MUSSELSHELL *E. COLI* TMDL PROJECT

Public Meeting

July 14, 2021

DEQ Montana Department of Environmental Quality

Presentation Outline

- TMDL Basics
- Musselshell Project Area
- Musselshell *E. coli* TMDL Development
- What to Expect From a Completed TMDL
- Future Efforts in Musselshell
- Public Comment Period Information

Why is there a Water Quality Problem?

Elevated concentrations of *E. coli* in the Musselshell watershed that put humans at risk for contracting water-borne illnesses.

What is E.coli?

E. coli

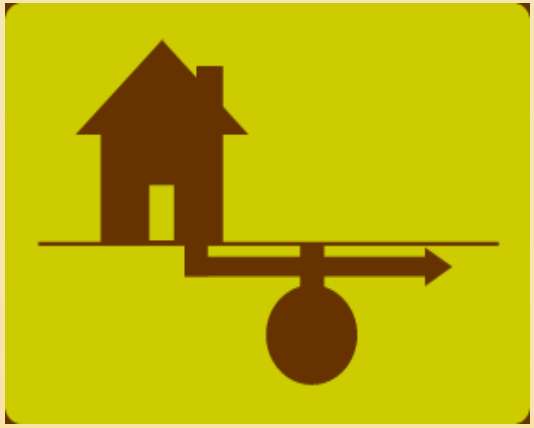
ē ˈkōlī/

noun:

A bacterium commonly found in the intestines of humans and other animals. Some strains can cause severe sickness, especially in children and the elderly.

You may be exposed to *E. coli* from contaminated water or food

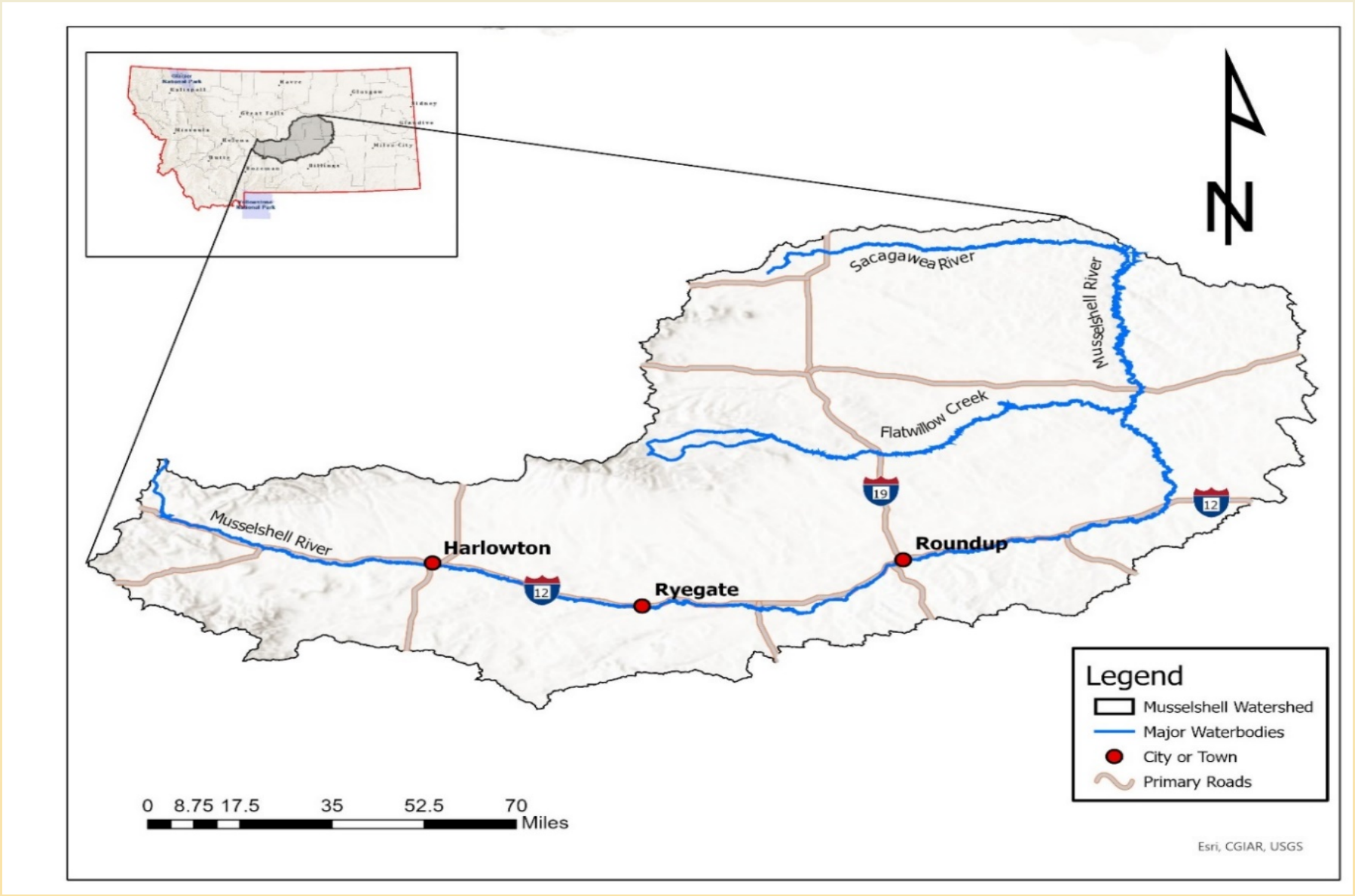
E. Coli is measured in units of Colony Forming Units (CFU) per 100 ml



