BEAVERHEAD WATERSHED WATER QUALITY PLANNING PROJECT
METALS TMDLS

Stakeholder Draft Review Presentation

July 8, 2020

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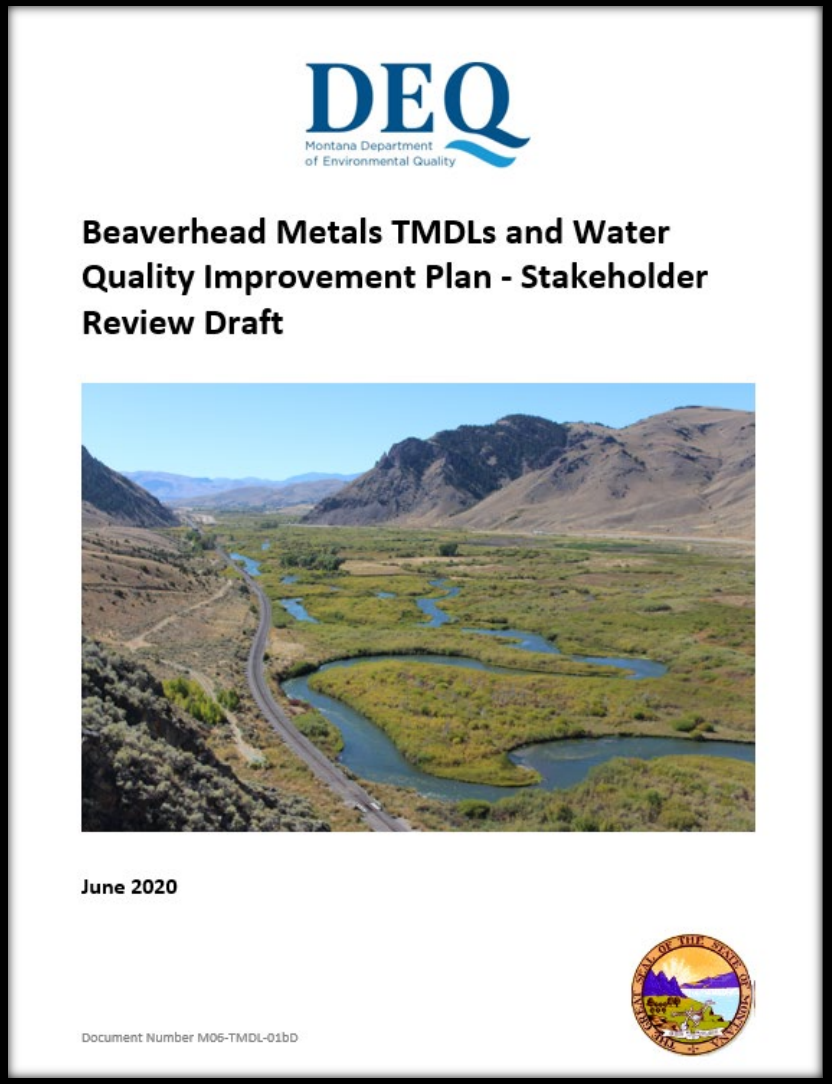
DEQ Montana Department of Environmental Quality

Meeting Purpose



Beaverhead River Watershed Advisory Group meeting to discuss the stakeholder review version of a draft total maximum daily load (TMDL) document containing metals TMDLs for impaired streams in the Beaverhead Watershed.

Document Breakdown

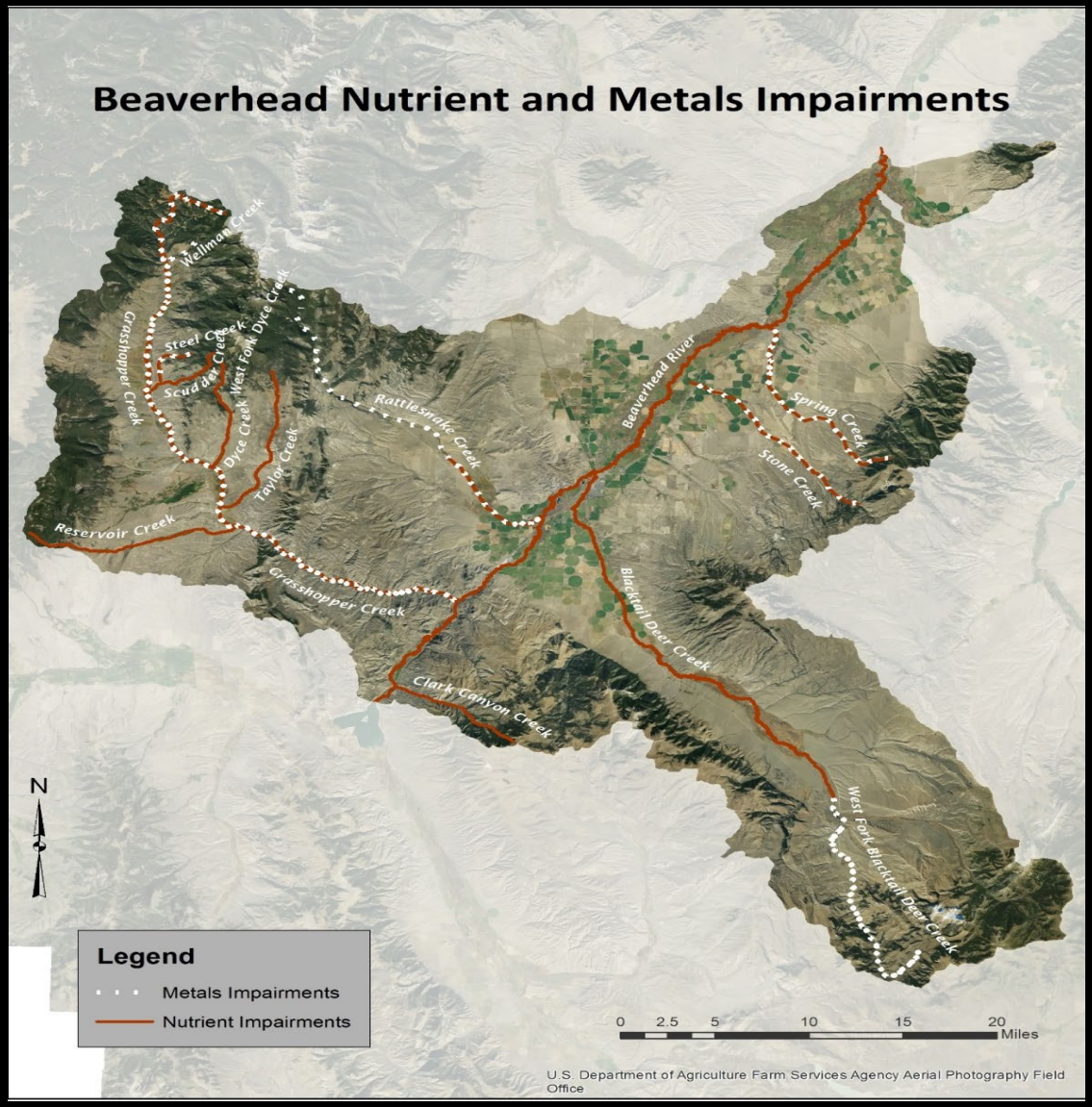
Part 1: Introduction	• 1.0 Project Overview • 2.0 Beaverhead TMDL Planning Area Description • 3.0 Montana Water Quality Standards • 4.0 Defining TMDLs and their Components
Part 2: TMDLs	• 5.0 Metals TMDLs and Source Assessment
Part 3: Water Quality Improvement Recommendations	• 6.0 Non-Pollutant Impairments • 7.0 Water Quality Improvement Plan and Monitoring Strategy • 8.0 Public Participation and Comments

http://mtwaterqualityprojects.pbworks.com/w/page/127224788/Beaverhead%20Metals%20and%20Nutrient%20TMDLs#view=page

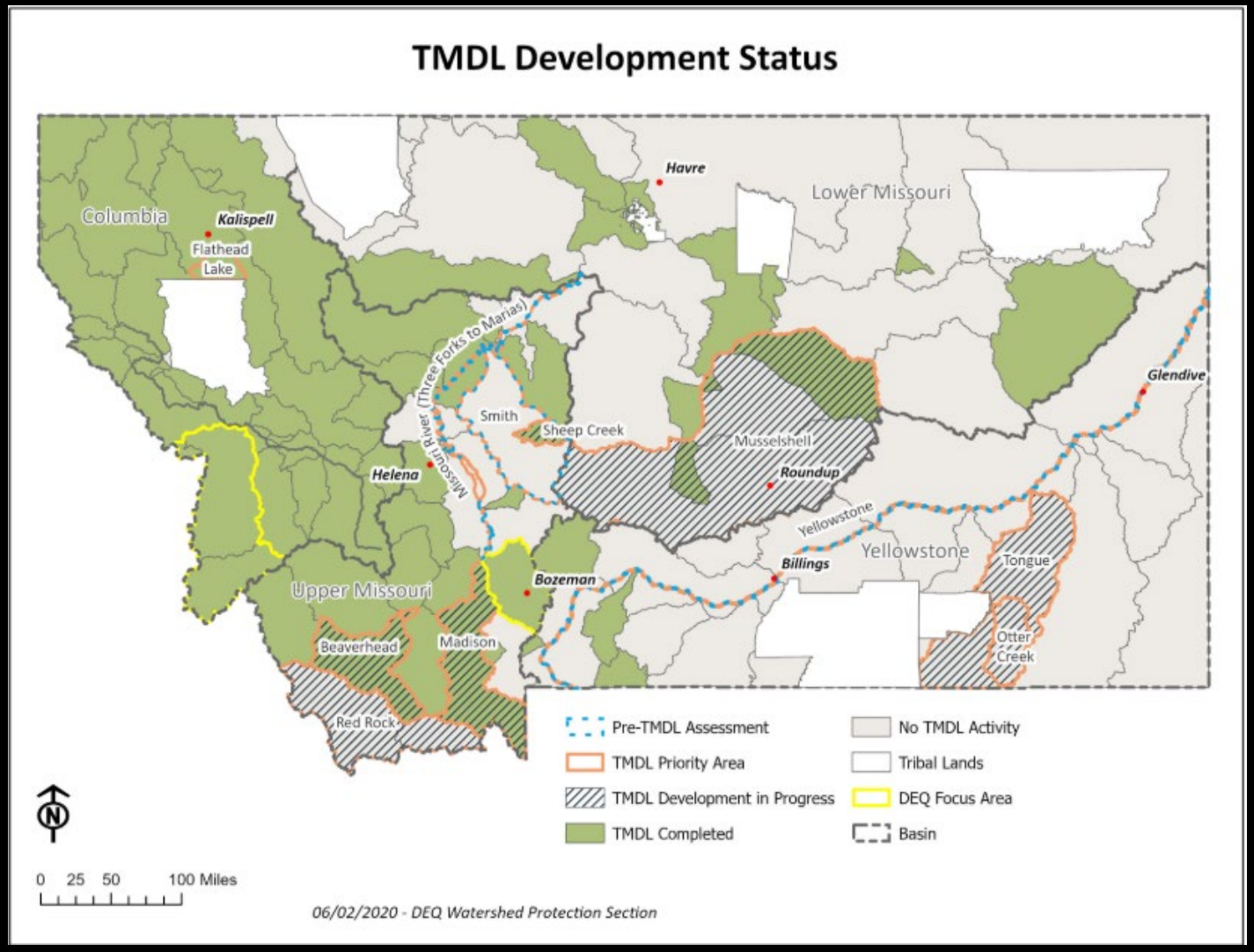
Why is DEQ writing TMDLs?

