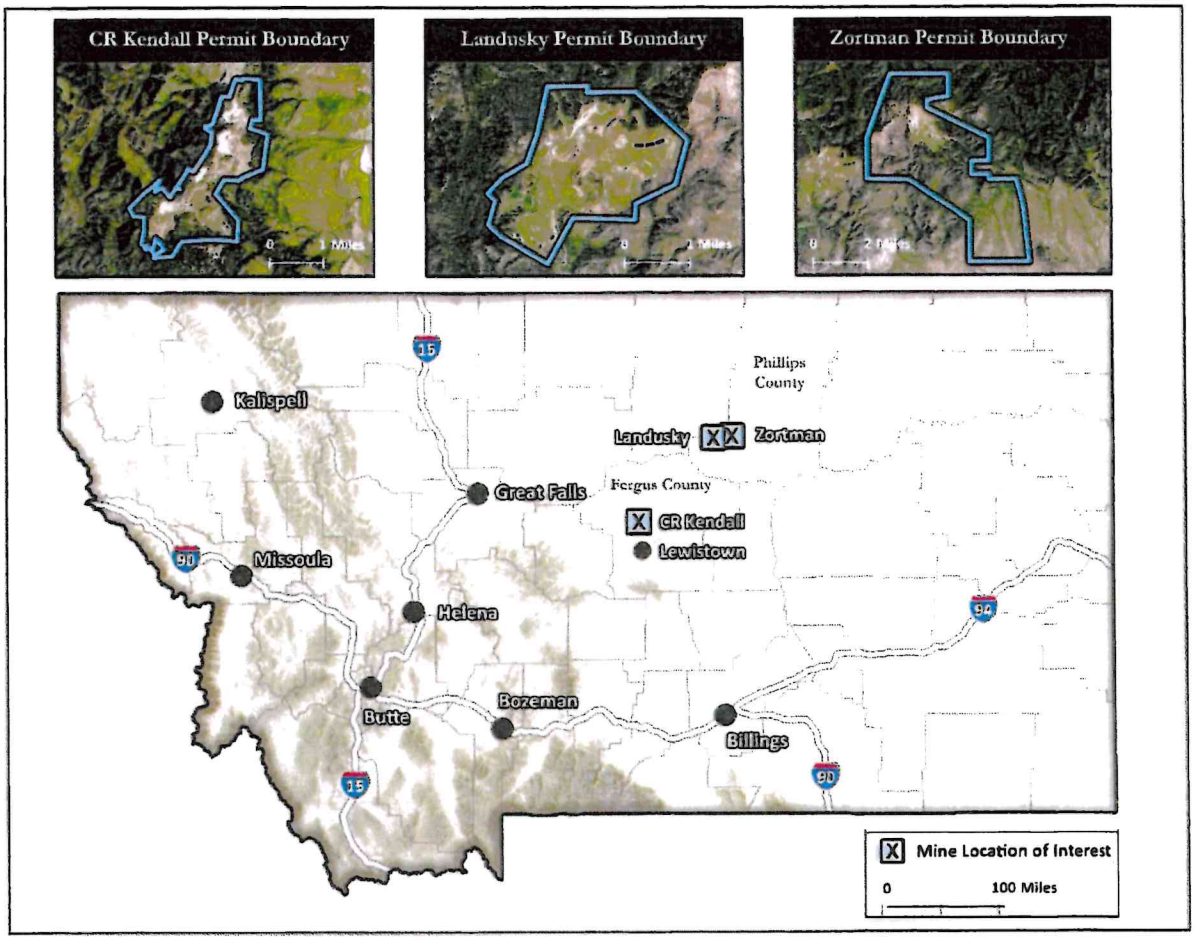
CR Kendall Mine, Zortman Mine and Landusky Mine

Location



ZORTMAN-LANDUSKY AND CR KENDALL WATER TREATMENT FUNDING

Resource Development Grant (02405)	
FY2024 Award Bal ($)	40,088
FY2026 Award ($)	500,000

Z/L Long Term H2O Trust Fund (09005)*	
Principal ($)	20,335,867
STIP ($)	22,818,099
Amount we can use ($)	2,482,232

Pegasus Bankruptcy/Operations (02521)*	
Principal ($)	-
STIP ($)	-
These funds were expended in 2018	

Zortman Landusky Long Term H20 (08217)	
Principal ($)	15,636,303
STIP ($)	17,099,993
Amount we can use ($)	1,463,690

BLM (03520)	
FY2025 Award ($)	1,779,646

BLM funding varies
$300K-$1.3M/yr

Metal Mines (02988)	
Taxes ($)	1.05M/yr

CR Kendall Trust (08237)	
Principal ($)	
STIP ($)	-
These funds were expended in 2023	

Orphan Share (02472)	
HB58 [2025] authorized funds to be used.	
Amount ($):	500,000/yr

Resource Development Grant (02405)	
FY2026 Award ($):	290,352



*CR Kendall may not require treatment in perpetuity. The EIS that DEQ completed in 2016 estimated that water treatment would continue for up to 40 years. After this time, treatment may only require two people onsite w/infrequent maintenance. The orphan share funding for CR Kendal will last for 13 years, starting with FY '26.

