EPA REGION VIII MONTANA OFFICE TMDL REVIEW FORM

Document Name:	**Water Quality Assessment and TMDLs for the Big Spring Creek Planning Area (March 2005)**
Submitted by:	**MTDEQ**
Date Received:	**March 30, 2005**
Review Date:	**May 16, 2005**
Reviewer:	**Ron Steg**
Formal or Informal Review?	**FORMAL**

This document provides a standard format for the EPA Montana Office to provide comments to the Montana Department of Environmental Quality on TMDL documents provided to the EPA for either official formal, or informal review. All TMDL documents are measured against the following 12 review criteria:

1. Water Quality Impairment Status
2. Water Quality Standards
3. Water Quality Targets
4. Significant Sources
5. Total Maximum Daily Load
6. Allocation
7. Margin of Safety and Seasonality
8. Monitoring Strategy
9. Restoration Strategy
10. Public Participation
11. Endangered Species Act Compliance
12. Technical Analysis

Each of the 12 review criteria are described below to provide the rational for the review, followed by EPA's summary and comments/questions. **Comments/questions that need to be addressed are presented in bold**. This review is intended to ensure compliance with the Clean Water Act and also to ensure that the reviewed documents are technically sound and the conclusions are technically defensible.

1. Water Quality Impairment Status

Criterion Description – Water Quality Impairment Status

TMDL documents must include a description of the listed water quality impairments. While the 303(d) list identifies probable causes and sources of water quality impairments, the information contained in the 303(d) list is generally not sufficiently detailed to provide the reader with an adequate understanding of the impairments. TMDL documents should include a thorough description/summary of all available water quality data such that the water quality impairments are clearly defined and linked to the impaired beneficial uses and/or appropriate water quality standards.

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Six water quality limited segments (WQLS) in the Big Spring TPA appeared on Montana's 1996 and/or 2004 303(d) lists: Upper Big Spring Creek, Lower Big Spring Creek, Beaver Creek, Casino Creek, Upper Cottonwood Creek, and Lower Cottonwood Creek. A summary of the 303(d) list status through 2004 and the current water quality impairment status is provided in the table below.

Waterbody	Year Listed	Listed Probable Causes	Current Status
Big Spring Creek (MT41S004_010) headwaters to confluence with E. Fork	1996	Nutrients Other habitat alterations Suspended solids	Impaired for PCBs **PCB TMDL required.**
	2004	Fully supporting all beneficial uses	
Big Spring Creek (MT41S004_020) confluence of E. Fork to mouth	1996	Noxious aquatic plants Nutrients Other habitat alterations Siltation	Impaired for sediment, nutrients, PCBs **Sediment TMDL required** **Nutrient TMDL required** **PCB TMDL required**
	2004	PCB Nutrients Siltation Other habitat alterations Riparian degradation Fish habitat degradation	
Beaver Creek (MT41S004_030)	1996	Nutrients Suspended solids	Not Impaired No TMDL required
	2004	Bank erosion Riparian degradation Other habitat alterations Nutrients Siltation Fish habitat alteration Dewatering	
Casino Creek (MT41S004_040)	1996	Nutrients Suspended solids	Impaired for nutrients

Waterbody	Year Listed	Listed Probable Causes	Current Status
	2004	Nutrients Other habitat alterations Riparian degradation	**Nutrient TMDL required**
Upper Cottonwood Creek (MT41S004_051)	1996	Nutrients Organic enrichment/DO Suspended solids	Not Impaired No TMDL required
	2004	Fully supporting beneficial uses	
Lower Cottonwood Creek (MT41S004_052)	1996	Nutrients Organic enrichment/DO Suspended solids	Impaired for nutrients, dissolved oxygen **Nutrient/Dissolved Oxygen TMDL required**
	2004	Nutrients Siltation Organic enrichment/low DO Flow alteration Dewatering Other habitat alterations Riparian degradation Fish habitat degradation	

2. Water Quality Standards

Criterion Description – Water Quality Standards

The TMDL document must include a description of all applicable water quality standards for all affected jurisdictions. TMDLs result in maintaining and attaining water quality standards. Water quality standards are the basis from which TMDL's are established and the TMDL targets are derived, including the numeric, narrative, use classification, and antidegradation components of the standards.

