Sheep Creek Aluminum TMDL

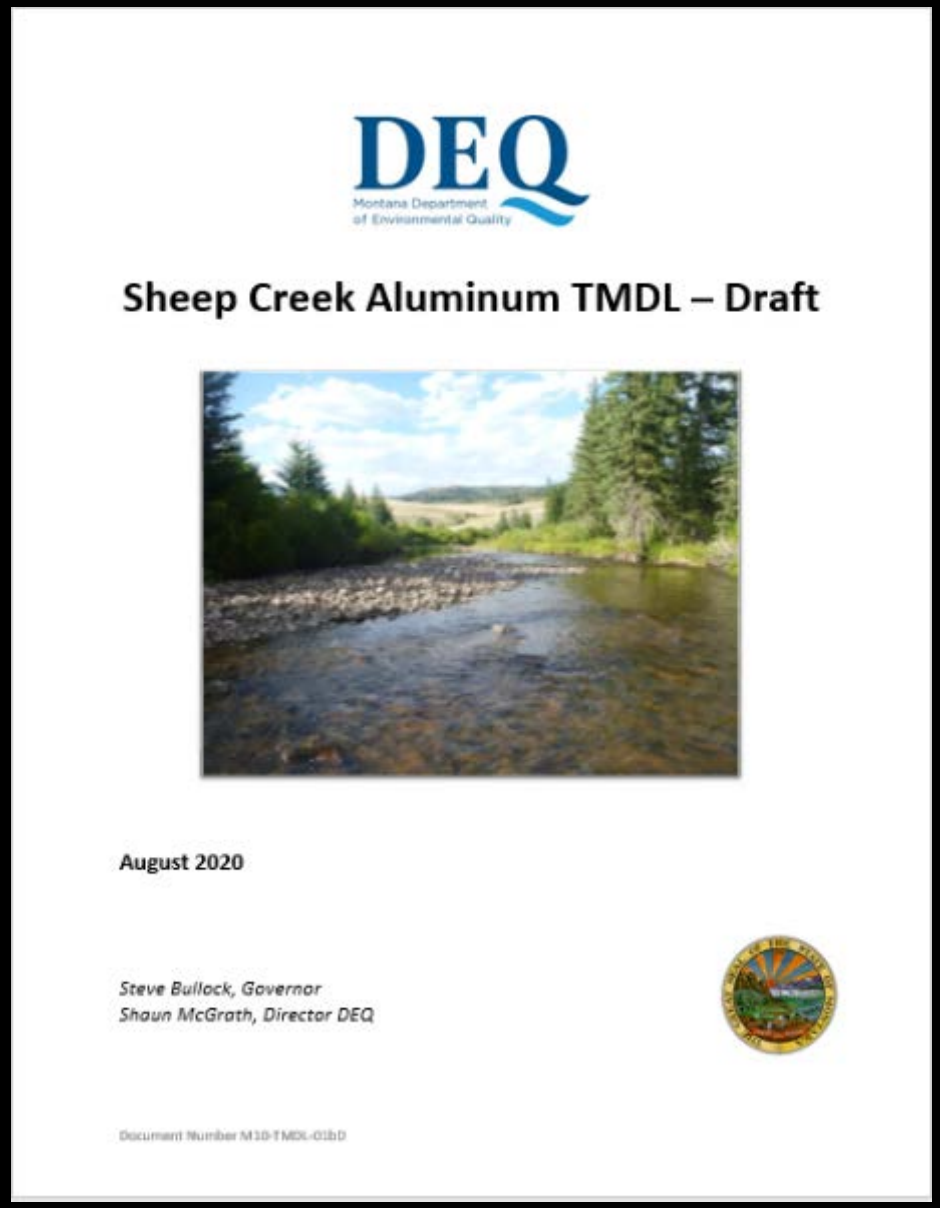
Lou Volpe

September 10, 2020

DEQ Montana Department of Environmental Quality

Who We Are

- Mission of maintaining and improving water health so that it:
  - Supports recreational enjoyment (fishing, swimming, boating, scenic views)
  - Provides clean drinking water for humans and livestock
  - Supports aquatic life (fish and bugs)
  - Is useable for irrigation
- Develop solutions to reduce pollution
- Provide support to local organizations working to improve water quality (stream and lake health)