*The fund must be invested by the board of investments pursuant to Title 17, chapter 6, part 2, and the earnings from the investment must be credited to the principal of the fund until the year 2018.

The prinicpal must remain untouched unless appropriated by a vote of 2/3 of the members of each house of the legislature. (MCA 82-4-367)

Updated: 05/21/2025

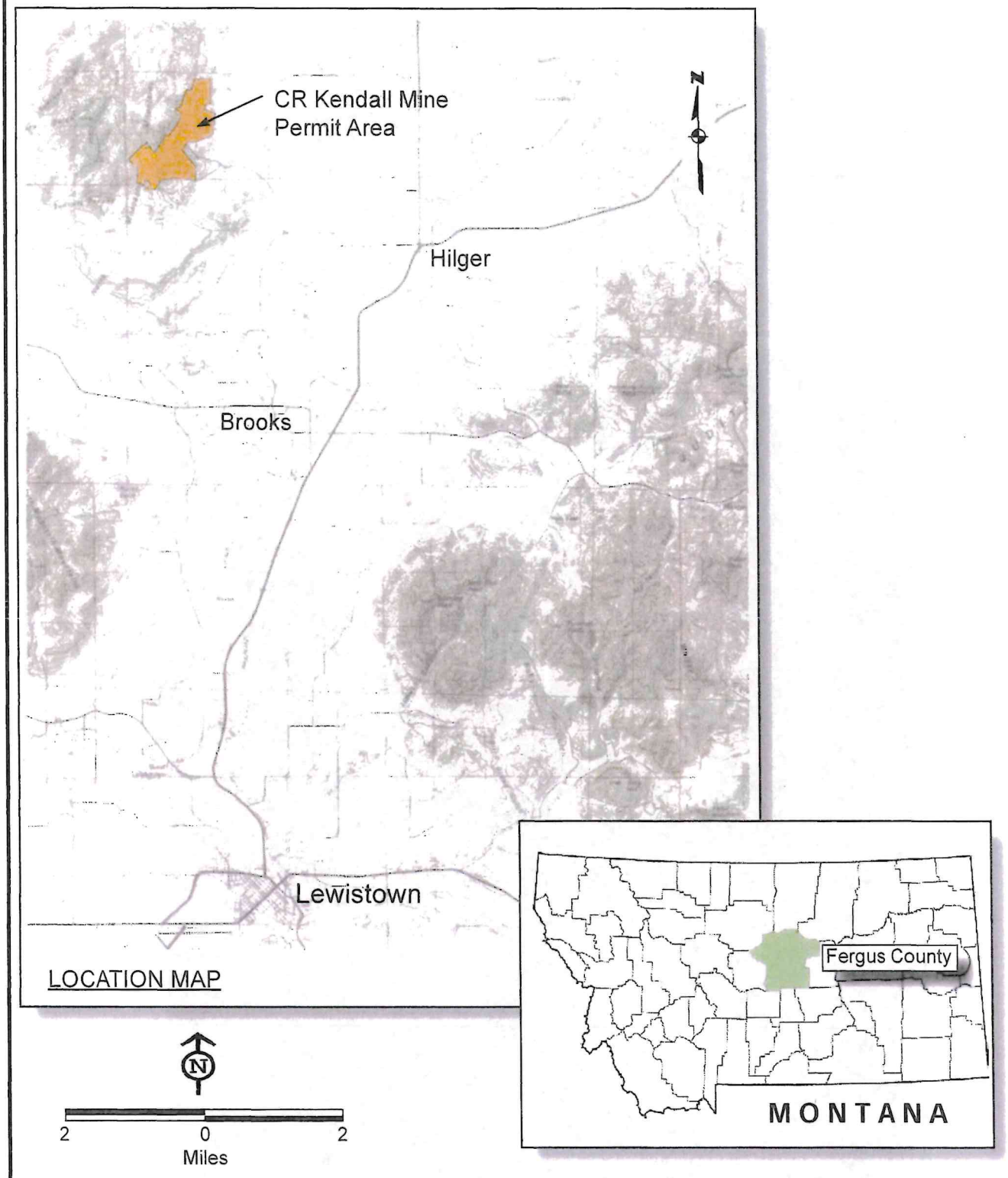


Figure 1-1
Project Location Map

CR Kendall Mine
Annual Site Management Expenses, 2017-2024

Year	Trustee Services [1]	Taxes [2]	Insurance [3]	On-site Labor [4]	Site Expenses [5]	HGL Main Office [6]	Total
2017	$18,600	$9,289	$29,879	$200,399	$94,262	$10,380	$362,809
2018	$18,600	$1,343	$30,545	$197,317	$116,241	$4,395	$368,441
2019	$18,600	$7,563	$30,462	$176,550	$121,286	$6,026	$360,487
2020	$18,600	$7,577	$32,648	$168,345	$135,775	$17,659	$380,604
2021	$18,600	$7,211	$33,227	$189,488	$99,337	$4,583	$352,446
2022	$18,600	$8,231	$33,442	$180,781	$121,548	$8,695	$371,387
2023	$18,600	$5,714	$34,038	$212,304	$86,018	$9,000	$365,674
2024	$18,600	$4,256	$33,919	$215,803	$84,275	$5,553	$362,406

1. As part of the Consent Decree settling the CR Kendall Corporation's bankruptcy, all assets and site management responsibility was transferred to the "CR Kendall Custodial and Work Trust" (Trust), which is managed by a trustee responsible for maintaining the property (including land, buildings, other water treatment infrastructure, water rights, easements, and the mine operating permit. The trustee is responsible for retaining a site management contractor for site operation and maintenance. Funding for site operation initially was derived from the project's reclamation bond, which was depleted during 2023. The trustee is paid at a fixed rate for project management
2. The trustee pays taxes for all property owned by the Trust, including land, buildings, and equipment. Annual taxes initially fluctuated due to the transition from the bankrupt corporation to the Trust and have decreased since 2022 due to the sale of land in 2023. The Trust owns all water treatment infrastructure at the property.
3. The trustee's costs include annual liability, property and vehicle insurance.
4. On-site labor is provided by a contractor (currently HydroGeoLogic, Inc. (HGL)) hired by the trustee.
5. This category includes all expenses such as utilities, fuel, phone and internet service, water quality monitoring, vehicle and infrastructure maintenance and replacement, etc.
6. On-site labor is overseen by staff in HGL's office in Billings which provides engineering services, personnel management, invoicing, etc.

Additional Notes:

