McLaren Tailings Reclamation
Project Status
July 21, 2011

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Tailings, Ore Rock, Alluvial Sediments Estimated 237,000 Cubic Yards

McLaren Tailings Contribution to Total Loads in Soda Butte Creek

Monitoring point SBC-2 near Cooke City

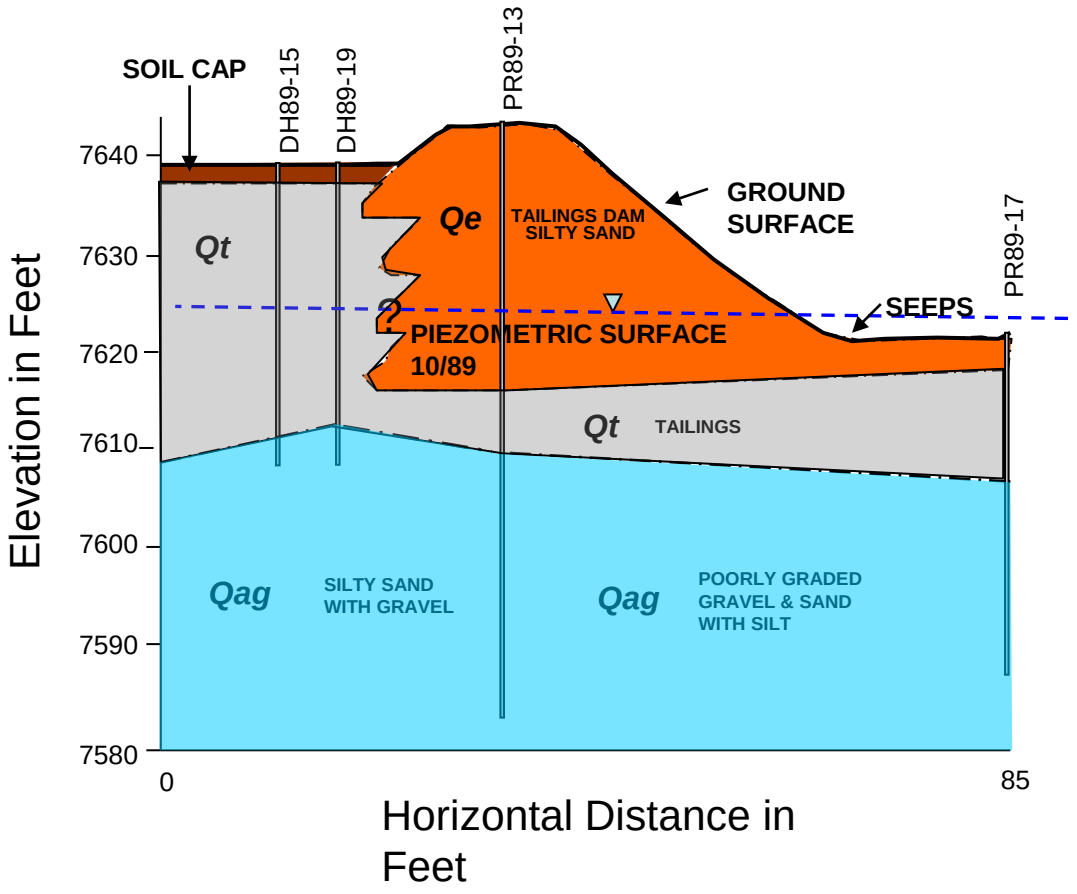
Metal	Low Flow	High Flow
Copper	60 - 90 %	> 5 %
Iron	70 - 95 %	20 - 40 %
Manganese	80 - 95 %	20 - 40 %

Monitoring point SBC-4 near Yellowstone National Park

Metal	Low Flow	High Flow
Copper	? - 90 %	?
Iron	25 -30 %	5 - 10 %
Manganese	80 - 95 %	< 5 %

MDEQ Water Quality Restoration Plan for the Cooke City TMDL Planning Area
http://www.deq.state.mt.us/wqinfo/TMDL/Cooke_City_files/FinalCCTMDL.pdf

Tailings Dam Stability
Cross-section View



<u>Previous Assessment</u>

Marginal static stability; material under dam highly susceptible to liquefaction.

