

APPENDIX B

REGULATORY FRAMEWORK AND REFERENCE CONDITION APPROACH

This appendix presents details regarding DEQ’s regulatory framework for TMDL development and presents applicable Montana Water Quality Standards (WQS) for metals-related water quality impairments in the Missouri-Cascade and Belt TMDL Planning Areas

B.1 TMDL Development Requirements

Section 303 of the Federal CWA and the Montana WQA (Section 75-5-703) requires development of TMDLs for impaired waterbodies that do not meet Montana WQS. Although waterbodies can become impaired from pollution (e.g. flow alterations and habitat degradation) and pollutants (e.g. nutrients, sediment, metals, pathogens, and temperature), the CWA and Montana State Law (75-5-703) both require TMDL development for waters impaired only by pollutants. Section 303 also requires states to submit a list of impaired waterbodies to EPA every two years. Prior to 2004, EPA and DEQ referred to this list as the 303(d) List.

Since 2004, EPA has requested that states combine the 303(d) List with the 305(b) report containing an assessment of Montana’s water quality and its water quality programs. EPA refers to this new combined 303(d)/305(b) report as the Integrated Water Quality Report. The 303(d) List also includes identification of the probable cause(s) of the water quality impairment problems (e.g. pollutants such as metals, nutrients, sediment, pathogens or temperature), and the suspected source(s) of the pollutants of concern (e.g. various land use activities). State law (MCA 75-5-702) identifies that a sufficient credible data methodology for determining the impairment status of each water body is used for consistency; the actual methodology is identified in DEQ’s Water Quality Assessment Process and Methods (Montana Department of Environmental Quality, 2006). This methodology was developed via a public process and was incorporated into the EPA-approved 2000 version of the 305(b) report (now also referred to as the Integrated Report).

Under Montana State Law, an "impaired water body" is defined as a water body or stream segment for which sufficient credible data show that the water body or stream segment is failing to achieve compliance with applicable WQS (Montana Water Quality Act; Section 75-5-103(11)). A “threatened water body” is defined as a water body or stream segment for which sufficient credible data and calculated increases in loads show that the water body or stream segment is fully supporting its designated uses, but threatened for a particular designated use because of either (a) proposed sources that are not subject to pollution prevention or control actions required by a discharge permit, the nondegradation provisions, or reasonable land, soil, and water conservation practices or (b) documented adverse pollution trends (Montana WQA; Section 75-5-103(31)). State Law and Section 303 of the CWA require states to develop all necessary TMDLs for impaired or threatened waterbodies. There are no threatened waterbodies within the Missouri-Cascade and Belt TMDL Planning Areas.

A TMDL is a pollutant budget for a waterbody identifying the maximum amount of the pollutant that a water body can assimilate without causing applicable WQS to be exceeded. TMDLs are often expressed in terms of an amount, or load, of a particular pollutant (expressed in units of mass per time such as pounds per day). TMDLs must account for loads/impacts from point and nonpoint sources in addition to natural background sources and must incorporate a margin of safety and consider influences of seasonality on analysis and compliance with WQS.

To satisfy the Federal CWA and Montana State Law, TMDLs will be developed for each metals water body-pollutant combination identified on Montana’s 2008 303(d) List of impaired waters in the Missouri-Cascade and Belt TMDL Planning Areas. State Law (Administrative Rules of Montana 75-5-703(8)) also directs Montana DEQ to “...support a voluntary program of reasonable land, soil, and water conservation practices to achieve compliance with water quality standards for nonpoint source activities for waterbodies that are subject to a TMDL...” This is an important directive that is reflected in the overall TMDL development and implementation strategy within this plan. It is important to note that water quality protection measures are not considered voluntary where such measures are already a requirement under existing Federal, State, or local regulations.

B.2 Applicable Water Quality Standards

Water quality standards include the uses designated for a water body, the legally enforceable narrative or numeric criteria that ensure that the uses are supported, and a nondegradation policy that protects the high quality of a water body. The ultimate goal of this TMDL document, once implemented, is to ensure that all designated beneficial uses are fully supported and all standards are met. Pollutants addressed in this Water Quality Planning Framework include salinity and a variety of metals identified on the 2008 303(d) List as causes of impairment. This section provides a summary of the applicable water quality standards for metals. Metals water quality standards form the basis for metals water quality and sediment targets described in **Section 5**.

B.2.1 Classification and Beneficial Uses

Classification is the assignment (designation) of a single or group of uses to a water body based on the potential of the water body to support those uses. Designated Uses or Beneficial Uses are simple narrative descriptions of water quality expectations or water quality goals. There are a variety of “uses” of state waters including growth and propagation of fish and associated aquatic life; drinking water; agriculture; industrial supply; and recreation and wildlife. The Montana WQA directs the Bureau of Environmental Review (i.e., the state) to establish a classification system for all waters of the state that includes their present (when the Act was originally written) and future most beneficial uses (ARM 17.30.607-616) and to adopt standards to protect those uses (ARM 17.30.620-670).