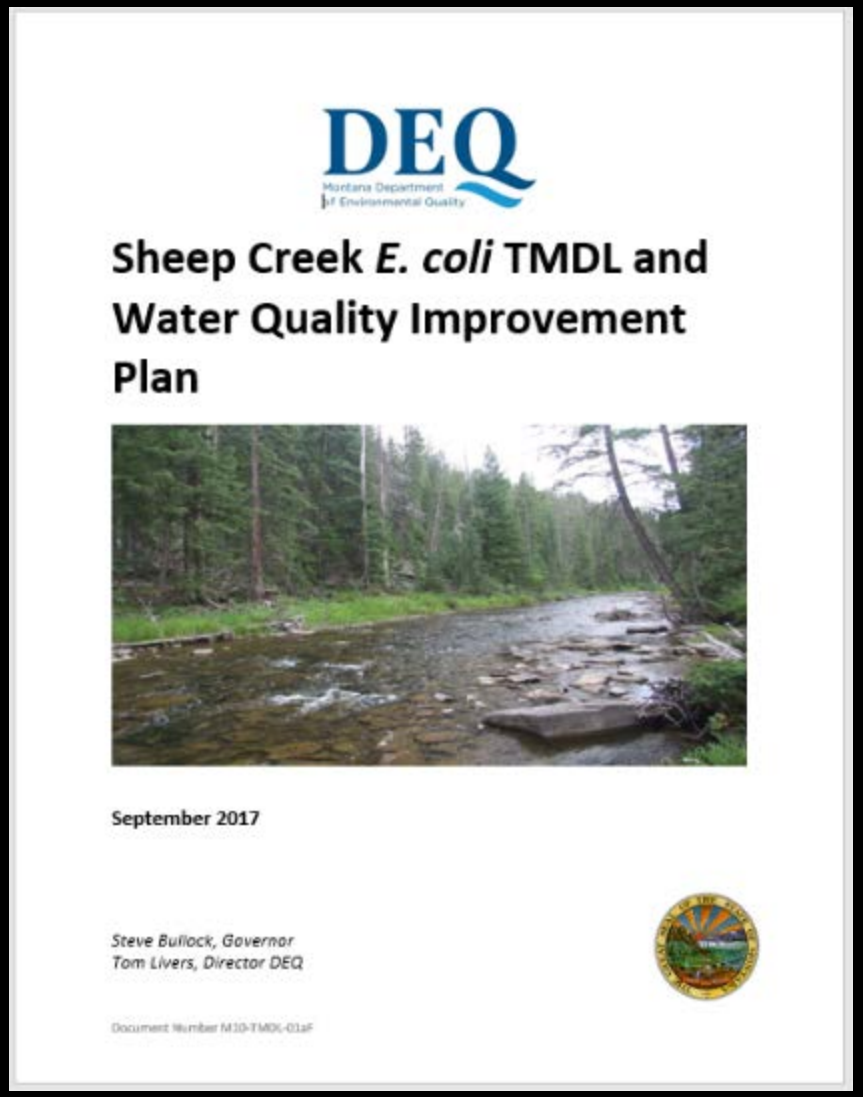
Meeting Purpose

Provide information about a total maximum daily load (TMDL) document available for a 30-day public comment period and answer questions

Describe a water quality study that looked at the effects of excess aluminum concentrations on Sheep Creek: what sampling was conducted, the outcomes, and suggestions for improving stream health

Presentation Outline

- Project overview, goals, and water quality planning steps
- Effects of aluminum on Sheep Creek and aluminum TMDLs
- How to improve water quality
- Organization of the TMDL document
- How to submit comments
- How to get involved



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Sheep Creek *E. coli* TMDL and Water Quality Improvement Plan

September 2017

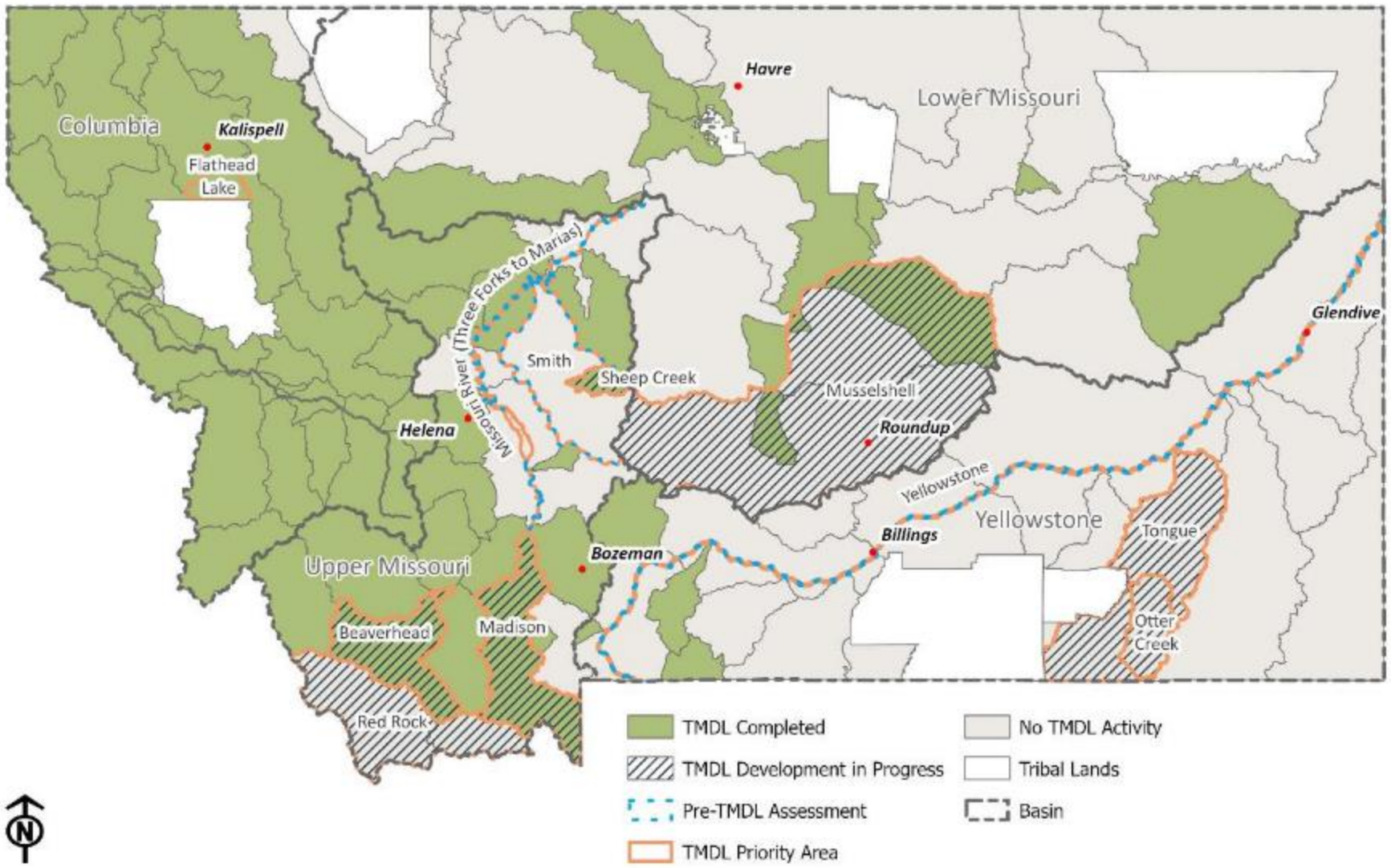
Steve Bullock, Governor
Tom Livers, Director DEQ

Document Number M10-TMDL-01aF

Project Purpose: Why DEQ is Writing TMDLs

- Montana DEQ has delegated authority under the federal Clean Water Act to identify impaired streams, rivers, and lakes and to develop a plan to address those impairments
- Montana state law requires DEQ to develop total maximum daily loads for all waters impaired by a pollutant
- Over 75 completed TMDL documents , including a E. coli TMDL for Sheep Creek