Total flow from seeps approx. 40 gpm from 5 seeps in September 2008

Cross-section from Lovell Parrish, Subsurface Investigation Report, U.S. Bureau of Reclamation, 1990

Tailings Water Quality vs. DEQ Standards

Chemical	Target	Measured	Factor
Iron	0.3	1490	5000
Manganese	0.05	19.6	400
Aluminum	0.087	13.9	160
Copper	0.012	1.86	159
Cadmium	0.00033	0.0060	18
Zinc	0.15	1.73	12

Target and Measured total recoverable metals in mg/L
Target = DEQ-7 aquatic life / human health standards
Factor = Measured / Target

Project Timeline

- May 2002: Expanded Engineering Evaluation/ Cost Analysis completed
- 2002-2008: Negotiations with EPA for property purchase
- October 2007 Finding of No Significant Impacts issued by Office of Surface Mining
- 2008-2009: Site Assessment/Reclamation Design
- October 2009: Invitation for Bid issued
- April 2010: Project award to Knife River
- June 2010: First construction season
- October 2015: Project completion

Project Bid Alternatives

(1) Place all wastes in onsite repository

(2) Reprocess tailings at Golden Sunlight Mine in 2011 with remaining mine wastes placed in repository

(3) Reprocess tailings at Golden Sunlight Mine in 2011 and 2012 with remaining mine wastes placed in repository

Project Scope of Work

- Excavate mine wastes and contaminated media
- Mix quicklime with tailings to stabilize
- Operate a construction dewatering and treatment system
- Place mine wastes and contaminated media in a repository constructed onsite
- Reconstruct 2,000 feet of creek channel
- Amend cover soils with compost
- Grade and revegetate affected areas

Tailings Stabilization

- Mix quicklime with tailings in place below ground surface to minimize lime dust
- Dry wet tailings to promote compaction and structural stability in repository
- Reduce metal mobility

Metals Leaching From Tailings Pre and Post Lime Addition

Chemical	Target	Pre-lime	3 percent lime
Iron	0.3	24.5	<0.01
Manganese	0.05	4.29	<0.001
Aluminum	0.087	0.182	0.038
Copper	0.012	0.065	0.086
Cadmium	0.00033	0.091	<0.010
Zinc	0.15	0.23	<0.02

