

Anaconda-Deer Lodge County

2012 N.R.D. Groundwater Restoration Plan

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Anaconda 2012 Groundwater Restoration Plan

PRELIMINARY ENGINEERING REPORT MUNICIPAL WATER SYSTEM

Prepared for:
Anaconda-Deer Lodge County
800 South Main
Anaconda, MT 59711

Prepared by:
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May 2004

Water Master Planning History:

- **2004 Water Master Plan**
 - 2002 Leakage of 2.2 mgd
- **2009 Modeling Study Amendment**
- 2008 & 2010 Leakage Re-evaluations
- **2010 Metering Implementation Plan**
- **2010 Metered Water Rate Study**
- **2012 Water Master Plan Update**
 - **Incl. GW Restoration Plan**
 - 2012 Leakage of 0.54 mgd

Anaconda 2012 Groundwater Restoration Plan

Water System IMPROVEMENTS HISTORY

- 
- **Pre-2000 Projects**
 - Mid-1990s Tank & Well Field
 - 1996 Park & Commercial Mains
 - **NRD-funded Projects (2002 thru 2010) – \$11.7M**
 - 2002 Main St. & Bowman Field
 - 2003 East 4th Transmission Main
 - 2004 West 4th Transmission Main
 - 2005 7th, East 6th & East 8th Mains
 - 2006 East 3rd & South Birch Mains
 - 2007 East 6th & 7th Mains
 - 2008 Front & Alder St. Mains
 - 2009 Updated PER Phase I – West 3rd
 - 2010 Updated PER Phase II – Anaconda Cross Streets (ongoing)

Water Main REPLACEMENT HISTORY (NRDP funded 67k ft since 2002)



WATER MASTER PLAN UPDATE Improvements (\$14.6M)



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WATER MASTER PLAN UPDATE

Table 14 – 2012 Master Plan Overall Improvement Cost Summary

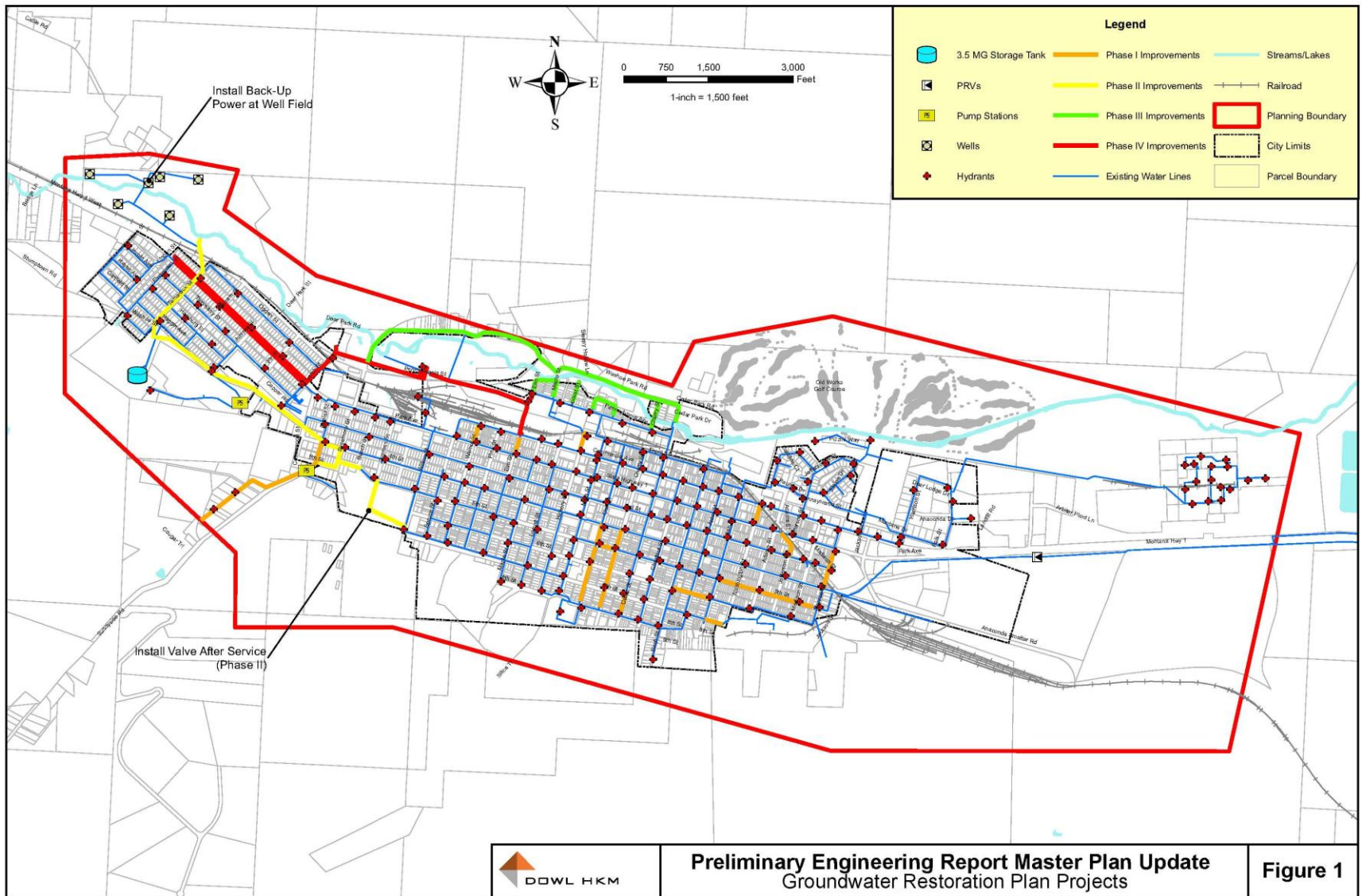
Description		Cost
Distribution System	Phase I	\$ 2,355,303
	Phase II	\$ 1,968,529
	Phase III	\$ 1,829,493
	Phase IV	\$ 2,525,947
	Phase V	\$ 1,478,026
	Phase VI	\$ 632,500
Voluntary Metering		\$ 1,000,000
Remaining Metering		\$ 2,709,983
Backup Power		\$ 80,000
Total		\$ 14,579,783

