

Water Quality in the Kooicanusa Reservoir

Lincoln County Commissioners Meeting
March 30, 2022

The Teck logo is displayed in a bold, blue, sans-serif font. It is positioned in the lower right quadrant of the slide, which has a white background. The logo consists of the word "Teck" in a clean, modern typeface.

Introductions

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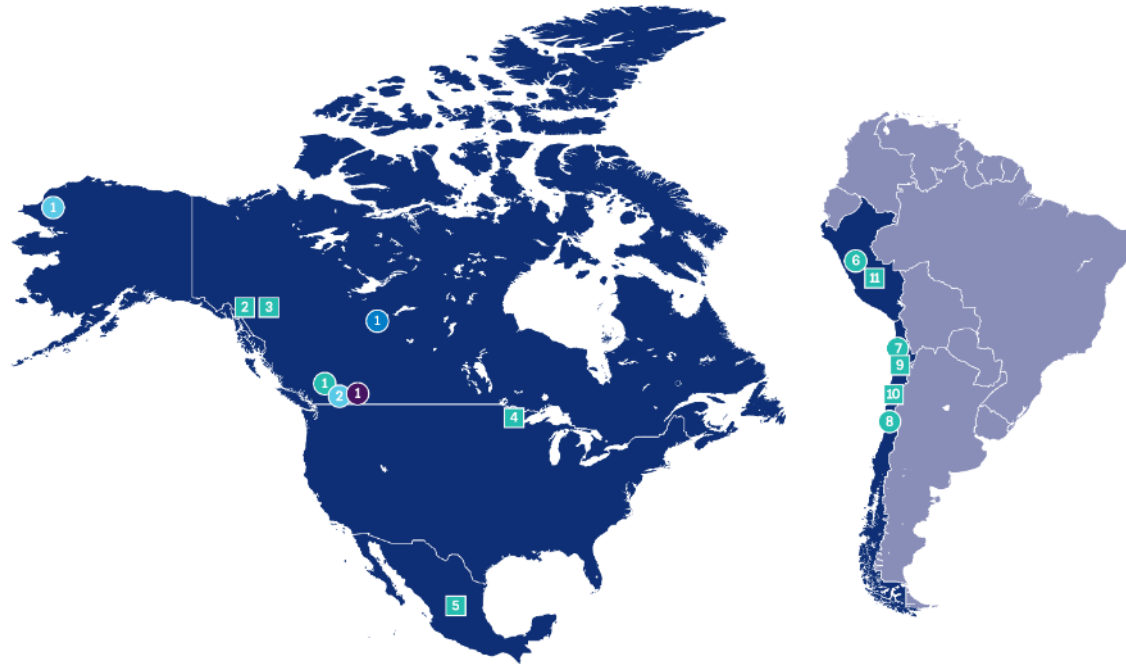
Trevor Hall

Vice President, General Counsel
& Secretary, Teck American
Incorporated

Rory O'Connor

Manager, Social Responsibility

About Teck



Operations & Projects

North America

Copper

- 1 Highland Valley Copper
- 2 Galore Creek
- 3 Schaft Creek
- 4 Mosaba
- 5 San Nicolas

Zinc

- 1 Red Dog
- 2 Trail Operations

Steelmaking Coal

- 12 Fording River
- 13 Greenhills
- 14 Line Creek
- 15 Elkview

Energy

- 16 Fort Hills

South America

Copper

- 6 Antamina
- 7 Quebrada Blanca
- 8 Carmen de Andacollo
- 9 Quebrada Blanca Phase 2
- 10 NuevaUnión
- 11 Zafranal

- Producing Operation
- Development Project

Teck in the United States

We have a significant economic presence in the U.S.:

- Red Dog Operations in AK – 2nd largest zinc mine in the world
- Mesaba Project in MN – copper & nickel development project
- Around 700 employees at our sites & corporate offices in Spokane & Anchorage
- Teck has spent nearly \$3 million in Montana over three years (2018–2020) on goods & services that support our Elk Valley operations
- This includes buying parts & equipment for our operations as well as important research support for water treatment and source control