- Reclamation bond funds were depleted in 2023. Continued funding through June 2025 was provided from the Hard Rock Mining Special Revenue Account pursuant to 82-4-315, Montana Code Annotated (MCA). HB58 (2025 Legislative Session) authorized funds of up to $500,000 per year for continued water management and treatment operations at the Kendall site.

- HB7 (2025 Legislative Session) authorized funding for a Reclamation and Development Grant of up to $291,056 for construction of a semi-passive long-term seepage water treatment system at the Kendall site. The semi-passive treatment system will replace the existing water treatment facility and substantially reduce the need for routine on-

CR Kendall
Background Information

The CR Kendall Mine was an open pit cyanide heap leach mine located on the eastern flanks of the North Moccasin Mountains in Fergus County, Montana. The private property owner is the "Birdwell" family.

Commodity: Gold and Silver

Location: NW of Lewistown (approximately 7 miles west of Hilger, MT)

Brief History:

Late 1800s	Mining began
1981 - 1986	Triad Investments, Inc. [Initially operated under Small Miner Exclusion Statement – Operating Permit issued in Fall 1984]
1986 - 1987	Grayhall Resources
1987 - 1989	Canyon Resources
1989 – 1990	Kendall Venture [Joint venture with Canyon Resources' partner Addwest Gold (a Western Energy affiliate)]
1990 to 2015	CR Kendall [Mining ceased in early 1995, Gold recovery ceased in Fall of 1997]
08/15/2016	Consent Decree and Settlement Agreement Establishing a Custodial and Work Trust for CR Kendall Mine Closure.

Reclamation Needs:

Water Treatment is required for seepage from four areas.

1) S. Fork Last Chance Gulch (tributary to Warm Springs Creek a tributary to Judith River)
2) Mason Canyon Drainage (tributary to Warm Springs Creek a tributary to Judith River)
3) Barnes-King Gulch (tributary to Warm Springs Creek a tributary to Judith River)
4) Little Dog Creek (tributary to Dog Creek, which flows to the Missouri River)

Average Thallium Concentrations Treated:

1) S. Fork Last Chance Gulch – 0.020 mg/L (surface water standard – 0.00024 mg/L)
2) Mason Canyon Drainage – 0.040 mg/L (surface water standard – 0.00024 mg/L)
3) Barnes-King Gulch – 1.0 mg/L (surface water standard – 0.00024 mg/L)
4) Little Dog Creek – 0.20 mg/L (surface water standard – 0.00024 mg/L)

Water intercepted and pumped from the four collection locations is currently blended and stored in a lined pond prior to being pumped to the water treatment building where it flows

system could be operated with minimal oversight, reducing the need for retaining an on-site workforce to operate the system.