What We Are Protecting

TMDL Basics

Musselshell E. coli TMDL Project Area



TMDL Basics

- Background:
  - The Clean Water Act requires states to assess the quality of their waters
  - Numeric or Narrative Water Quality Standards
  - Protect Water Quality Designated Uses

Recreation

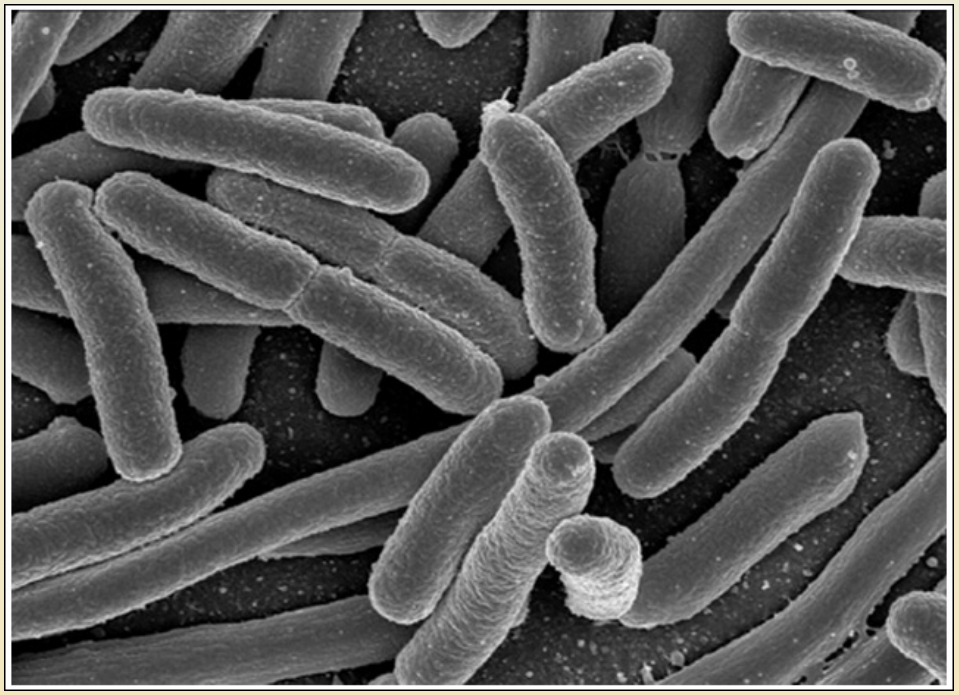
Drinking Water

Aquatic Life

Water Quality Monitoring and Assessment

- DEQ uses monitoring data to assess water quality and compare to applicable water quality standards
- If the data show a water quality problem, the waterbody is put on a list of impaired waters
- Waterbodies impaired by a pollutant will require a TMDL to be developed for that particular waterbody-pollutant combination

Major Pollutant Group(s)



E coli

Metals

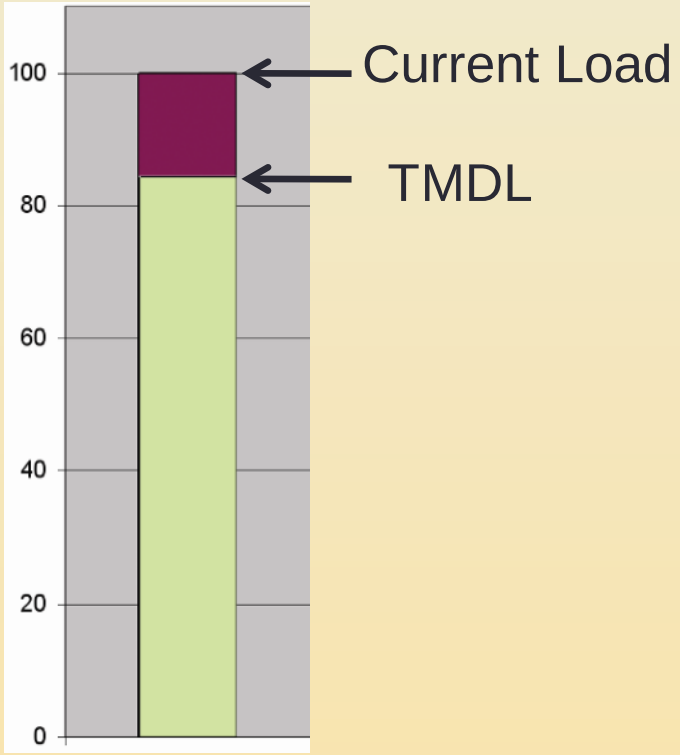
Nutrients

Temperature

Sediment

What is a TMDL?