- Montana Constitution
  - All persons have an inalienable right to a clean and healthful environment
  - The state and each person shall maintain and improve a clean and healthful environment in Montana for present and future generations.
- Clean Water Act (CWA)
  - Montana DEQ has delegated authority under the federal Clean Water Act (Section 303d) to identify **impaired** streams, rivers, and lakes AND to develop a plan to address them

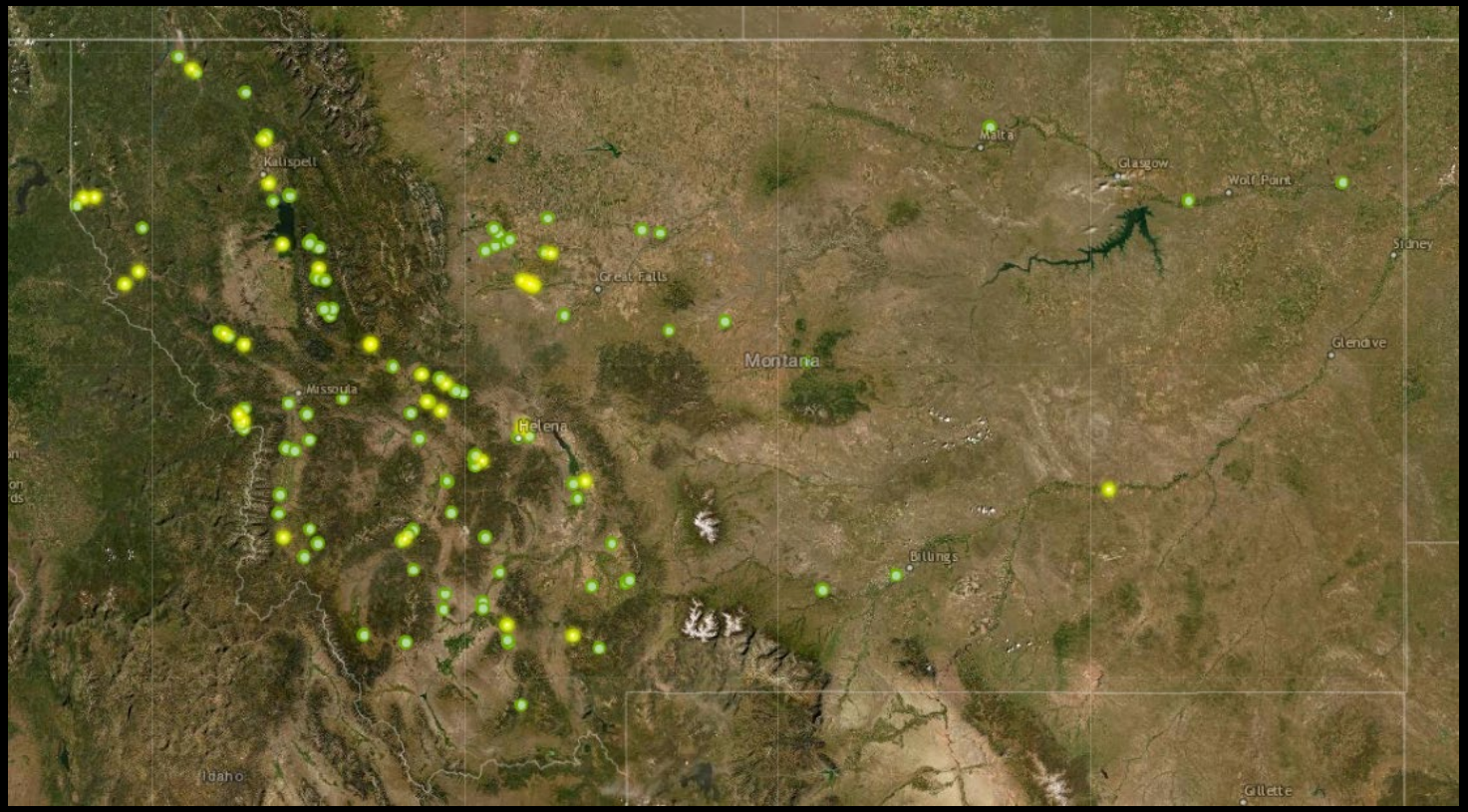
Beaverhead TMDL Planning Area



Why is DEQ interested in Beaverhead watershed?



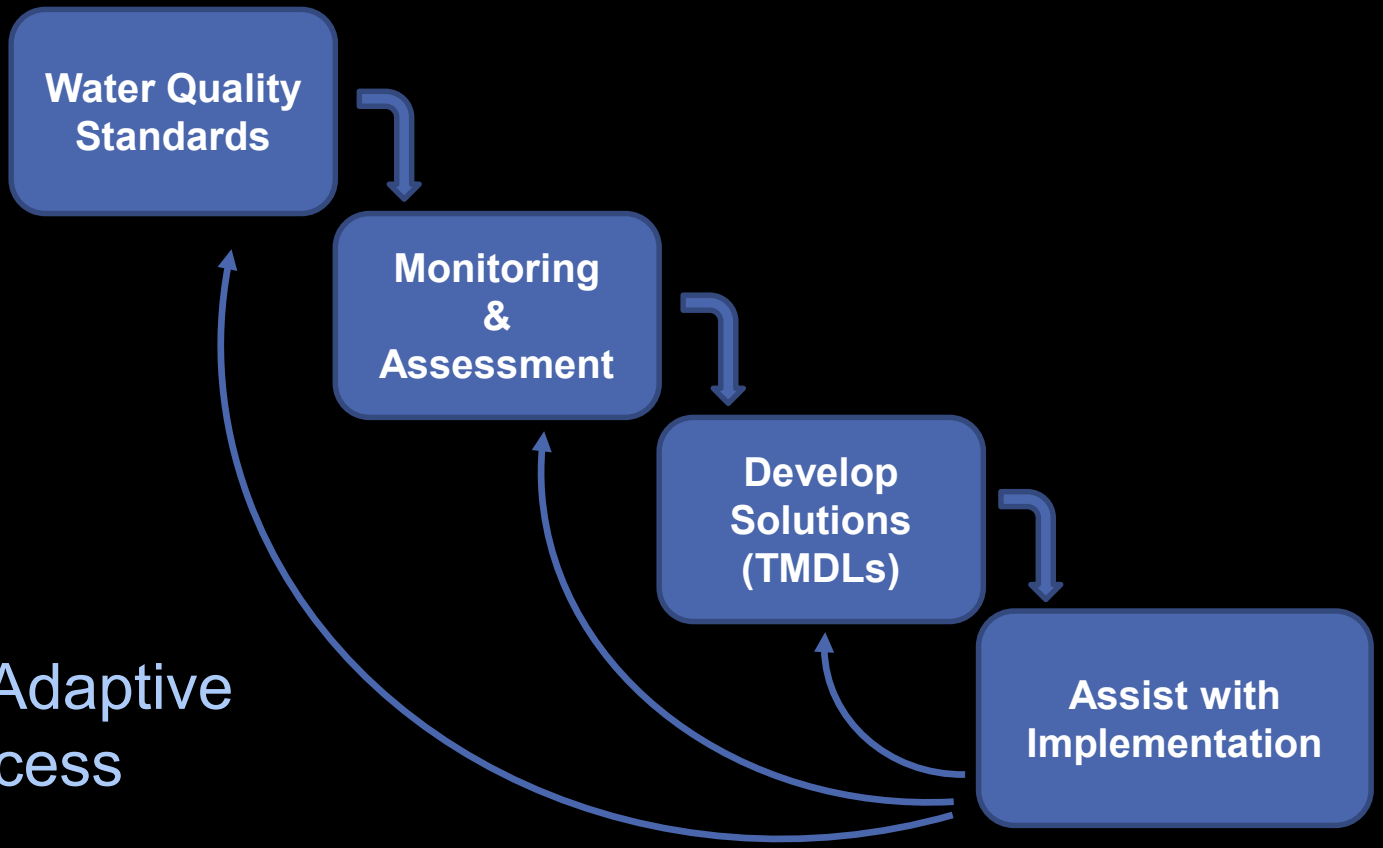
TMDLs lead to projects



https://mtdeq.maps.arcgis.com/apps/webappviewer/index.html?id=97f1b426b66d495f802ddc29a129da43

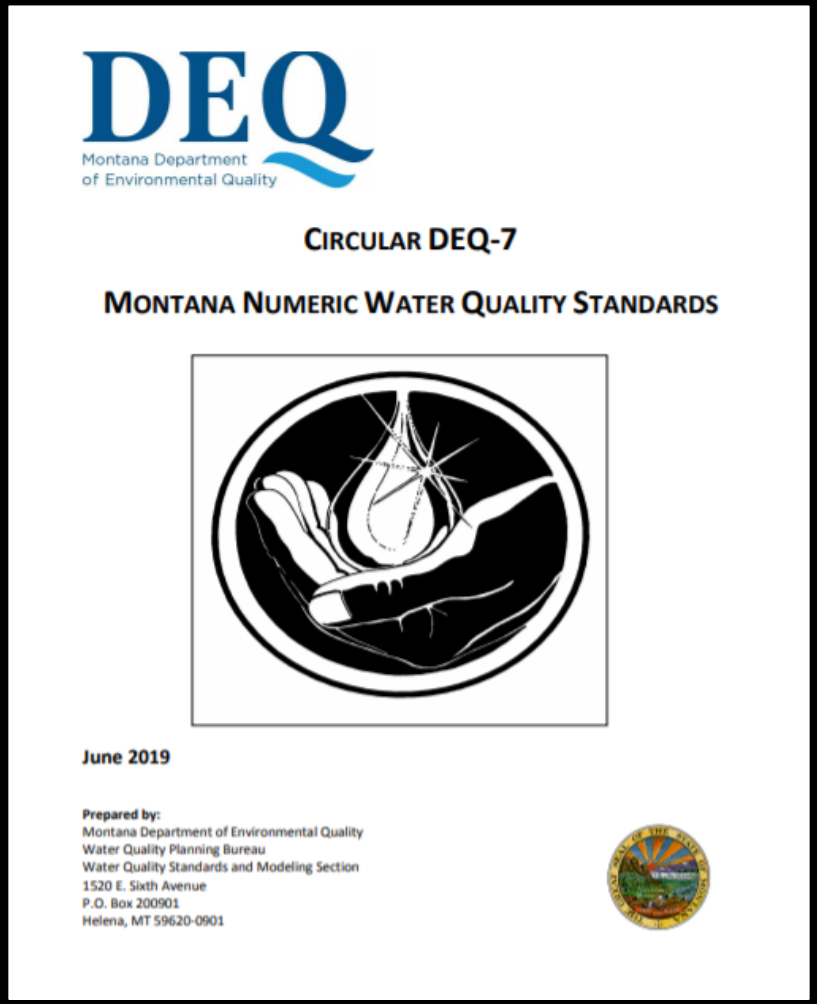
Lily/Orphan Boy Mine reclamation and stream restoration - https://www.youtube.com/watch?v=owFuMr9W7_8