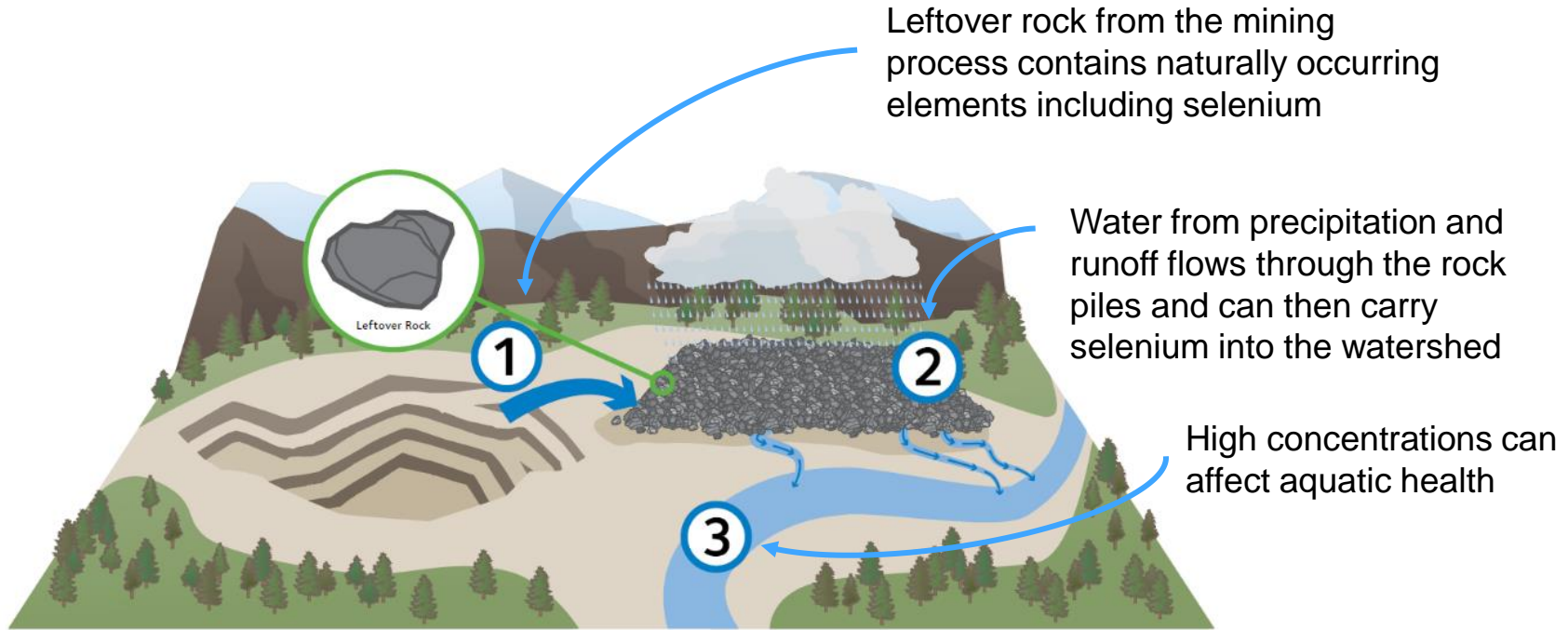


A Long History of Mining in the Elk Valley

- Mining has taken place in the Elk Valley for over 120 years
- Today, Teck operates four steelmaking coal mines in the region
- These mines create and sustain more than 30,000 jobs
- 72% of global steel production relies on steelmaking coal



Mining Can Affect Water Quality



Elk Valley Water Quality Plan (EVWQP)