*Cost estimates include 15% Engineering and 10% Contingency.

Water Master Plan
Update Priorities Have
Been Prioritized for the
\$9.76M Most Urgent to
Include in GW
Restoration Plan

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GROUNDWATER RESTORATION PLAN Projects (\$9.76M)



Anaconda 2012 Groundwater Restoration Plan

GROUNDWATER RESTORATION PLAN Budget & Schedule

Table 1 – Groundwater Restoration Plan Costs

Description		Construction Cost	Engineering Cost	Total Cost
Distribution System	Phase I	\$ 2,048,090	\$ 307,214	\$ 2,355,304
	Phase II	\$ 1,711,765	\$ 256,765	\$ 1,968,530
	Phase III	\$ 1,590,864	\$ 238,630	\$ 1,829,494
	Phase IV	\$ 2,196,476	\$ 329,471	\$ 2,525,947
Voluntary Metering		\$ 1,000,000	\$ -	\$ 1,000,000
Backup Power		\$ 80,000	\$ -	\$ 80,000
Totals		\$ 8,627,195	\$ 1,132,079	\$ 9,759,274

- Includes \$200k per Year for 5 Years for Fully Subsidized 'Voluntary' Water Metering Program

- ADLC Will Provide Cash for Any 'Funding Gap' Between ~\$9.4M GW Allocation & \$9.76M Total

Table 2- Implementation Time Line

	Design Completion	Bid Opening	Construction Startup	Construction Completion
Phase I	March 2013	April 2013	June 2013	October 2013
Phase II	March 2014	April 2014	June 2014	October 2014
Phase III	March 2015	April 2015	June 2015	October 2015
Phase IV	March 2016	April 2016	June 2016	October 2016
Voluntary Metering	N/A	N/A	January 2013	December 2018
Backup Power	March 2013	April 2013	June 2013	October 2013

