

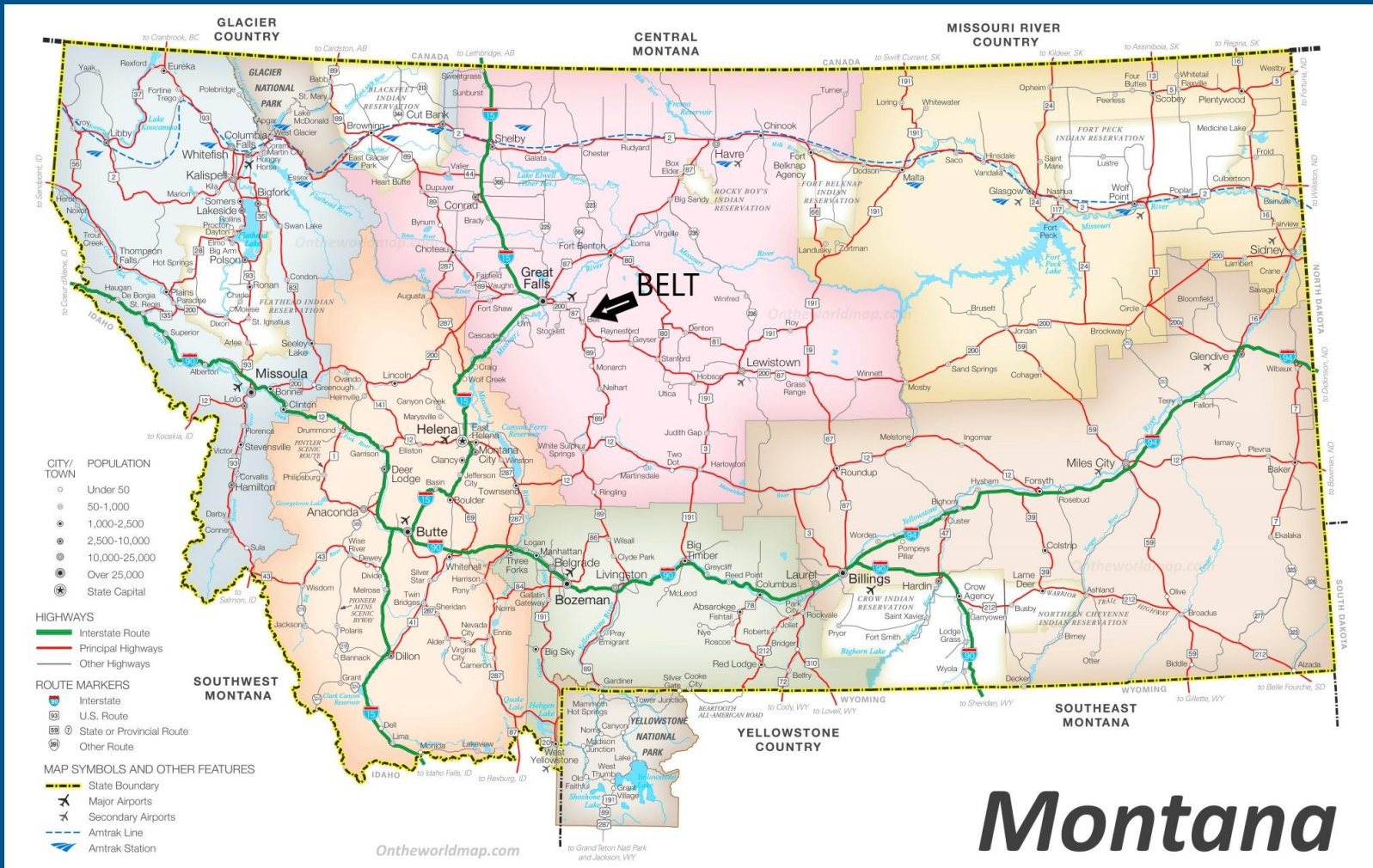
BELT WATER TREATMENT PLANT

BELT, MONTANA



DEQ
MONTANA

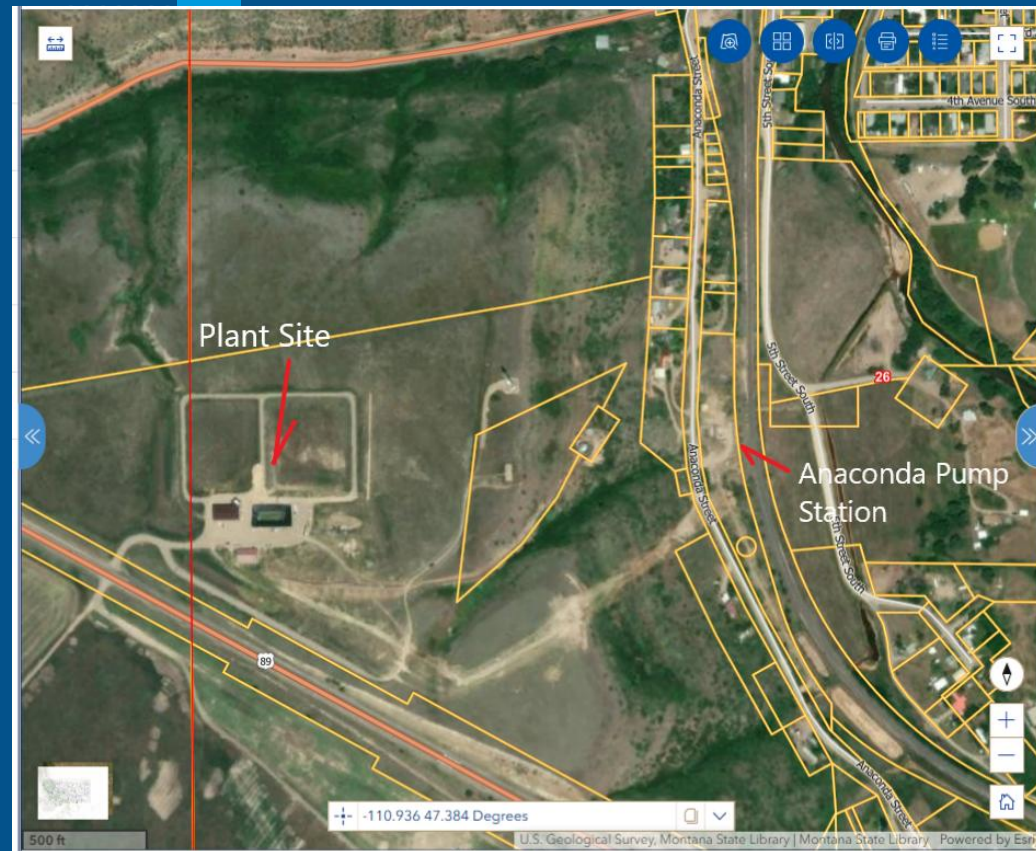
PROJECT LOCATION



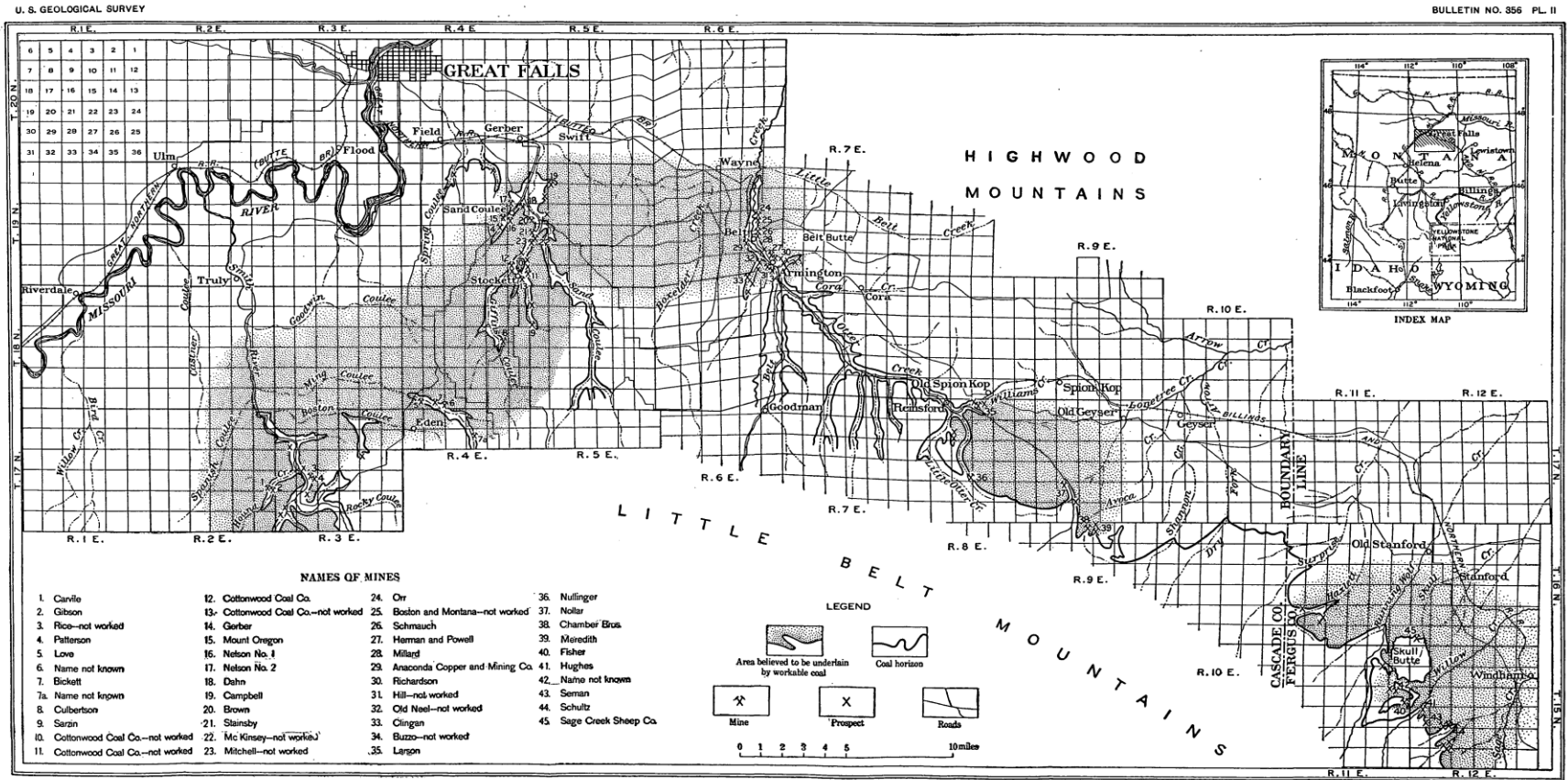
PROJECT LOCATION (cont.)

SITE MAP

- The Belt Water Treatment Plant is located on the bench just west of the town of Belt.
- After a geotechnical survey, the original site in Belt was determined to be too unstable to support the plant. DEQ purchased the current site from a local landowner.



The Great Falls Coal Field



MAP OF THE GREAT FALLS REGION, MONTANA, SHOWING COAL LANDS.



The Great Falls Coal Field (cont.)