- **T**otal **M**aximum **D**aily **L**oad is the amount of pollutant a waterbody can receive from all sources and still meet water quality standards.
- It is typically expressed as a load per unit time (e.g., lbs/day, CFU/day)
- TMDLs are specific to a waterbody segment and a pollutant, so a single waterbody may have multiple TMDLs
- In the case of the Musselshell River, there are 3 impaired segments out of a total of 4 with *E. coli* TMDLs addressed in the document



Steps for Developing a TMDL

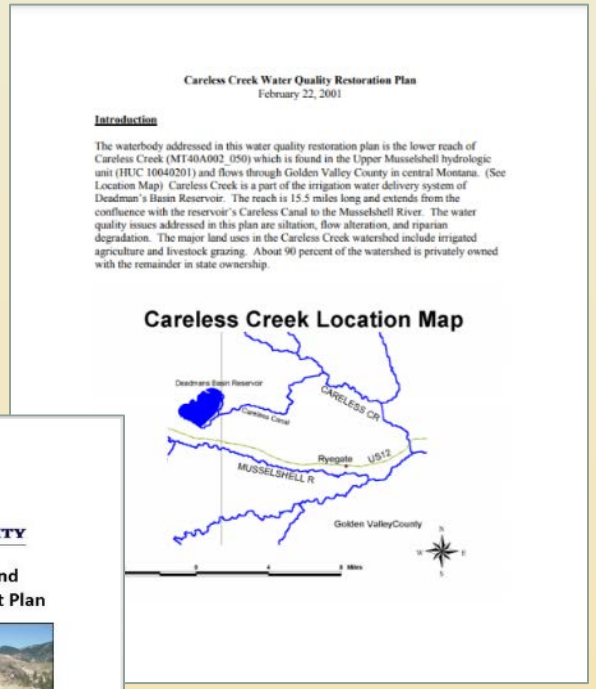
- Characterize the impaired waterbody's existing water quality conditions and compare those conditions to Montana's water quality standards.
- Quantify the magnitude of the pollutant contribution from each significant source
- Determine the total allowable load of the pollutant to the waterbody
- Allocate the total allowable load into individual loads for each significant source or source type (point sources and nonpoint sources) and determine reductions

Water Quality Goals

- Developing TMDLs for waterbodies impaired by a pollutant is an important step to address water quality problems
- For all waterbodies to support their designated water quality beneficial uses
- TMDL documents can be used as a water quality planning tool

Montana's TMDL History

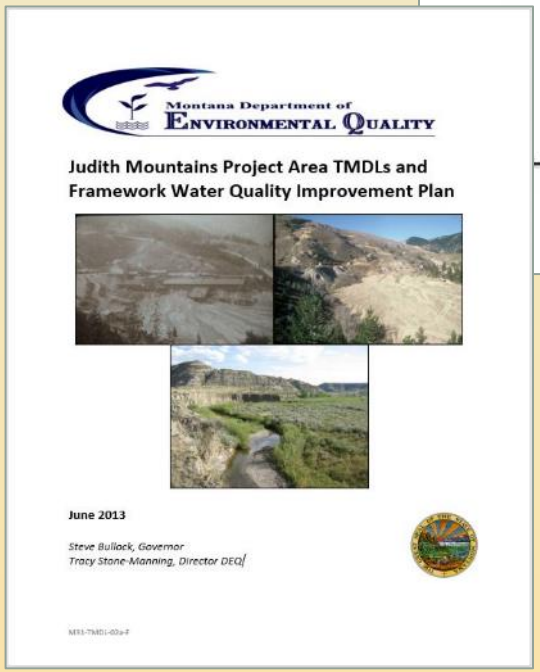
- More than 1,400 approved TMDLs (1998 – present)
- More than 73 TMDL documents completed as of January 2021
- Completed documents can be found at:


Careless Creek Water Quality Restoration Plan
February 22, 2001

Introduction

The waterbody addressed in this water quality restoration plan is the lower reach of Careless Creek (MT40A002_050) which is found in the Upper Musselshell hydrologic unit (HUC 10040201) and flows through Golden Valley County in central Montana. (See Location Map) Careless Creek is a part of the irrigation water delivery system of Deadman's Basin Reservoir. The reach is 15.5 miles long and extends from the confluence with the reservoir's Careless Canal to the Musselshell River. The water quality issues addressed in this plan are siltation, flow alteration, and riparian degradation. The major land uses in the Careless Creek watershed include irrigated agriculture and livestock grazing. About 90 percent of the watershed is privately owned with the remainder in state ownership.