Montana, unlike many other states, uses a watershed based classification system with some specific exceptions. As a result, *all* waters of the state are classified and have designated uses and supporting standards. All classifications have multiple uses and in only one case (A-Closed) is a specific use (drinking water) given preference over the other designated uses. Some waters may not actually be used for a specific designated use, for example as a public drinking water supply;

however, the quality of that water body must be maintained suitable for that designated use. When natural conditions limit or preclude a designated use, permitted point source discharges or nonpoint source activities or pollutant discharges may not make the natural conditions worse.

Modification of classifications or standards that would lower a water’s classification or a standard (i.e., B-1 to a B-3), or removal of a designated use because of natural conditions can only occur if the water was originally misclassified. All such modifications must be approved by the BER, and are undertaken via a Use Attainability Analysis (UAA) that must meet EPA requirements (40 CFR 131.10(g), (h) and (j)). The UAA and findings presented to the BER during rulemaking must prove that the modification is correct and all existing uses are supported. An existing use cannot be removed or made less stringent.

Descriptions of Montana’s surface water classifications and designated beneficial uses are presented in **Table B-1**. All waterbodies within the Missouri-Cascade and Belt TMDL Planning Areas are classified as B-1 or B-2 (see **Section 3.1, Table 3-1** for individual stream classifications).

Table B-1. Montana Surface Water Classifications and Designated Beneficial Uses

Classification	Designated Uses
A-CLOSED CLASSIFICATION:	Waters classified A-Closed are to be maintained suitable for drinking, culinary and food processing purposes after simple disinfection.
A-1 CLASSIFICATION:	Waters classified A-1 are to be maintained suitable for drinking, culinary and food processing purposes after conventional treatment for removal of naturally present impurities.
B-1 CLASSIFICATION:	Waters classified B-1 are to be maintained suitable for drinking, culinary and food processing purposes after conventional treatment; bathing, swimming and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.
B-2 CLASSIFICATION:	Waters classified B-2 are to be maintained suitable for drinking, culinary and food processing purposes after conventional treatment; bathing, swimming and recreation; growth and marginal propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.
B-3 CLASSIFICATION:	Waters classified B-3 are to be maintained suitable for drinking, culinary and food processing purposes after conventional treatment; bathing, swimming and recreation; growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.
C-1 CLASSIFICATION:	Waters classified C-1 are to be maintained suitable for bathing, swimming and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.
C-2 CLASSIFICATION:	Waters classified C-2 are to be maintained suitable for bathing, swimming and recreation; growth and marginal propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.
C-3 CLASSIFICATION:	Waters classified C-3 are to be maintained suitable for bathing, swimming and recreation; growth and propagation of non-salmonid fishes and associated aquatic life, waterfowl and furbearers. The quality of these waters is naturally marginal for drinking, culinary and food processing purposes, agriculture and industrial water supply.
I CLASSIFICATION:	The goal of the State of Montana is to have these waters fully support the following uses: drinking, culinary and food processing purposes after conventional treatment; bathing, swimming and recreation; growth and propagation of fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.

B.2.2 Standards

In addition to the Use Classifications described above, Montana’s water quality standards include numeric and narrative criteria as well as a nondegradation policy.

Numeric surface water quality criteria have been developed for many parameters to protect human health and aquatic life. These numeric criteria are in the Department Circular DEQ-7 (Montana Department of Environmental Quality, 2004). The numeric human health water quality criteria have been developed for parameters determined to be toxic, carcinogenic, or harmful and have been established at levels to be protective of long-term (i.e., life long) exposures as well as through direct contact such as swimming.

The numeric aquatic life criteria include chronic and acute values that are based on extensive laboratory studies including a wide variety of potentially affected species, a variety of life stages and durations of exposure. Chronic aquatic life criteria are protective of long-term exposure to a parameter. The protection afforded by the chronic criteria includes detrimental effects to reproduction, early life stage survival and growth rates. In most cases the chronic criteria is more stringent than the corresponding acute criteria. Acute aquatic life criteria are protective of short-term exposures to a parameter and are not to be exceeded.

High quality waters are afforded an additional level of protection by the nondegradation rules (ARM 17.30.701 et. seq.) and in statute (75-5-303 MCA). Changes in water quality must be “non-significant”, or an authorization to degrade must be granted by the Department. However, under no circumstance may standards be exceeded. It is important to note that waters that meet or are of better quality than a standard are high quality for that parameter, and nondegradation policies apply to new or increased discharges to that water body.

Narrative criteria have been developed for substances or conditions for which sufficient information does not exist to develop specific numeric criteria. The term “Narrative Standards” commonly refers to the General Prohibitions in ARM 17.30.637 and other descriptive portions of the surface water quality standards. The General Prohibitions are also called the “free from” standards; that is, the surface waters of the state must be free from substances that impair the beneficial uses of a water body.

