

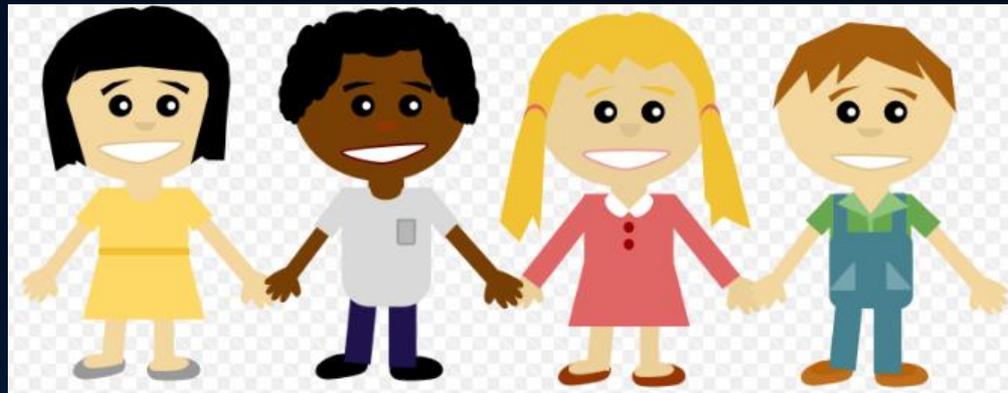
The background features a dark blue gradient on the left, transitioning into a series of curved, glowing blue lines on the right. These lines form a tunnel-like structure that recedes into the distance. A grid of fine, light blue lines is visible within the tunnel, creating a sense of depth and perspective.

TREATMENT RESEARCH

SETH TOURNEY, P.E.

STANDARD OPTIONS

- Water Quality Based Standards
 - Desire to meet the designated use of the receiving water.
- Technology Treatment
 - Desire to provide the best available treatment towards achieving designated uses



STANDARD OPTIONS

WATER QUALITY BASED NEEDS

- Total Nitrogen
 - 0.1 – 2.0 mg/L (100-2000 ppb)
- Total Phosphorus
 - <0.1 – mg/L (100 ppb)

TREATMENT TECHNOLOGY CAPABILITIES

- Total Nitrogen
 - 10 mg/L
- Total Phosphorus
 - 1 mg/L

AVAILABLE ?

EPA REGION 8 STATES – STUDIES

COST-BENEFIT FEASIBILITY STUDIES

MONTANA



Montana Department of ENVIRONMENTAL QUALITY

Demonstration of Substantial and Widespread Economic Impacts to Montana That Would Result if Base Numeric Nutrient Standards had to be Met by Entities in the Private Sector in 2011/2012

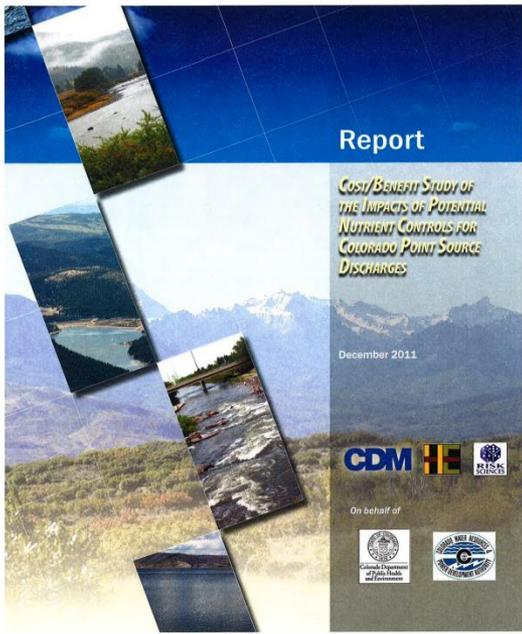
December 2012

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



WQP8WQSTR-002

COLORADO



Report

COST/BENEFIT STUDY OF THE IMPACTS OF POTENTIAL NUTRIENT CONTROLS FOR COLORADO POINT SOURCE DISCHARGES

December 2011

On behalf of



UTAH



FINAL REPORT

Statewide Nutrient Removal Cost Impact Study

October 2010

PREPARED FOR
UTAH DIVISION OF WATER QUALITY



CH2MHILL

WYOMING TREATMENT PERFORMANCE

PROPOSED CURRENT PERFORMANCE STUDY

- Select 12-18 Wastewater Treatment Plants across Wyoming
 - Various treatment technologies
 - Various watersheds
- Gather Influent and Effluent samples over the course of one year