Anaconda-Deer Lodge County

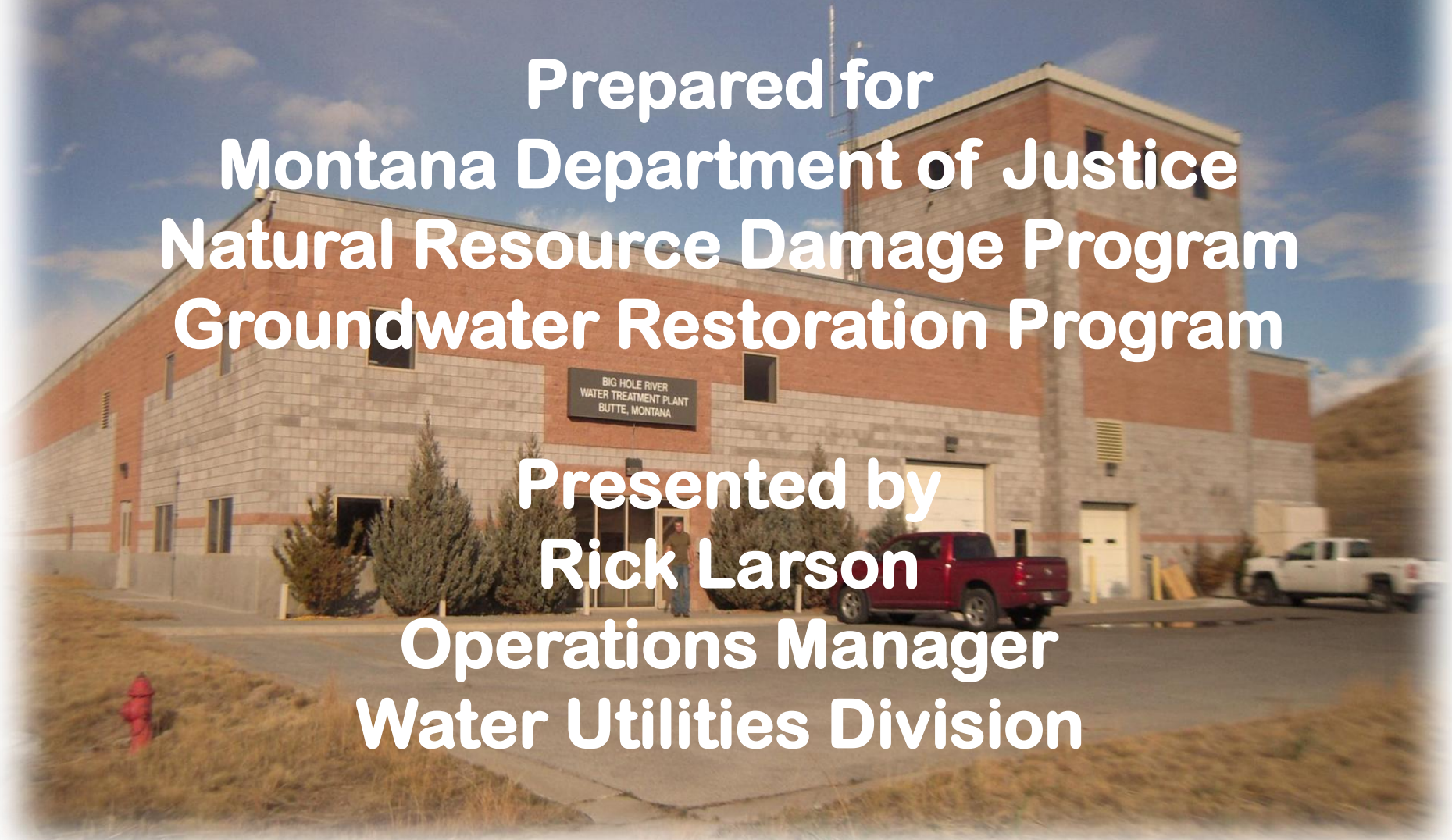
2012 N.R.D. Groundwater Restoration Plan

Questions?

City and County of Butte Silver Bow Groundwater Restoration Plan

**Prepared for
Montana Department of Justice
Natural Resource Damage Program
Groundwater Restoration Program**

**Presented by
Rick Larson
Operations Manager
Water Utilities Division**



BSB's Groundwater Restoration Plan

The Butte-Silver Bow (BSB) domestic water system is comprised of the surface water resources of the Big Hole River (including South Fork Reservoir), Basin Creek and Moulton Watersheds. Surface water treatment plants provide treatment for the Moulton and Big Hole supplies, while Basin Creek has historically operated under a filtration waiver with only chlorine disinfection. These sources provide domestic water supply and fire protection to approximately 12,800 residential and commercial customers.