Careless Creek Location Map


Montana Department of Environmental Quality

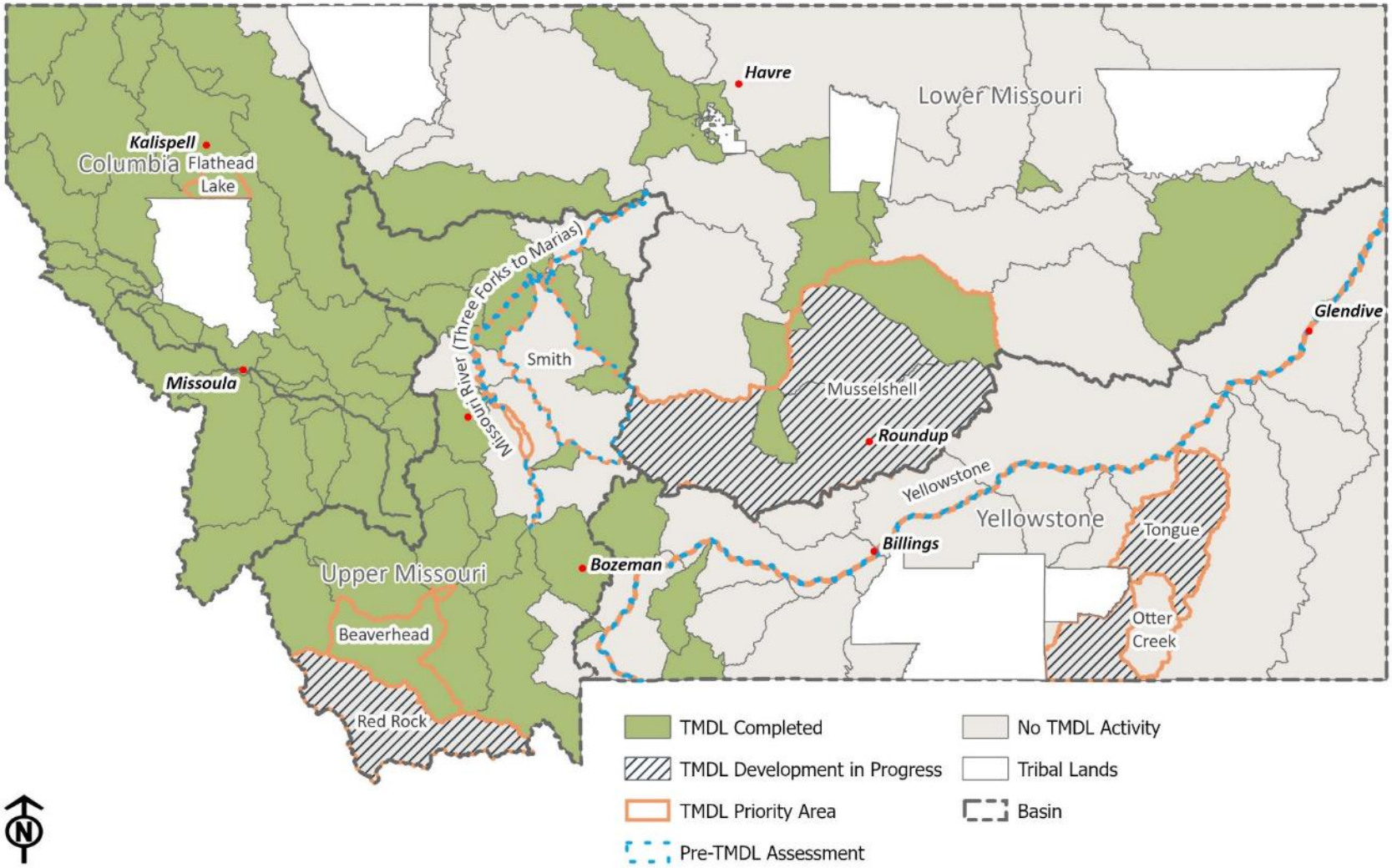
Judith Mountains Project Area TMDLs and Framework Water Quality Improvement Plan

