Note: This initial draft template document is being provided for consultation purposes with the Nutrient Work Group. This is a preliminary document for review and may undergo changes based on Nutrient Work Group input. Additionally, this template is based on requirements outlined in draft Circular DEQ-15. Any applicable changes to Circular DEQ-15 will be incorporated into this template.

How to Use This AMP Implementation Plan Template

Based on Circular DEQ-15, key components for a successful AMP implementation plan include:

- AMP watershed identification and description
- Identify, quantify, and characterize all sources of nutrient contributions in the AMP watershed
- Identify partners
- Identify load reduction goals and action items for reduction of nutrients in the watershed
- Demonstration of ability to fund and implement the plan
- Continued data collection
- Timeline for completing above components and annual reporting
- Outreach strategy and communication plan

The following template is outlined according to the above components and contains both required and suggested language. Permittees may modify and adapt this template based on their needs, with approval from the Montana DEQ AMP Scientist. Permittees are encouraged to work with the AMP Scientist throughout development of an AMP Implementation Plan to ensure current Department guidance is followed. The most current information and AMP contacts can be found on Montana DEQ's website at: [URL]. Please refer to the website to ensure you have the most current version of this template.

Template Key:

- Black text indicates required information that should generally remain intact, such as section headings, table titles and column headings, and boilerplate language.
- Text between brackets indicates the type of information to be inserted. The brackets (i.e., [ ]) are to be deleted once populated.
- Red text provides instructions to the user and should be deleted once your document is final.
- Yellow-highlighted items are to be completed by DEQ. The highlighting will be removed when this template is made final.

Delete this page before finalizing your document.

AMP Implementation Plan

[Watershed Name and Entity Name(s)]

Insert Image if Desired

[Month] [Year (YYYY)]
AMP ID: [ID]

The AMP ID will be assigned by the Montana DEQ AMP Scientist

Prepared by:
[Entity Name]
[Entity Address]

Approved by:

[Name], Montana DEQ AMP Scientist Date

[Name], Montana DEQ MPDES Permitting Section Supervisor Date

Cover Photo:
[image description, including waterbody name]
Photo by: [photographer or entity name]

Suggested Citation: [Author]. [Year Published (YYYY)]. [Document Title]. [City, State Abbreviation where published]: [Publishing Company or Entity Name].

Example Suggested Citation: Montana DEQ. 2020. Madison Sediment and Temperature TMDLs and Water Quality Improvement Plan. Helena, MT: Montana Dept. of Environmental Quality.

DOCUMENT REVISION HISTORY

Revision No.	Date	Modified By	Sections Modified	Description of Changes

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TABLE OF CONTENTS

To update the table of contents, right click on the table and then select "Update Field" and then "Update entire table."

APPENDICES

LIST OF TABLES

Use Header 6 to populate a list of tables.

LIST OF FIGURES

Use Header 7 to populate a list of figures.

ACRONYMS AND ABBREVIATIONS

Add rows to the below table to provide an alphabetical list of all acronyms and abbreviations that appear in this document and their meaning.

Acronym or Abbreviation	Definition
AMP	Adaptive Management Plan
ARM	Administrative Rules of Montana
DEQ	Department of Environmental Quality (Montana)
MCA	Montana Code Annotated
MPDES	Montana Pollutant Discharge Elimination System

DOCUMENT SUMMARY

Summarize the contents of your final document and provide key conclusions.

Table DS-1. Affected MPDES Permit(s)

Facility Name	MPDES Permit Number	Receiving Waterbody(ies)

1.0 INTRODUCTION AND BACKGROUND

This document presents an analysis of nutrient water quality information in the [watershed name] watershed and establishes an implementation plan for reducing nutrient loading to support beneficial uses. This document inventories nutrient sources to [insert stream/river names or provide the main river name and the number of tributaries that were evaluated] and outlines mechanisms to fund and implement the nutrient reduction goals. This plan in combination with the [associated monitoring plan name] ([monitoring plan citation]) create an adaptive management plan (AMP).

In 2021, the 67th Montana Legislature adopted Senate Bill 358, which described a new process for implementing narrative standards for nutrients in permits. Nutrients, in this context, refer to total phosphorus (TP) and total nitrogen (TN) concentrations in state surface waters. The Montana Legislature also directed the Montana Department of Environmental Quality (DEQ) to eliminate the numeric criteria that had been adopted for these parameters in Circular DEQ-12A. The numeric criteria in Circular DEQ-12A applied to wadeable streams across Montana as well as portions of the Yellowstone River. Circular DEQ-12A criteria were not applicable to Montana's remaining large rivers.