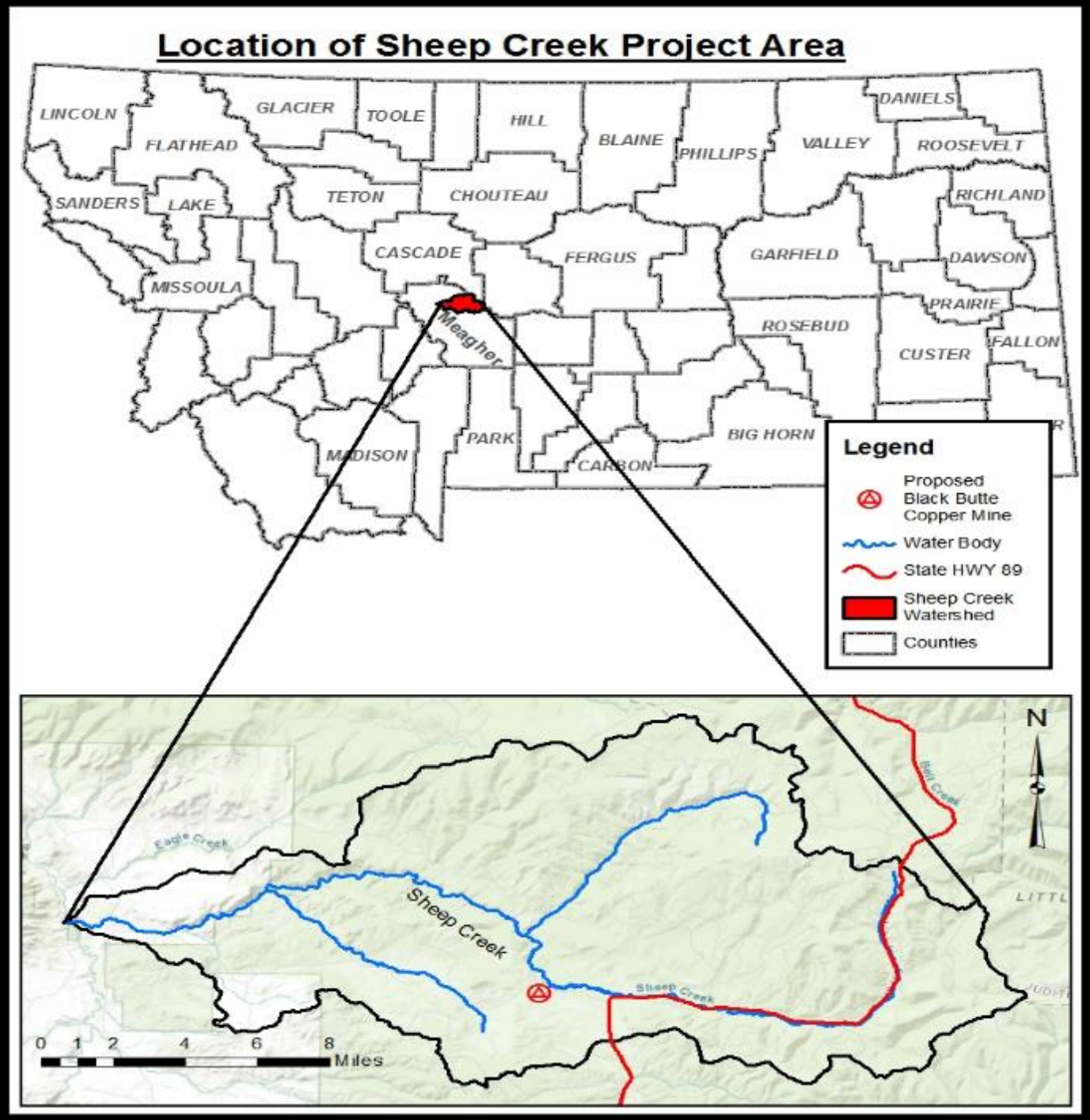
TMDL Development Status



05/12/2020 - DEQ Watershed Protection Section

Why the Sheep Creek Watershed

- Important economic resource (recreation, fishing, tourism, ranching)
- Application for MPDES permit for the Black Butte Copper Mine by Tintina Montana Inc.