June 2013

Steve Bullock, Governor
Tracy Stone-Manning, Director DEQ

https://deq.mt.gov/water/Programs/sw

TMDL Development Status



2/12/2021 - DEQ Watershed Protection Section

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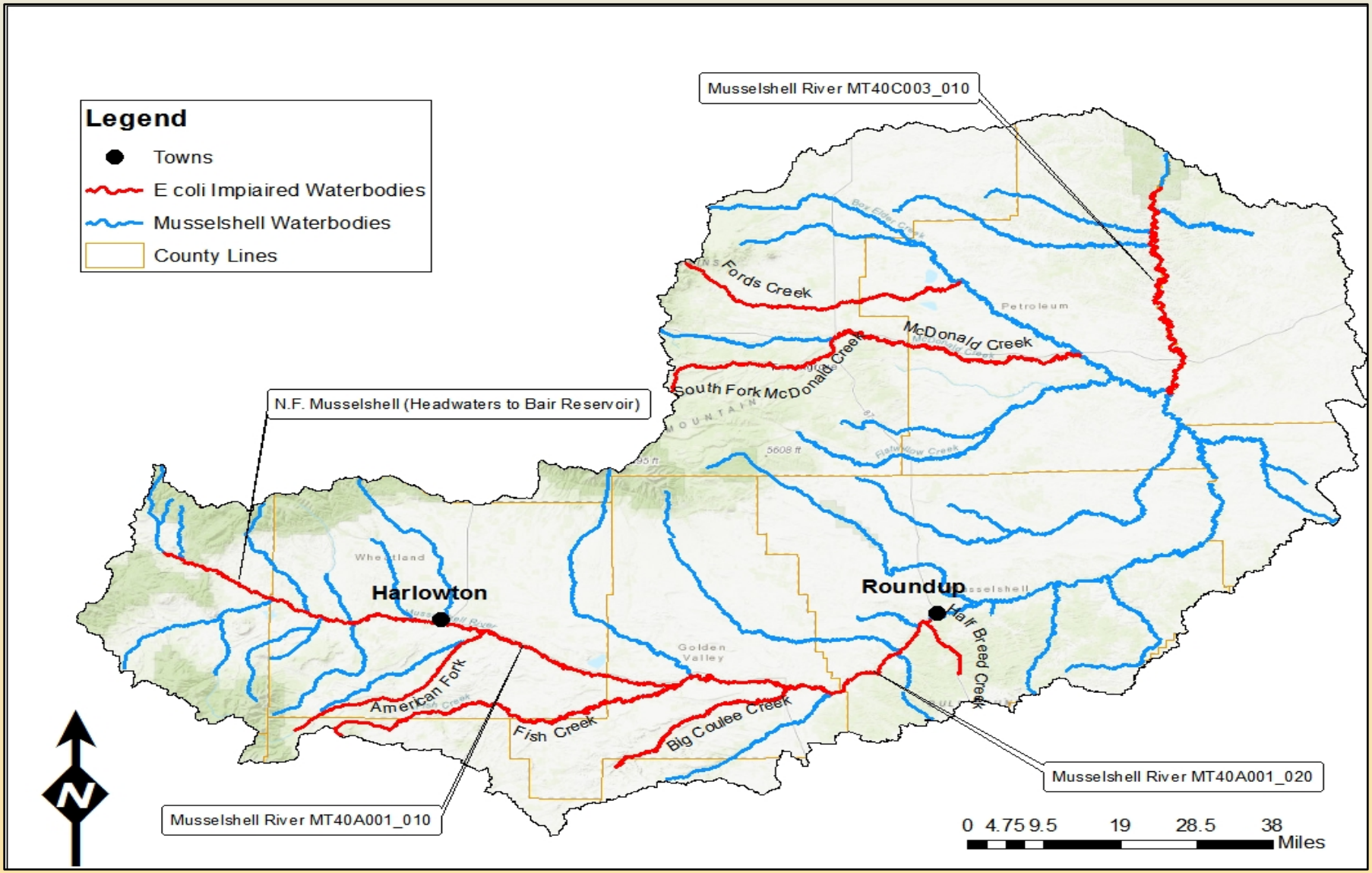
2021 Musselshell *E. Coli* TMDL Development

E. coli Impaired Waters



Data Collection & Impairment Determination

- Sampling conducted in 2015 and 2016
- Total of 131 *E. coli* samples from 45 sampling locations on 19 impaired waterbodies

E. coli Sampling and Analysis

- Minimum of five samples obtained during separate 24-hour periods during any consecutive 30-day period
- Sample preservation
- Strict holding times, 6-hour handling time and 2-hour processing time.
- Sample incubation
- Sample interpretation

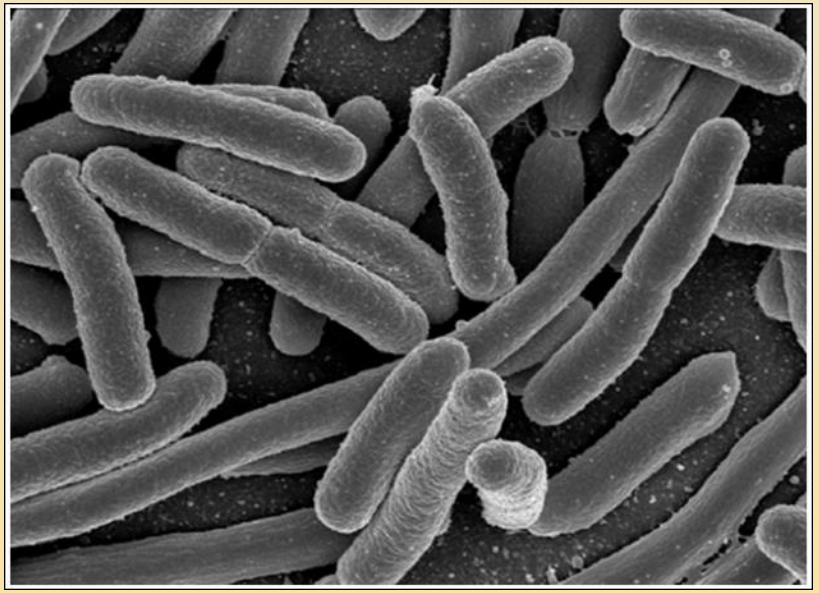
E. coli Water Quality Targets

Applicable Period	**Target Concentration** (cfu[1]/100mL)	**Analysis Type**	**Allowable Exceedance Frequency**	**Dataset Requirement**
Summer *(April 1 – October 31)*	126	Geometric mean	Not to be exceeded	Minimum of five samples obtained during separate 24-hour periods during any consecutive 30-day period
	252	Individual samples	<10% exceedance rate allowed	
Winter *(November 1 – March 31)*	630	Geometric mean	Not to be exceeded	
	1,260	Individual samples	<10% exceedance rate allowed	