Target and Measured SPLP metals in mg/L

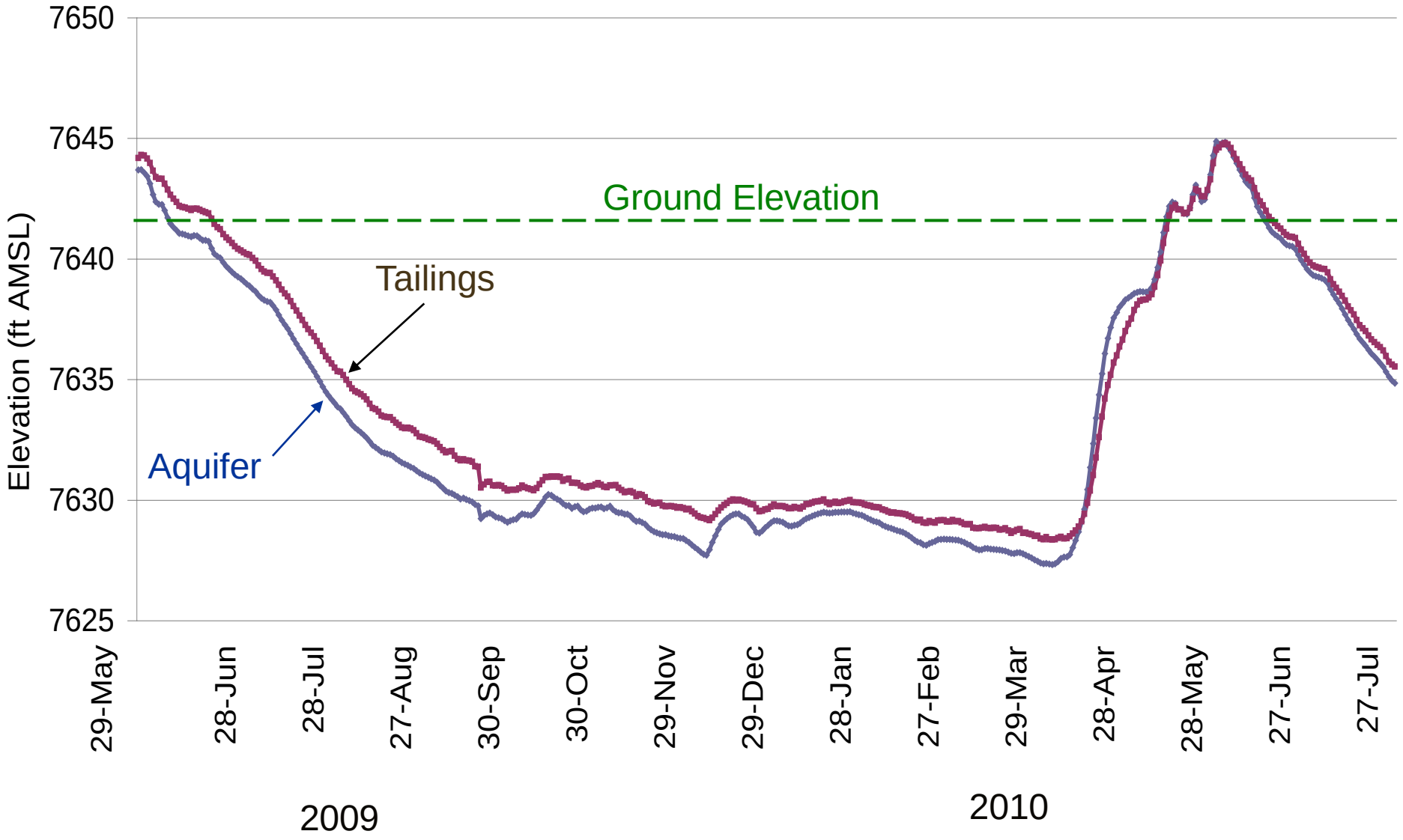
Target = DEQ-7 aquatic life / human health standards

Water Treatment

- Pump groundwater from site margins and beneath tailings
- Apply lime slurry as needed to increase water pH and alkalinity
- Precipitate metals in a constructed sediment basin equipped with filter curtains