DEQ's Water Quality Planning Steps



An Adaptive Process

Numeric WQ Standards for Metals


DEQ
Montana Department of Environmental Quality

CIRCULAR DEQ-7

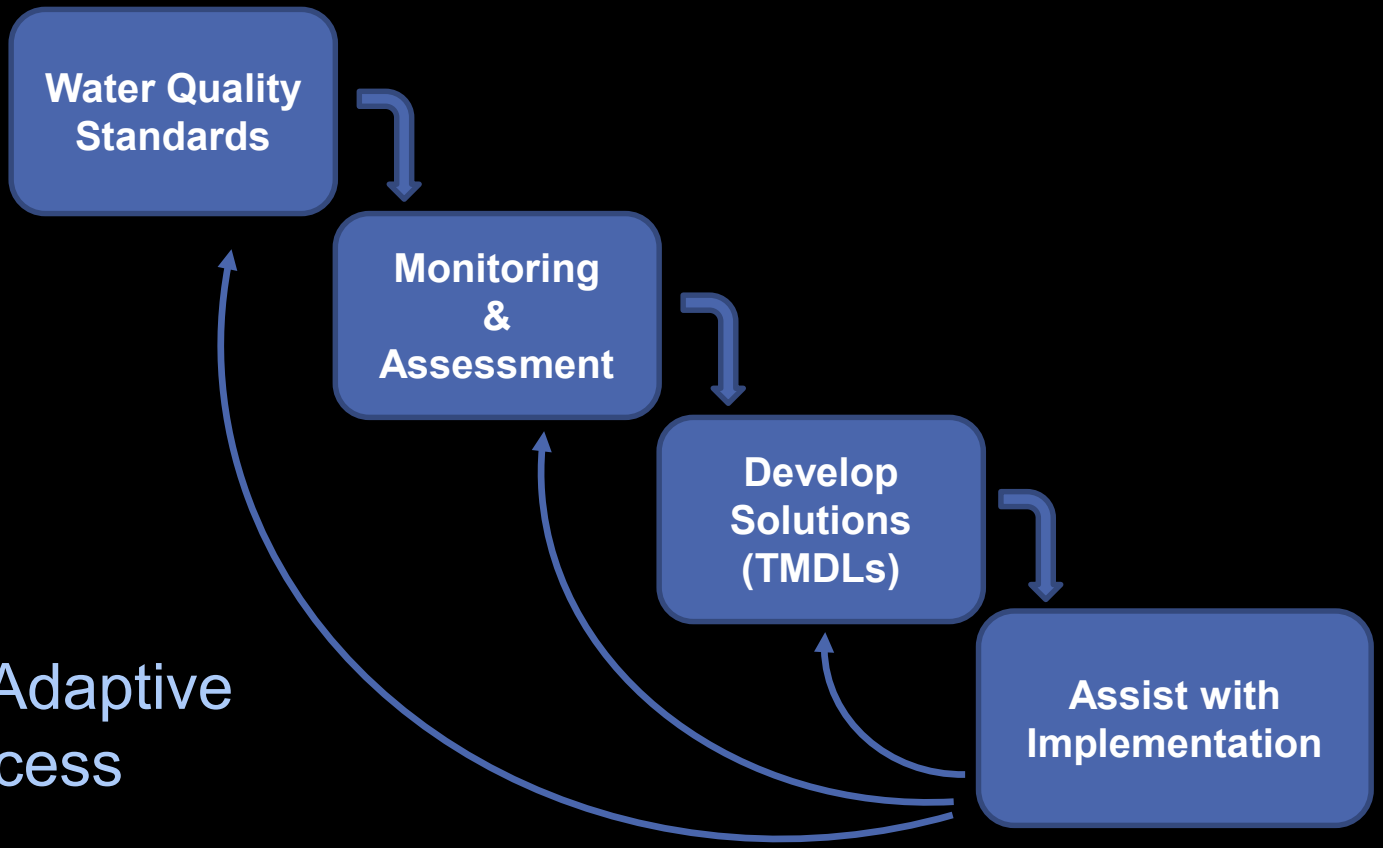
MONTANA NUMERIC WATER QUALITY STANDARDS

June 2019

Prepared by:
Montana Department of Environmental Quality
Water Quality Planning Bureau
Water Quality Standards and Modeling Section
1520 E. Sixth Avenue
P.O. Box 200901
Helena, MT 59620-0901

- Standards are protective of beneficial uses
- Listed as concentrations (mg/L)

DEQ's Water Quality Planning Steps

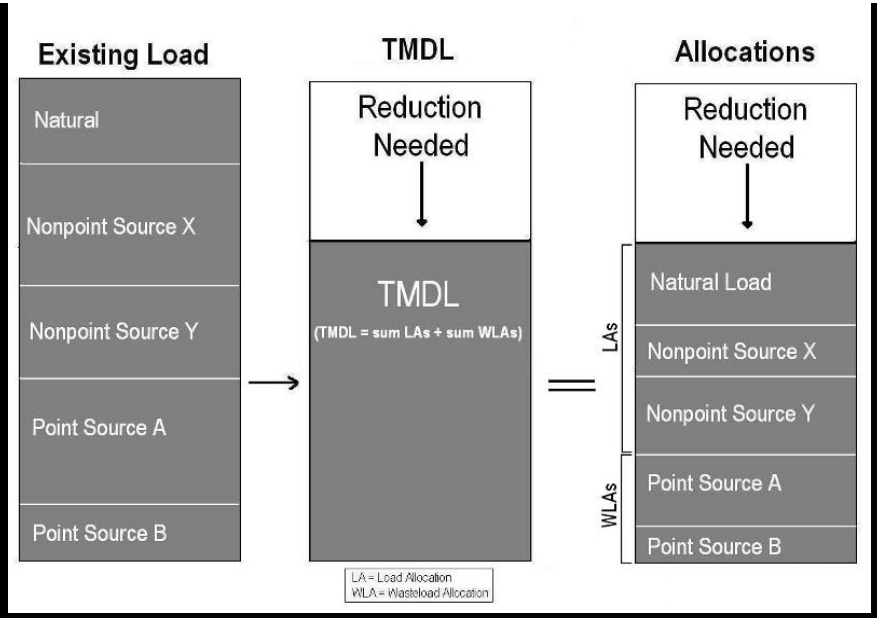


An Adaptive Process

What is a TMDL?

- A TMDL (Total Maximum Daily Load) is a calculation of the maximum amount of a pollutant (nutrients, sediment, etc.) that a waterbody can receive from all sources and still meet water quality standards

- Montana State Law and the Federal Clean Water Act require that a TMDL be developed for all waterbodies impaired by a pollutant



Types of Pollutants

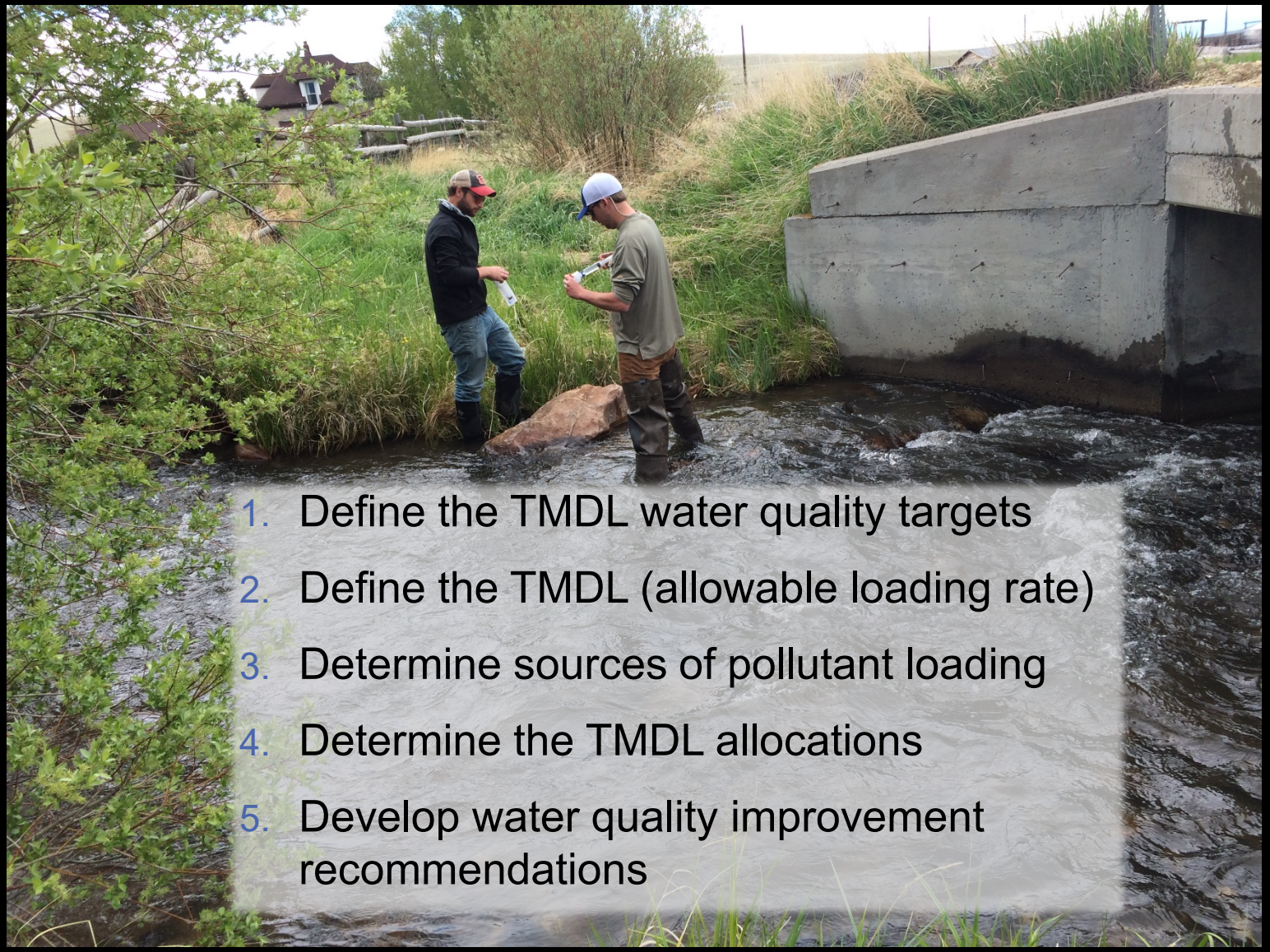
Sources of Pollutants

Point Sources

Nonpoint Sources

Natural Sources

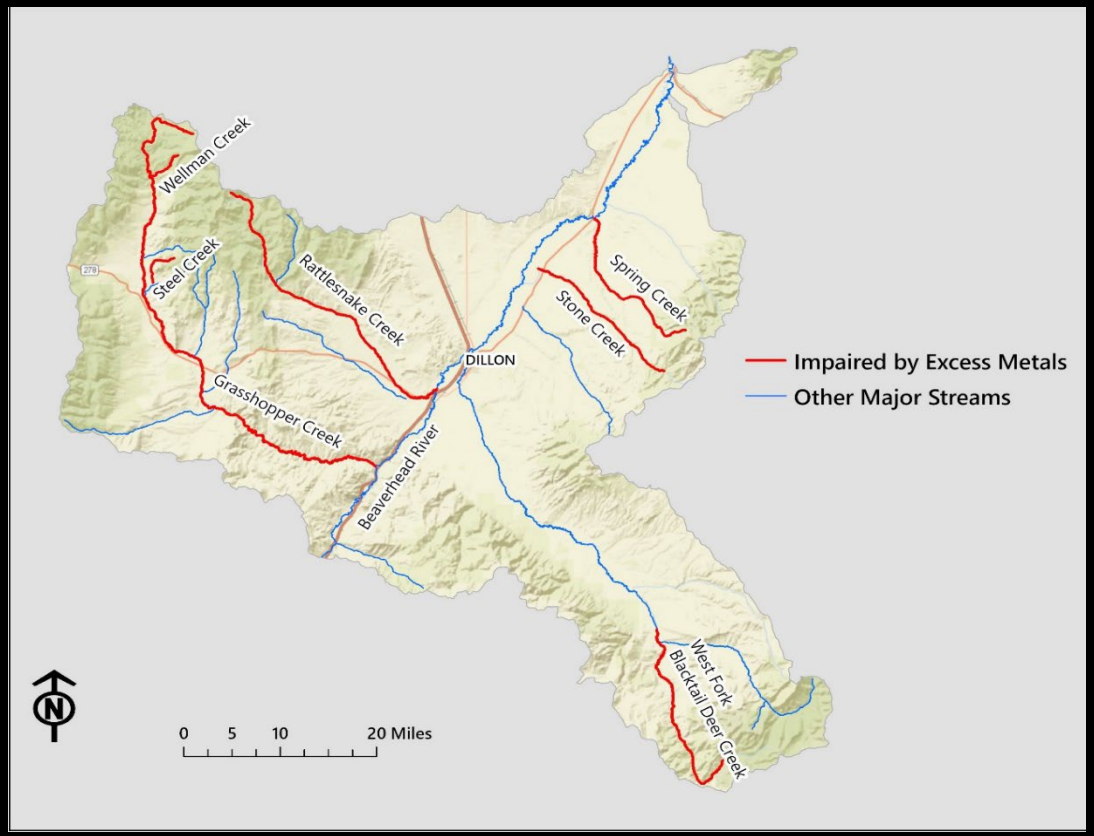
Beaverhead TMDL Development Steps



1. Define the TMDL water quality targets
2. Define the TMDL (allowable loading rate)
3. Determine sources of pollutant loading
4. Determine the TMDL allocations
5. Develop water quality improvement recommendations