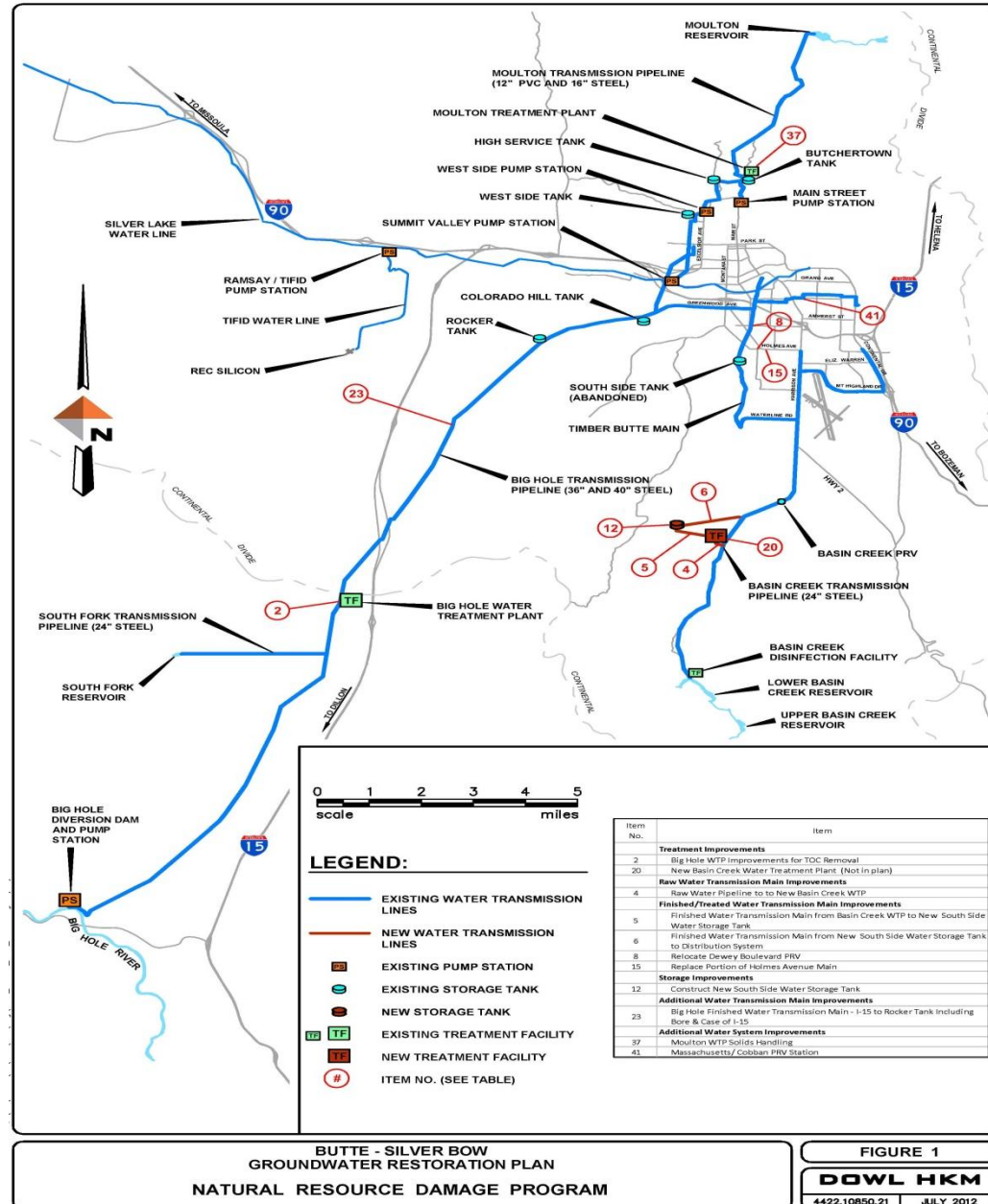
The Montana Department of Environmental Quality (DEQ) revoked the filtration waiver on the Basin Creek Reservoir. Additionally, DEQ reclassified the Big Hole Water Treatment Plant from a “direct” to “conventional” water plant.

Reclassification of the Big Hole Water Treatment Plant to a “conventional” facility mandates more stringent treatment at this facility, thereby, requiring major modifications to the facility to meet the additional treatment objectives.