E. Coli Assessment and Impairment

- Pathogen impairment occurs if either of the following are true:
  - Geometric mean of Colony Forming Units/100 mL exceeds 126
  - 10% of all *E.coli* sampling results exceed 252 (CFU/100mL)

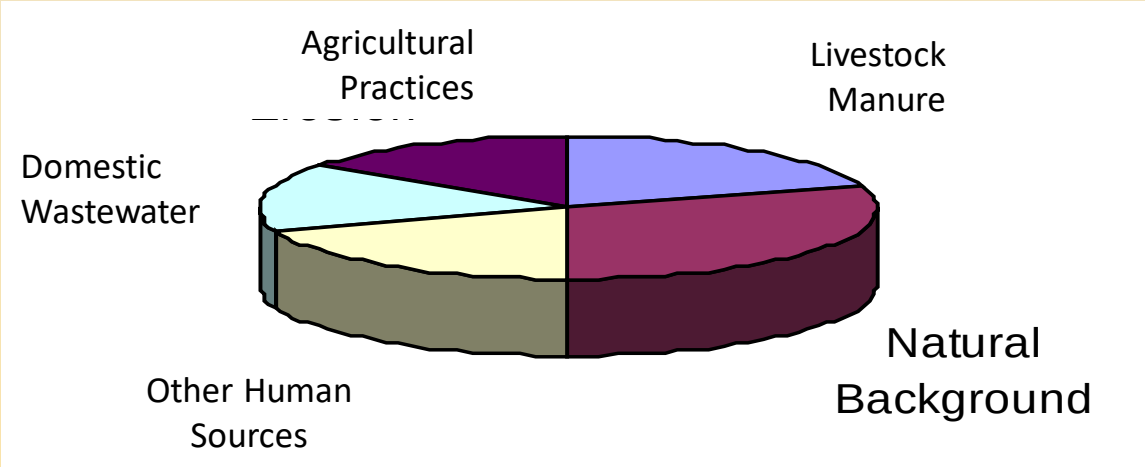
- Beneficial uses impaired:
  - Primary contact recreation