Teck



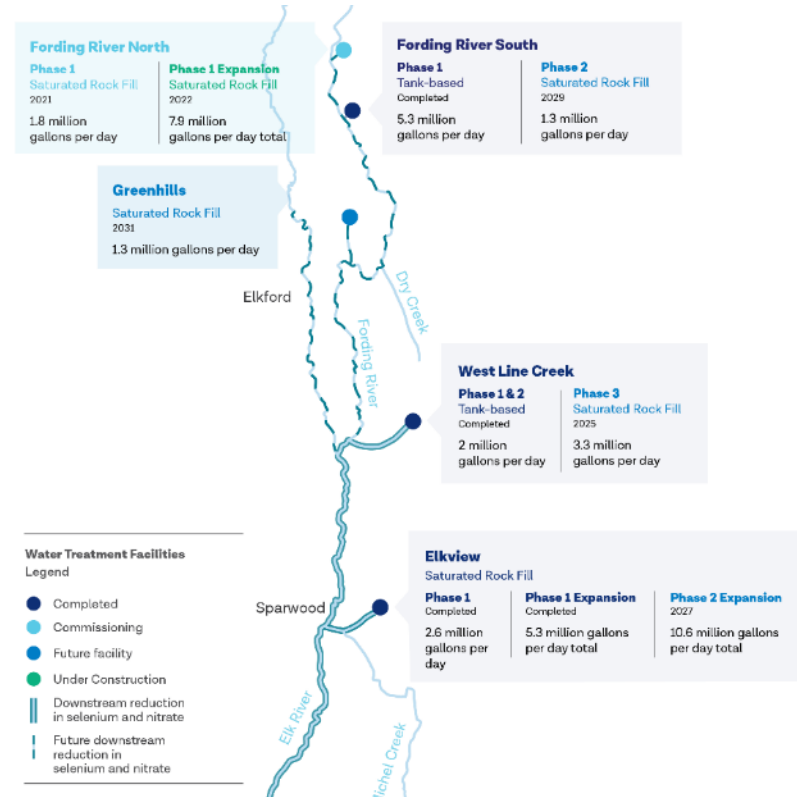
Elk Valley Water Quality Plan

- Created under direction from the BC Government.
- Developed with collaboration from the First Nations, governments, independent scientific experts, public and other stakeholders.
- Technical Advisory Committee with members from the EPA, USGS and Montana Department of Environmental Quality.
- Plan objectives:
 - Stabilize and reverse the trend of selenium and nitrate, manage calcite formation and protect the ongoing health of the watershed
 - Allow for continued sustainable mining in the Elk Valley



Significant Progress Building Water Treatment Facilities

- Water treatment of 12.5 million gallons of water per day, achieving near complete removal of selenium and nitrate
- After completion of the FRO-N SRF water treatment facility later this year, we will have capacity to treat more than 20 million gallons of water per day, a four-fold increase from 2020



West Line Creek – Active Water Treatment Facility (LCO WLC AWTF)

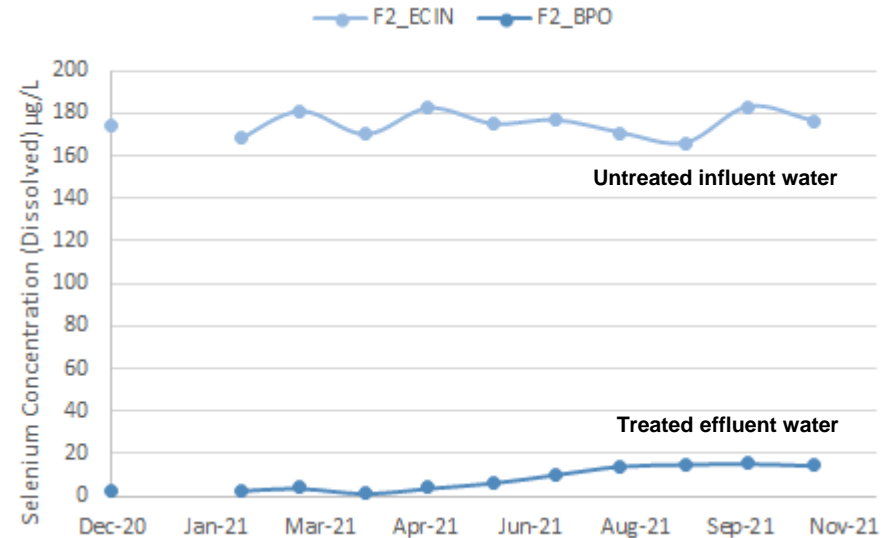
- Original construction completed in 2014
- Upgrades to facility completed in 2018
- Biological treatment facility removing selenium and nitrate
- Operating at designed capacity – 7.5 million litres per day (2 million gallons per day)
- Effectively removing approximately 95% of selenium and nitrate
- Improved performance being measured downstream of treatment facility in water and biota