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The applicable water quality standards are adequately summarized in Section 3.2.

3. Water Quality Targets

Criterion Description – Water Quality Targets

Quantified targets or endpoints must be provided to address each listed pollutant/water body combination. Target values must represent achievement of applicable water quality standards and support of associated beneficial uses. For pollutants with numeric water quality standards, the numeric criteria are generally used as the TMDL target. For pollutants with narrative standards, the narrative standard must be translated into a measurable value. At a minimum, one target is required for each pollutant/water body combination. It is generally desirable, however, to include several targets that represent achievement of the standard and support of beneficial uses (e.g., for a sediment impairment issue it may be appropriate to include targets representing water column sediment such as TSS, embeddeness, stream morphology, up-slope conditions, and a measure of biota).

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The targets are summarized in Enclosure 1. With the exception some of the sediment targets for Big Spring Creek, they appear to be appropriate. Three targets were used for sediment in Big Spring Creek; clinger taxa, periphyton siltation index, and percent surface fines less than 2 mm. While the clinger taxa and periphyton siltation index targets were commonly used by MTDEQ and EPA in Montana at the time this TMDL document was prepared, it has subsequently been determined that they may not provide an accurate linkage between the aquatic life beneficial use and sediment. Note, however, that the target metrics, *% Clinger Taxa* and *Periphyton Siltation Index*, were chosen in this case because of the large amount of biologic data and the broad spatial and temporal distribution of the data. This allowed specific internal trends of biologic integrity, both latitudinal and longitudinal, to be identified. Given the extent of biologic data on Big Spring Creek, it was felt that these indicators, used in conjunction with substrate indicators (% surface fines <2mm) were appropriate for use as targets in Big spring Creek. Please refer to Figures 4-4 through 4-8 for spatial coverage and trends analysis.

4. Significant Sources

Criterion Description – Significant Sources

TMDLs must consider all significant sources of the stressor of concern. All sources or causes of the stressor must be identified or accounted for in some manner. The detail provided in the source assessment step drives the rigor of the allocation step. In other words, it is only possible to specifically allocate quantifiable loads or load reductions to each significant source when the relative load contribution from each source has been estimated. Ideally, therefore, the pollutant load from each significant source should be quantified. This can be accomplished using site-specific monitoring data, modeling, or application of other assessment techniques. If insufficient time or resources are available to accomplish this step, a phased/adaptive management approach can be employed so long as the approach is clearly defined in the document.

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The three primary pollutants addressed in this document include PCBs, nutrients/dissolved oxygen, and sediment. Comments pertaining to each are provided below.

PCBs

The primary source of PCB loading to Big Spring Creek is from the Big Spring Trout Hatchery and PCBs contained in stream bottom substrates.

Nutrients/DO

The primary anthropogenic source of nutrients in Big Spring Creek is the Lewistown WWTP. The source assessment for nutrients in Big Spring Creek appears to be adequate.

Insufficient information was provided in Casino and Lower Cottonwood Creeks to adequately identify sources and/or determine the relative importance of potential sources.

Sediment

The primary anthropogenic sources of sediment to Big Spring Creek include bank erosion, urban non-point sources, and tributary inputs.

5. TMDL

Criterion Description – Total Maximum Daily Load

TMDLs include a quantified pollutant reduction target. According to EPA reg (see 40 C.F.R. 130.2(i)) TMDLs can be expressed as mass per unit of time, toxicity, % load reduction, or other measure. TMDLs must address, either singly or in combination, each listed pollutant/water body combination.