The narrative standards at Administrative Rules of Montana (ARM) 17.30.637(1) are the primary narrative standards the department uses to regulate the impacts of excess phosphorus and nitrogen in state waters (see **Section 3.2**). These narrative nutrient standards apply to wadeable streams and medium rivers, as well as large river segments previously under Circular DEQ-12A, and continue to apply to other large rivers of the state.

While the narrative nutrient standards remain unchanged, 75-5-321, Montana Code Annotated (MCA), required DEQ to adopt rules allowing for the use of an adaptive management program when implementing the narrative standards. The adaptive management program is an incremental, watershed-based approach for protecting and maintaining water quality affected by excess nutrients. An important element of the adaptive management program is that it allows different types of nutrients (phosphorus vs. nitrogen) and nutrient sources to be addressed separately and incrementally over time by incorporating flexible decision-making which can be adjusted as management actions and other factors become better understood in each watershed.

Montana DEQ evaluates each point source with nutrients as a pollutant of concern for the discharge's reasonable potential to cause or contribute to an exceedance of the narrative nutrient standards. For point sources with reasonable potential, adaptive management allows for permittees to prioritize phosphorus reduction, where appropriate. Reduction of phosphorus is the initial phase of adaptive management and will be implemented if appropriate. If phosphorus-focused control is not successful in protecting water quality and beneficial uses, then phosphorus *and* nitrogen controls are implemented. Nitrogen sources in watersheds are often dispersed among different sources and the adaptive management process at this stage allows permittees to examine the potential for wider reduction of nutrients in their watershed. The entire process is adaptive in that it allows for an incremental approach (phosphorus focus first, then nitrogen) and incorporates flexible decision-making which can be adjusted as management actions and other factors become better understood in each watershed. An adaptive management plan (AMP) is watershed-specific plan developed under the broader adaptive management program.

1.1 Why This Plan is Being Written

Per Section 8.0 of Circular DEQ-15 (citation), if Montana DEQ finds that (1) phosphorus-focused control at the point source was unsuccessful in supporting beneficial uses and achieving the narrative nutrient standards, or (2) that phosphorus prioritization was not appropriate for the point source or receiving waterbody, the permittee must develop and execute an AMP Implementation Plan.

Provide a short overview of the beneficial use and narrative nutrient standards compliance evaluation that has taken place and led to initiation of this process.

1.2 Permittees Affected by this Plan

The permittees shown in **Table 1-1** below are participating in Montana's adaptive management program and their Montana Pollutant Discharge Elimination System (MPDES) permits are affected by this plan.

Table 1-1. Affected MPDES Permit(s)

Facility Name	MPDES Permit Number	Receiving Waterbody(ies)

1.3 Water Quality Parameters Addressed by this Plan

Table 1-2 below lists all parameters addressed by this plan, as well as those parameters that are listed by Montana DEQ as impaired in the [IR year] Water Quality Integrated Report ([IR citation]).

"Addressed by this plan" means that there is an action item included in Section 6.0 that targets reducing the impacts of the parameter. Note if Montana DEQ has not assigned an assessment unit ID to a waterbody, enter "N/A" in the second column of the below table.

Assessment unit IDs can be found by using Montana's Clean Water Act Information Center, found here: https://deq.mt.gov/water/resources. Montana's Water Quality Integrated Reports are also found at this link.

Table 1-2. Water Quality Parameters Addressed by This Plan and their Impairment Status

Waterbody & Location Description	Assessment Unit ID	Parameter(s) Addressed by this Plan*
Example Creek, headwaters to mouth (x creek)		

*** bolded parameters** are listed as impaired on Montana's [most recent IR year] Water Quality Integrated Report

2.0 [Watershed Name] Watershed Description

This watershed description provides a general overview of the physical and social characteristics of the [watershed name] watershed. At a minimum, the following elements need to be included. The DEQ AMP Scientist will provide additional guidance on how to obtain the GIS layers needed to compile this information, which may be incorporated as an appendix to this template.