Sheep Creek Watershed

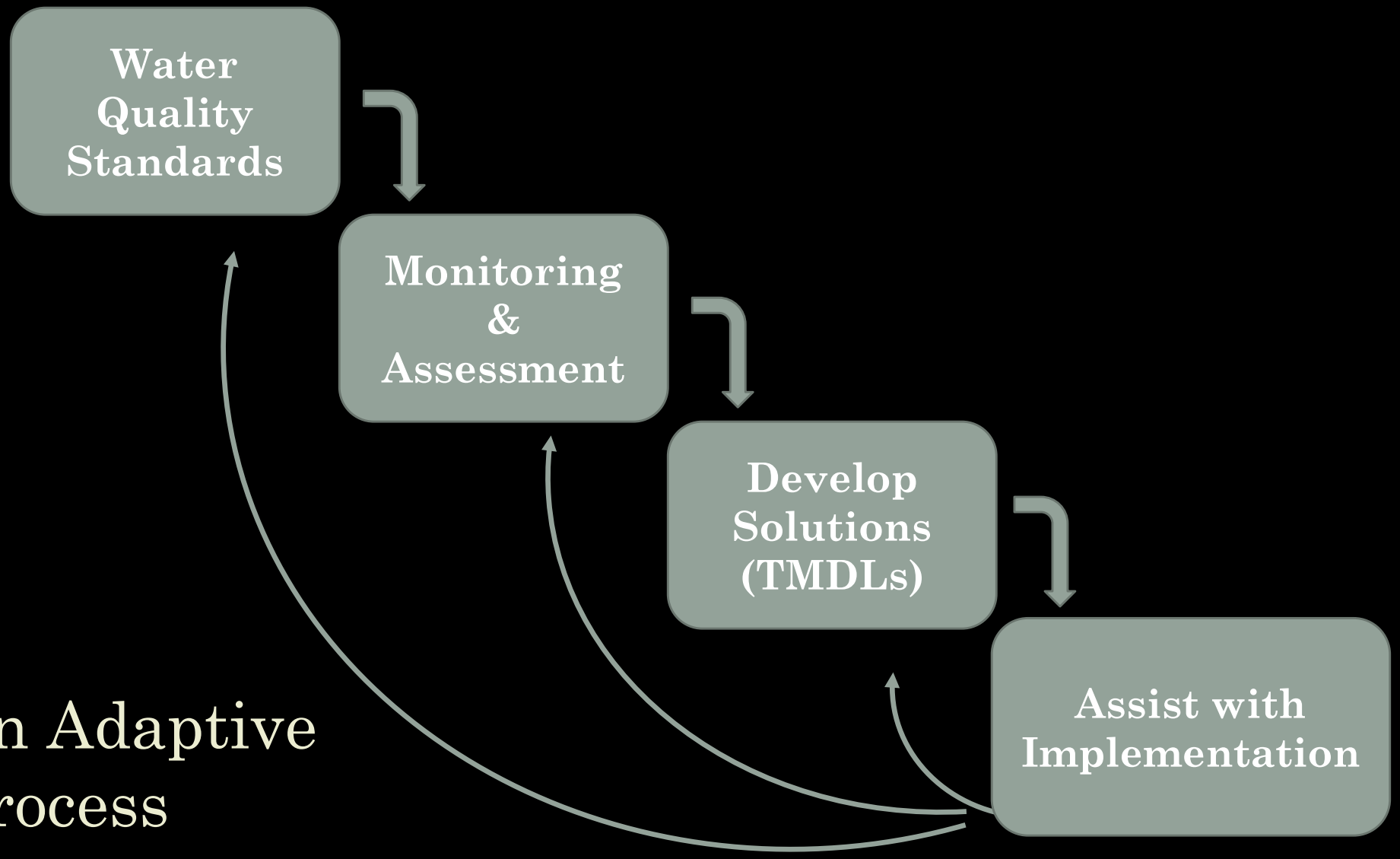
Project History

2011-2015	2016	2017	2020
Water quality sampling and pollution source assessment	Water quality assessments / impairment determinations	*E.Coli* TMDL document published. DEQ receives MPDES permit application for Black Butte Mine	Aluminum TMDL document

Project Goals

- To help achieve water quality standards, through the development of TMDLs and waste load allocations
- Provide information that will help protect water quality in the Sheep Creek watershed

DEQ's Water Quality Planning Steps



An Adaptive Process

Water Quality Standards

- Protect designated water quality uses for the Sheep Creek watershed
- Numeric (numbers) or narrative (description)

Recreation

Aquatic Life

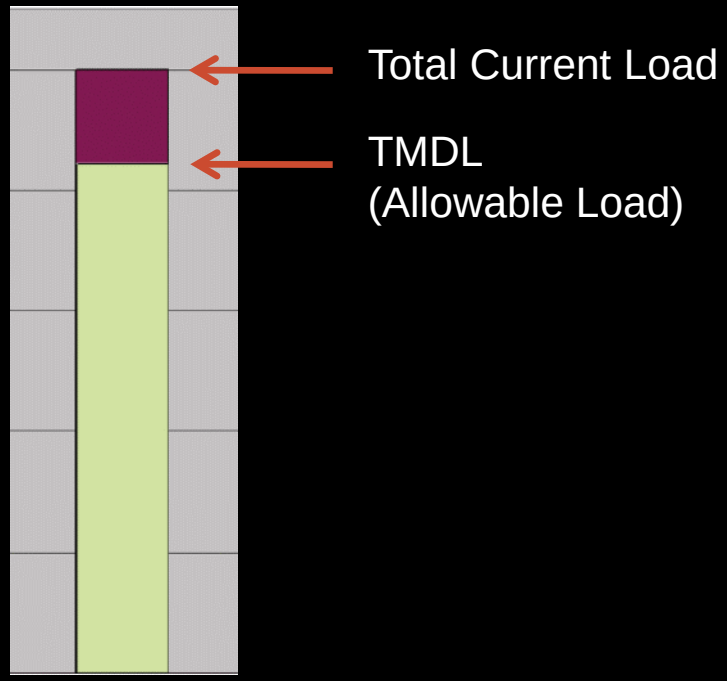
Drinking Water

Water Quality Monitoring

- Monitoring data is compared to the water quality standards
- If a water is not meeting a water quality standard, it is considered impaired
- Waters impaired for a pollutant require a total maximum daily load
- Information is tracked via an impaired waters list that includes the waterbody – pollutant impairment causes that require TMDL development

TMDL

Total Maximum Daily Load is the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards