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TMDLs have been prepared for PCBs in two segments of Big Spring Creek, and nutrients and siltation in one segment of Big Spring Creek. These TMDLs appear to be appropriate and are described in Enclosure 1. **Insufficient information has been presented for the necessary TMDLs for Casino Creek (nutrients) and Lower Cottonwood Creek (nutrients and dissolved oxygen)**.

6. Allocation

Criterion Description – Allocation

TMDLs apportion responsibility for taking actions or allocate the available assimilative capacity among the various point, nonpoint, and natural pollutant sources. Allocations may be expressed in a variety of ways such as by individual discharger, by tributary watershed, by source or land use category, by land parcel, or other appropriate scale or dividing of responsibility. A performance based allocation approach, where a detailed strategy is articulated for the application of BMPs, may also be appropriate for non point sources.

In cases where there is substantial uncertainty regarding the linkage between the proposed allocations and achievement of water quality standards, it may be necessary to employ a phased or adaptive management approach (e.g., establish a monitoring plan to determine if the proposed allocations are, in fact, leading to the desired water quality improvements).

Allocating load reductions to specific sources is generally the most contentious and politically sensitive component of the TMDL process. It is also the step in the process where management direction is provided to actually achieve the desired load reductions. In many ways, it is a prioritization of restoration activities that need to occur to restore water quality. For these reasons, every effort should be made to be as detailed as possible and also, to base all conclusions on the best available scientific principles.

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TMDLs, and associated allocations, have been prepared for PCBs in two segments of Big Spring Creek, and nutrients and siltation in one segment of Big Spring Creek. The allocations appear to be appropriate/adequate and are described in Enclosure 1. **No allocations are presented for the necessary TMDLs for Casino Creek (nutrients) and Lower Cottonwood Creek (nutrients and dissolved oxygen)**.

7. Margin of Safety and Seasonality

Criterion Description – Margin of Safety/Seasonality

A margin of safety (MOS) is a required component of the TMDL that accounts for the uncertainty about the relationship between the pollutant loads and the quality of the receiving water body (303(d)(1)(c)). The MOS can be implicitly expressed by incorporating a margin of safety into conservative assumptions used to develop the TMDL. In other cases, the MOS can be built in as a separate component of the TMDL (in this case, quantitatively, a TMDL = WLA + LA + MOS). In all cases, specific documentation describing the rational for the MOS is required.

Seasonal considerations, such as critical flow periods (high flow, low flow), also need to be considered when establishing TMDLs , targets, and allocations.

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TMDLs have been prepared for PCBs in two segments of Big Spring Creek, and nutrients and siltation in one segment of Big Spring Creek. The margins of safety for each are described below:

PCBs

The TMDL and allocations for PCBs are based on achievement of the target value for PCB sediment quality. DEQ conservatively selected the lowest Probable Effect Level (PEL) from the literature as the target. Additionally, it is stated that this target may be revised based on a pending Ecological Risk Assessment.

Nutrients

An explicit margin of safety (10%) is incorporated into the nutrient allocations.

Siltation

The TMDL and associated allocations are performance-based. In other words, it is DEQ's hypothesis that if the performance-based actions are implemented, the targets will be met. The only means by which to ensure that targets will be met through the proposed performance-based approach would be to conduct follow-up monitoring and apply adaptive management. If the monitoring strategy presented in Section 5.1.5 were implemented, it would likely provide an adequate margin of safety.

The *Big Springs Watershed Partnership* has a proven track record of restoration planning and implementation through collaboration with a variety of local, state and federal agencies and organizations. Tables 4-3 and 5-6 highlight locally driven riparian improvement projects on Big Spring Creek and a variety of its tributaries. Water quality and riparian improvements include: implementation of BMPs, restoration of stream channels, and enhancement of riparian vegetation. The extent of stream and riparian improvement projects attest to the commitment of local agencies and organizations to improve water quality, and provides reasonable assurance that such efforts will continue to be implemented and monitored for success.