According to the Environmental Impact Statement completed in 2016, the need for ongoing water treatment was estimated to continue for up to 40 years (i.e. until 2056).

Semi-passive Water Treatment System:

The proposed semi-passive water treatment system for the Kendall mine is intended to replace the current active treatment process (requiring on-site laborers for operations and maintenance) that is used for removal of thallium from water intercepted at four surface headwater locations:

- South Fork Last Chance Creek (pump-back site KVPB-5);
- Mason Canyon (pump-back site TMW-26);
- Barnes-King Gulch (pump-back site KVPB-2); and,
- Little Dog Creek (pump-back site KVPB-6).

The first three drainages are tributaries to Warm Springs Creek, a tributary of the Judith River. Little Dog Creek is a tributary of Dog Creek, which flows to the Missouri River.

Thallium Source:

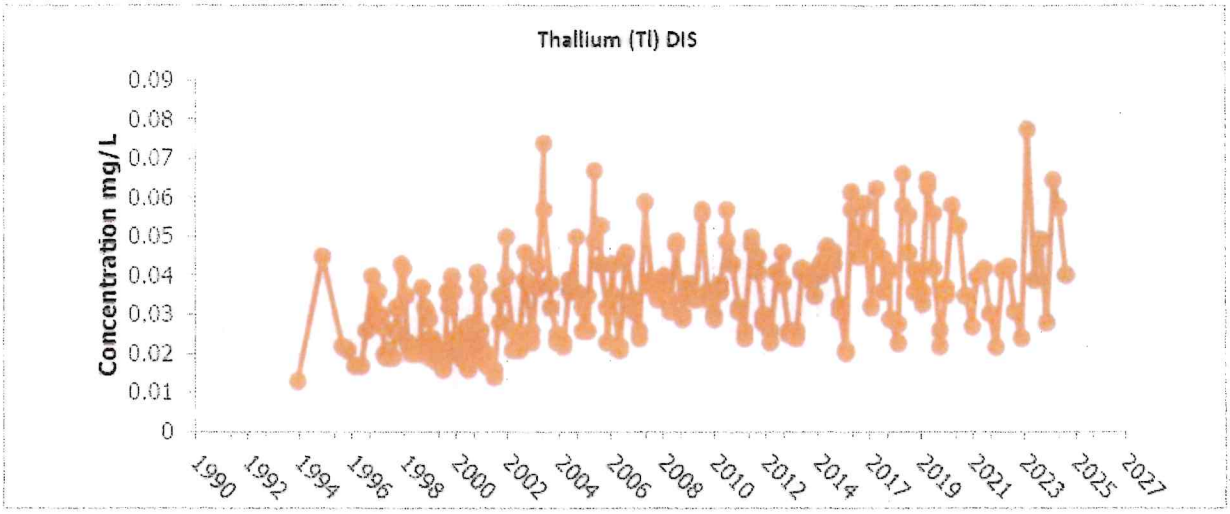
Thallium was deposited at the same time as the gold in the mineralized rock. Weathering of these minerals can release thallium into mine drainage and stormwater from the site (2016 Final EIS, page 3-13).

Thallium occurs in two oxidation states in natural water, thallium (1+) and thallium (3+). Thallium (1+) behaves similarly to the alkali metal ions (sodium, potassium, etc.) and is extremely soluble and mobile in water. Thallium (3+) has chemical properties similar to aluminum and precipitates as a thallium (3+) hydroxide or co-precipitates with iron oxyhydroxides in higher pH waters.