Elkview Saturated Rock Fill (EVO SRF)

- Full scale trial operated at 10 million litres per day from 2018 to 2020 (2.6 million gallons per day)
- Completed expansion to 20 million litres per day in 2020 (5.3 million gallons per day)
- Commissioned in early 2021
- Successfully removing >95% of selenium and nitrate
- Seeing step change decrease in selenium and nitrate concentrations downstream

EVO SRF Treatment Success



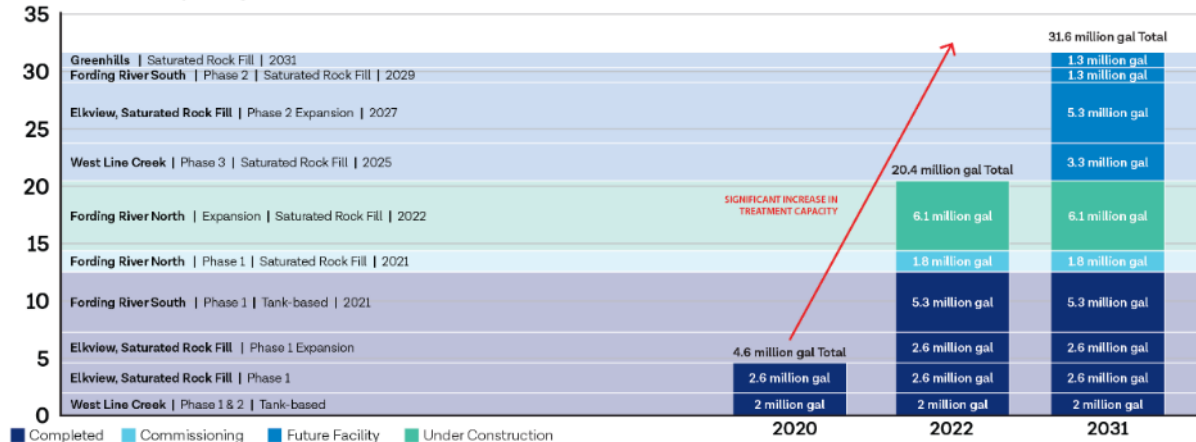
Fording River South Water Treatment Facility



Water Treatment Improving Water Quality

- In 2022 water treatment capacity will be four-times 2020 capacity
- Teck expects to achieve primary objective of the EVWQP: Stabilizing and reducing the selenium trend across the Elk Valley
- \$1.2 billion invested so far in water quality with plans to spend additional \$750 million to 2024
- Water treatment facilities are achieving approximately 95% removal of selenium

Water Treatment Facilities to 2031
Millions of Gallons per Day



Research & Development

Teck



EVWQP Grounded in R&D to Manage Water Quality

- Comprehensive R&D program has led to the development of breakthrough technologies, including:
 - Saturated Rock Fill technology to treat mine-impacted water
 - Development of a new nitrate prevention technique that uses liners that prevent explosives with nitrate from coming in contact with water
 - Ongoing source control R&D
- Teck has more than 25 research and development projects underway

