located;
- (2) the assumed distribution of land use in the watershed (e.g., urban, forested, agriculture);
- (3) population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources;

- (4) present and future growth trends, if taken into consideration in preparing the TMDL (e.g., the TMDL could include the design capacity of a wastewater treatment facility); and
- (5) an explanation and analytical basis for expressing the TMDL through *surrogate measures*, if applicable. *Surrogate measures* are parameters such as percent fines and turbidity for sediment impairments; chlorophyll *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comments:

The Wisconsin Department of Natural Resources (WDNR) developed a sediment TMDL for a segment in the Middle Kickapoo River watershed, Jug Creek, a 3.6 mile segment in Vernon County. The TMDL addresses the sediment impacts and impairments which were identified on the Wisconsin 1998 303(d) list. The segment was ranked as medium priority on the Wisconsin 1998 303(d) list.

Jug Creek drains an area about 5.2 square miles. About 27% of the land use in the Jug Creek subwatershed is agriculture, about 62% of the drainage area is woodland, which contributes little sediment to the creeks, and the remaining 11% is classified as “other” by WDNR (grassland, roads, quarries, and wetlands).

There are no point sources in the Jug Creek subwatershed that discharge sediments. Non-point sources are identified in the Nonpoint Source Control Plan for the Middle Kickapoo River Priority Watershed Project (“Watershed Plan”), Chapter 2. The Watershed Plan is an attachment to the TMDL. Nonpoint sources identified in the Watershed Plan as contributing to the impairments include agricultural field run-off and streambank erosion. The TMDL (Tables 2 and 3) identifies the existing annual sediment load of 1326 tons to Jug Creek from the following sources:

- Uplands 796 tons
- Gullies 460 tons
- Stream Banks 97 tons

EPA finds that the TMDL document submitted by WDNR satisfies all requirements of this first element

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target

The TMDL submittal must include a description of the applicable State/Tribal water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. (40 C.F.R. §130.7(c)(1)). EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

The TMDL submittal must identify a numeric water quality target(s) – a quantitative value

used to measure whether or not the applicable water quality standard is attained. Generally, the pollutant of concern and the numeric water quality target are, respectively, the chemical causing the impairment and the numeric criteria for that chemical (e.g., chromium) contained in the water quality standard. The TMDL expresses the relationship between any necessary reduction of the pollutant of concern and the attainment of the numeric water quality target. Occasionally, the pollutant of concern is different from the pollutant that is the subject of the numeric water quality target (e.g., when the pollutant of concern is phosphorus and the numeric water quality target is expressed as Dissolved Oxygen (DO) criteria). In such cases, the TMDL submittal should explain the linkage between the pollutant of concern and the chosen numeric water quality target.

Comments:

The State identified the narrative standard set forth at Section NR 102.04 (1) intro and (a) of the Wisconsin Administrative Code (WAC) as the applicable standard. This standard states in part, “Substances that will cause objectionable deposits on the shore or in the bed of a body of water, shall not be present in such amounts as to interfere with public rights in waters of the state.” The designated uses applicable to each segment are set forth at Section NR 102.04(3) intro, (a) and (b) of the WAC. Jug Creek is identified as currently supporting a warmwater forage fishery but with the potential to support a Cold Water Community fishery.

The state established a water quality target for the segment as meeting a potential use of Cold Water Community, as described in NR 1.02(7)(b) of the WAC. Although sediment has been determined to be the pollutant of concern, WDNR will be monitoring the fish community to determine the effectiveness of TMDL implementation, as the fish community is the designated use being impaired.

EPA finds that the TMDL document submitted by WDNR satisfies all requirements of this second element.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

A TMDL must identify the loading capacity of a waterbody for the applicable pollutant. EPA regulations define loading capacity as the greatest amount of a pollutant that a water can receive without violating water quality standards (40 C.F.R. §130.2(f)).

The pollutant loadings may be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. §130.2(i)). If the TMDL is expressed in terms other than a daily load, e.g., an annual load, the submittal should explain why it is appropriate to express the TMDL in the unit of measurement chosen. The TMDL submittal should describe the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In many instances, this method will be a water quality model.