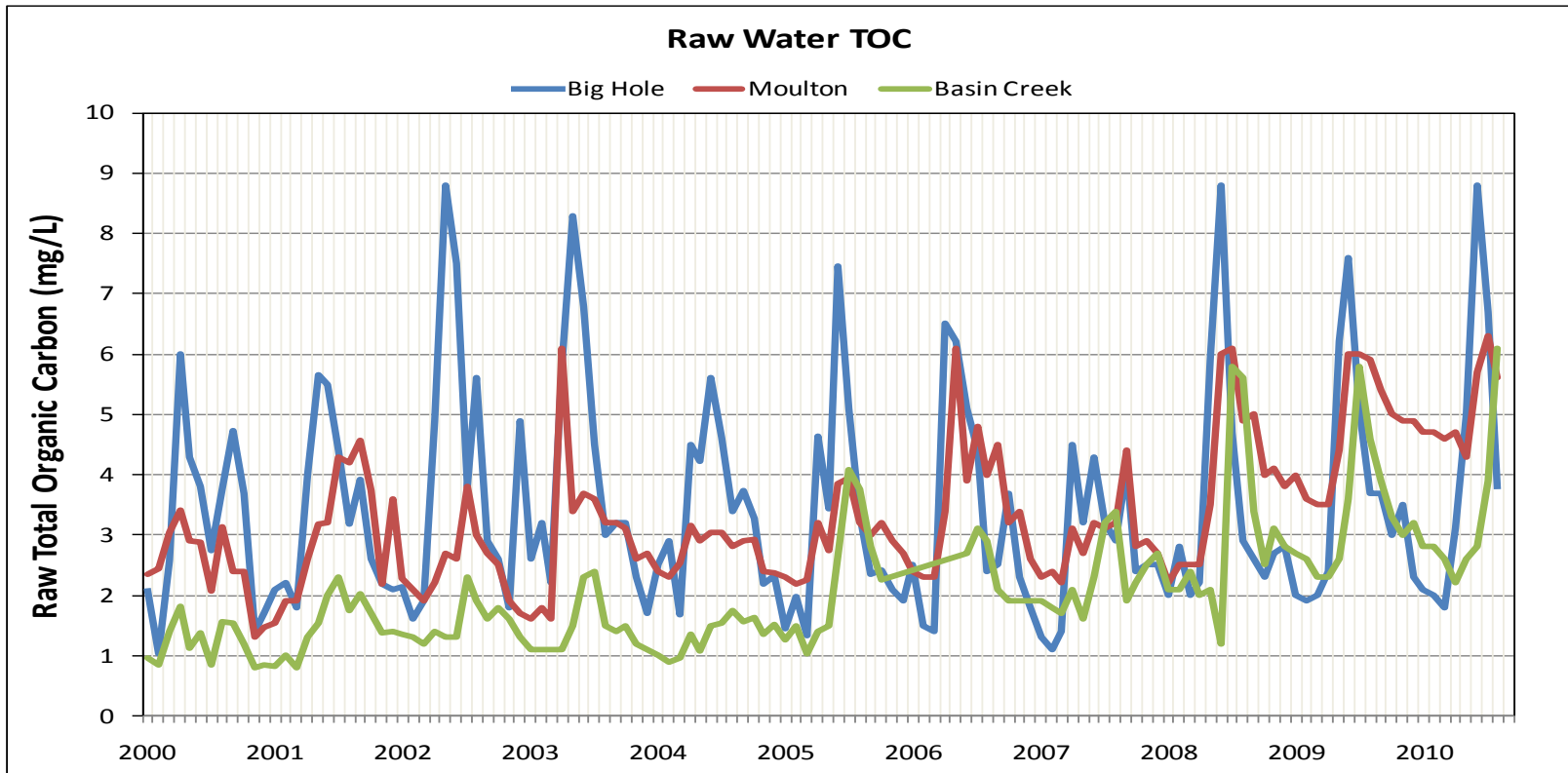
BSB's Groundwater Restoration Plan

To maintain compliance with the treatment requirements given the ever increasing Total Organic Carbon levels in their raw water supplies, the Big Hole and Moulton Treatment plants suffer over 50% reduction in treatment.

Over the past three years, considerable study has been given to these problems resulting in a 2012 Amendment to the 2008 Water Master Plan. Through this effort, Butte-Silver Bow County has charted a course for the future for both their domestic water systems. This new path of direction is the genesis of BSB's Groundwater Restoration Program.