The narrative and numeric water quality criteria applicable to metals-related pollutants addressed in the Missouri-Cascade and Belt TMDL Planning Areas are summarized below.

Metals

Water quality standards that are applicable to metals impairments include both numeric water quality criteria given in DEQ-7 (**Table B-2**) and general prohibitions (narrative criteria) given in **Table B-3**. As water quality criteria for many metals is dependent upon water hardness, **Table B-2** presents acute and chronic metals numeric water quality criteria at water hardnesses of 25 mg/L and 100 mg/L for metals of concern in the Missouri-Cascade and Belt TMDL Planning Areas. Also presented in **Table B-2** is the Human Health Criteria (HHC): note that for mercury and arsenic, the HHC is lower than applicable chronic criteria.

Table B-2. Metals Numeric Water Quality Criteria for the Missouri-Cascade and Belt TMDL Planning Areas

Metal of Concern	Aquatic Life Criteria (ug/L) at 25 mg/L Hardness		Aquatic Life Criteria (ug/L) at 100 mg/L Hardness		HHC
	Acute	Chronic	Acute	Chronic	
Aluminum, dissolved	750	87	750	87	--
Arsenic, TR	340	150	340	150	10
Cadmium, TR	0.52	0.10	2.13	0.27	5
Chromium, TR	579.32	27.69	1803.05	86.18	---
Copper, TR	3.79	2.85	14.00	9.33	1,300
Iron, TR	---	1,000	---	1,000	
Mercury, TR	1.70	0.91	1.70	0.91	0.05
Lead, TR	13.98	0.54	81.65	3.18	15
Nickel, TR	145.21	16.14	469.17	52.16	100
Silver, TR	0.37	---	4.06	---	100
Antimony, TR	---	---	---	---	6
Zinc, TR	37.02	37.02	119.82	119.82	2,000

In addition to numeric criteria given in **Table B-2**, narrative criteria also provides protection of beneficial uses. Toxic levels of metals in stream sediment are prohibited via ARM 17.30.637 (1)(d)). Metals concentrations in stream sediment are addressed via the suite of narrative criteria presented in **Table B-3**. The relevant narrative criteria do not allow for ‘concentrations or combinations of materials that are toxic or harmful to human, animal, plant, or aquatic life.’ This is interpreted to mean that water quality goals should strive toward a condition in which any increases in metals concentration in sediment above naturally occurring levels are not harmful, detrimental or injurious to beneficial uses (see definitions in **Table B-3**). Evaluation of numeric and narrative criteria for specific metals impairments by stream segment is given in **Section 5**.

Table B-3. Applicable Rules for Metals Concentrations in Sediment

Rule(s)	Criteria
17.30.623 (1) 17.30.624 (1)	Waters classified B-1 (B-2) are to be maintained suitable for drinking, culinary, and food processing purposes, after conventional treatment; bathing, swimming, and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply.
17.30.623(2) 17.30.624(2)	No person may violate the following specific water quality standards for waters classified B-1 (B-2).
17.30.623 (2) (f) 17.30.624 (2) (f)	(f) No increases are allowed above naturally occurring concentrations of sediment or suspended sediment (except as permitted in 75-5-318, MCA), settleable solids, oils, or floating solids, which will or are likely to create a nuisance or render the waters harmful, detrimental, or injurious to public health, recreation,
17.30.623 (2) (h) 17.30.624 (2) (h)	(h) Concentrations of carcinogenic, bioconcentrating, toxic, radioactive, nutrient, or harmful parameters may not exceed the applicable standards set forth in department Circular DEQ-7.

Table B-3. Applicable Rules for Metals Concentrations in Sediment

Rule(s)	Criteria
17.30.637	General Prohibitions
17.30.637(1)	State surface waters must be free from substances attributable to municipal, industrial, agricultural practices or other discharges that will.
17.30.637(1)(d)	Create concentrations or combinations of materials that are toxic or harmful to human, animal, plant, or aquatic life.

Salinity

Water quality standards that are applicable to salinity impairments include narrative criteria consisting of B-1 and B-2 classification standards and general prohibitions given in **Table B-3**. Beneficial uses most sensitive to high salinity in the Belt and Missouri-Cascade TPAs include aquatic life and agricultural (irrigation water) uses. In-stream salinity levels must therefore be supportive of those uses.

References

- Montana Department of Environmental Quality. 2004. Circular WQB-7: Montana Numeric Water Quality Standards. Helena, MT: Montana Department of Environmental Quality (MDEQ). <http://www.deq.state.mt.us/wqinfo/Circulars/WQB-7.PDF>.
- . 2006. Standard Operating Procedure, Water Quality Assessment Process and Methods. Helena, MT: Montana Department of Environmental Quality.