The TMDL submittal should contain documentation supporting the TMDL analysis, including the basis for any assumptions; a discussion of strengths and weaknesses in the analytical process; and results from any water quality modeling. EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

TMDLs must take into account *critical conditions* for stream flow, loading, and water quality parameters as part of the analysis of loading capacity. (40 C.F.R. §130.7(c)(1)). TMDLs should define applicable *critical conditions* and describe their approach to estimating both point and nonpoint source loadings under such *critical conditions*. In particular, the TMDL should discuss the approach used to compute and allocate nonpoint source loadings, e.g., meteorological conditions and land use distribution.

Comments:

WDNR will consider that Jug Creek is meeting the narrative water quality standard when Cold Water Community is established. To achieve Cold Water Community, WDNR has determined a total load capacity of sediment for the segment to be no greater than 575 tons/year (TMDL and Watershed Plan).

The total load capacity of 575 tons/year represents a 57% reduction of sediment entering the creek for existing conditions. WDNR has determined that this reduction of sediment will achieve the water quality target of establishing the appropriate cold water community in the segment. Establishment of a cold water community has been determined by WDNR to be an adequate surrogate for the narrative water quality standard. The TMDL includes a monitoring plan which is appropriate for demonstrating whether or not progress has been made towards establishment of the cold water community. The critical condition has been identified as storm events, when high amounts of run-off water eroded the stream banks, causing the coarse-grained sediments to be flushed downstream at higher velocities impairing the fish community. The storm-related critical condition is addressed by the implementation plan, in which best management practices are to be developed that specifically address the storm events.

WDNR used the WINHUSLE model for determining soil erosion and loading of sediments in the watershed. The WINHUSLE model calculates the amount of soil erosion based on a number of parameters, and routes the sediment to the waterbody in question. The amount of sediment reduction needed can then be estimated for the stream. The volume of sediment entering the waterbodies from streambank erosion was estimated using the NRCS volumetric spreadsheet model, which was applied to field data collected on the individual eroding streambanks to estimate sediment loads.

EPA finds that the TMDL document submitted by WDNR satisfies all requirements of this third element.

4. Load Allocations (LAs)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity attributed to existing and future nonpoint sources and to natural background. Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. §130.2(g)). Where possible, load allocations should be described separately for natural background and nonpoint sources.

Comments:

WDNR allocated 575 tons/year to nonpoint sources. WDNR was unable to calculate a natural background value. Specific allocations were determined for the various land uses within the Jug

Creek subwatershed. The land-use load allocations are as follows:

<u>category</u>	<u>load allocation (tons/year)</u>	<u>Reduction</u>
Upland sources (Cropland and other uplands)	346	55%
Eroding stream banks	45	54%
Eroding gullies	184	60%

EPA finds that the TMDL document submitted by WDNR satisfies all requirements of this fourth element.

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to individual existing and future point source(s) (40 C.F.R. §130.2(h), 40 C.F.R. §130.2(i)). In some cases, WLAs may cover more than one discharger, e.g., if the source is contained within a general permit.

The individual WLAs may take the form of uniform percentage reductions or individual mass based limitations for dischargers where it can be shown that this solution meets WQs and does not result in localized impairments. These individual WLAs may be adjusted during the NPDES permitting process. If the WLAs are adjusted, the individual effluent limits for each permit issued to a discharger on the impaired water must be consistent with the assumptions and requirements of the adjusted WLAs in the TMDL. If the WLAs are not adjusted, effluent limits contained in the permit must be consistent with the individual WLAs specified in the TMDL. If a draft permit provides for a higher load for a discharger than the corresponding individual WLA in the TMDL, the State/Tribe must demonstrate that the total WLA in the TMDL will be achieved through reductions in the remaining individual WLAs and that localized impairments will not result. All permittees should be notified of any deviations from the initial individual WLAs contained in the TMDL. EPA does not require the establishment of a new TMDL to reflect these revised allocations as long as the total WLA, as expressed in the TMDL, remains the same or decreases, and there is no reallocation between the total WLA and the total LA.

Comments:

There are no point sources on Jug Creek; therefore, the waste load allocation is zero.