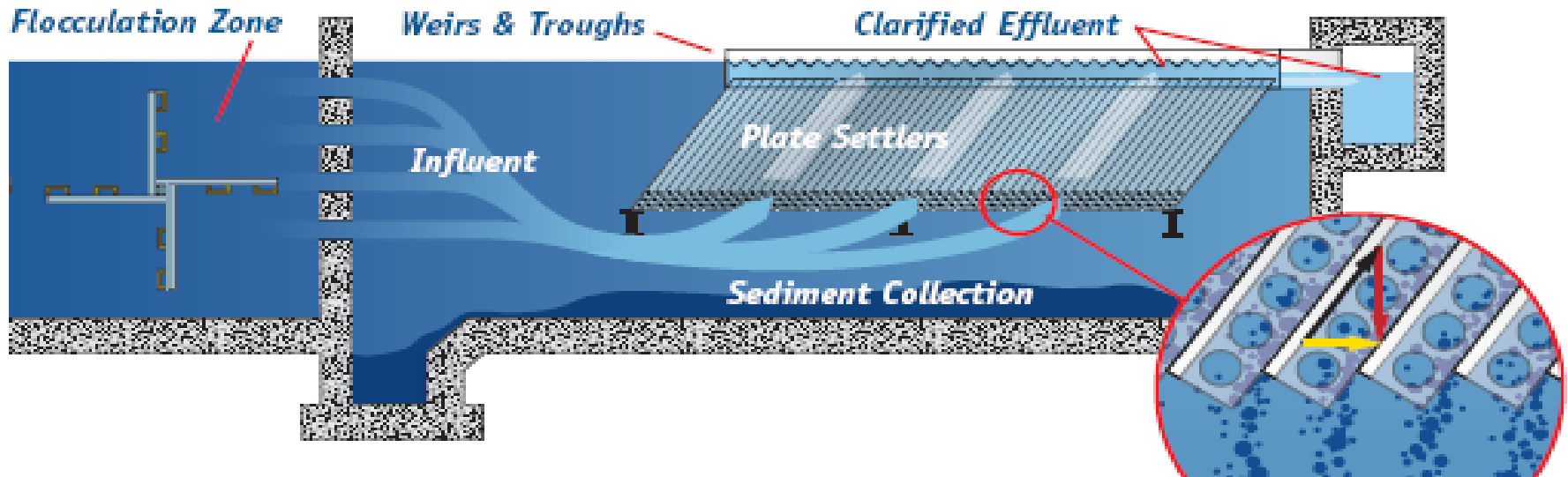


Source Water Degradation



There has been a trend of increasing Total Organic Carbon TOC concentrations in the three raw water sources. When these TOCs come in contact with chlorine for disinfection, secondary disinfection byproducts (DBP's) are formed. TOC removal requires enhanced pre-treatment of the raw water prior to chlorine contact to minimize the DBP formation.

TOC Removal



Enhanced coagulation is the process of adding coagulants that targets high removal of TOC by binding the dissolved organic carbon into a flocculant which settles and can be removed from the raw water supply.

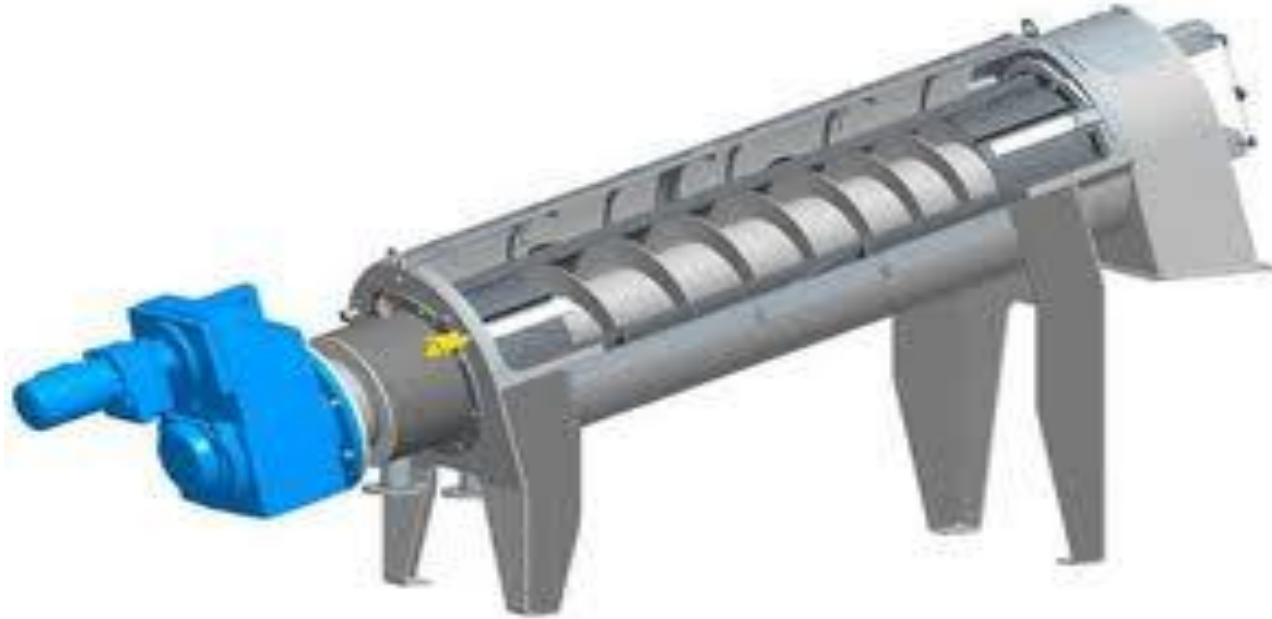
The most-common and least-costly coagulants used for enhanced coagulation include alum and ferric chloride. The existing treatment equipment at the BHWTP are not capable of being used with enhanced coagulation due to the large volume of floc/solids produced that will severely and quickly clog the process thereby reducing production capacity dramatically.

Treatment Plant Components of BSB's Groundwater Restoration Plan

A new building addition is proposed at the Big Hole Water Treatment Plant that would house new flocculation and sedimentation equipment and new chemical mixing capabilities for the express purpose of removing Total Organic Carbon (TOC) from the raw water source. Additionally, new solids handling equipment would be added to prevent the additional sedimentation process sludge from overloading the existing lagoons at the site.