Beaverhead Watershed Metals Impairments

- 2020 303(d) List Metals Impairments:
  - Grasshopper Creek
  - Rattlesnake Creek (both segments)
  - Spring Creek
  - Steel Creek
  - Stone Creek (both segments)
  - Wellman Creek
  - West Fork Blacktail Deer Creek

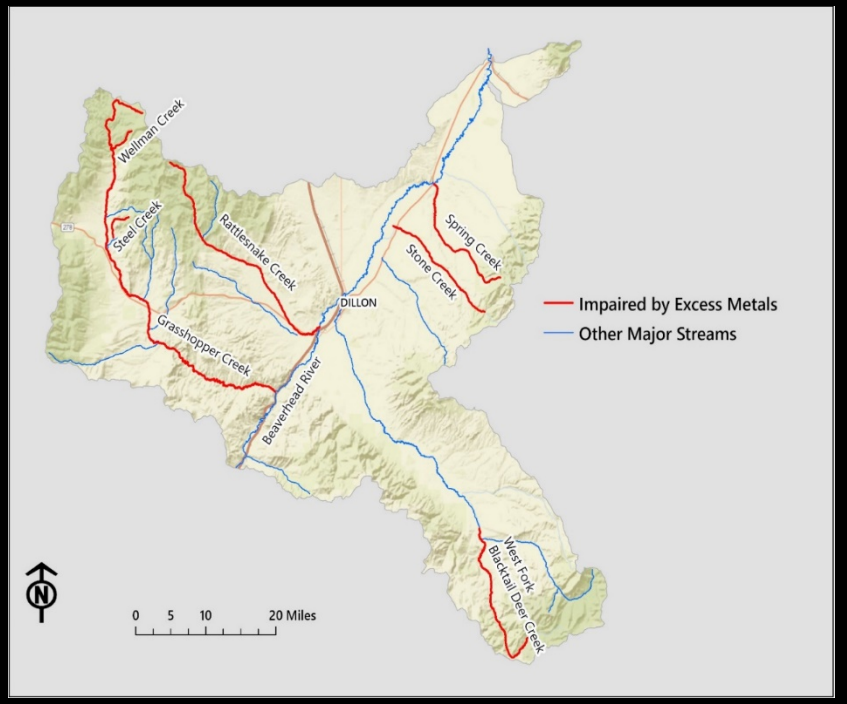


Beaverhead Watershed Metals Impairments

- 2020 303(d) List Metals Impairments:
  - Arsenic
  - Aluminum
  - Cadmium
  - Copper
  - Iron
  - Lead
  - Zinc

Grasshopper Creek - 2018

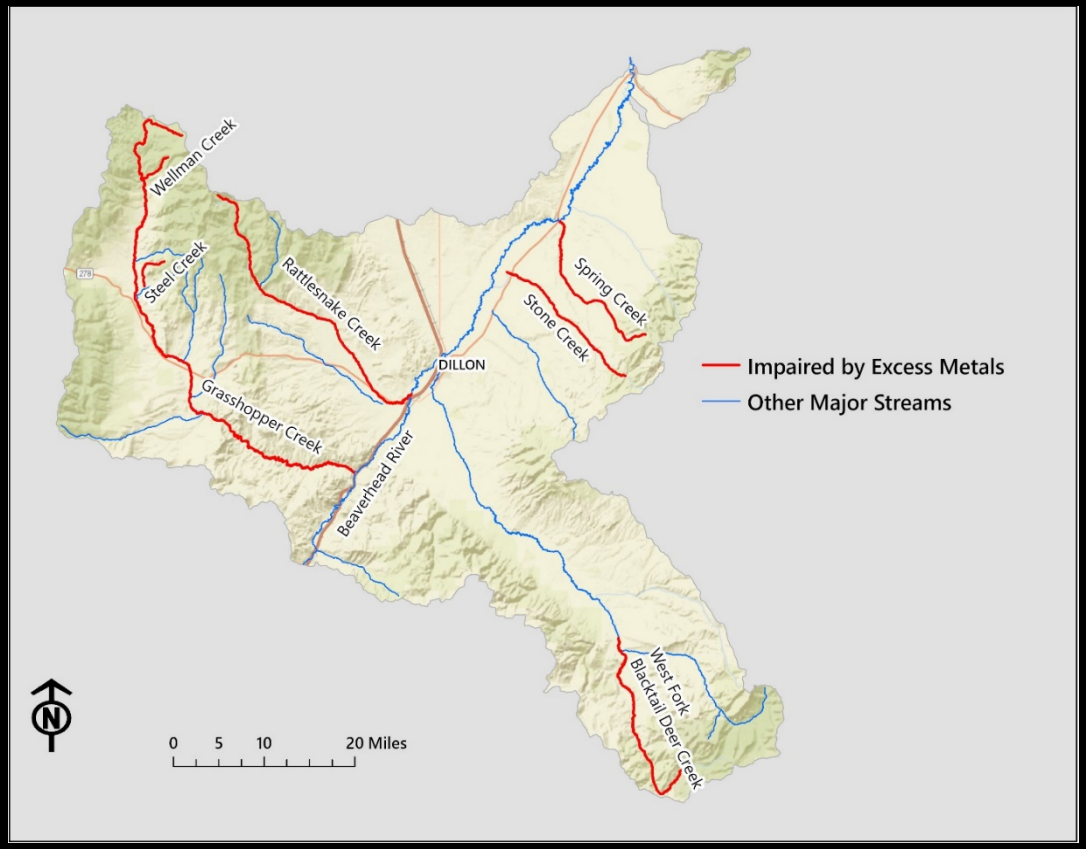
Beaverhead Metals TMDLs



Metals Impairment Determination Factors

- Samples collected from 2014-2017 (DEQ) and 2009 (Beaverhead Watershed Committee)
  -at least 8 samples per segment; various flow levels
- **Chronic life standard: Harmful to aquatic life over long-term exposure**
  -only 10% allowed
- Acute standard: Harmful to aquatic life over short-term exposure
  -only 10% allowed
- **Human health standard: no exceedance allowed**

Impaired Streams



Grasshopper Creek:
Lead

Rattlesnake Creek, Upper:
Lead

Rattlesnake, Lower:
Lead, Copper

Spring Creek:
Iron

Steel Creek:
Arsenic

Stone Creek, *Upper:*
Iron

Stone Creek, Lower:
Aluminum, Copper, Iron

Wellman Creek:
Aluminum, Cadmium,Copper, Lead, Zinc

Westfork Blacktail Creek: *Arsenic*

TMDL Process

Assessment:
Does it Exceed Targets?

Define Total Maximum Daily Load/Sources

Load Allocation: What % Reduction is Recommended to Meet Targets?

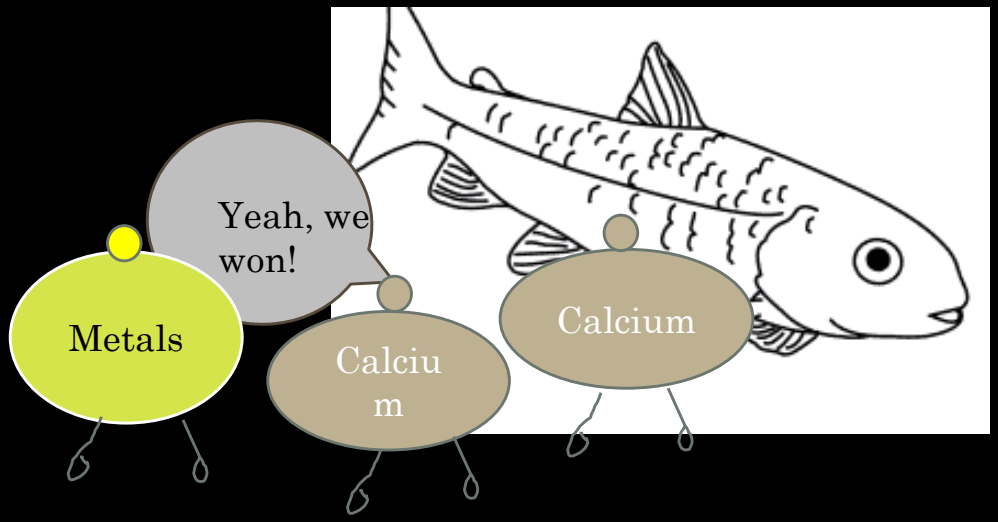
Watershed Restoration Plan and Implementation

Determine % Target Concentration

- According to Montana State Standards
- Often depends on hardness value

Hardness-dependent:
Copper
Lead
Cadmium
Zinc

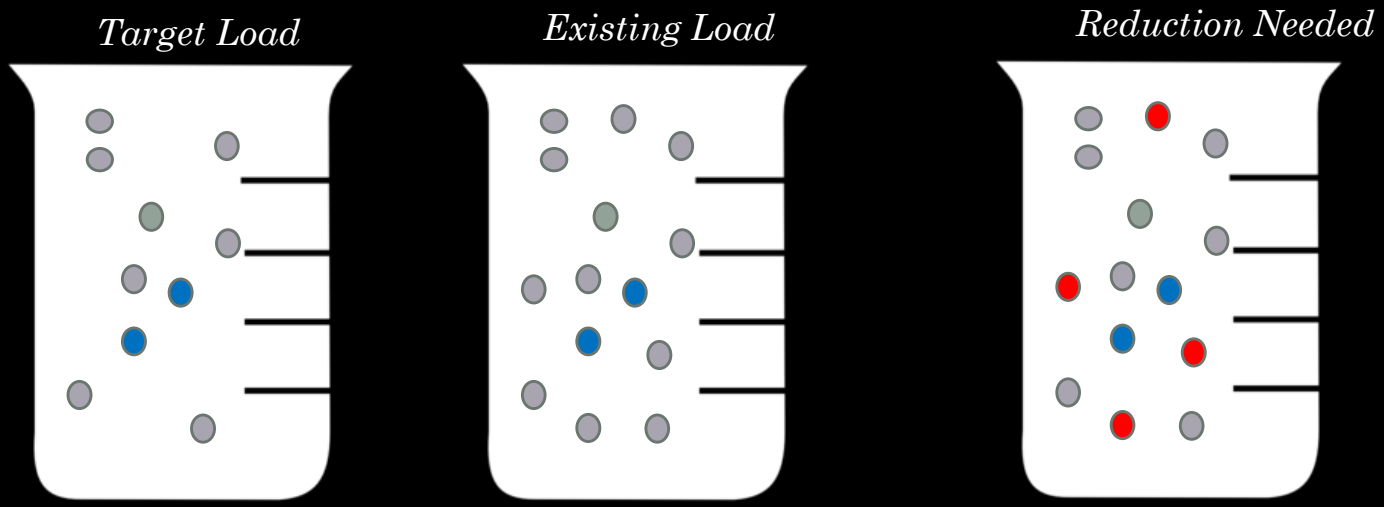
Non Hardness-dependent
Iron
Aluminum
Arsenic