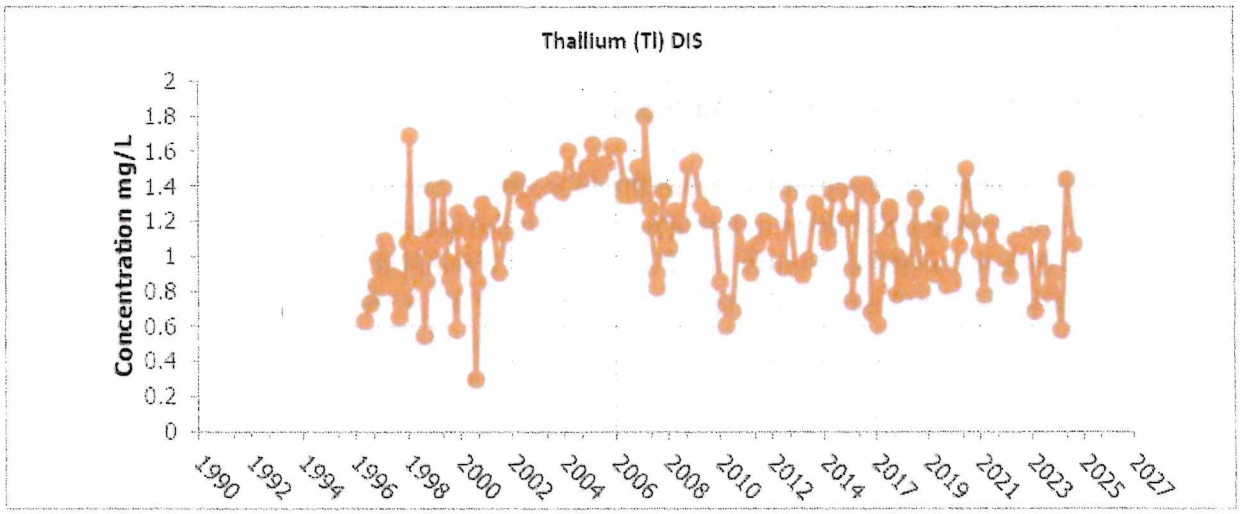
Thallium Environmental Hazards:

Thallium is listed in Circular DEQ-7 (Montana Numeric Water Quality Standards) as a toxin having a human health standard of 0.002 milligrams per liter (mg/L) in groundwater and a human health standard of 0.00024 mg/L in surface water. Surface water criteria are more stringent due to additional possible exposure pathways.

According to the Agency for Toxic Substances and Disease Registry (ATSDR)'s thallium fact sheet, thallium poisoning can cause: hair loss, numbness and pain in the feet and hands,



KVPB-2 (Barnes-King Gulch / Last Chance Creek): Average thallium concentrations in intercepted water are currently in the 1.0 mg/L range (approximately 5000x the surface water standard). The long-term trend in concentration at KVPB-2 is shown on the following graph:



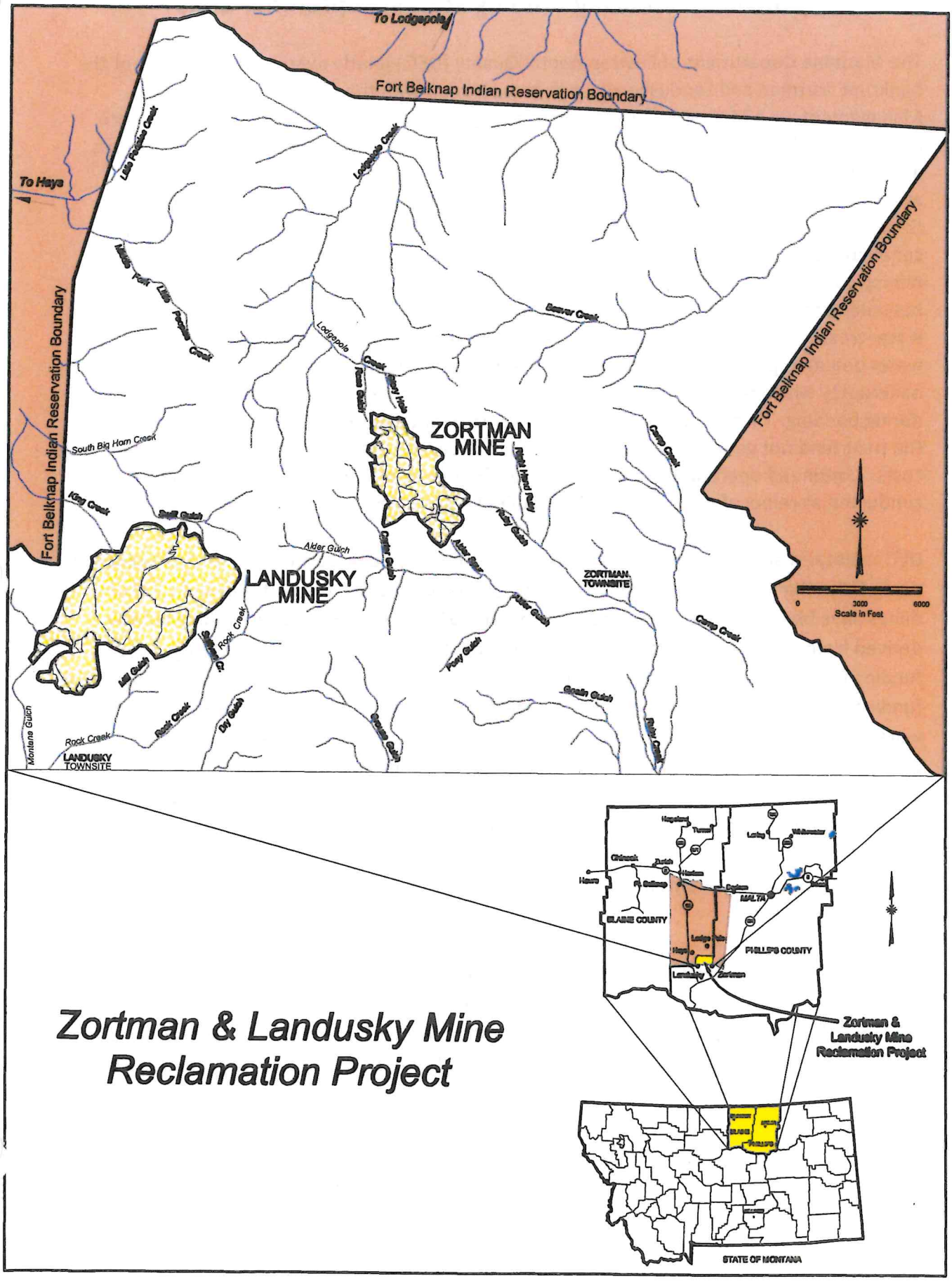
KVPB-6 (Little Dog Creek / Dog Creek): Average thallium concentrations in intercepted water are currently in the 0.20 mg/L range (approximately 1000x the surface water standard). The long-term trend in concentration at KVPB-6 is shown on the following graph:

Potential Duration of Treatment System Operation:

According to the Environmental Impact Statement completed in 2016 which reviewed closure options for the Kendall mine, the need for ongoing water treatment was estimated to continue for up to 40 years (i.e. until 2056). Actual anticipated duration of water treatment is not certain.

With the installation of the new water treatment system, labor requirements will be limited to occasional monitoring, maintenance, and replacement of the zeolite media.

In addition to the treatment of water from the four interception sites, water that collects in the mine's leach pads (lined rock piles from which gold was extracted using cyanide) is collected in a lined pond from which it is irrigated on the mine site seasonally. This process will need to continue over the long term in order to prevent discharge of untreated water to Last Chance Creek; however, system modifications are planned which will largely automate this process and minimize labor requirements associated with the irrigation process.



Zortman & Landusky Mine Reclamation Project

maintenance. The trust fund was originally intended to generate sufficient interest to maintain operations, but does not contain sufficient principal value given current interest rates.

Since July 2020, the US BLM and the Montana DEQ have contributed the following funds toward the project:

State Fiscal Year	BLM Funding	DEQ Funding	DNRC Grant	Total
2021	$745,000	$1,005,646		$1,750,646
2022	$1,484,636	$591,084		$2,075,723
2023	$547,864	$1,668,119		$2,215,982
2024	$2,159,820	$571,253	$109,992	$2,841,064
2025	$1,779,646	$1,070,017	$286,098	$3,135,761
Total:	$6,716,966	$4,906,148	$396,090	$12,019,204

In addition, DEQ received a funding from DNRC's Reclamation and Development Grant Program for $405,000 for new construction at the Landusky site in 2021 and has been fully expended. An additional grant was awarded in 2025.

Funding previously contributed by BLM was expended by March of 2025. BLM has awarded an additional $1.667 million to DEQ for continued operation and maintenance of the Zortman and Landusky facilities, effective August 29, 2025.

At the time of ZMI's bankruptcy, very little reclamation had been completed at either the Zortman or Landusky mines, and the sites needed to be reclaimed in the short term to minimize ongoing water pollution and water treatment expenses. Performance of water management and treatment was necessary in both the short and long term and became the responsibility of Montana DEQ and US BLM as recipients of the bond funds.

From June of 1999 forward, HGL (previously Spectrum Engineering) was tasked with operation of the water treatment plants. In 1999, a group was formed called the Technical Working Group, consisting of the DEQ, BLM, Region 8 EPA, Fort Belknap, and their consultants, and Spectrum Engineering in association with Robertson GeoConsultants. Monthly meetings took place (usually consisting of 2 to 3 days sessions) to discuss the future on-going reclamation. By July 2000, a Multiple Accounts Analysis was developed to rank and scope different options for reclamation. The selected reclamation plan contained significant variations from the plan approved in the original ROD, therefore it was decided that a supplemental EIS would be developed. , The draft SEIS was published in March 2001. Meanwhile, the Governor issued an emergency order allowing Spectrum to provide construction services using the DEQ-owned equipment. All individual work items that did not vary among the alternative plans were considered constant by the Technical Working Group; this work proceeded concurrently during the development of the SEIS. Most of the main earthwork was completed from 1999 through 2005.