EPA finds that the TMDL document submitted by WDNR satisfies all requirements of this fifth element.

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)). EPA's 1991 TMDL Guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that

account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

Comments:

WDNR included an implicit margin of safety by accounting for additional reductions in sediment loads. Above and beyond the BMPs in the Watershed Plan, WDNR is also implementing activities under the Conservation Reserve Enhancement Plan (CREP). This will result in additional riparian vegetative buffers, resulting in an additional control of sediment. About 27% of the watershed is agricultural use, and WDNR estimates that riparian buffers should provide control of 50%-75% of the sediment carried in overland flow (i.e., cropland).

EPA finds that the TMDL document submitted by WDNR satisfies all requirements of this sixth element.

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The TMDL must describe the method chosen for including seasonal variations. (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)).

Comments:

Sediment enters Jug Creek through rainfall and snowmelt runoff events throughout the year. Most of the sediment enters during spring runoff and intense summer rainstorms, but to some extent year-round. The sediment enters the creeks due to episodic events (storms) rather than “seasonal” events. In addition, the BMPs selected to achieve the load allocation were selected and designed to function for the 10-year or 25-year, 24-hour design storms, in order to address these episodic events.

EPA finds that the TMDL document submitted by WDNR satisfies all requirements of this seventh element.

8. Reasonable Assurances

When a TMDL is developed for waters impaired by point sources only, the issuance of a National Pollutant Discharge Elimination System (NPDES) permit(s) provides the reasonable assurance that the wasteload allocations contained in the TMDL will be achieved. This is because 40 C.F.R. 122.44(d)(1)(vii)(B) requires that effluent limits in permits be consistent with “the assumptions and requirements of any available wasteload allocation” in an approved TMDL.

When a TMDL is developed for waters impaired by both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur, EPA’s 1991 TMDL Guidance states that the TMDL should provide reasonable assurances that nonpoint source control measures will achieve expected load reductions in order for the TMDL to be approvable. This information is necessary for EPA to determine that the TMDL, including the load and wasteload allocations, has been established at a level necessary to implement water quality standards.

EPA's August 1997 TMDL Guidance also directs Regions to work with States to achieve TMDL load allocations in waters impaired only by nonpoint sources. However, EPA cannot disapprove a TMDL for nonpoint source-only impaired waters, which do not have a demonstration of reasonable assurance that LAs will be achieved, because such a showing is not required by current regulations.

Comments:

WDNR has demonstrated adequate reasonable assurance that the necessary nonpoint source reductions will occur by having various programs in place that will address the sediment movement into Jug Creek. First, Jug Creek is part of a larger priority watershed project, A Non-point Source Control Plan for the Middle Kickapoo River Priority Watershed Project. A copy of the approved Watershed Plan is included as an attachment to the TMDL. The project has already been underway for several years. The concepts of long-term state cost sharing and local staff funding was discussed in the project plan. The approval of the Watershed Plan by WDNR allows for the availability of grants through Wisconsin's nonpoint source program. Chapter Five of the approved Watershed Plan includes an implementation plan for rural and urban nonpoint sources, anticipated project costs, cost-share budgets, and staffing needs.

WDNR has an approved 319 Management Plan (approved by U.S. EPA in 2000). This 319 Management Plan describes a variety of financial, technical and educational programs in the state which support nonpoint source programs. Wisconsin's Nonpoint Source Water Pollution Abatement Program set forth in Section 281.65 of the Wisconsin Statutes and Chapter NR 120 of the WAC is described in the 319 Management Plan. WDNR has a variety of voluntary and "back-up" enforcement authorities available under the 319 plan. Administrative rules passed by the Natural Resources Board indicate that watersheds with impaired waters will have the highest priority for enforcement.

Additionally, as discussed in the Margin of Safety section of the TMDL, in October 2001 the Conservation Reserve Enhancement Program was approved for portions of Wisconsin. The Jug Creek subwatershed is included in the approved portions. This program can provide assistance to farmers and land owners for the installation of additional vegetative buffers along the creek.

EPA finds that the TMDL document submitted by WDNR satisfies all requirements of this eighth element.