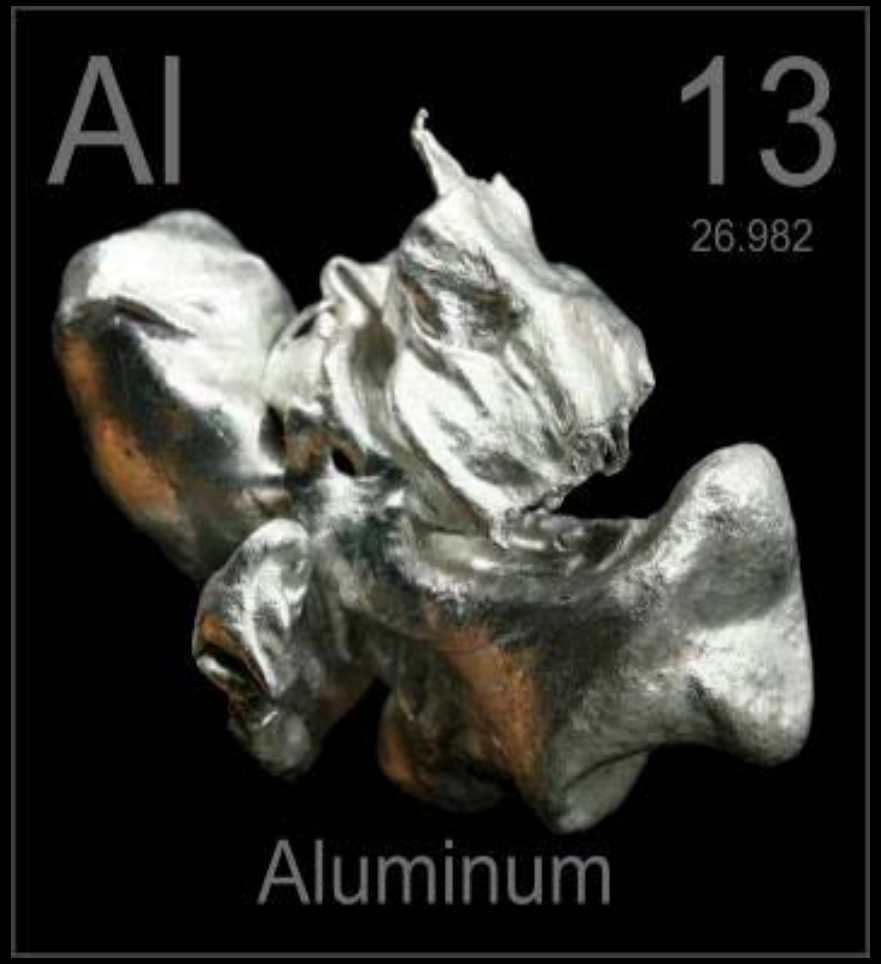


How a TMDL is Developed

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

Aluminum TMDL

Lou Volpe

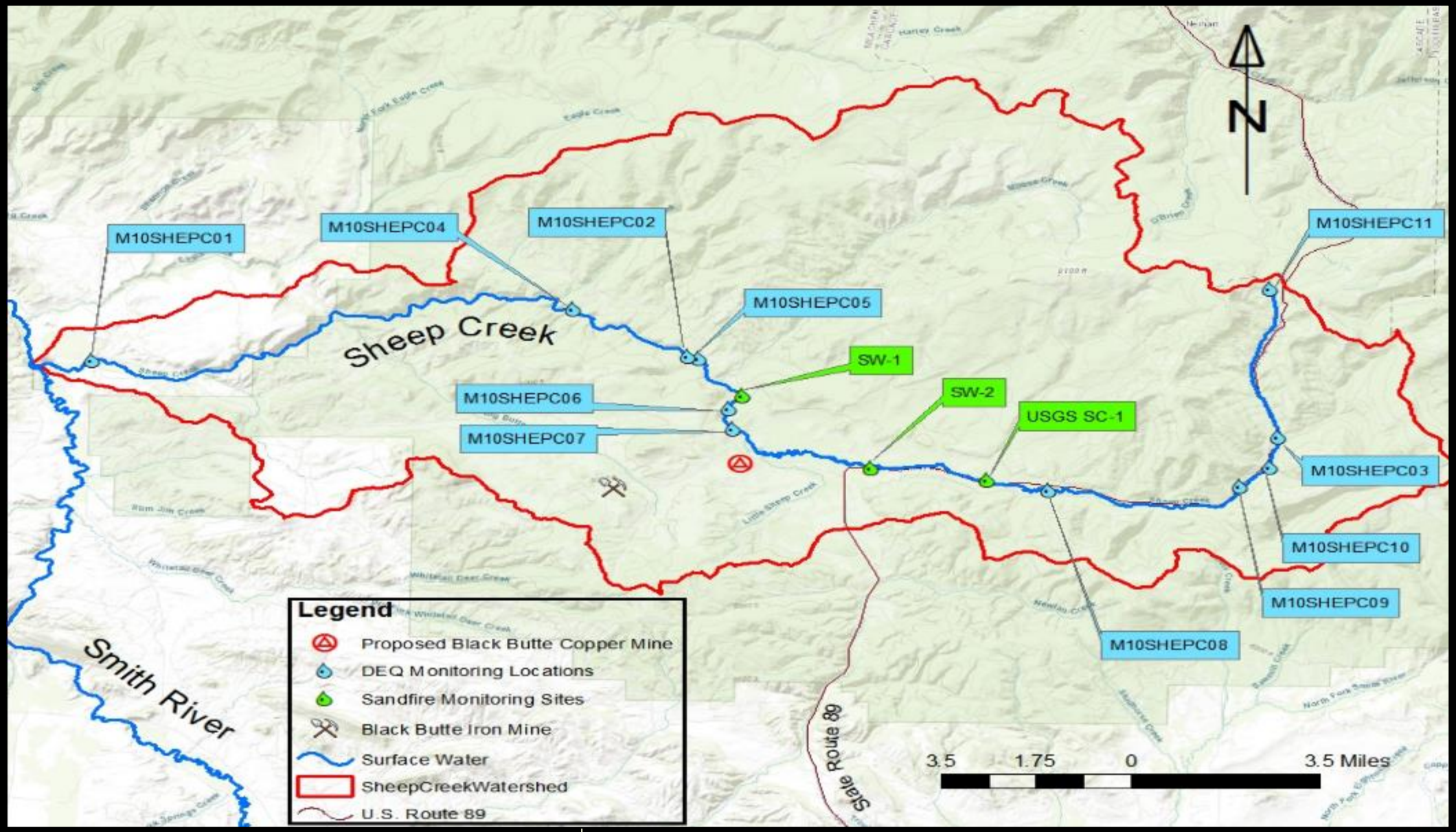


Problem Studied: Aluminum

- Aluminum is naturally occurring on the earths surface
- Elevated concentrations of aluminum can impair the support of aquatic life and fisheries beneficial uses.
- Within aquatic ecosystems, aluminum can have a toxic and bioconcentrating effect on biota.