From 1999 through 2002, the Fort Belknap Community actively worked with the DEQ and the BLM during the preparation of the SEIS on a mutually agreeable reclamation plan for the site. In April 2000, the Fort Belknap Community Council filed suit against the United States, claiming the United States violated its trust agreement with the Tribes by allowing cyanide heap leach mining in the Little Rocky Mountains. In January 2004, the Tribes filed suit against the BLM, the DEQ, and Luke Ployhar, the landowner of the private land within the mine areas, demanding that surface water discharge permits be issued for the mine sites. In June 2004, the BLM issued an Action Memorandum for Time Critical Removal Actions to continue water treatment in the absence of a mine operator. The January 2004 lawsuit against the State and the BLM was resolved when the BLM listed the mine sites under their CERCLA authority. In April 2006, the Tribes and the private landowner resolved the remaining portion of the lawsuit. From 2008 through the present day, DEQ and BLM have continued participation in a Technical Working Group with the Tribes to resolve remaining reclamation and water quality issues at the mine sites.

nickel, selenium, and zinc. As specified in the 2006 EE/CA, other constituents may be added as contaminants of concern if identified during monitoring or characterization studies at levels that present a threat to public health, welfare, or the environment.

Sampling includes both surface water and groundwater and is conducted monthly as required by the HGL O&M staff based at the site. Fifty-six water sample locations are included in the sampling program.

Water Treatment Review

Water volumes treated through July 31, 2025, compared to 2024 and the five-year and 20-year averages are shown on the table below:

Year	ZWTP(Gal.)	LWTP(Gal.)	LBTP (Gal.)	SGWTP (Gal.)	Goslin LAD(Gal.)
2025, To Date	40,055,142	109,552,000	20,476,500	49,628,763	12,463,000
2024	71,877,205	172,399,000	32,050,300	64,425,462	17,313,500
Five-Year Average (gal/year)	57,907,780	186,044,600	31,160,980	51,609,351	17,429,870
20-Year Average (gal/year)	84,905,436	228,829,880	41,835,635	37,632,403*	31,932,505

*SGWTP was commissioned in 2008, so the 20-year average only includes 18 years of data

Operational Costs

Expenditures by facility, as compared to 2024 and the five-year average, are shown in the following table:

Year	LWTP, ZWTP	LBTP	SGWTP	Total
2025, To Date	$ 724,136	$ 923,168	$ 116,345	$ 1,763,649
2024	$ 1,413,175*	$ 1,068,874	$ 215,135	$ 2,697,183**
Five-Year Average (cost per year)	$ 963,432	$1,016,449	$ 155,342	$ 1,780,760

- *In 2024, a Liner was installed at ZWTP for $77,529 and is included in the expenditures
- **In 2024, $340,263 was spent on a grant from the Montana Department of Natural Resources and Conservation (DNRC) and is not included in the expenditures.

Recent and Upcoming Projects

Swift Gulch High Flow Treatment and Stream Restoration – Completed Summer 2025

Swift Gulch, located at the Landusky Mine site, was heavily impacted by placer dredge mining prior to Pegasus Gold Corp operating the Landusky Mine, and is currently impacted by acid rock drainage (ARD) seeps. In 2023/24, DNRC issued a grant for $411,199, and MT DEQ committed $34,648 to complete two projects: the Swift Gulch Stream Restoration (SGSR) project and the High Flow Treatment System (HFTS) project. The objectives were met by completing the following:

- Increase water treatment capacity during high flow events. This objective was completed by constructing the HFTS. The system was completed prior to the 2025 Spring melt, where flows exceeded the capacity of the SGWTP. The HFTS was operational and treated ARD prior to being discharged over the sediment retention structure. Low pH water was increased to treat the ARD, and metal laden sludge was captured in the Swift Gulch sediment retention structure.
- as Restore impacted areas of Swift Gulch. This objective was achieved by conducting stream restoration activities below SGWTP. Historic placer mining dredge piles were moved back into the floodplain, and Stage 0 stream restoration techniques were implemented to restore a stable and functional floodplain.
- Stabilize the sludge drying beds to reduce erosion. This objective was met by utilizing stream bank erosion techniques during the SGSR construction. Buried riprap, installation of Vegetated Streambank Stabilization, and regrading the floodplain to direct flows away from the sludge drying beds.

Landusky Mine Biological Treatment Plant Improvement Project – Anticipated Completion Fall 2026

- The LBTP has exceeded its anticipated lifespan and is not functioning as designed due to corrosion and scale buildup. For the past 5 years, patches have been installed to fix corrosion leaks, but corrosion is now at the point where new patches will not work. The Landusky Mine Biological Treatment Plant Improvement project aims to upgrade and replace the current LBTP.