- The depositional environment for these coal deposits was dominated by shifting swamps and lakes creating coal deposits which vary in thickness across the area.
- The Great Falls field extends east from the Missouri River near Great Falls for a distance of 60 miles along the base of the Little Belt Mountains. The coal occurs in a zone about 60 to 90 feet above the base of the formation.



The Great Falls Coal Field (cont.)

- The coal deposits are found in the Lower Cretaceous Kootenai formation which also contains one of the local aquifers.
- Much of the Kootenai Aquifer has been compromised by historic coal mining due to the acidic water.
- DEQ has replaced many Kootenai wells in this area accessing the Madison Aquifer for potable water. The Kootenai is generally from 30 to 200 feet bgs in this area and the Madison is found between 400 and 600 feet bgs.

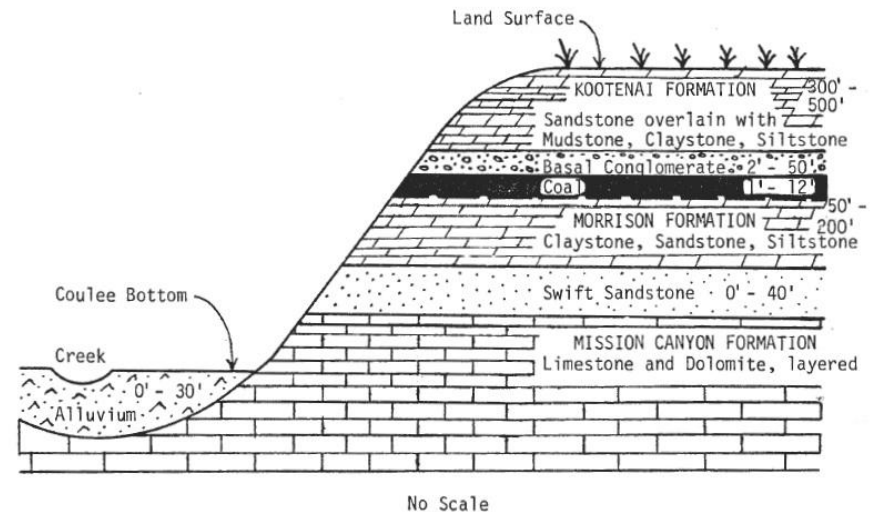


Figure 3. Generalized Cross-Section Showing Stratigraphy of the Sand Coulee Creek Drainage (after McArthur, 1970)

History of Coal Mining in Belt

- **April 28, 1805:** Lewis wrote there was "more appearance of coal today than they had yet seen," indicating massive deposits near what is now known to be the Great Falls coal field.