Determine % Reduction Needed

Existing Load= Amount of a pollutant present

TMDL Load= Amount of a pollutant if water quality standards are met



Sources of Existing Load

Natural

Point Source
(MPDES)

Nonpoint Source
(Abandoned Mines)

Other Potential Sources

General MPDES Permitted Activities
A permit for common activities such as construction that typically discharge during rare events

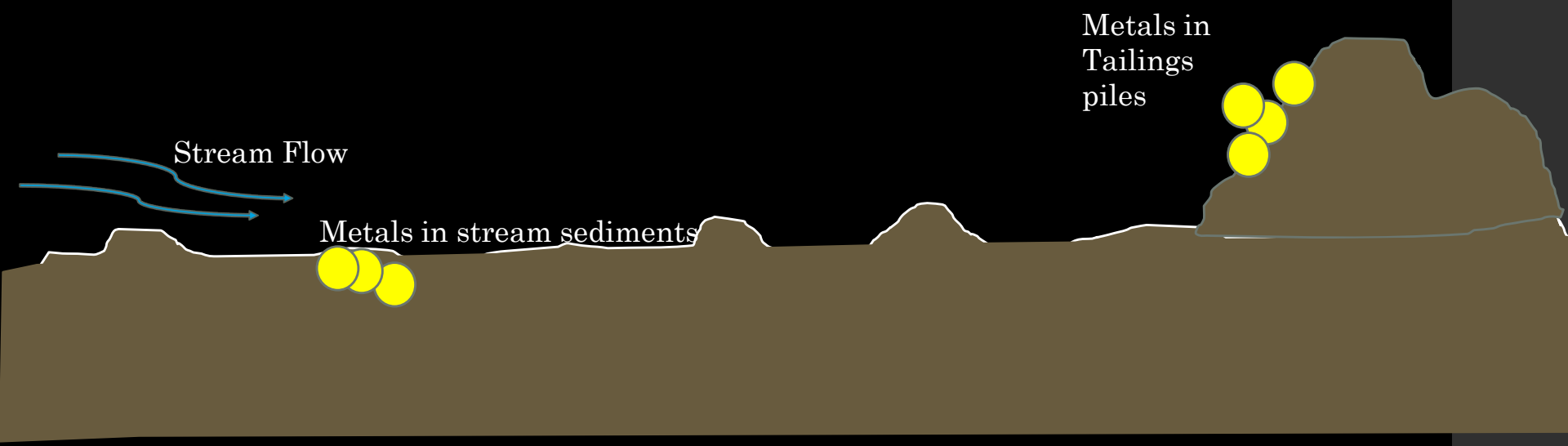
Hardrock Mines
Mines that disturb more than 5 acres of surface, requiring baseline environmental information and a reclamation plan; individual MPDES permit may be associated with these activities

Opencut Mines
Permits to strip or excavate over 10,000 cubic yards of soil or mine material

Small Mining Exclusion/Exploration Permits
A small mining exclusion is an affidavit by a miner attesting that they will not disturb more than 5 acres of material; an exploration permit is a permit to assess the feasibility of mining and may require some disturbance

Miscellaneous agricultural and earth moving activities

Evaluate at High and Low Flow



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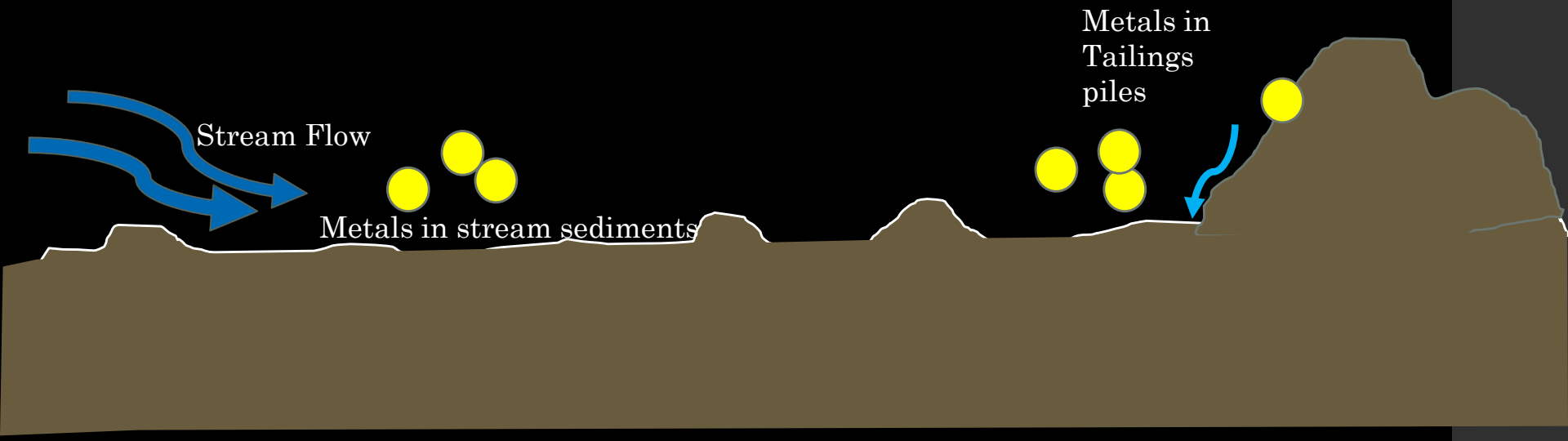


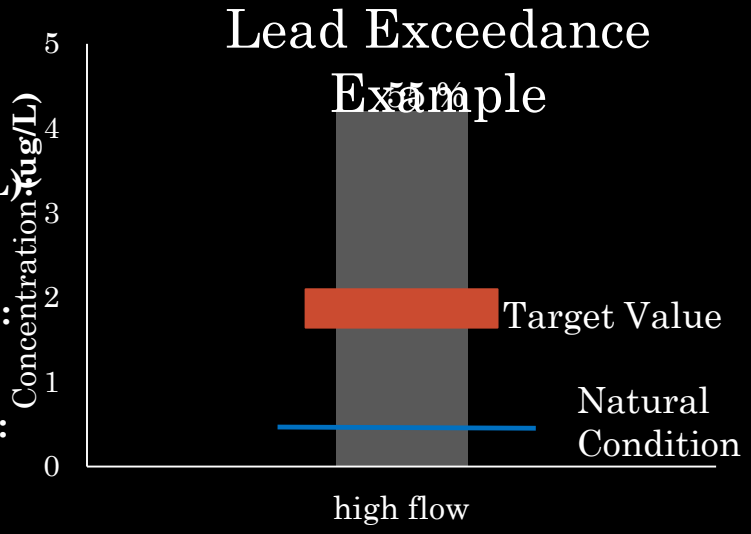
Determine flow condition:
High flow = 166-332 cfs

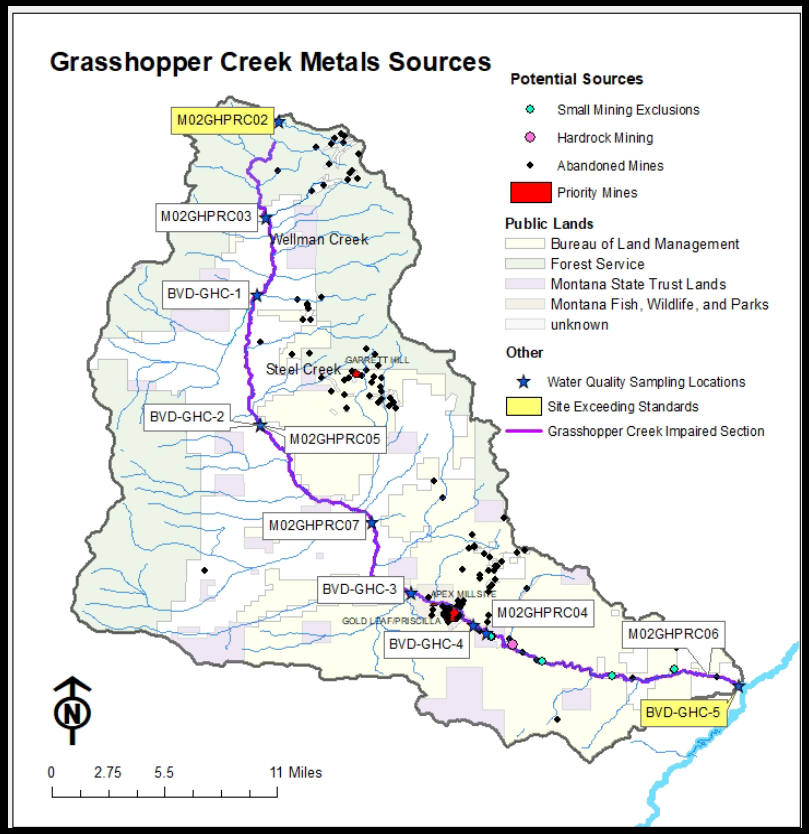
Determine lowest hardness at high flow (mg/L):
66