Treatment Plant Components of BSB's Groundwater Restoration Plan

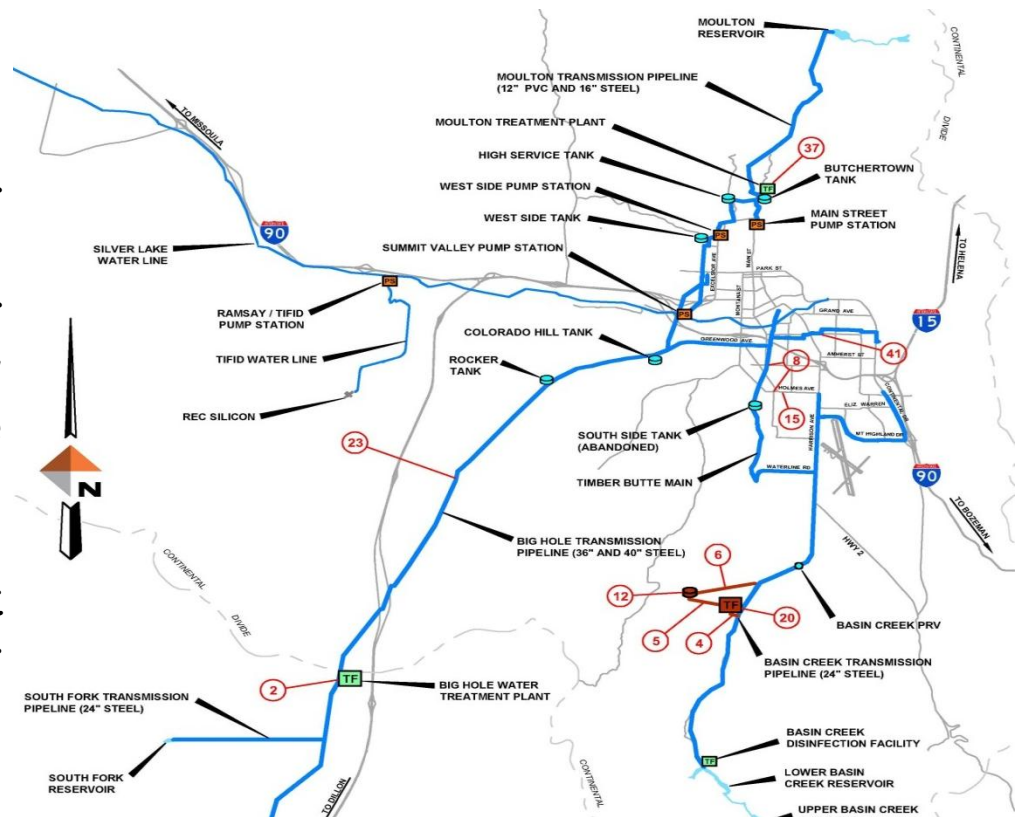


Installation of a screw press is proposed to be installed at Moulton Water Treatment Plant to enable continued use of this facility as a treated water supply. This upgrade to the solids handling capability of the water treatment plant is needed to manage the increased solids production expected from the switch to alum as the primary coagulant to reduce the Total Organic Carbon concentrations experienced in the raw water.