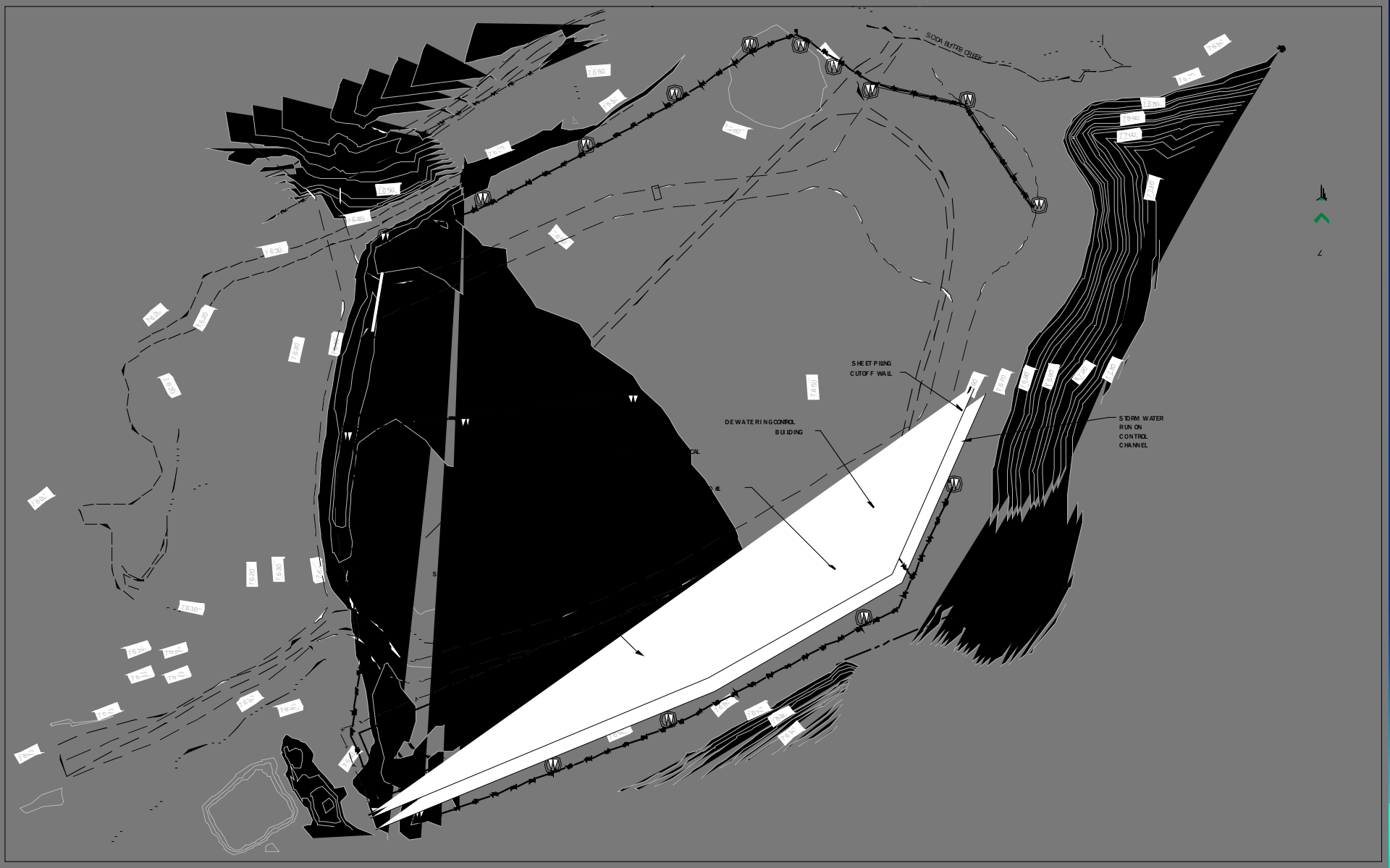
Water in Tailings Excavation: July 20,2011