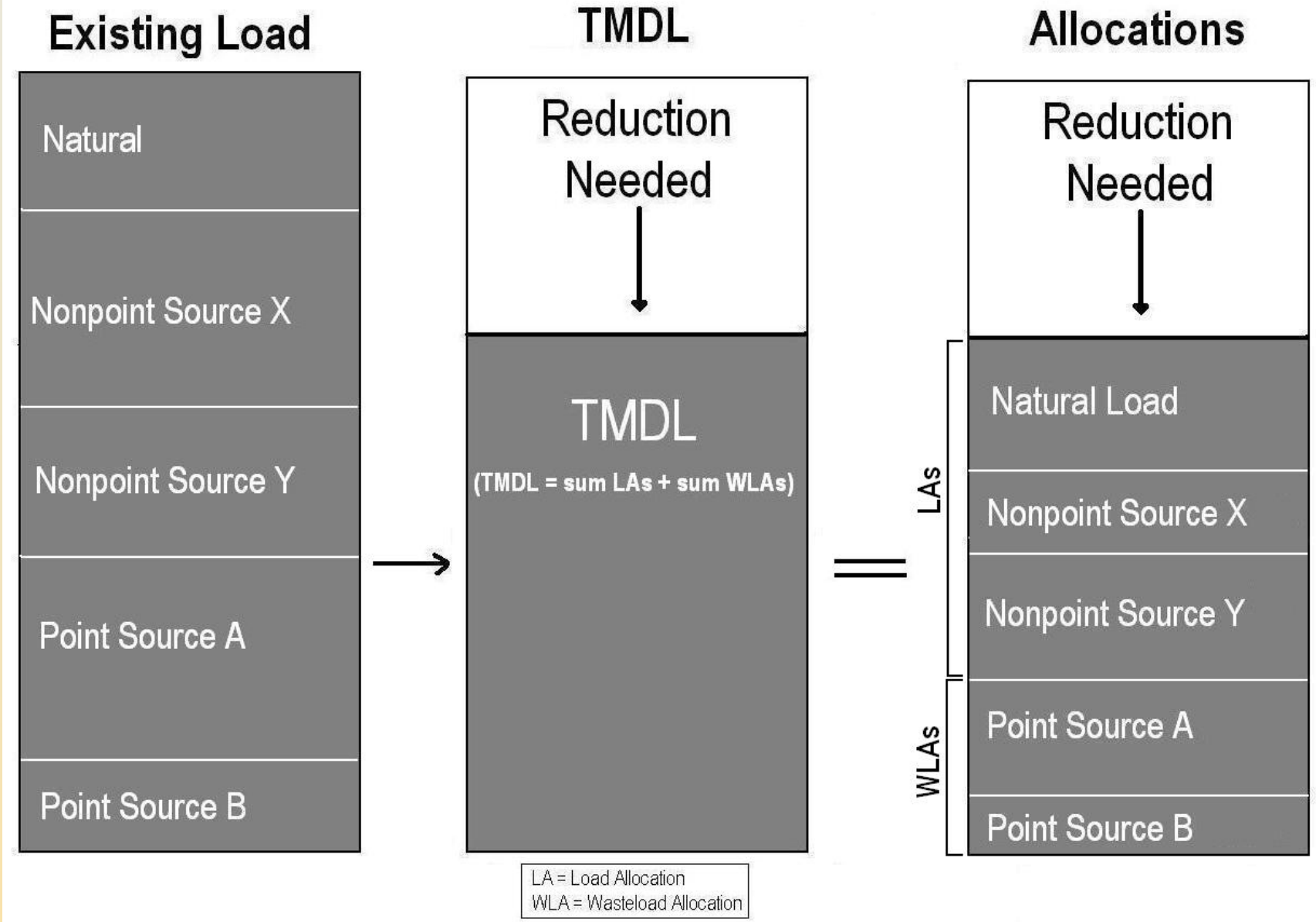


What Makes up a TMDL or the Allowable Load?

TMDL = Load Allocations (LA) + Wasteload Allocations (WLA)

- The TMDL must be allocated to sources
- Allocations usually based on existing loading and opportunity for reductions via best management practices




Existing Load
Natural
Nonpoint Source X
Nonpoint Source Y
Point Source A
Point Source B
TMDL
Reduction Needed
TMDL
(TMDL = sum LAs + sum WLAs)
Allocations
Reduction Needed
Natural Load
Nonpoint Source X
Nonpoint Source Y
Point Source A
Point Source B
LAs
WLAs
LA = Load Allocation
WLA = Wasteload Allocation

TMDL and Allocations

TMDL = Load Allocations (LA) +Waste Load Allocations (WLA)

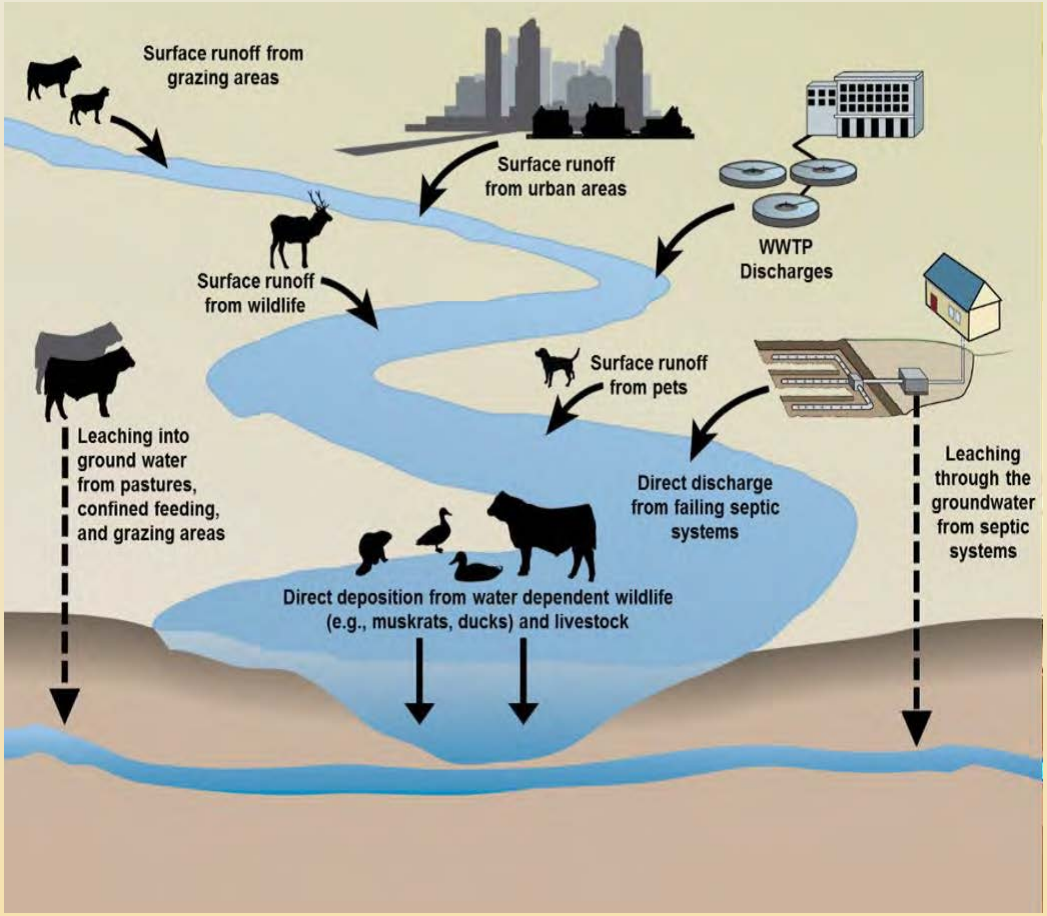
$TMDL = LA_{NB} + COMP\ LA_{Trib} + WLA_{Harlowton} + WLA_{COMP\ CAFO} + COMP\ LA_{H}$

Upper Musselshell River *E. coli* TMDL and Load Allocation at a Median Flow of 42 cfs