8. Monitoring Strategy

Criterion Description – Monitoring Strategy

Many TMDL's are likely to have significant uncertainty associated with selection of appropriate numeric targets and estimates of source loadings and assimilative capacity. In these cases, a phased TMDL approach may be necessary. For Phased TMDLs, it is EPA's expectation that a monitoring plan will be included as a component of the TMDL documents to articulate the means by which the TMDL will be evaluated in the field, and to provide supplemental data in the future to address any uncertainties that may exist when the document is prepared.

At a minimum, the monitoring strategy should:

- *Articulate the monitoring hypothesis and explain how the monitoring plan will test it.*
- *Address the relationships between the monitoring plan and the various components of the TMDL (targets, sources, allocations, etc.).*
- *Explain any assumptions used.*
- *Describe monitoring methods.*
- *Define monitoring locations and frequencies, and list the responsible parties.*

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Monitoring goals include:

Sediment

- Monitoring to evaluate targets and target attainment
- Conducting further assessment of sources
- Evaluation of BMP implementation and effectiveness

PCBs

- Assessing the success of remediation activities at the hatchery
- Monitoring to evaluate targets and target attainment
- Conducting further assessment of sources

Nutrients

- Monitoring to evaluate targets and target attainment
- Collecting supplemental flow information
- Conducting further assessment of sources

The monitoring strategies presented in the subject document are conceptual, but generally address the relationships between the monitoring plan and the various components of the TMDL (targets, sources, allocations, etc.). If these conceptual monitoring strategies were implemented, they would likely result in sufficient information to track attainment of targets and allow for adaptive management.

9. Restoration Strategy

Criterion Description – Restoration Strategy

At a minimum, sufficient information should be provided in the TMDL document to demonstrate that if the TMDL were implemented, water quality standards would be attained or maintained. Adding additional detail regarding the proposed approach for the restoration of water quality is not currently a regulatory requirement, but is considered a value added component of a TMDL document.

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Conceptual restoration strategies are provided for each of the water body/pollutant combinations for which TMDLs have been prepared.

10. Public Participation

Criterion Description – Public Participation

The fundamental requirement for public participation is that all stakeholders have an opportunity to be part of the process. Public participation should fit the needs of the particular TMDL.

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Public involvement activities are described in Section 9.0 and appear to be adequate.

11. Technical Analysis

Criterion Description – Technical Analysis

*TMDLs must be supported by an appropriate level of technical analysis. It applies to **all** of the components of a TMDL document. It is vitally important that the technical basis for **all** conclusions be articulated in a manner that is easily understandable and readily apparent to the reader. Of particular importance, the cause and effect relationship between the pollutant and impairment and between the selected targets, sources, TMDLs, and allocations needs to be supported by an appropriate level of technical analysis.*

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The level of technical analysis for the PCB related issues appears to be very thorough. However, the lack of source assessment information (i.e., identification of specific sources and quantification of loads from each of the significant sources) is only marginally adequate for the nutrient and sediment TMDLs. Future TMDL analyses should include a more thorough consideration of pollutant sources.

12. Endangered Species Act Compliance

Criterion Description – Endangered Species Act Compliance

EPA's approval of a TMDL may constitute an action subject to the provisions of Section 7 of the Endangered Species Act ("ESA"). EPA will consult, as appropriate, with the US Fish and Wildlife Service (USFWS) to determine if there is an effect on listed endangered and threatened species pertaining to EPA's approval of the TMDL. The responsibility to consult with the USFWS lies with EPA and is not a requirement under the Clean Water Act for approving TMDLs. States are encouraged, however, to participate with FWS and EPA in the consultation process and, most importantly, to document in its TMDLs the potential effects (adverse or beneficial) the TMDL may have on listed as well as candidate and proposed species under the ESA.

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EPA will address ESA issues.