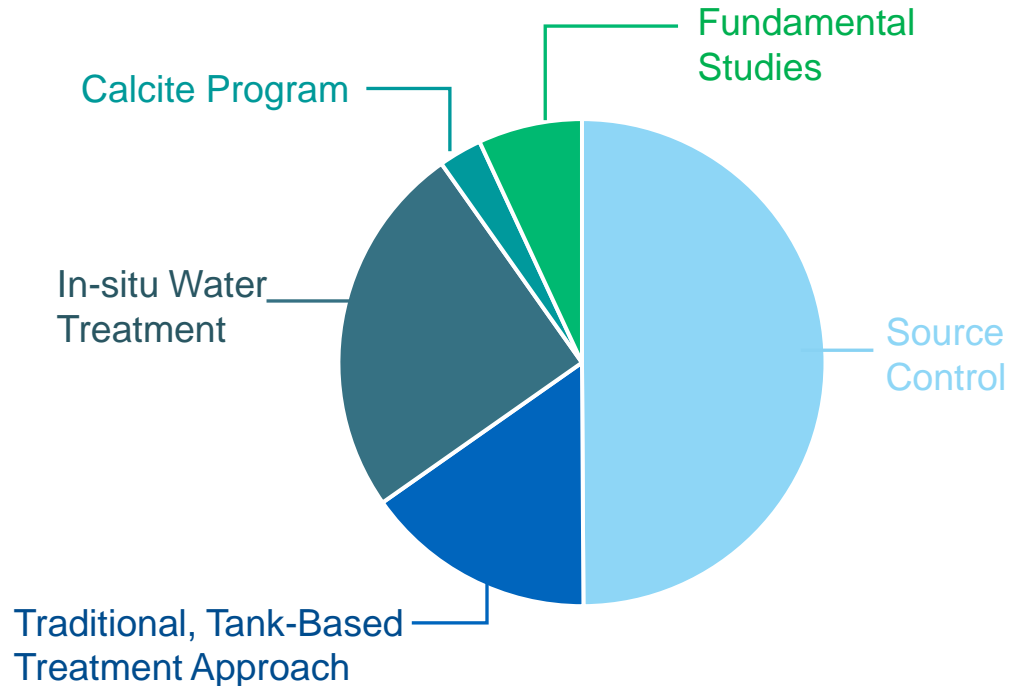


Research and Development Program Focus on Source Control and In-situ Treatment

Investment shifting to manage constituents more sustainably and at source where possible

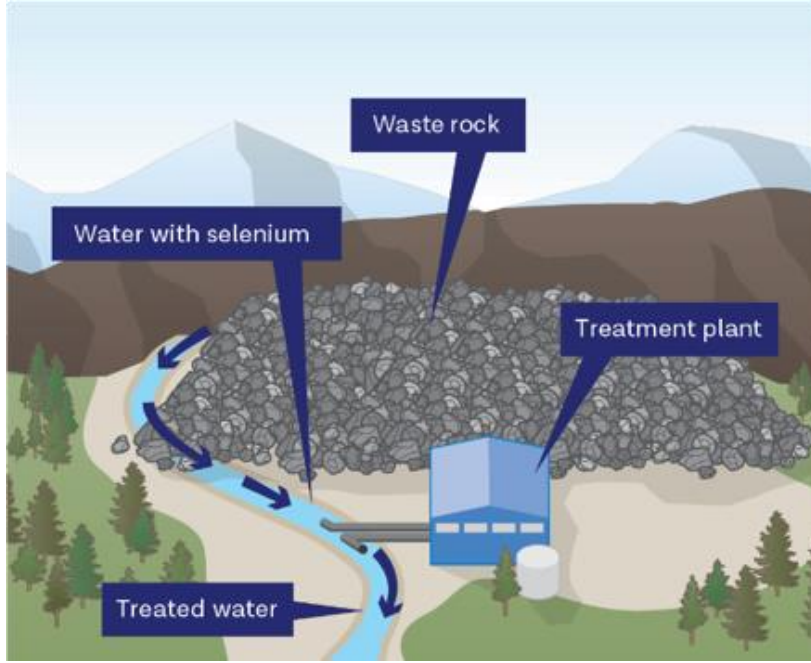
Research program designed to address key drivers:

- **Compliance**
- **Opportunity** to reduce cost and/or improve sustainability
- **Understanding** system with respect to aquatic effects and predicted water quality