Typical Flow (cfs)	TMDL (Mcfu/day)	Load Allocation to Natural Background (LA_{NB}) (Mcfu/day)	Composite Load Allocation to Tributaries (COMP LA_{Trib}) (Mcfu/day)	Wasteload Allocation to the Harlowton WWTP ($WLA_{Harlowton}$) (Mcfu/day)	Wasteload Allocation to the CAFO COMP WLA_{CAFO} (Mcfu/day)	Composite Load Allocation to Human Caused (COMP LA_{H}) (Mcfu/day)
42	129,125	37,917	58,429	1,230	0.0	31,548

E. coli Sources

- Point Sources:
  - Wastewater treatment plants
  - CAFOs
- Nonpoint Sources:
  - Agriculture land use (irrigated cropping and pasture/rangeland/forest grazing)
  - Recreation and domestic animals
  - Septic systems
  - Natural background (wildlife)



MPDES Point Sources

Permit Number	Permittee	Permitted Activity	Receiving Water
MT0020354	City of Harlowton	Sewerage Systems	Musselshell River (Upper)
MT0020451	Town of Ryegate	Sewerage Systems	Musselshell River (Middle) via Unnamed Slough
MT0030309	Town of Grass Range	Sewage Systems	South Fork McDonald Creek
MTG010150	Duncan Ranch Colony	Concentrated Animal Feeding Operations	Musselshell River (Upper)
MTG010156	Golden Valley Colony	Concentrated Animal Feeding Operation	Fish Creek via unnamed tributary
MTG010242	Springwater Colony	Concentrated Animal Feeding Operation	Musselshell River via unnamed tributary
MTG010244	Martinsdale Colony Inc.	Concentrated Animal Feeding Operation	Musselshell River via unnamed tributary
MTG580013	Town of Lavina	Lagoon (Batch)	Musselshell River (Middle)
MTG580041	Town of Winnett	Lagoon (Batch)	McDonald Creek

E. Coli Impairment Determinations and TMDLs

- 11 of 19 waterbodies assessed were found to be impaired for *E. coli*
  - North Fork Musselshell River
  - Musselshell River (MT40A001_010)
  - Musselshell River (MT40A001_020)
  - Musselshell River (MT40C003_010)
  - Big Coulee Creek
  - Fish Creek
  - Half Breed Creek
  - McDonald Creek
  - American Fork
  - Fords Creek
  - South Fork McDonald Creek

Completed TMDL

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Draft Musselshell *E.coli* TMDLs and Water Quality Improvement Plan

July 2021

Greg Gianforte, Governor
Christopher Dorrington, Director DEQ

Document Number LMO-TMDL-01aD

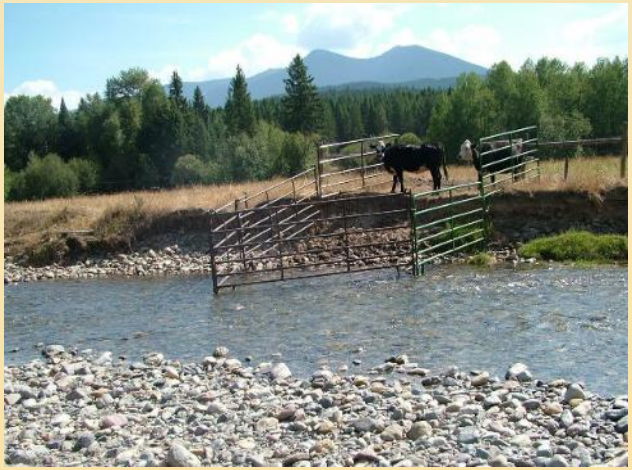
TMDL Implementation

What to Expect After TMDL Completion

- A completed TMDL provides information on water quality problems and strategies to reduce pollutants by changing land and water management activities
- The TMDL document provides a basis for action, but it is up to local stakeholders, organizations, and government agencies to determine how best to use the information and implement a restoration strategy
- Watershed Restoration Plan (WRP) development provides an option for stakeholders to implement the goals of the TMDL

TMDL Goals

- Best Management Practices (BMPs)
  - Livestock grazing management
    - Reduce duration of livestock along streams
    - Improve riparian buffers
  - Septic system maintenance and upkeep
    - Residential
  - Increased awareness for recreationists



Sources of Assistance

DEQ

- Technical assistance
  - WRP development
  - Source Identification
- Financial assistance
  - Water quality monitoring
  - 319 funding

Conservation Districts and NRCS

- Conservation planning
- Financial assistance

Future TMDL Development

- Additional water quality impairments in the Musselshell:
  - Metals
  - Nutrients
  - Salinity
  - Temperature

How To Submit Comments

- **Comment period ends Monday July 26 at 11:59 p.m.**
- Internet access to view document available at:
  Roundup Community Library or the Harlowton Public Library
- Comments can be mailed to:

  DEQ, Water Quality Planning Bureau, P.O. Box 200901, Helena, MT 59620
- Comments can be e-mailed to:

  lvolpe@mt.gov

- Musselshell TMDL document:
  http://deq.mt.gov/Public/publiccomment

- Final document will be available after EPA approval

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