2.1 Location and Boundaries

Provide the following information:

- Watershed size in square miles and acres
- Counties and major cities/towns
- Origin/headwaters of main waterbody and its confluence (general upstream and downstream watershed context)
- Corresponding hydrologic unit code (HUC)
- Corresponding Level III ecoregion(s)
- Corresponding Montana TMDL Planning Area(s)
- Major mountain ranges bounding the watershed
- Include a location map

2.2 Hydrology

Provide the following information:

- General hydrologic cycle of the watershed, including typical spring runoff months and base flow months
- Note any dams in the watershed and their type of release
- Note any USGS gaging stations (include gage number and name)
- Include a map showing major tributaries and any USGS gage stations

2.3 Climate

Provide the following information:

- Average precipitation by elevation and temperatures (highest/lowest average temperatures)
- Peak precipitation months
- Optional: discussion on climate trends
- Note any FWP-identified dewatered streams

2.4 Land Cover and Land Uses

Provide the following information, where applicable:

- Vegetation types and their percent cover
- Percent of private vs public lands
- Agricultural land uses (crop types, irrigation methods, irrigation ditch networks, grazing acreage, etc.)
- Years and locations of wildfires
- Types of mining activity
- Recreational activities that may affect water quality or quantity (e.g., note any golf courses)

2.5 Population and Septic Density

Provide the following information:

- Towns and cities located in the watershed
- Census data and population growth information

- Septic densities

3.0 NUTRIENT WATER QUALITY STANDARDS

Water quality standards include three main parts:

1 Stream classifications and beneficial uses
2 Numeric and narrative water quality criteria designed to protect beneficial uses
3 Nondegradation provisions

Those water quality standards that apply to this document are reviewed briefly below. More detailed descriptions of Montana's water quality standards may be found in the Montana Water Quality Act (75-5-301 and 302 Montana Code Annotated (MCA)) and Montana's Surface Water Quality Standards and Procedures (Administrative Rules of Montana (ARM) 17.30.601 through 670).

3.1 STEAM CLASSIFICATIONS AND BENEFICIAL USES

Stream classification is the assignment of a group of beneficial uses to a waterbody based on the potential of the waterbody to support those uses. Beneficial uses are the valuable characteristics of a stream or river resource that, directly or indirectly, contribute to human welfare. They are established in law and reflect the societal values embodied in those laws. Montana waters are classified for multiple uses. Streams and lakes within the [watershed name] watershed are classified as [classification] (ARM 17.30.[subchapter]). Waters classified as [classification] are to be maintained suitable for [list beneficial uses] (ARM 17.30.[subchapter]). **Table 3-1** shows the waterbody segments in the [watershed name] watershed not fully supporting their beneficial uses due to nutrient related impairment causes.

Stream classification and impairment information can be found at Montana's Clean Water Act Information Center and by using the "Use Class Map," both found here: https://deq.mt.gov/water/resources

ARM subchapters can be determined at this site: https://sosmt.gov/arm/

Table 3-1. Nutrient Impaired Waterbodies and their Impaired Beneficial uses in the [Watershed Name] Watershed

Waterbody & Location Description	Assessment Unit ID	Nutrient-Related Impairment Cause	Impaired Use(s)*
Example Creek, Headwaters to mouth (X Creek)	[ID]	Total Nitrogen	Aquatic Life Primary Contact Recreation
		Total Phosphorus	Aquatic Life Primary Contact Recreation

* A full summary of beneficial use support information for each waterbody can be found in Montana's [most recent IR year] Integrated Report

3.2 NARRATIVE NUTRIENT STANDARDS

Montana's water quality standards include numeric and narrative criteria that protect the beneficial uses described above. For nutrients, only narrative water quality standards apply in the [watershed name] watershed (Note: DEQ has written this statement as what will be true at the time this template is

first used. As of August 2022, this statement is known to be incorrect). The narrative standards found at ARM 17.30.637(1) are the primary narrative standards Montana DEQ uses to regulate the impacts of excess nitrogen and phosphorus in state waters: "State surface waters must be free from substances attributable to municipal, industrial, agricultural practices or other discharges that will: (d) create concentrations or combinations of materials which are toxic or harmful to human, animal, plant, or aquatic life; and (e) create conditions which produce undesirable aquatic life." These narrative nutrient standards apply to wadeable streams and medium rivers, as well as large river segments previously under Circular DEQ-12A, and continue to apply to all other large rivers of the state (Circular DEQ-15 citation).