Sources of Aluminum

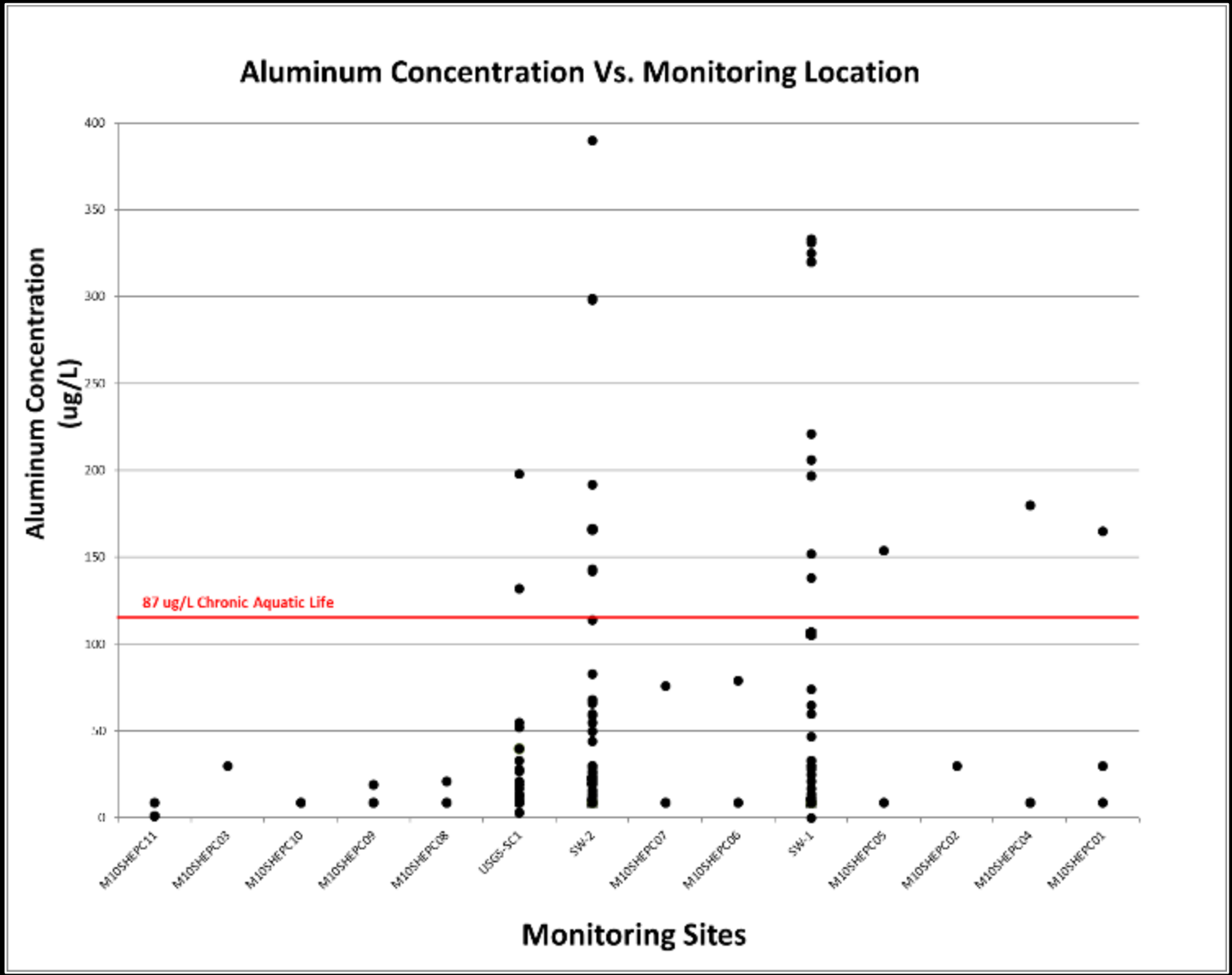
- Natural Sources
- Historical and Active Mining
- Human Land Disturbances
  - Unpaved roads without best management practices in place
  - Cattle Grazing (livestock access to stream channels)
  - Ski Resort (high concentration of unpaved roads)
  - Eroding streambanks



Aluminum Water Quality Monitoring

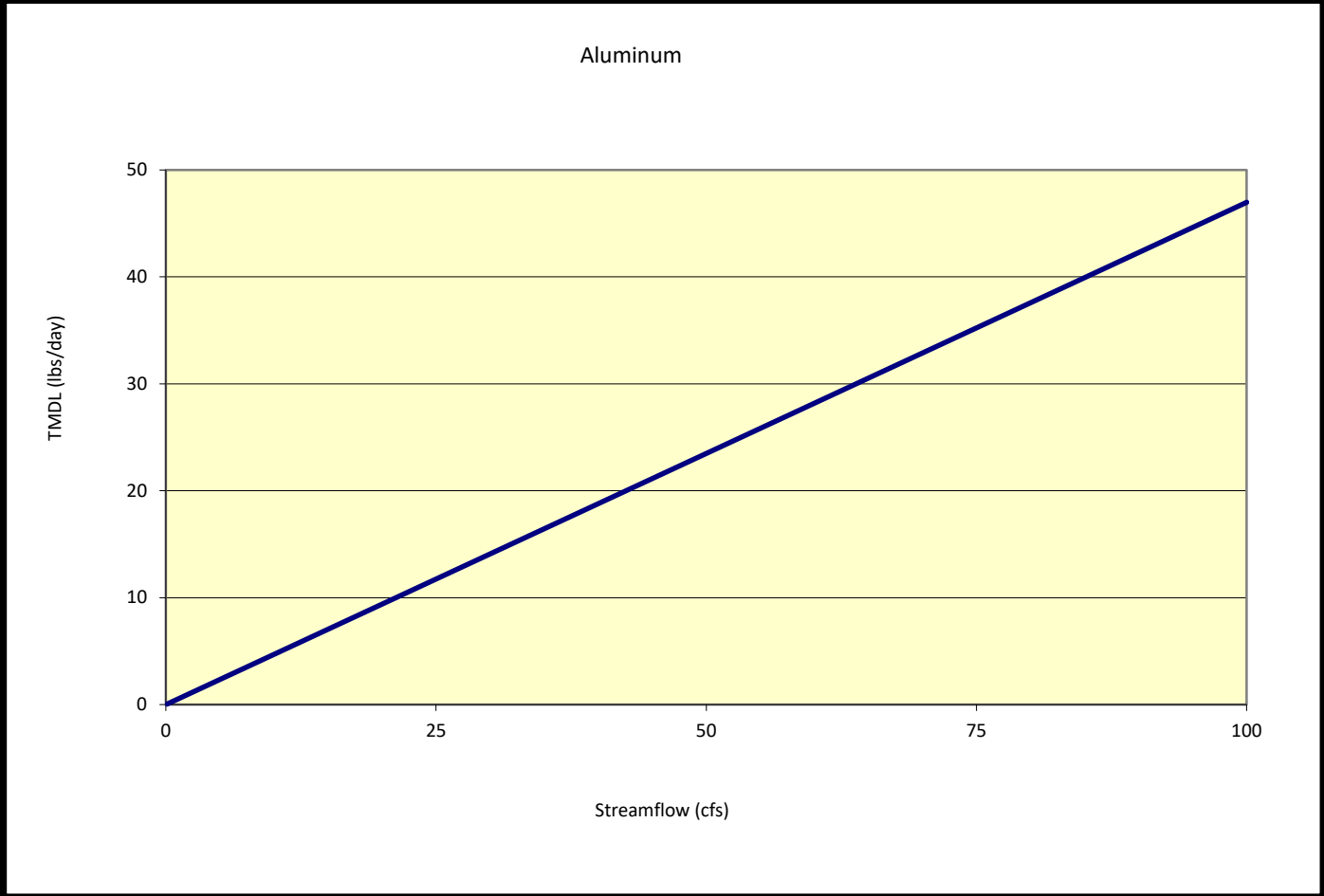
Aluminum Water Quality Standards

Aluminum Standards Applicable to Sheep Creek			
Metal of Concern	Aquatic Life Criteria (µg/L)		Human Health Criteria (µg/L)
	Acute	Chronic	
Aluminum, Dissolved	750	87	Not Applicable