- The existing LBPT, constructed in 2001, treats leach pad water by removing selenium and nitrate. It was anticipated that the treatment system would be necessary for approximately 10 years, after which residual nitrate concentrations in the leach pads were expected to decline to levels not requiring treatment. However, nitrate concentrations remain elevated up to about 120 milligrams per liter (mg/L) and treatment is anticipated for over the next 20 years.

- DNRC has approved a grant for $500,000 and MT DEQ has committed $271,425 to replace the existing LBTP reactors with a moving bed bioreactor to ensure continued effective treatment of nitrate and selenium in leach pad water. The project will include engineering design and construction of the new treatment system.

BLM Briefing Paper

ISSUE: Funding to address Human Health & Environmental Risks at Zortman Landusky mines CERCLA site

I. KEY POINTS

1. A funding solution is needed for Zortman and Landusky mines (ZL) water treatment and capital improvement needs. This site requires water treatment in perpetuity, with a five-year average annual 184,371,520 gallons treated. From July 2024 to June 2025, $2.8 million was spent to capture and treat water and maintain site infrastructure. Because ZL is a mix of private and public lands and was jointly permitted by Montana DEQ and BLM, both entities are responsible for water treatment.
2. No long-term or adequate funding solution has been realized. With some variations based on annual expenses and available funding, BLM and DEQ have been splitting costs at the site over the years.

II. OPPORTUNITIES AND CHALLENGES

Adequate funding is needed to address known and potential threats to human health and the environment at ZL mines CERCLA site and other post-1981 mine sites.
The BLM and DEQ could:

1. Seek a Legislative or Congressional line-item for increased annual funding or adding funds to long-term trust.
2. Pursue external funding assistance, such as through the Foundation for America's Public Lands.

III. BACKGROUND

The ZL mines were permitted and approved by the State of Montana and BLM in the early 1980s. These open-pit mines used cyanide heap leach methods to extract gold and silver. In 1996, the mining company was required to establish a trust fund to address longer term water treatment, but the company entered bankruptcy before fully funding the trust. Reclamation of the sites and operation of water treatment facilities became State and BLM responsibility when Pegasus Gold Corporation – including their subsidiary Zortman Mining Inc. (ZMI) – entered bankruptcy in 1999. State and BLM site management was initially conducted using a combination of reclamation and water treatment bonds posted by the mining company, as well as public funds. The reclamation and water treatment bonds have been depleted. Water pollution problems associated with the mines developed in additional areas after the bankruptcy which required the installation of new water treatment facilities not anticipated during bonding. That, in conjunction with lower than anticipated interest rates, has resulted in the trust fund not generating enough interest to cover annual site operating costs. Continued operation and maintenance of six active water treatment systems at ZL is conducted as removal actions under BLM's CERCLA authority and a 2004 BLM/DEQ Memorandum of Understanding.

Funding is needed to pay for site management contract staff and purchase electricity and chemical additives for water treatment operations. Without treatment, contaminated water that poses a threat to human health and the environment will drain to the adjacent small communities of Zortman and Landusky and onto the Fort Belknap Indian Reservation.

Regardless of lack of a funding solution, actual or threatened releases of hazardous substances at ZL mines present an imminent and substantial endangerment to human health and/or the environment. Under BLM's 3809 regulations, the operator is responsible for reclamation in accordance with the reclamation plan at these sites and the costs that BLM incurs. However, if there is no operator and or Potentially Responsible Party (PRP), then BLM is responsible for clean-up under most circumstances. Monthly operational expenses at the site have ranged from $244,248 to $471,492 in 2024 and 2025.

The current annual budgets and operating costs do not consider the life cycle costs of treatment plant equipment, pumps, and piping, as well as the mobile equipment fleet. Given the age and utilization of ZL operational components, several significant upgrades or complete replacements are necessary in the coming years. DEQ's contractor HydroGeoLogic Inc. recently compiled a 5-year Capital Improvement Plan that recommends capital outlay ranging from $153,000 to $1.6 million per year to address various site needs. Some of these needs have been addressed in 2023 and 2024, including replacing the Landusky water treatment plant liner, updating water treatment plant operating systems and purchasing a spare clarifier rake drive system. Work is also underway to replace the Landusky Biologic Treatment plant bioreactor tanks with moving bed concrete cells using recently awarded DNRC reclamation grant funds.

Based on water treatment costs since 2004, $4.56 per minute is needed in perpetuity to prevent contaminant release. How many gallons of contaminated water were captured and treated in the time it took you to read this briefing paper? How will DEQ and BLM pay for water treatment at ZL in perpetuity?

IV. Additional Project Information:

BLM project page with site documents:
https://eplanning.blm.gov/eplanning-ui/project/2019045/510

Web map of site infrastructure and other features: https://arcg.is/14LLyz4

V. PREPARED BY:

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DATE: July 14, 2025