History of Coal Mining in Belt

(cont.)

ANACONDA MINE, BELT, MT



- From the 1880's through the early 1900's, the Great Falls Coal Field was Montana's most productive coal field.
- Railroads were a major user of coal from this area. Montana's first railroad, the Utah & Northern, entered the state in 1880. The Northern Pacific completed an east-west line across Montana in 1883, and by 1889 a predecessor of the Great Northern had completed a line from North Dakota as far as Butte.



History of Coal Mining in Belt

(cont.)



COKE OVEN FLATS

- Mining began in Belt on a small scale in the mid 1870's when the first coal claims were staked by John Castner. Initial mining supplied fuel for shipping in Ft. Benton and local use.
- The Anaconda Mining Company (ACM) began large scale mining throughout the area. They built coke ovens to produce coke for smelting ore from the Butte mines and shipped 2,500 tons of coke per day to the Great Falls Smelter.
- The largest of the Great Falls field operations was ACM's Belt Mine, which a predecessor company began aggressively developing in 1894. The mine supplied ACM's mining and beneficiation operations in Butte, Anaconda, and Great Falls with coal and coke from 1894 to 1913.



History of Coal Mining in Belt

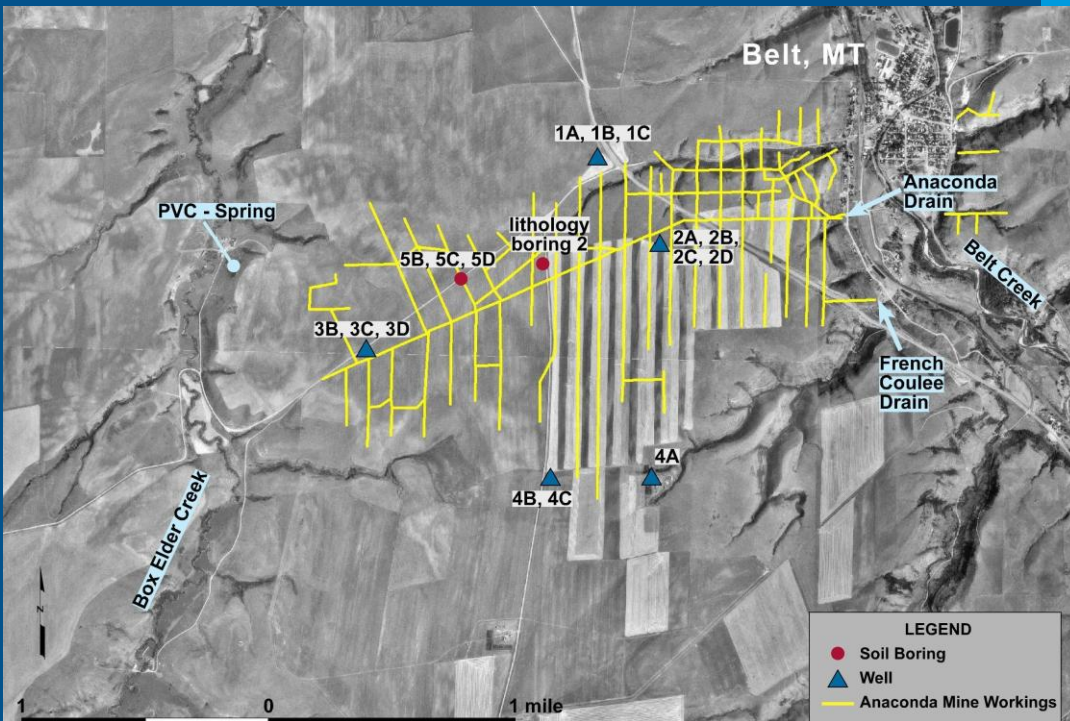
(cont.)