WYOMING TREATMENT OPTIONS

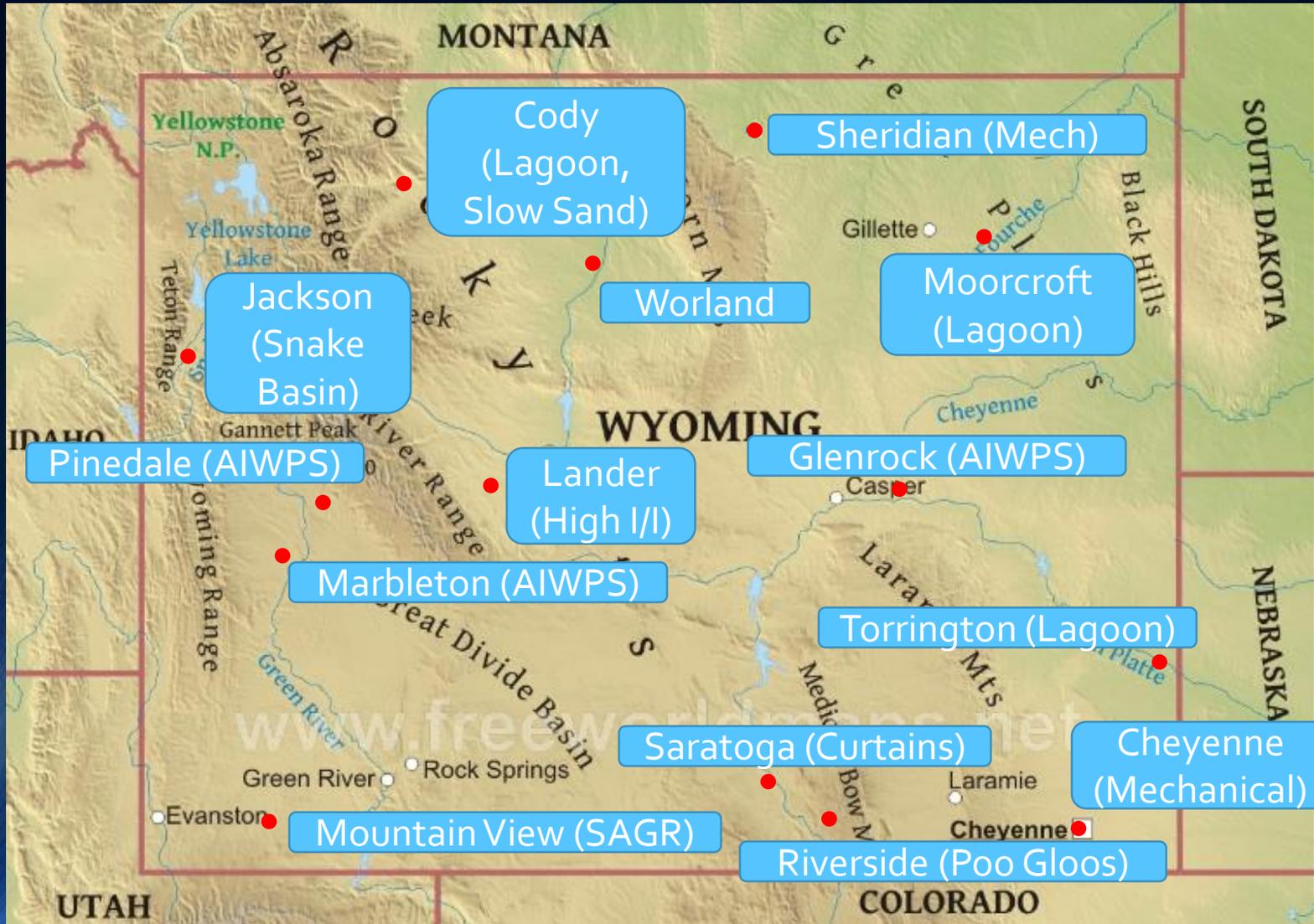
NITROGEN

- Mechanical Plants
 - Ludzack-Ettinger Process
 - Trickling Filters
- Lagoons
 - AIWPS
 - Poo-Gloos
 - SAGR

PHOSPHORUS

- TSS Removal
- Soluble Phosphorus Removal
 - Chemical Addition
 - Biological Process (PAOs)

POTENTIAL WYOMING COMMUNITIES



WYOMING - ONE YEAR STUDY

OVERALL REPORT PROCESS



WYOMING - ONE YEAR STUDY

STUDY FORMAT

- FACILITY EVALUATION
 - **SEWAGE SOURCES**
 - WASTEWATER FACILITY PROCESS
 - TREATMENT PERFORMANCE
 - OPERATIONAL COST



WYOMING - ONE YEAR STUDY

STUDY FORMAT

- FACILITY EVALUATION
 - SEWAGE SOURCES
 - **WASTEWATER FACILITY PROCESS**
 - TREATMENT PERFORMANCE
 - OPERATIONAL COST



TREATMENT FACILITY

WYOMING - ONE YEAR STUDY

STUDY FORMAT

- FACILITY EVALUATION
 - SEWAGE SOURCES
 - WASTEWATER FACILITY PROCESS
 - **TREATMENT PERFORMANCE**
 - OPERATIONAL COST



WYOMING - ONE YEAR STUDY

STUDY FORMAT

- FACILITY EVALUATION
 - SEWAGE SOURCES
 - WASTEWATER FACILITY PROCESS
 - TREATMENT PERFORMANCE
 - **OPERATIONAL COST**



WYOMING - ONE YEAR STUDY

HOW MUCH ?

- SAMPLE GATHERING – Treatment Operator Time
- SAMPLE COSTS – Proposed Financial Budget
- FACILITY EVALUATION – DEQ Staff/Municipal Time
- REPORT PREPARATION - DEQ Staff

WYOMING - ONE YEAR STUDY

SAMPLE COSTS

- Sampling Event (including shipping) = \$325.00/facility
 - Number of Facilities = 18
 - Collect Samples on a Quarterly Basis
-
- **TOTAL COST = \$23,400**

IS THIS A GOOD IDEA?



Contact Information

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