Transmission and Storage Tank Improvements

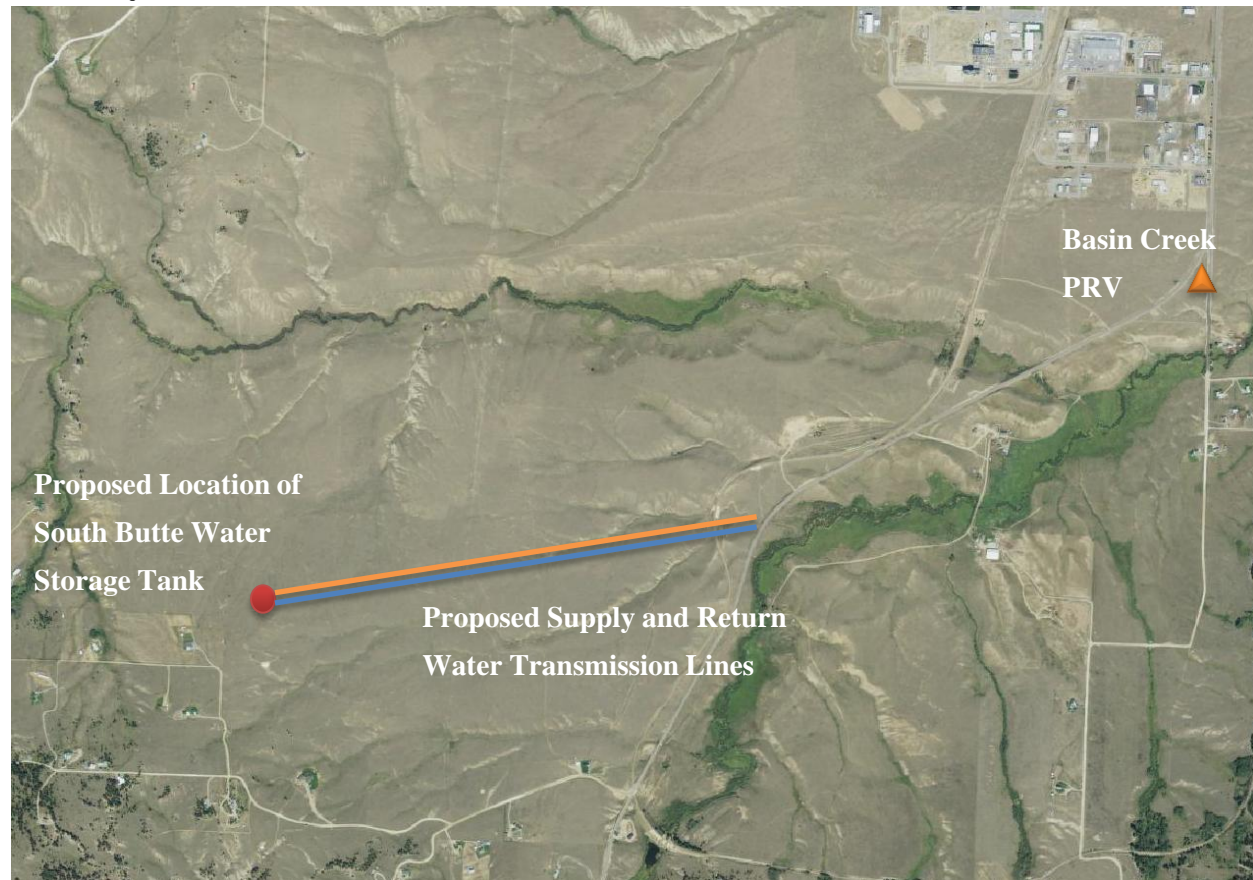
Five years ago, BSB began annual pipe replacement program for the raw and finished water transmission main from the Big Hole River near Divide to the Big Hole Water Treatment plant near Feely and from the WTP to the Colorado Hill Tank. This pipeline is the major artery for the Butte water system.

To date, BSB crews have installed nearly 65,000 feet of 36-inch ductile iron pipeline or nearly two thirds of the total pipeline scheduled for replacement. Approximately 40,000 feet remains to be replaced, beginning approximately 2 miles north of the Big Hole Water Treatment Plant to the Rucker Water Storage Tank.



Transmission and Storage Tank Improvements

In June of 2012, the BSB Chief Executive decided to ultimately treat the raw water supplies provided for by the Basin Creek Watershed. This decision was made with recognition that other sources of funding will need to be developed to address the financial requirements of that decision.



Only a storage tank and associated transmission piping installations are included in the Groundwater Restoration Plan. These components are a requirement to restore water service to the South Side Pressure Zone (South Butte) and are not dependent upon other improvements. Moreover, they will not be sacrificed when other improvements are made to the system in future years.

BSB's Groundwater Restoration Plan Summary


Summary of Financial Request from Groundwater Restoration Program

#	Item	2012 Master Plan Item #	\$\$\$ (Millions)
1	Big Hole WTP Improvements for TOC Removal	2	9.00
2	Big Hole Finished Water Transmission Main I-15 to Rocker Tank	23	7.20
3	Moulton WTP Solids Handling	37	0.20
4	Water Transmission Main for South Side Pressure Zone	4 & 5	1.60
5	New South Side Water Storage Tank	12	6.98
6	Water Transmission Main from South Side Tank to Distribution System	6	1.60
7	New Massachusetts/Cobban Pressure Reducing Valve and Vault	41	0.50
8	Relocate Dewey Blvd Pressure Reducing Valve and Vault to Holmes Avenue	8	0.50
9	Replace section of Holmes Avenue for new PRV Vault	15	0.70
	Totals		28.28

BSB's Groundwater Restoration Plan

Schedule of Completion

COMPONENT	2012				2013				2014				2015			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Big Hole WTP Improvements for TOC Removal																
Big Hole Finished Water Transmission Main I-15 to Rocker Tank																
Moulton WTP Solids Handling																
Water Transmission Main for South Side Pressure Zone																
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Relocate Dewey Blvd Pressure Reducing Valve and Vault to Holmes Avenue																
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 Design and Permitting

 Bidding

 Construction and Commissioning