9. Monitoring Plan to Track TMDL Effectiveness

EPA's 1991 document, *Guidance for Water Quality-Based Decisions: The TMDL Process* (EPA 440/4-91-001), recommends a monitoring plan to track the effectiveness of a TMDL, particularly when a TMDL involves both point and nonpoint sources, and the WLA is based on an assumption that nonpoint source load reductions will occur. Such a TMDL should provide assurances that nonpoint source controls will achieve expected load reductions and, such TMDL should include a monitoring plan that describes the additional data to be collected to determine if the load reductions provided for in the TMDL are occurring and leading to attainment of water quality standards.

Comments:

WDNR included a description of a monitoring program for the Jug Creek subwatershed. The segment has been monitored as part of the WDNR's whole stream study effort since the early 1990's. WDNR intends to re-monitor Jug Creek in 2004, depending on resources. The monitoring will include fish population data and habitat analysis.

EPA finds that the TMDL document submitted by WDNR satisfies all requirements of this ninth element.

10. Implementation

EPA policy encourages Regions to work in partnership with States/Tribes to achieve nonpoint source load allocations established for 303(d)-listed waters impaired by nonpoint sources. Regions may assist States/Tribes in developing implementation plans that include reasonable assurances that nonpoint source LAs established in TMDLs for waters impaired solely or primarily by nonpoint sources will in fact be achieved. In addition, EPA policy recognizes that other relevant watershed management processes may be used in the TMDL process. EPA is not required to and does not approve TMDL implementation plans.

Comments:

Jug Creek is part of the Non-point Source Control Plan for the Middle Kickapoo River Priority Watershed Project. The Watershed Plan, Chapter 5 discusses implementation for nonpoint source pollution control for Jug Creek, as well as other waterbodies included in the Watershed Plan. Implementation includes the following:

- agencies involved
- BMPs necessary to control nonpoint source run-off
- funding sources
- information and education activities
- schedule for completion
- staffing needs and costs involved

While this information was reviewed, it did not form a basis for the decision.

11. Public Participation

EPA policy is that there should be full and meaningful public participation in the TMDL development process. The TMDL regulations require that each State/Tribe must subject calculations to establish TMDLs to public review consistent with its own continuing planning process (40 C.F.R. §130.7(c)(1)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval should describe the State's/Tribe's public participation process, including a summary of significant comments and the State's/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. §130.7(d)(2)).

Provision of inadequate public participation may be a basis for disapproving a TMDL. If EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer

its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.

Comments:

There was public participation in the development of the elements of the Jug Creek TMDL consistent with Wisconsin's continuing planning process in Sections NR 120.08 and NR 121.07(1) of the WAC. The load allocations set out in the Jug Creek TMDL were calculated and established during the development of the Watershed Plan for reducing the overall amount of sediment in the Middle Kickapoo River watershed. Public meetings were held during the development of the Watershed Plan and a public hearing on the Watershed Plan was held on August 29, 1991. Public comments were incorporated into the final Watershed Plan. WDNR approved the final Watershed Plan on June 9, 1992.

The USEPA has decided to pursue additional public participation in the Jug Creek TMDL, by opening very shortly a 30 day public comment period on the USEPA approval of the TMDL. This will allow the public additional opportunity to provide comments or data regarding these TMDL.

EPA finds that the TMDL document submitted by WDNR satisfies all requirements of this eleventh element.

12. Submittal Letter

A submittal letter should be included with the TMDL submittal, and should specify whether the TMDL is being submitted for a *technical review* or *final review and approval*. Each final TMDL submitted to EPA should be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final review and approval, should contain such identifying information as the name and location of the waterbody, and the pollutant(s) of concern.

Comments:

U.S. EPA received the Jug Creek TMDL on November 26, 2002, accompanied by a submittal letter dated November 14, 2002. The submittal letter states, “. . . for your review and approval is the final TMDL for Jug Creek . . .”.

EPA finds that the TMDL document submitted by WDNR satisfies all requirements of this twelfth element.

13. Conclusion

After a full and complete review, EPA finds that the TMDL for Jug Creek satisfies all of the elements of an approvable TMDL. This document addresses 1 TMDL for 1 waterbody with 1 impairment from the 1998 Wisconsin 303d list.