Target value at hardness -see table 5-26 (µg/L):
1.87

Highest lead concentration at high flow(µg/L):
4.2

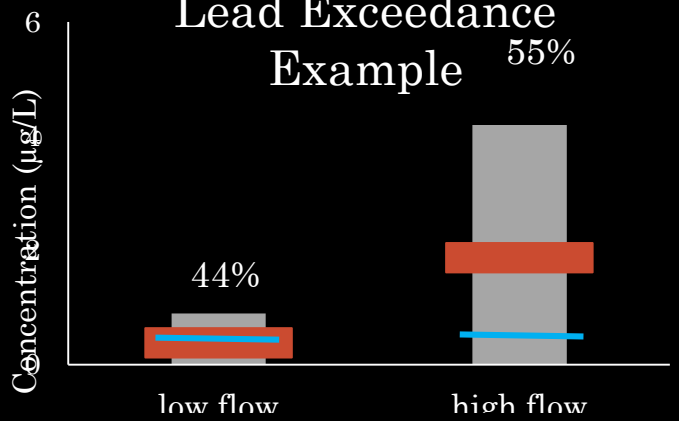
Determine Natural Condition(µg/L)::
0.5

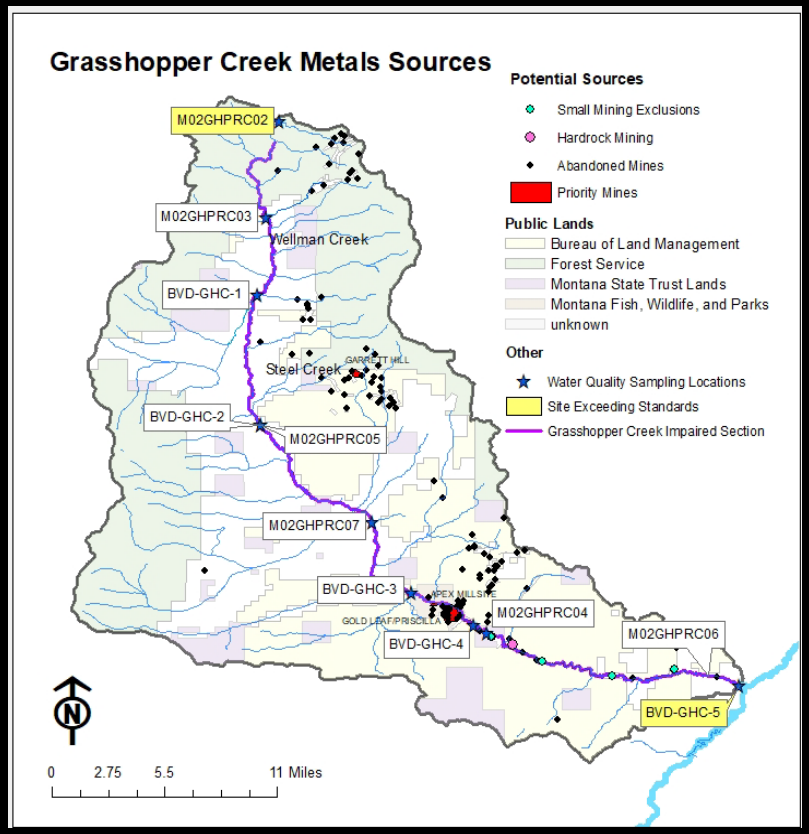




Grasshopper Creek

- Findings suggest impairment downstream of BVD-GHC3





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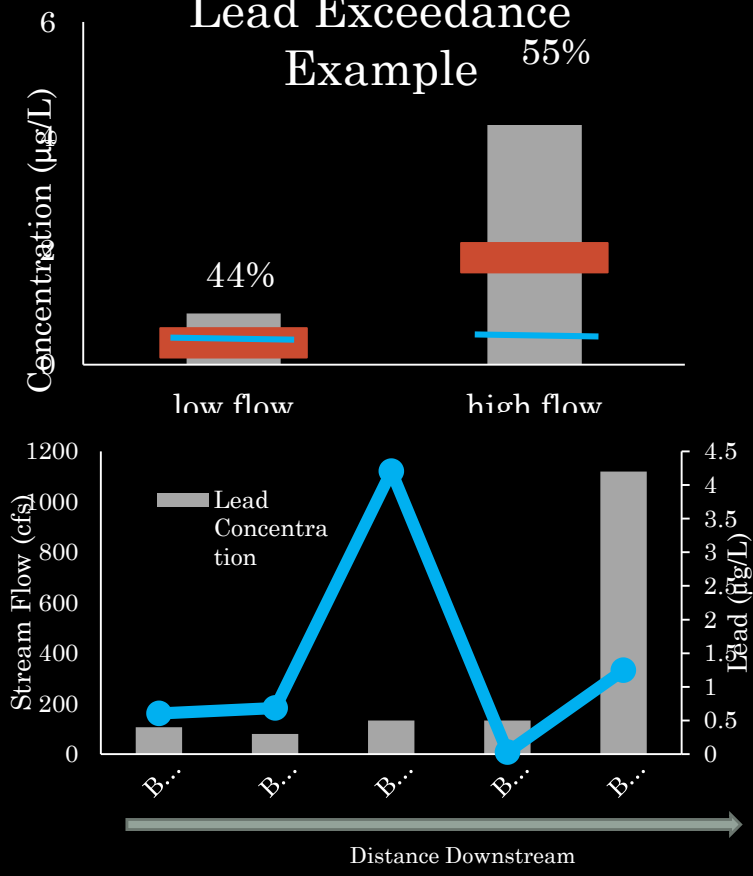
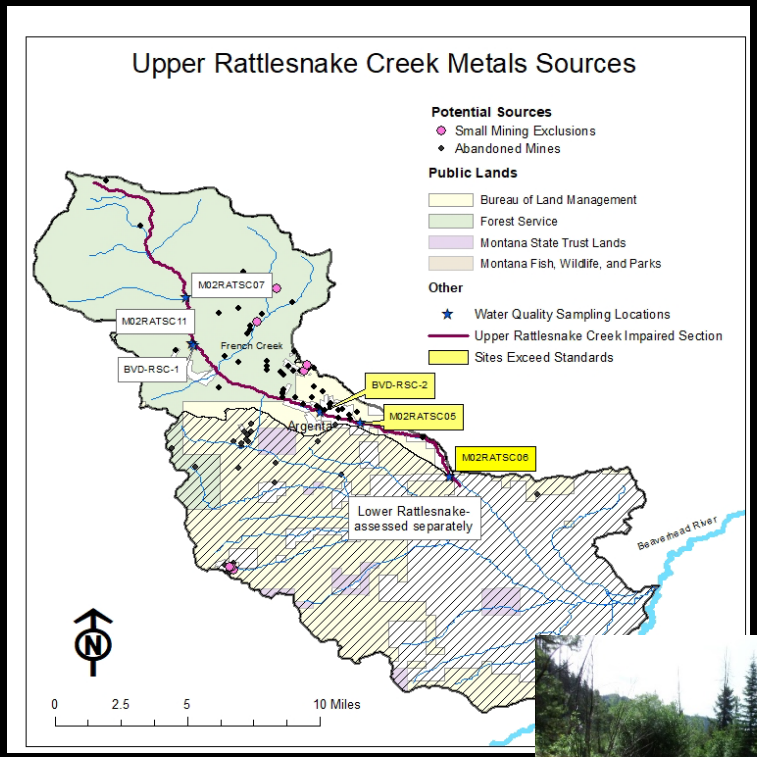
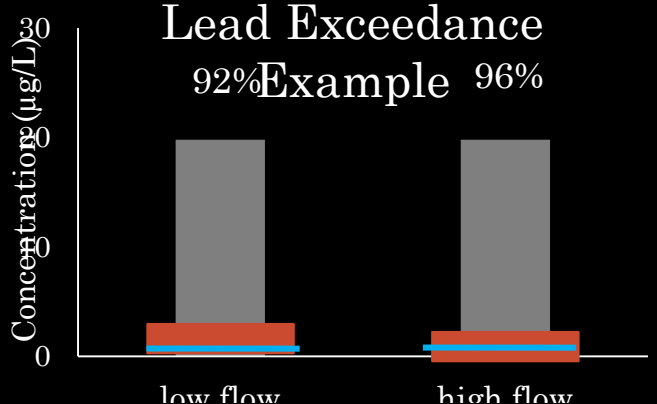


Upper Rattlesnake Creek

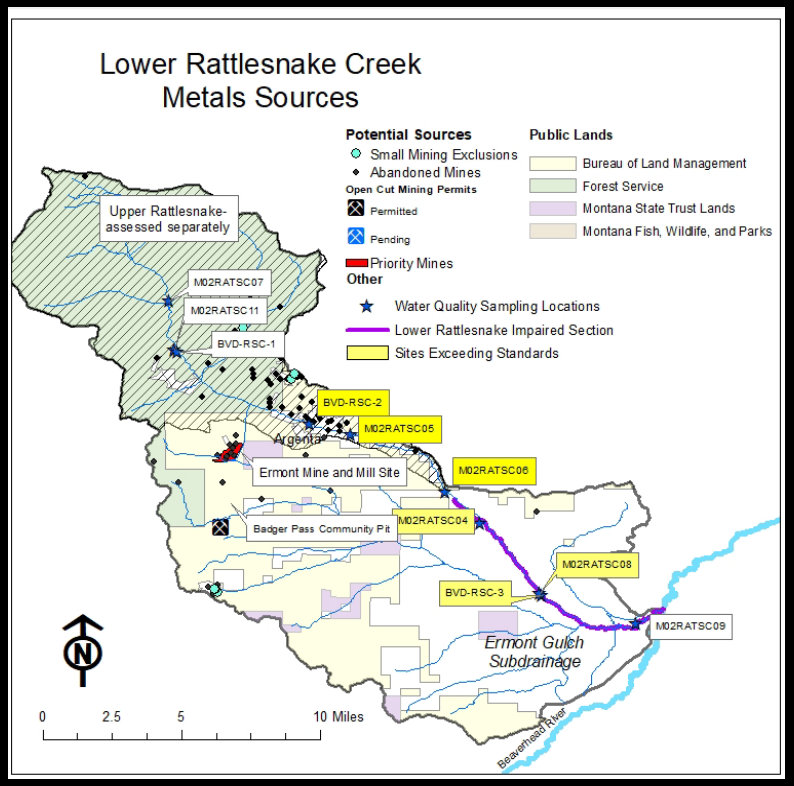
- Findings suggest impairment downstream of French Creek
- All samples indicated impairment regardless of streamflow

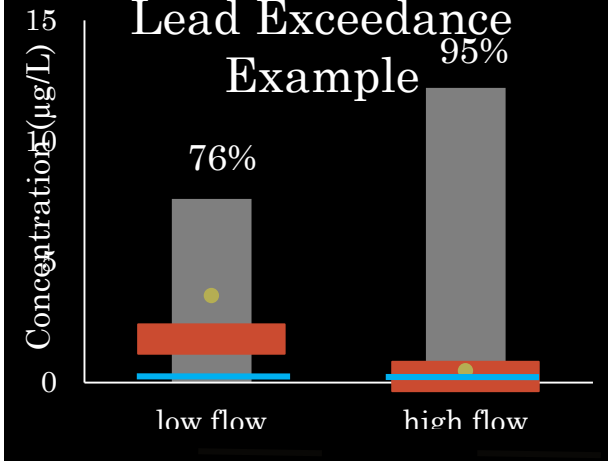




Lower Rattlesnake Creek

- Impairment at all stream flow levels
- Only one site impaired for copper
- Water withdrawals effects
- Source of lead and potentially copper is Upper Rattlesnake Creek