➤ The mine produced a total of about 7.5 million tons of coal over a 20-year period. After ACM closed its Belt property due to increasing poor mine economies, it transferred its local coal department to the Sand Coulee area.

➤ The Anaconda mine is quite extensive being nearly 2 miles from the portal to where mining ceased

➤ Intermittent mining occurred after ACM left with a slight resurgence during WWI.

➤ Some mining likely occurred during the depression and the last known coal extraction in the Belt area was completed by 1963.



History of Remediation Investigations in the Belt area

- The coal deposits in the Great Falls Coal Field contain iron pyrite nodules, which when exposed to air and water, result in water that is very low in pH and high in dissolved metals especially Fe and Al.
- The acid generating potential of the coal in the Great Falls Coal Field was recognized early in the history of mining in the area. Reports from the early 1900's discuss the problems with iron pipes and pumps corroding quickly and the need for constant replacement.



Ferrocement at the local swimming hole on Belt Creek

History of Remediation Investigations in the Belt area (cont.)

- The first report appears to have been completed in 1981 and began a district-wide survey of coal mines, mine wastes, and other mining related issues.
- As a result of this survey, a great deal of surface coal waste and infrastructure was cleaned up. Many portals were closed.
- From 1994 to 1996 the USGS completed a large monitoring program that collected water quantity and quality data.

Gauging Station discharge to Belt Creek



History of Remediation Investigations in the Belt area (cont.)

- Numerous studies were completed in the following years.
- MBMG, USGS, several Universities, and the State of Montana DEQ are some of the organizations that have completed work here.
- A great deal of test work has been completed over the years investigating various methods for treating the Acid Mine Water.