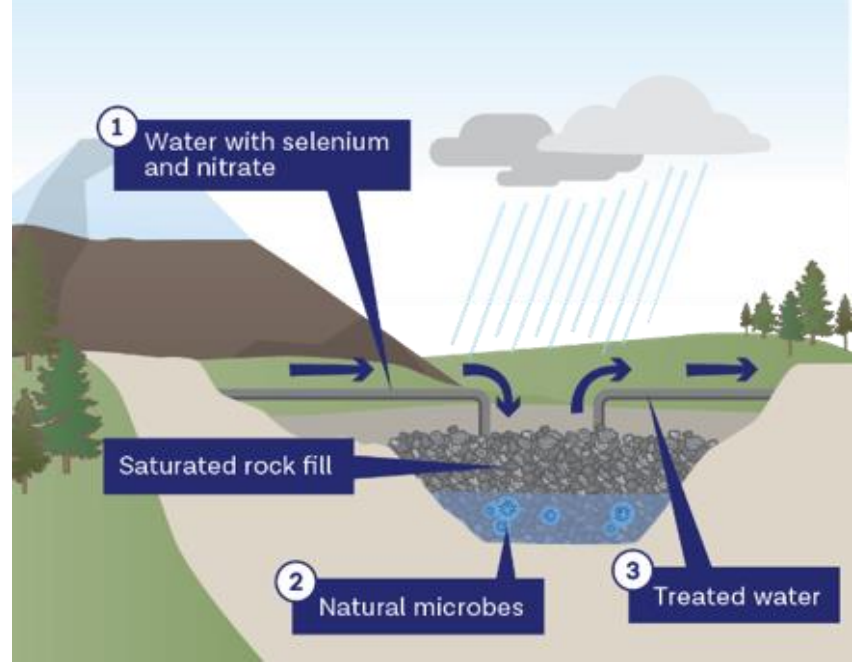


Water Treatment Technology

Tank-Based Plants

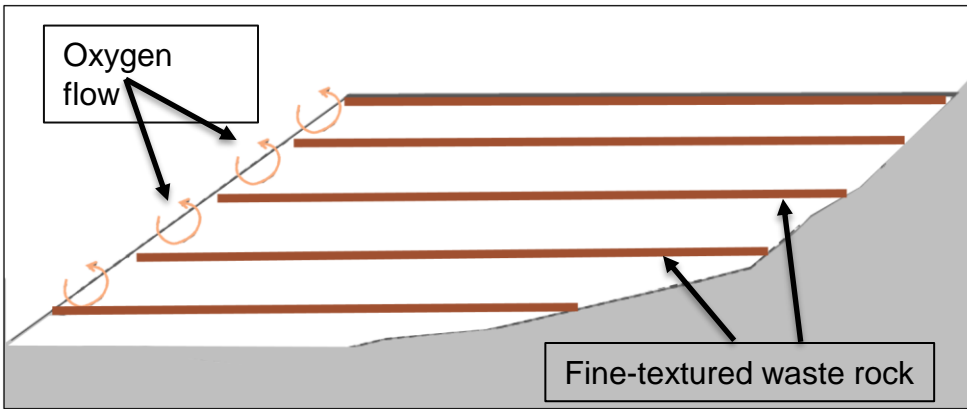


Saturated Rock Fill



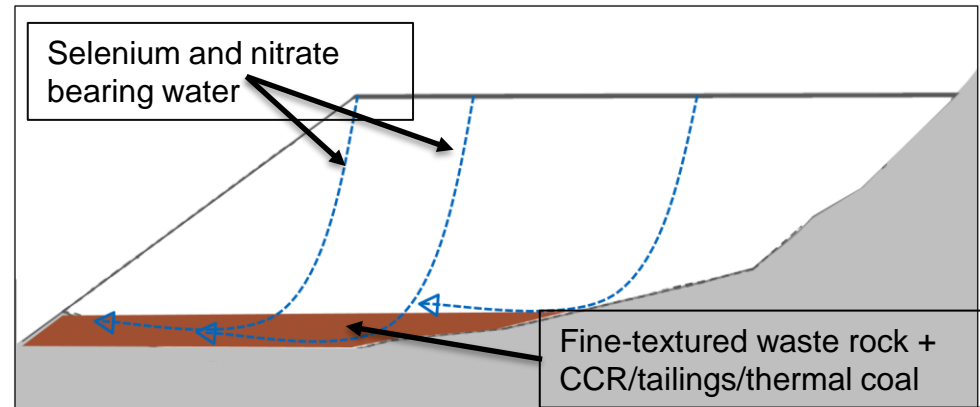
Building a better (bottom up) waste rock pile