3.3 Translation of the Narrative

To translate the narrative nutrient water quality standard described in **Section 3.2**, the threshold values listed in **Table 3-2** will be used. The values are derived from the table of ranges provided in Circular DEQ-15 (citation).

Provide a table of the water quality parameters addressed by this plan and their direct or translated threshold values. Response variable thresholds are defined in Tables 5-3 and 5-4 of Circular DEQ-15. The DEQ AMP Scientist will provide you with the direct translation of TP and TN values derived from the ranges found in Table 4-1 of Circular DEQ-15.

Table 3-2. Water Quality Parameter Thresholds Used in this Plan

Parameter	Threshold Value

3.4 Nondegradation Provisions

Nondegradation is addressed via the Nondegradation Policy within Montana state statute (75-5-303, MCA) and via Montana's nondegradation rules (ARM 17.30.7). The Nondegradation Policy states that existing uses of state waters and the level of water quality necessary to protect those uses must be maintained and protected. Montana nondegradation rules apply to any new or increased point or nonpoint source resulting in a change of existing water quality occurring on or after April 29, 1993 (ARM 17.30.702). If nondegradation may apply to you, please consult with the AMP Scientist before proceeding, as different standards and methods will apply.

4.0 Nutrient Source Contributions in the [Watershed Name] Watershed

This section focuses on nutrients as a cause of water quality impairment in the [watershed name] watershed and describes: 1) how excess nutrients impair beneficial uses, 2) significant sources of nutrients in the watershed and the methods used to quantify those sources, and 3) a nutrient source assessment by waterbody.

4.1 Effects of Excess Nutrients on Beneficial Uses

Nitrogen and phosphorus are naturally occurring elements required for healthy functioning of aquatic ecosystems. Streams are dynamic systems that depend on a balance of nutrients, which can enter streams from various sources. Healthy streams strike a balance between organic and inorganic nutrients from sources such as natural erosion, groundwater discharge, and instream biological decomposition. Eutrophication is the over enrichment of a waterbody by nitrogen and phosphorus, leading to increased plant and algae growth and decay, and all the consequential changes to the water quality and biology that occur as a result of this enrichment. Enrichment becomes detrimental when the effects manifested in a waterbody are undesirable relative to the uses the waterbody. Human influences may alter nutrient cycling, damaging biological stream function and degrading water quality.

Excess nitrogen and phosphorus from human sources can cause excess algal growth, which in turn depletes the supply of dissolved oxygen, harming or killing fish and other aquatic life. Excess nutrient concentrations in surface water can create nuisance algae blooms including blue-green algae blooms (Priscu 1987), which can produce toxins lethal to aquatic life, wildlife, livestock, and humans. Aside from the toxicity effects of blue-green algae, nuisance algae can reduce water clarity and shift the structure of macroinvertebrate communities, which may also negatively affect the fish that feed on macroinvertebrates (U.S. Environmental Protection Agency 2010). Additionally, changes in water clarity, fish communities, and aesthetics can harm recreational uses, such as fishing, swimming, and boating (Suplee et al. 2009). Nuisance algae can also increase the cost of treating drinking water or pose health risks if ingested in drinking water (World Health Organization 2003). Where instream nutrient concentrations are grossly elevated over naturally occurring concentrations, net primary production may lead to anoxic (low-oxygen) conditions in the water column.

4.2 Significant Nutrient Sources and Source Quantification Methods

Provide the following information in level three subsections (e.g., 4.2.1, 4.2.2):

- A list of information sources
- Overview of methods used to quantify nutrient loading (add detailed appendices, if needed)
- Description of each significant nutrient source category (e.g., livestock grazing, residential development and subsurface wastewater disposal, irrigated and dryland cropping, silviculture, mining, MPDES point sources)

4.3 Nutrient Source Assessment by Stream

Provide the following information for each waterbody/stream (each waterbody should be its own level three subsection):

- Overview of water quality data and comparison to narrative translation values (include tables of data and boxplots of nutrient concentrations)
- Point vs nonpoint contributions (parsed out by source type, including septic loading estimates, if applicable)
- Natural background loading (Note: please review the reference site concentrations shown in Suplee and Watson 2013, statistically described per ecoregion. The DEQ AMP Scientist will provide guidance on what percentile of the natural background to choose.
- Seasonal variability for lakes and reservoirs, if applicable

- Include a map showing sampling sites and significant sources (e.g., grazing allotments, septic densities, wildland fire boundaries, cultivated crops, pasture/hay, mines, MPDES point sources, etc.)