AMD Discharge to Belt Creek with heavy iron deposits



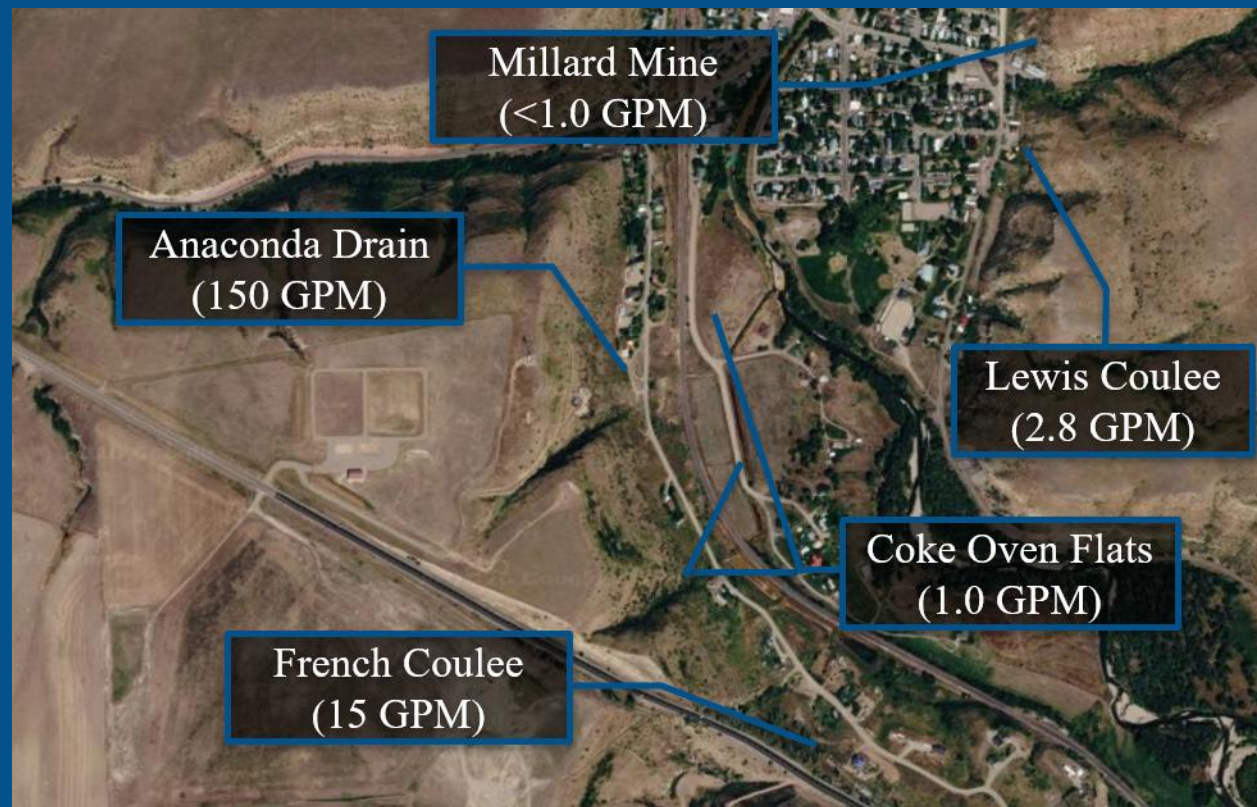
PROJECT FUNDING

- OSM Funding – Funding for the plant was provided by the Office of Surface Mining (OSM). These federal coal tax dollars provided funding for construction and future operation of the plant. Final construction costs were approximately \$13m.
- Set Aside (Future Operation) – Planning for long term funding for operation of the plant was initiated in 2012. In 2013 approximately \$7 million dollars were placed in the account. Currently there is over \$31m in the account which will operate the plant for close to 100 years.
- DNRC Grants – A DNRC Planning Grant was awarded in 2014 in the amount of \$500,000.

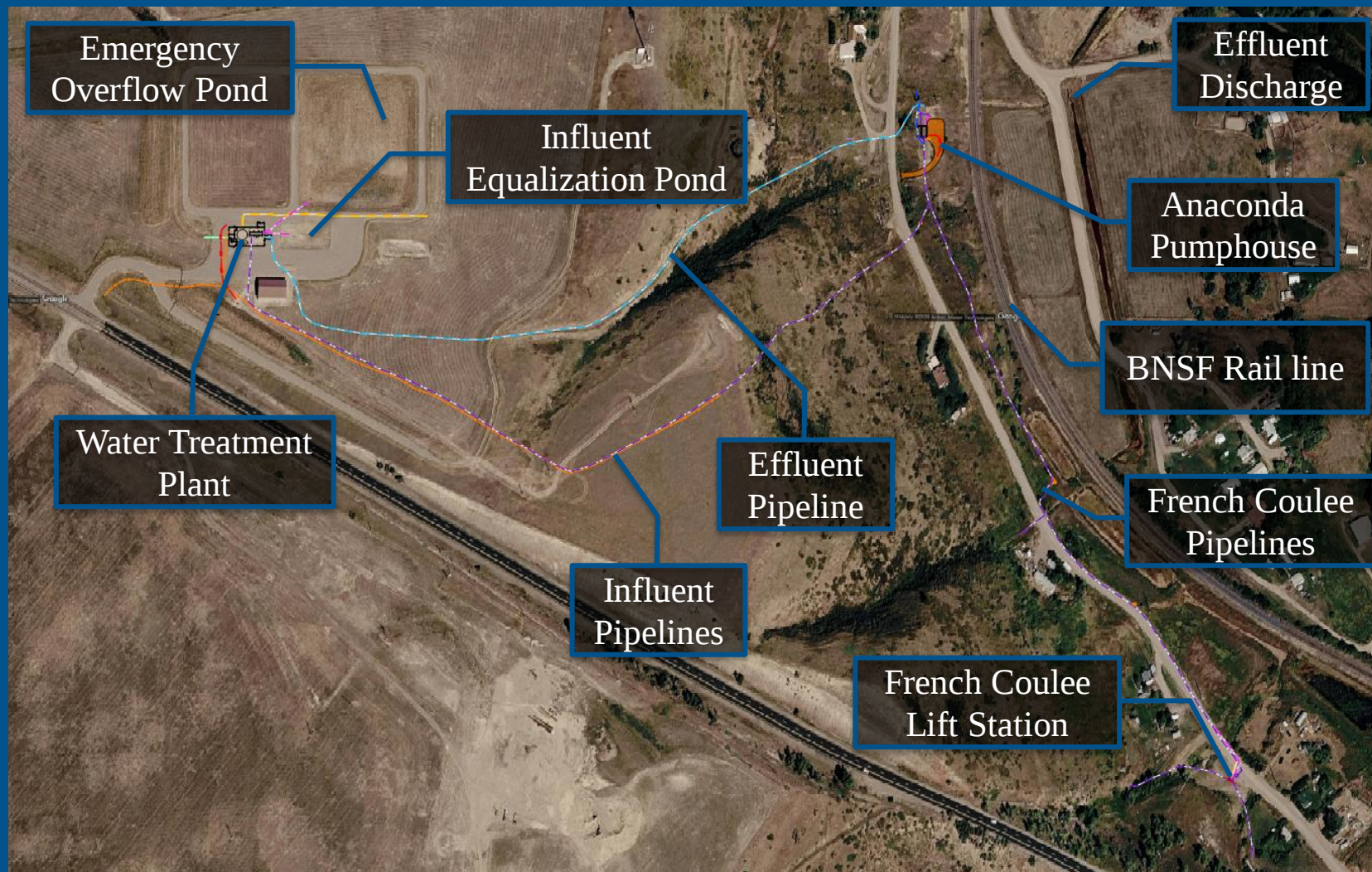


Water Treatment Plant Design (cont.)