Aluminum Concentration Vs. Monitoring Location
Aluminum Concentration (ug/L)
400
350
300
250
200
150
100
50
0
87 ug/L Chronic Aquatic Life
M10SHEPC11
M10SHEPC03
M10SHEPC10
M10SHEPC09
M10SHEPC08
USGS-SC1
SW-2
M10SHEPC07
M10SHEPC06
SW-1
M10SHEPC05
M10SHEPC02
M10SHEPC04
M10SHEPC01
Monitoring Sites

Sheep Creek TMDL

TMDL = (Flow) (Target) (Conversion)



Sheep Creek TMDL Allocations

$$TMDL = LA_{NB+H} + WLA_{TMW} + WLA_{Storm}$$

LA_{NB+H} = Load allocation to naturally occurring and human caused sources

WLA_{TMW} = Surface water wasteload allocation for the Black Butte Copper Mine

WLA_{Storm} = Storm water wasteload allocation for the Black Butte Copper Mine

TMDL Requirements of Black Butte Copper Mine

Meet wasteload allocation for the treated mine wastewater discharge to Sheep Creek

Meet the wasteload allocation to stormwater discharges to Sheep Creek

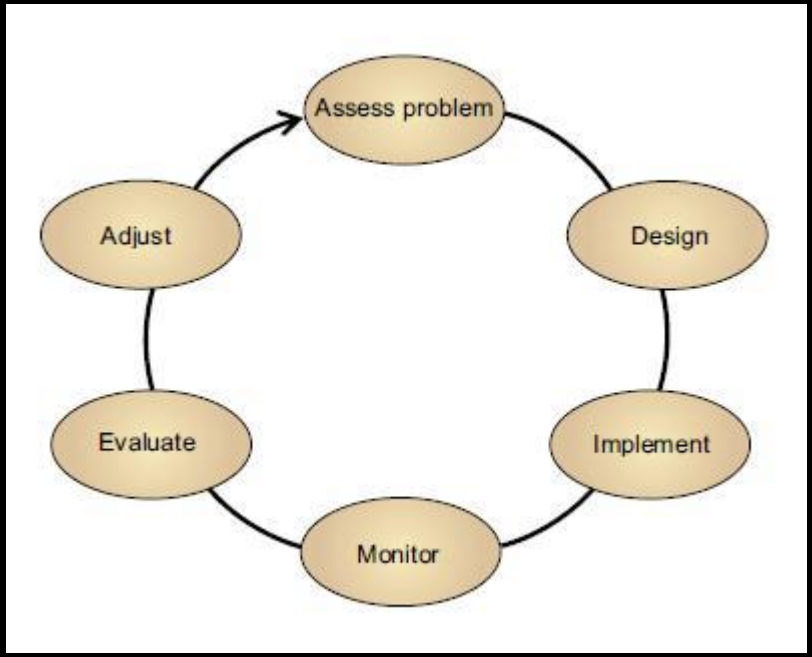
Improving Stream Health

How Do We Get to a Healthy Stream

- Adherence by Tintina Montana Inc. to all load allocations/MPDES permit requirements.
- BMPs is areas with historical and active mining
- Limiting human caused land disturbances
- Improving riparian practices can improve stream health
- Education on responsible streamside management