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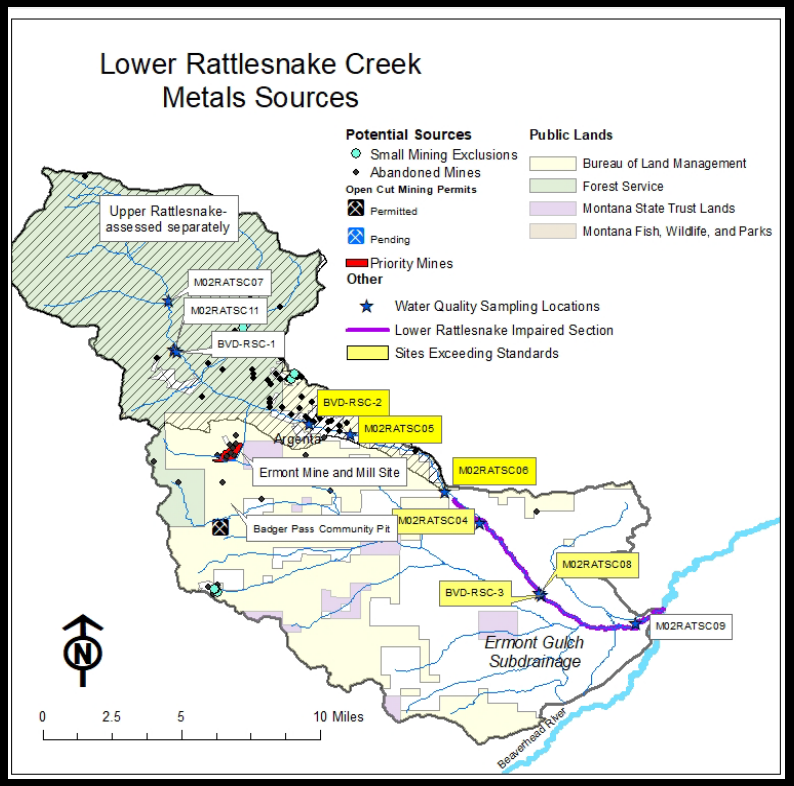
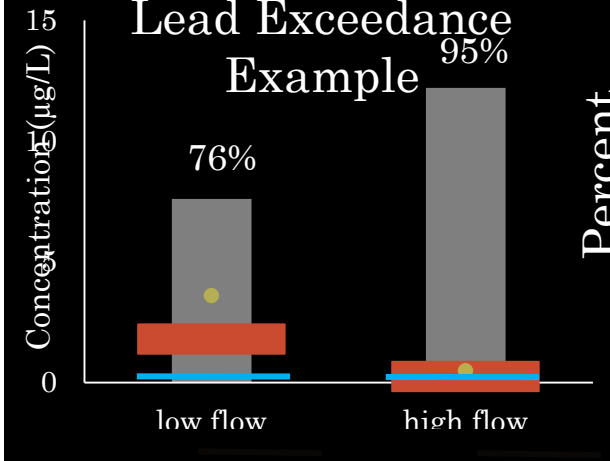
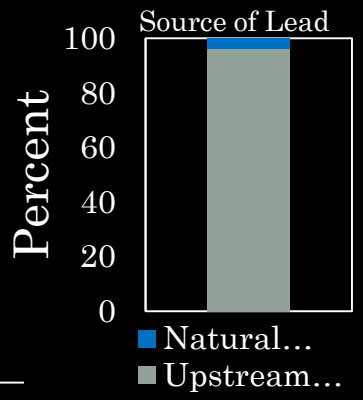
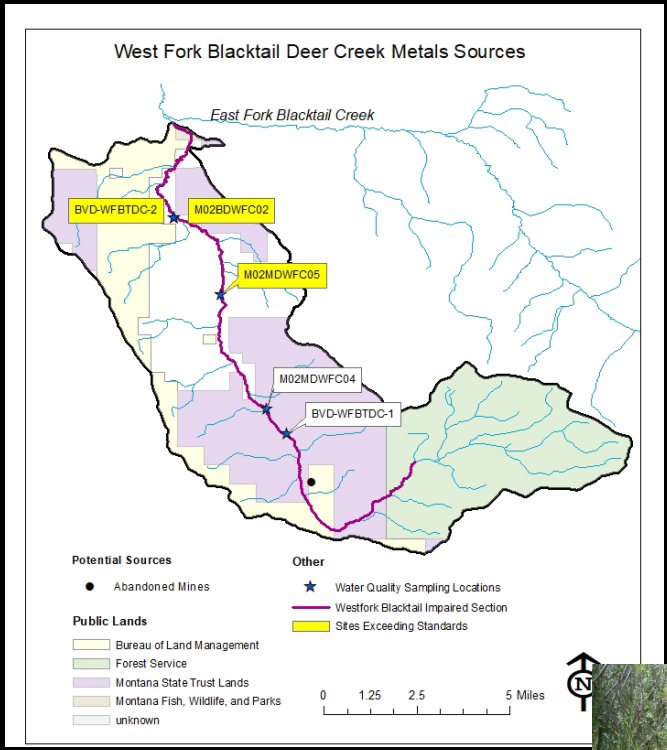


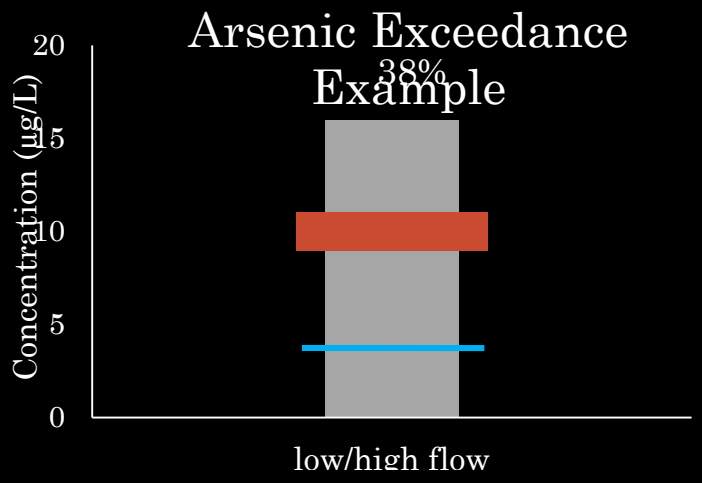




Westfork Blacktail Deer Creek

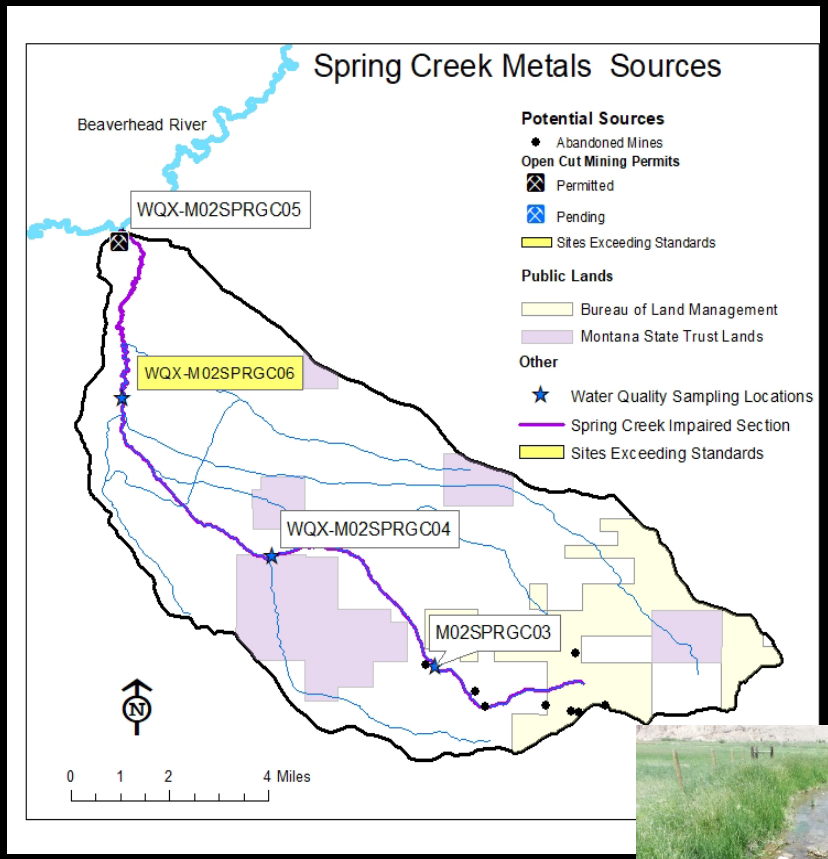


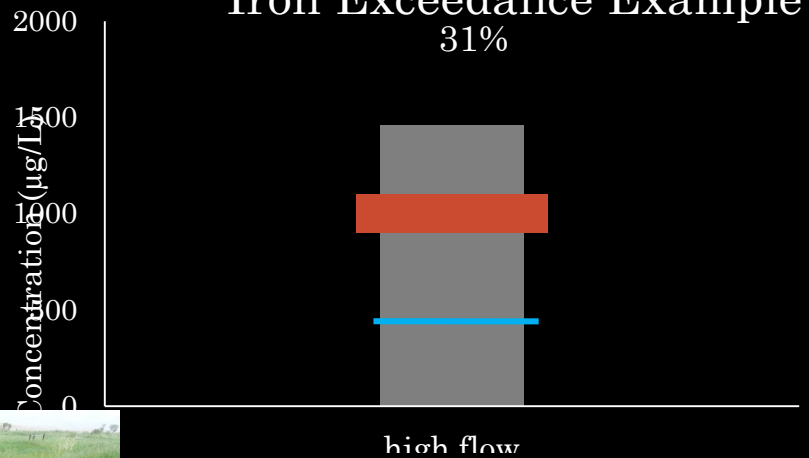
- Source assumed to be abandoned mines
- Impaired sites are impaired at high and low flows
- Exceeded human health standard



Spring Creek

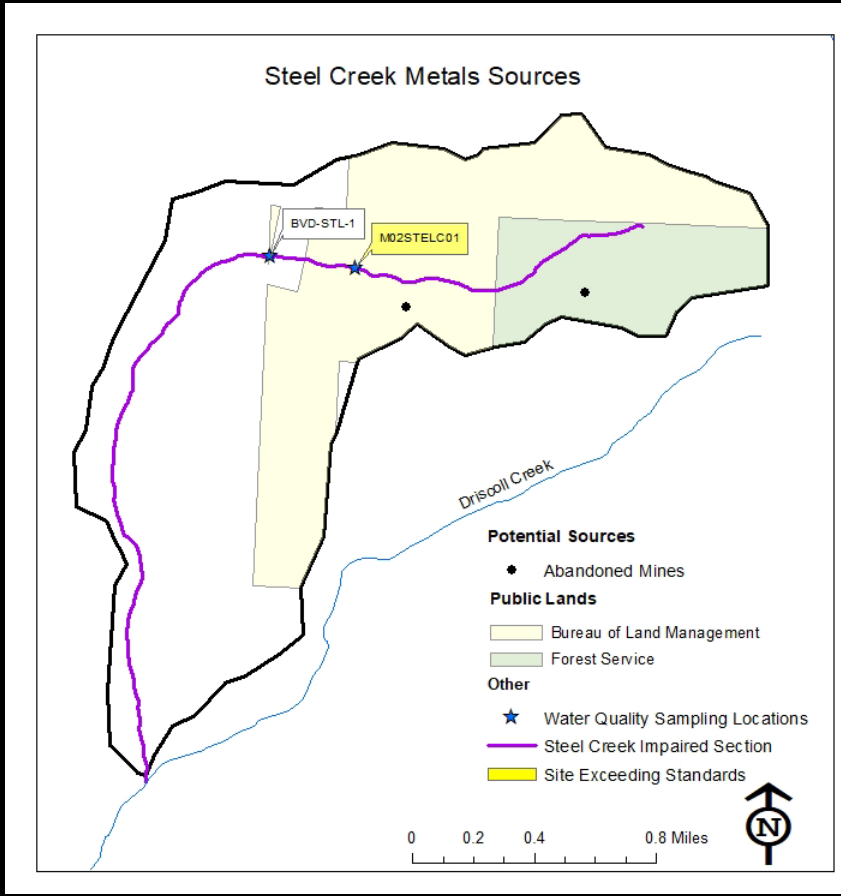
- No exceedance at low flow
- Affected by water withdrawals and additions