- The selected sources of mine impacted water (MIW) to be treated included the Anaconda adit and French Coulee drains.
- Respectively these sources produce ~150gpm and ~15gpm at peak flows.



Water Treatment Plant Design



Water Treatment Plant Design

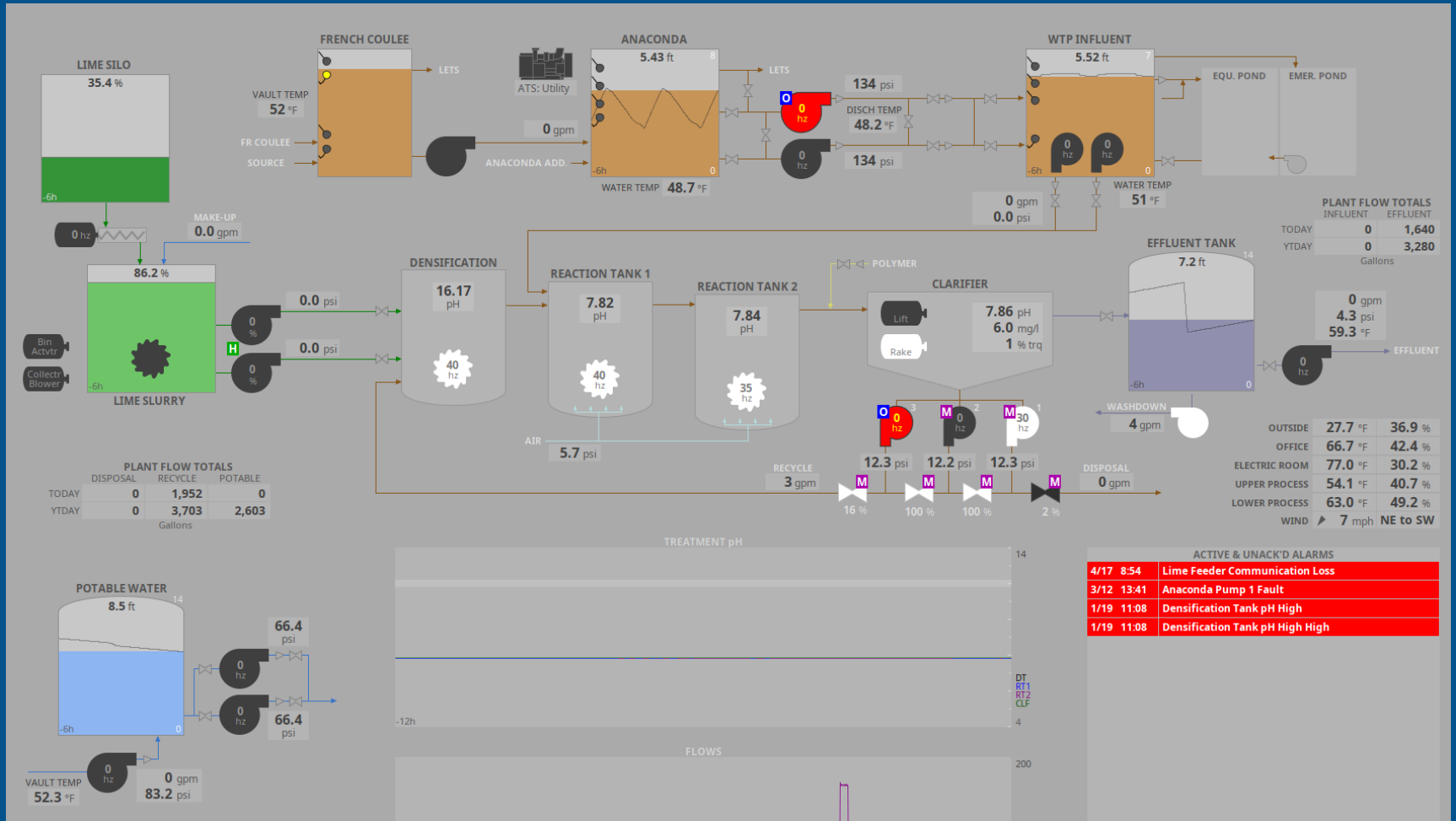
- A High-Density Sludge treatment system was selected to treat the MIW.
- The plant was designed for a 30 to 1 sludge recycle to disposal rate, which was selected to increase the percent solids in the sludge to ~12% due to limited on-site disposal capacity.
- A pH adjustment is used to transform the dissolved metals into suspended particles in the MIW.