5.0 Partners Assisting with Implementing Nutrient Reductions

Provide the following information:

- A list of participants and their roles. Refer to Section 8.2 of the Guidance Document for the Implementation of Narrative Nutrient Standards for assistance identifying stakeholders.
- Stakeholder engagement strategy employed during development of this plan

6.0 Action Items for the Reduction of Nutrients in the [Watershed Name] Watershed

Provide the following information:

- Outline any planned facility improvements, including expected nutrient reductions and capital costs
- List all nonpoint source projects to be implemented in the AMP watershed. Include timeline for completion, timeline for expected nutrient load reductions, costs, partners, expected life of the project, and project maintenance plans
- List all trades applicable to nutrient reductions in your watershed
- Include a table of milestones, addressing timeframes for completion of implementation activities (e.g., project implementation/completion, vegetation survival rate monitoring, riparian density and vigor restored, etc.) and subsequent nutrient reductions
- Provide a map showing all project locations

7.0 Ability to Fund and Implement This Plan

Per Section 8.4 of Circular DEQ-15, permittees who choose to invest in nonpoint source projects in the watershed to reduce nutrient loading must provide funding documentation in the AMP implementation plan. This documentation may include memorandums of agreement, contracts, or other written agreements that document a commitment to fund, implement, and complete projects with stakeholders. The documentation must identify all stakeholders participating, include cost estimates, assign specific contribution amounts to each stakeholder, and identify timelines for project completion that include responsibilities for each project implementation step. The contract or agreement must also specify the period nonpoint source controls will be maintained.

In this section, please include:

- A table summing all action items listed in Section 6.0 and show total expected nutrient reductions for the watershed, cost for each project, funding secured, and timeline for completion
- Include MOAs/contracts/landowner agreements for projects listed in Section 6.0 in an appendix

8.0 Future Data Collection

Include the following information:

- New monitoring sites and parameters identified for the associated AMP monitoring plan. This might include:
    - Data collection for monitoring nonpoint source projects listed in section 6.0 of this document
    - Additional far field sites to monitor beneficial use support
- Monitoring sites to be discontinued in the associated AMP monitoring plan
- Include a map and table of all new and discontinued sites; include latitudes and longitudes in the table

9.0 Timeframes for Implementing This Plan and Annual Reporting

This section should Include a table of timelines for completing any incomplete items in Sections 6.0, 7.0, and 8.0 of this template document. Also include a statement that annual reports will be submitted to the DEQ AMP Scientist by [deadline] of each year. Annual reports will follow the annual report template that will be included as an appendix to this document (Note: the annual report template has not yet been developed).

10.0 Outreach Strategy and Communication Plan

Per ARM 17.30.1372, DEQ will conduct public notice and will hold a public hearing for all draft permits prepared under ARM 17.30.1370. At this time, this will not include noticing AMPs; however, they will be posted to the DEQ website.

This section should outline:

- How you intend to involve the public, including any schedules for public meetings as future modifications are made to this plan, how public noticing will occur (e.g., if notices will be run in newspapers, identify the specific papers to be used), and how public comment will be incorporated
- A strategy for continued stakeholder engagement as projects are implemented, the plan is modified, and monitoring continues

11.0 References

Use Chicago style citations to list all resources referenced throughout this implementation plan. If retained from the recommend language included in this template, include the following:

Priscu, John C. 1987. Environmental Factors Regulating the Dynamics of Blue-Green Algal Blooms in Canyon Ferry Reservoir, Montana. Bozeman, MT: Montana Water Resources Research Institute. Report # 159.

Suplee, Michael W., Vicki Watson, Mark E. Teply, and Heather McKee. 2009. How Green Is Too Green? Public Opinion of What Constitutes Undesirable Algae Levels in Streams. Journal of the American Water Resources Association. 45(1): 123-140.

U.S. Environmental Protection Agency. 2010. Using Stressor-Response Relationships to Derive Numeric Nutrient Criteria. Washington, DC: Office of Science and Technology, Office of Water, EPA. EPA-820-S-10-001.