Fluid Levels Under Tailings Impoundment 2009 - 2010

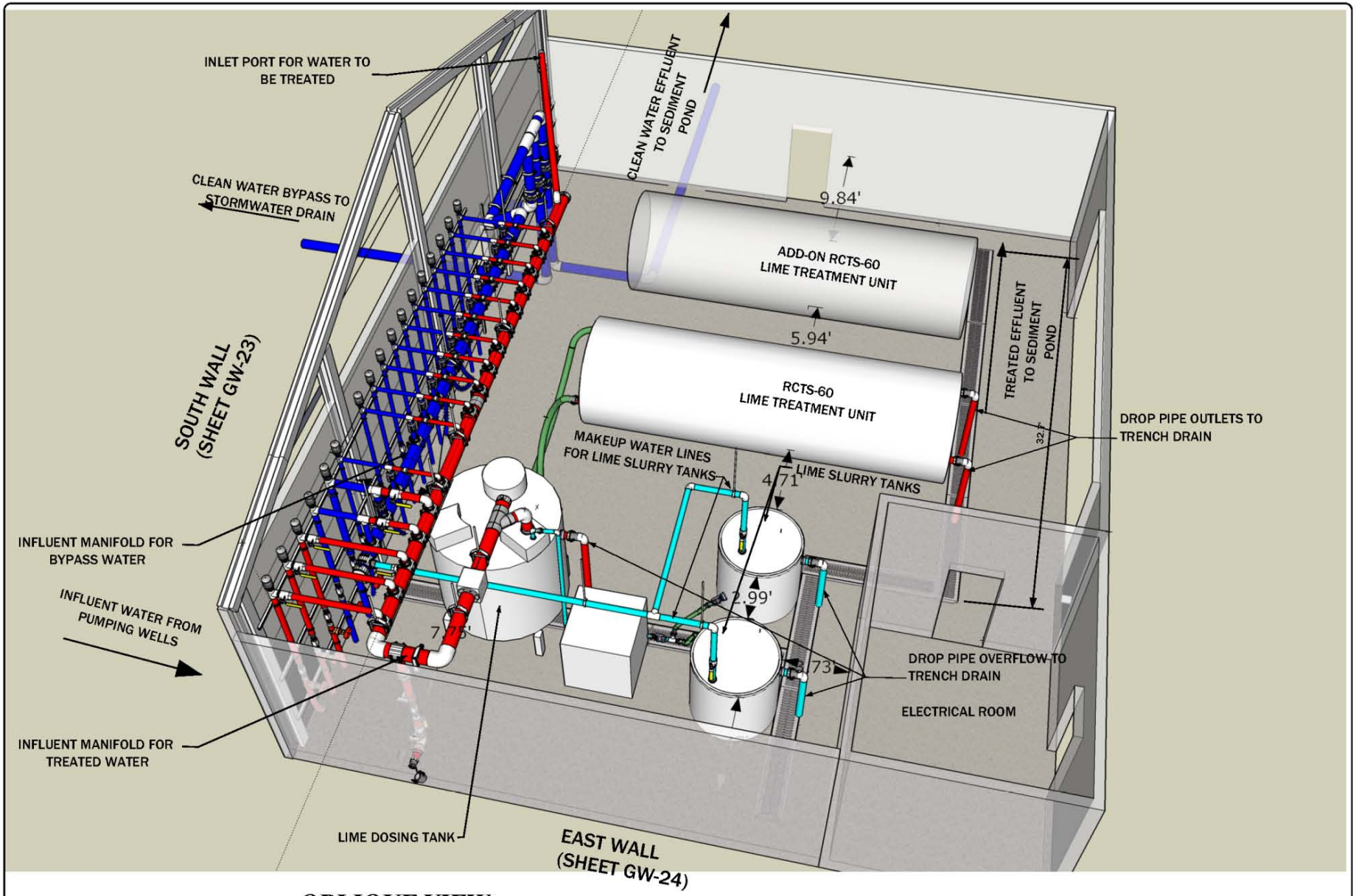


Artesian Conditions Below Tailings

Groundwater Pumping Wells



Water Treatment System

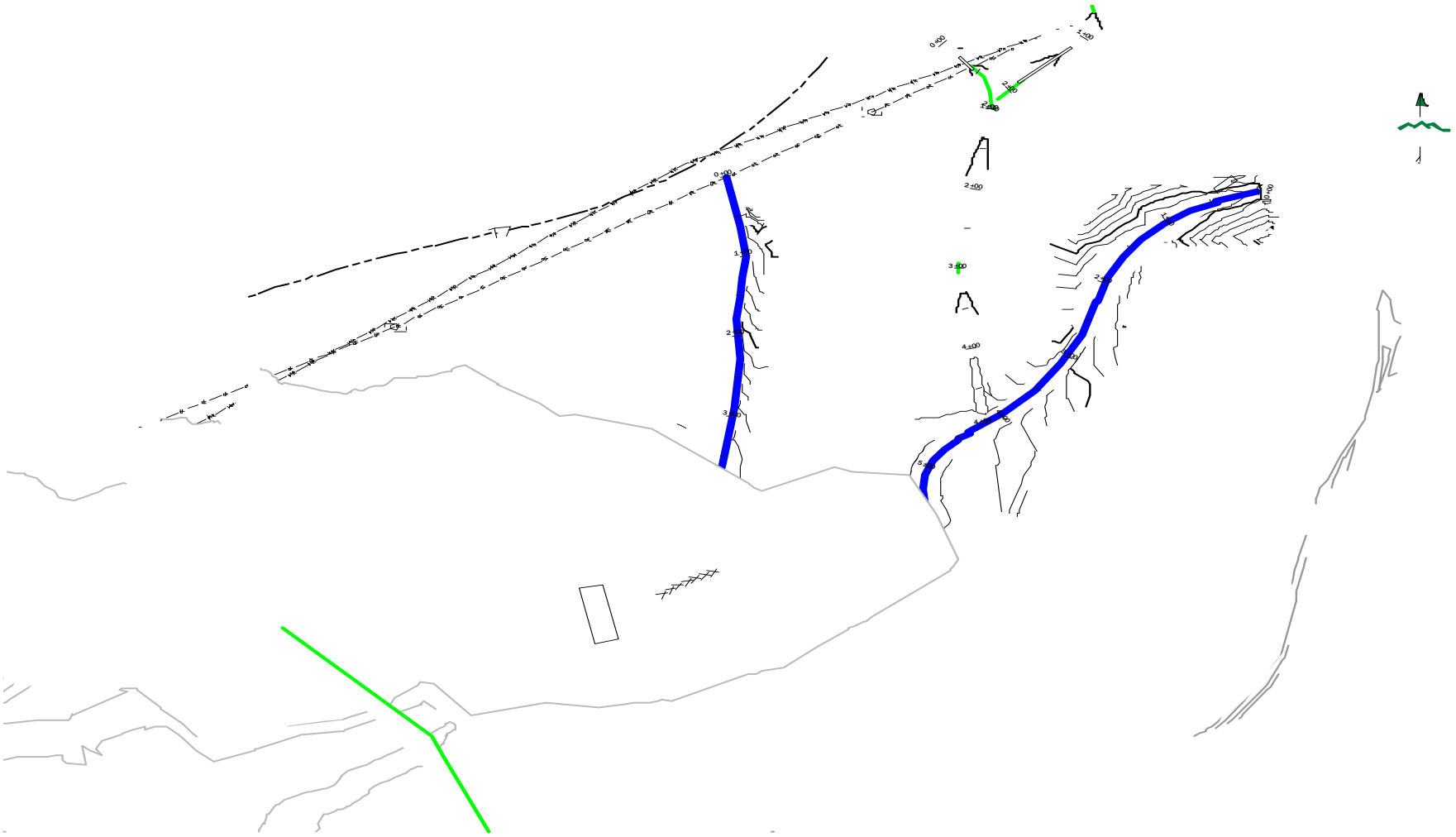


OBLIQUE VIEW

Stream Reconstruction

- Historical Soda Butte Creek and Miller Creek channels are covered by the tailings impoundment
- Create runs, pools and transitions, and flood-prone areas to enhance streambed and floodplain habitat
- Divert flows between existing Soda Butte Creek and newly constructed Soda Butte Creek in winter 2014

Reconstructed Stream Geometry



2010 Reclamation Work

- Constructed two bridges over Soda Butte Creek
- Installed surface water and sediment control measures
- Salvaged and seeded cover soil
- Began repository excavation
- Began stabilizing tailings using ALLU system
- Placed mine wastes in repository and covered with temporary liner

Soil Mixing: 2010

August 17, 2010

2011 Reclamation Work

- Abandoned plan for offsite hauling
- Constructed 2 new piezometers in repository
- Deepen western portion of repository approximately 6 feet
- Complete water treatment building
- Complete sediment pond
- Stabilize tailings using ALLU system
- Compact mine wastes in repository and cover with temporary liner

Site Conditions: May 13, 2011

New Piezometer PZ-8

New Piezometer PZ-9

2011 Fluid Level Measurements in Feet Below Ground Surface

Date	PZ-8	PZ-9
June 21, 2011	15.6	ND
June 22, 2011	15.7	ND
June 23, 2011	15.8	ND
June 28, 2011	17.7	ND
June 29, 2011	17.9	ND
July 6, 2011	19.4	ND
July 7, 2011	ND	ND
July 12, 2011	ND	ND
July 21, 2011	ND	ND

New ALLU Mixing Head

Repository Floor: June 30, 2011

Repository Floor: June 30, 2011

Stabilized Tailings: July 20, 2011

Stabilized Tailings: July 20, 2011

Water Treatment Building: June 28, 2011

2011 Project Status

- New piezometers indicate adequate separation to groundwater under expanded repository
- Significant improvements in mixing lime into tailings have occurred in 2011
- Stabilization and compaction of tailings in repository have been successful
- Project currently on schedule / ahead of schedule

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

Questions

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