Parameter	Units	Influent AVG	Effluent Target	Removal
pH	s.u.	3.02	6.0 to 9.0	-
Total Suspended TSS	mg/L	13.0	70.0	-
Aluminum, Dissolved	mg/L	126.0	0.143	125.9
Iron, Total	mg/L	201.0	7.0	194.0
Manganese, Total	mg/L	73.0	4.0	69.0
Cadmium, Total	mg/L	0.008	0.003	0.005
Copper, Total	mg/L	0.217	0.037	-
Lead, Total	mg/L	0.001	0.015	-
Zinc, Total	mg/L	3.7	0.3	3.4

Note: TDS Influent is 3,600 mg/L



Water Treatment Plant Design



Site Preparation

- Ground was broken in October 2021 to establish the upper site.
- The WTP pad, access roads, influent equalization pond, and emergency retention pond were constructed.



Covid Supply Chain Uncertainties

- Manufacturers of key equipment were still recovering from supply chain issues in 2022 caused by the pandemic, resulting in lead times of 12 to 18+ months.
- Procurement of the process equipment was completed early 2023.
- Over the summer of 2023, a storage building was constructed for major components.



Water Treatment Plant Construction

- Ground was broken on May 7th, 2024.
- WTP Foundation was completed July 26th, 2024.



Water Treatment Plant Construction

- Process equipment was completed Oct. 2, 2024
- WTP building erection completed Nov. 22, 2024



Water Treatment Plant Construction

- Through 2024 and 2025 more than 20,000 feet of pipelines were installed



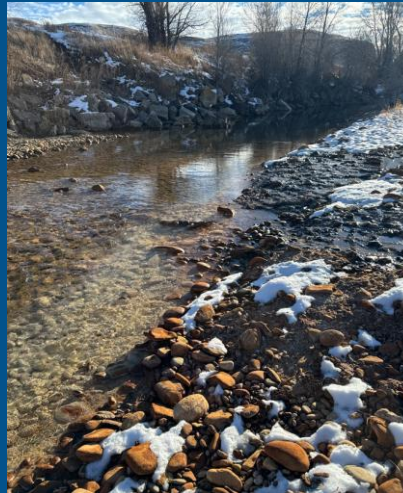
Water Treatment Plant Construction

- The Anaconda pumphouse became operational on Oct. 10, 2025
- The French Coulee lift station became operational on Dec. 4, 2025



Water Treatment Plant Construction

- Pumping of mine impacted water from lower site began Oct. 14, 2025 and preliminary treatment began.
- After substantial completion, DEQ held a grand opening on Nov. 5, 2025.
- Effluent water discharge to Belt Creek began Dec. 4, 2025.
- Through the end of 2025, a total of 29,800 manhours were worked on the project with zero incidents.

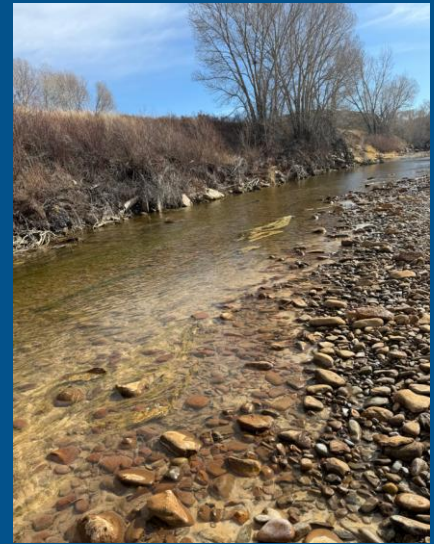


TIME-LAPSE OF PLANT CONSTRUCTION



Treatment Results

- Since the WTP has been in operation the treatment process is continually refined to efficiently remove the metals.
- Approximately 98.8% of the metals are being removed



Q U E S T I O N S ?