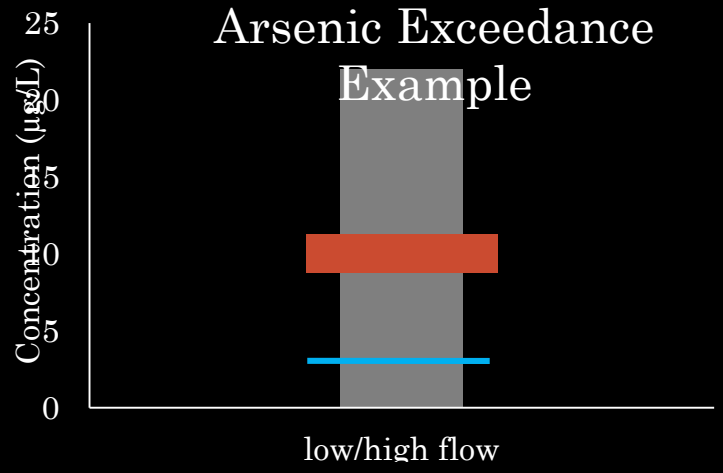




Steel Creek

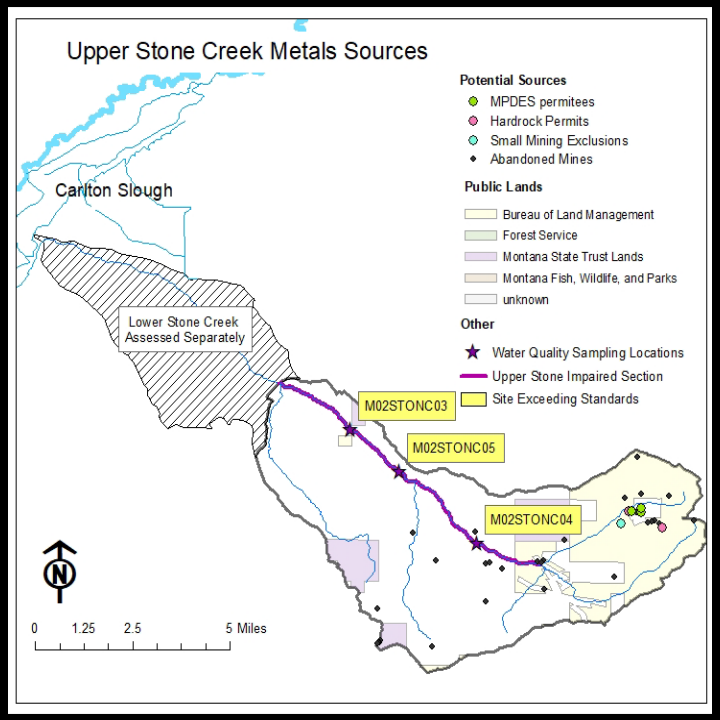
- Dry most of time
- Only two samples ever collected
- Exceeded human health standard

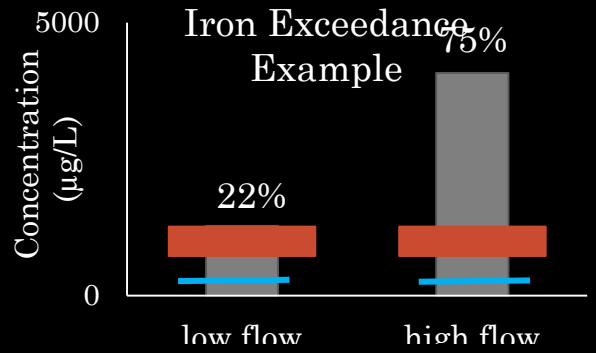


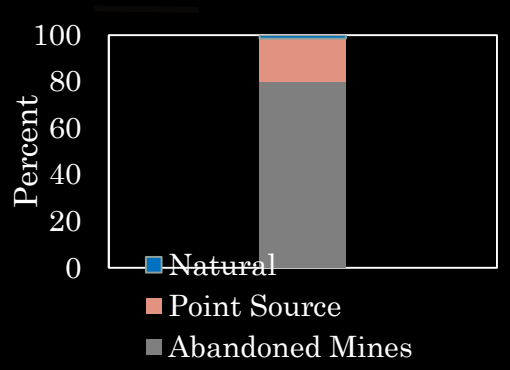


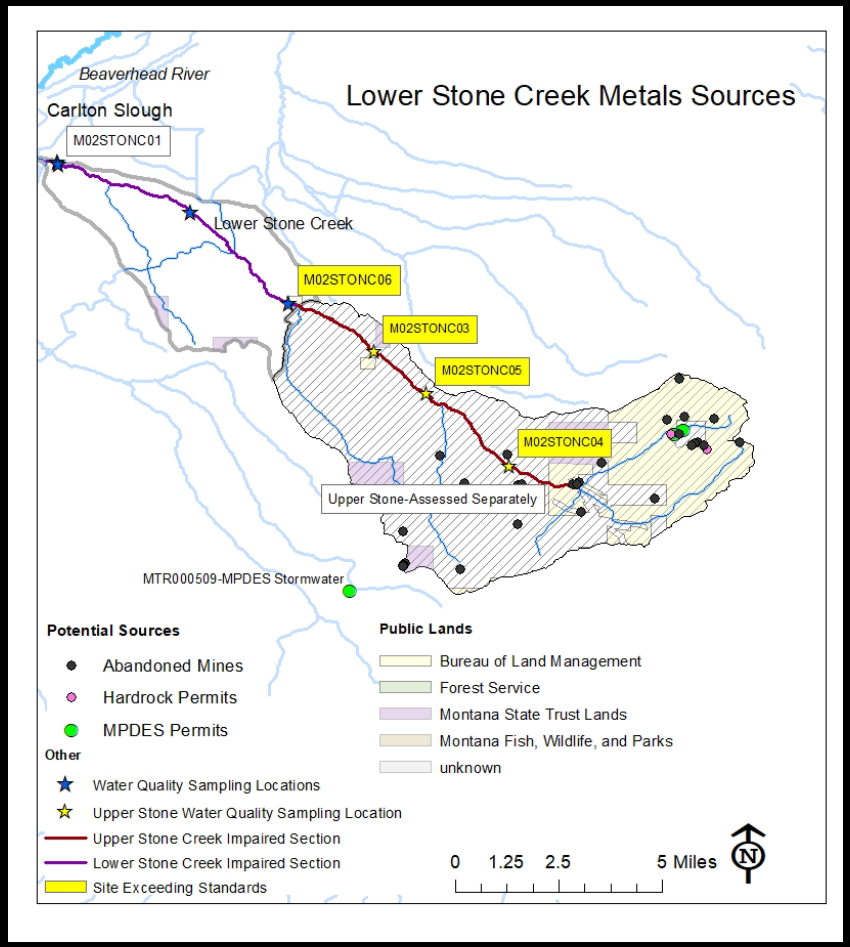
Upper Stone Creek

- Two individual and one general MPDES permittee
- Hardrock mines associated with permits
- Permittees are required to meet water quality
- standards
- All sites impaired during high flows
- Only one site impaired during low flows



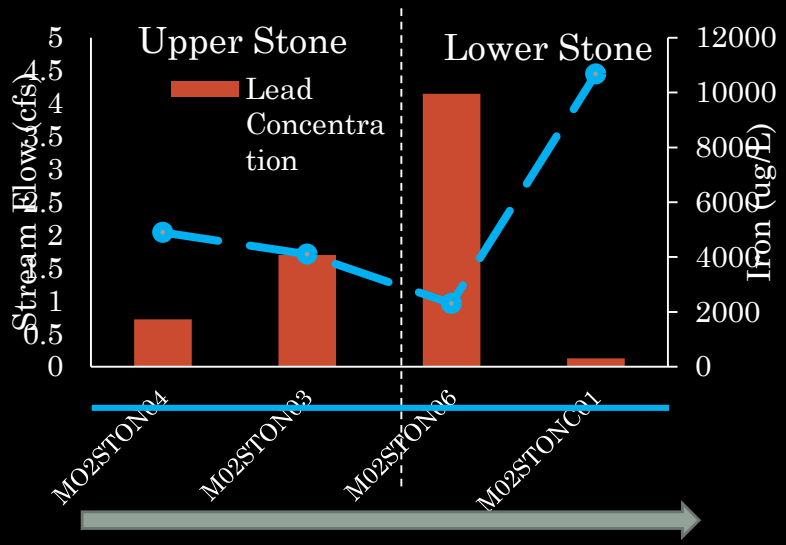






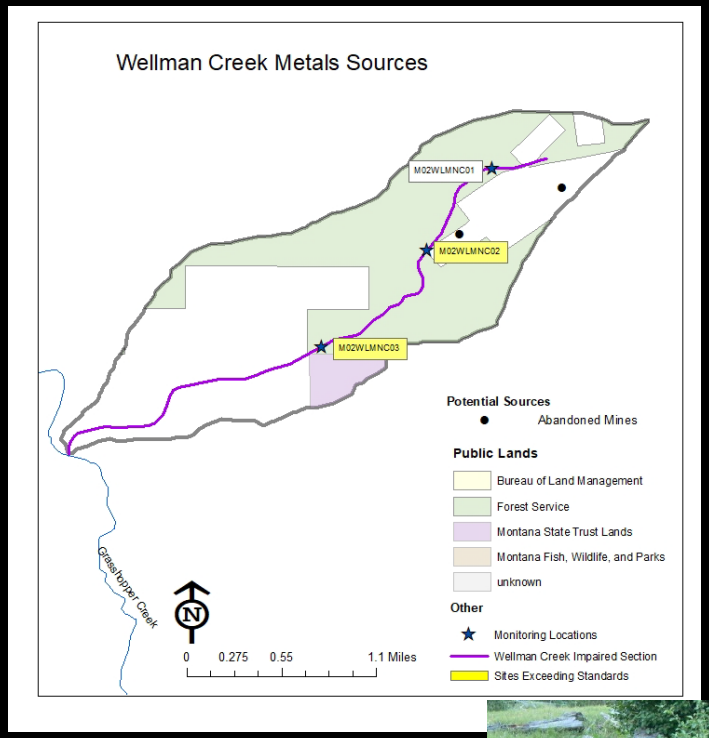
Lower Stone Creek

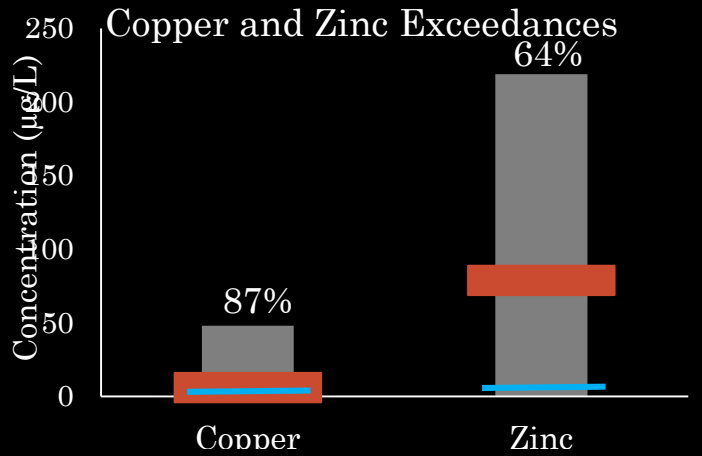
- Source of impairment is Upper Stone Creek
- Only impaired at high flows and at most upstream site
- % Reductions needed are Aluminum: 52%,copper: 5%, and iron 90%
- Water additions potentially dilute metals



Wellman Creek

- Impairment occurred during multiple flow conditions
- Impaired for aluminum, copper, cadmium, lead, and zinc





Recommendations

- Removal of tailings that are obvious sources
- Maintenance of priority mines
- Ensure meeting of water quality standards by permittees
- Better understanding effects of irrigation withdrawals
- Prioritize based on loading amounts, aquatic life, and humans

Future Monitoring

- Additional sampling, especially varying with flow and irrigation timing, to clarify sources
- Sampling additional streams not covered by TMDL

Questions?

How to Submit Comments

http://mtwaterqualityprojects.pbworks.com/

Send to: etrum@mt.gov

Questions:

- Eric Trum: Project Coordinator
- Christy Meredith: Metals TMDLs Project Manager
  Christy.Meredith@mt.gov

DEQ Montana Department of Environmental Quality