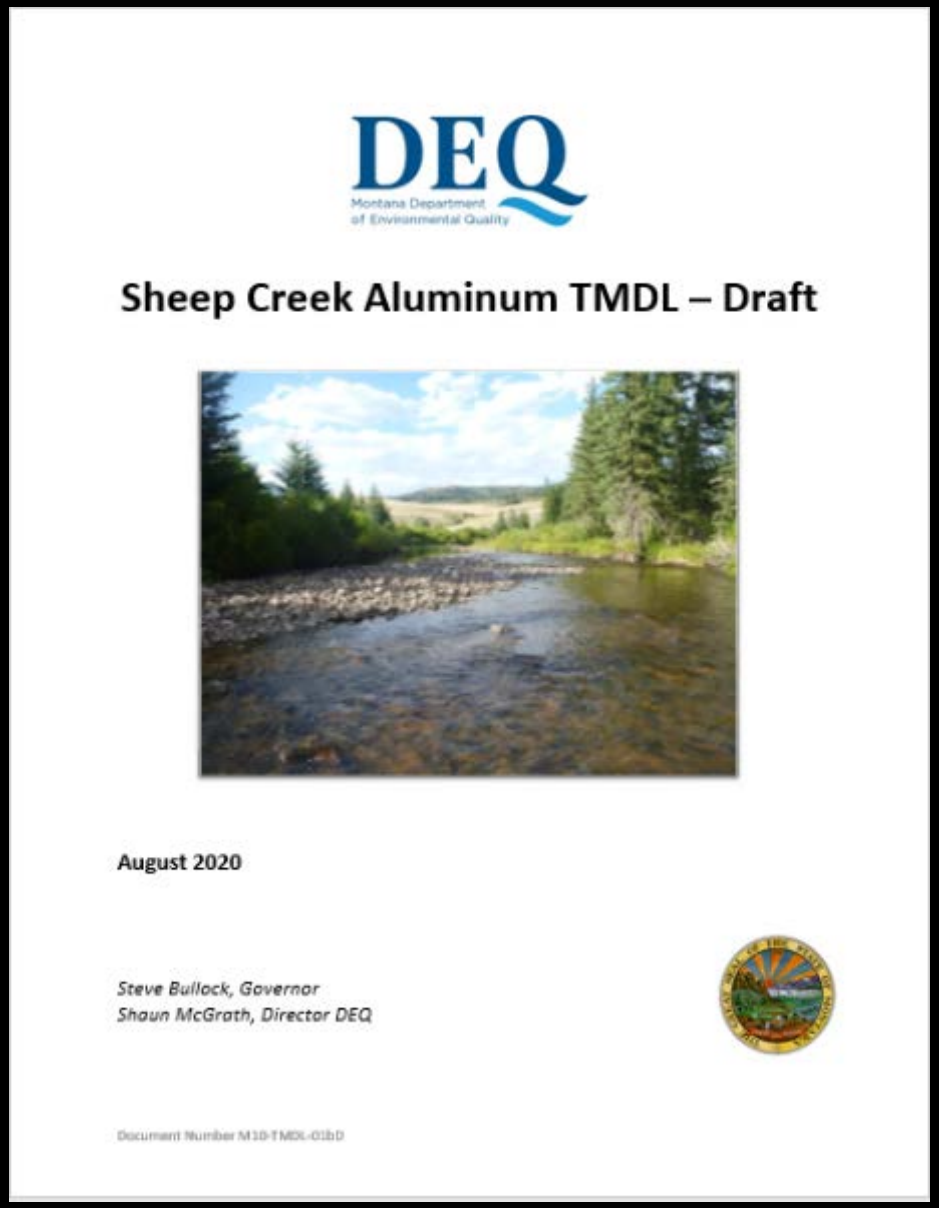
Adaptive Management in Sheep Creek

- An adaptive management approach works in cooperation with monitoring, and as new information is collected, it allows for adjustments to restoration goals or pollutant targets, TMDLs, and/or allocations



How Do We Fund Water Quality Improvement Practices

- Various grants are available for government and nonprofit agencies, such as conservation districts and local watershed and conservation groups
- Federal funding is available for private landowners through the NRCS
- DEQ Nonpoint Source Pollution Program staff are available to assist with obtaining funding



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Montana Department of Environmental Quality

Sheep Creek Aluminum TMDL – Draft

August 2020

Steve Bullock, Governor
Shaun McGrath, Director DEQ

Document Number M10-TMDL-01bD

The TMDL Document

Contents of the TMDL Document

Part 1: Introductory Information

- 1.0 Project Overview
- 2.0 Sheep Creek TMDL Project Area Description
- 3.0 Montana Water Quality Standards
- 4.0 Defining TMDLs and their Components

Part 2: TMDLs

- 5.0 Aluminum TMDL Components
- 6.0 Implementing the Sheep Creek Aluminum TMDL
- 7.0 Public Participation and Public Comment

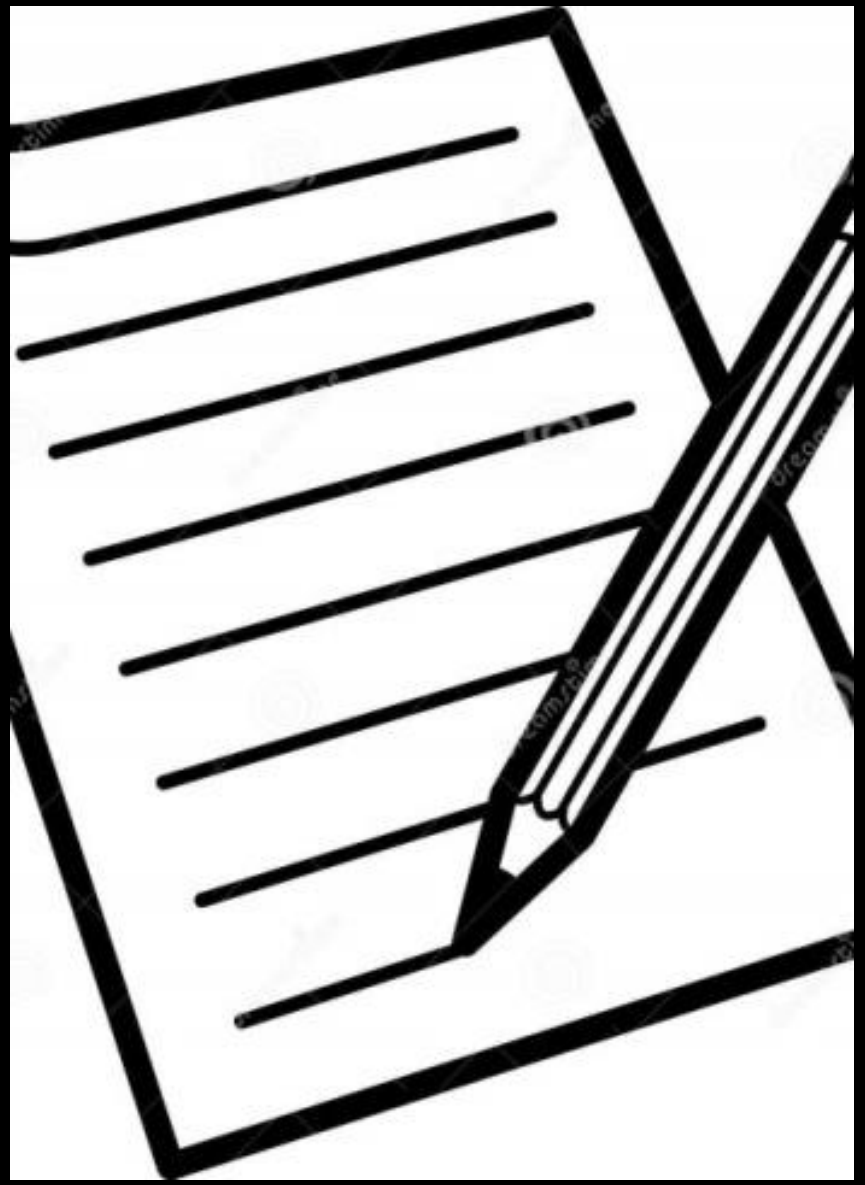
How to Submit Comments

Electronically at:
http://deq.mt.gov/Public/publiccomment

Mail to:
DEQ – Water Quality Division
PO Box 200901
Helena, MT 59620

Email to:

Lou Volpe, lvolpe@mt.gov



TMDL Document Completion Steps

- DEQ reviews all public comments, makes document edits, and writes responses to public comments
- Document submitted to U.S. EPA for approval
- Upon approval, final document is posted on DEQ's website at: http://deq.mt.gov/water/surfacewater/TMDL
- The TMDL document is used to guide water quality improvement plans and practices

Questions?