Two strategies to reduce release of selenium and other constituents of interest



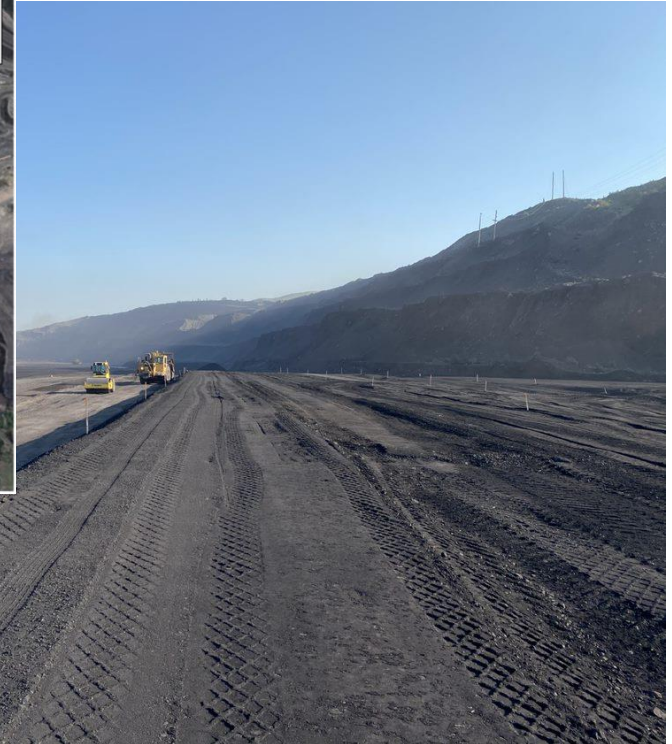
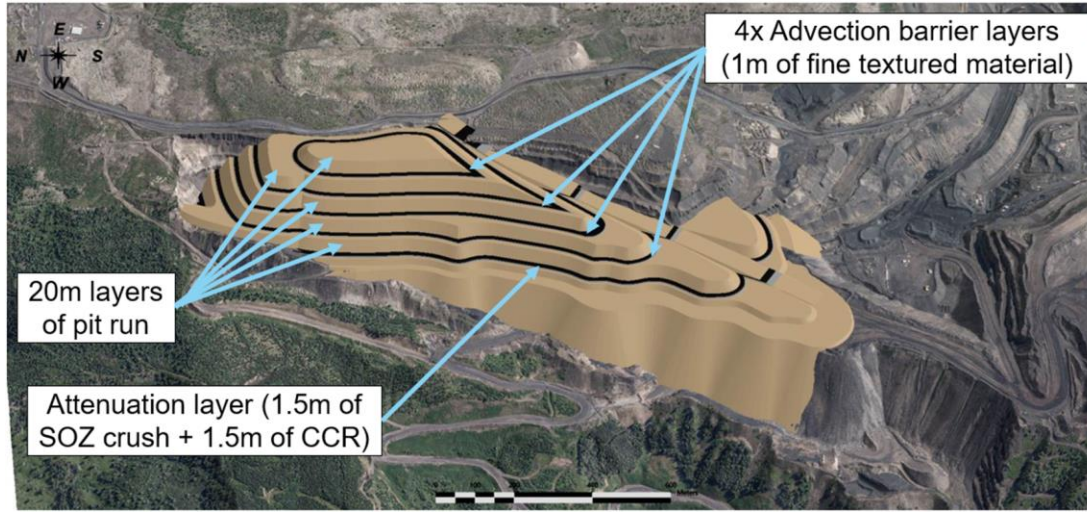
Advective Transport Barrier: “Prevent oxidation of pyrite by eliminating oxygen”

Attenuation Layer: “Create a treatment zone at the bottom of the pile”



Bottom-up Future Waste Source Control

Completing full scale trial at Cedar North and designing Swift North trial



Water and Biological Monitoring



Ongoing Monitoring of Water Quality

- Teck conducts extensive studies and monitoring of water quality and aquatic health
- Teck monitors water quality routinely at more than 130 locations in the Elk Valley and in the Koochanusa Reservoir
- Additional samples are routinely collected in coordination with biological monitoring programs
- Monitoring reports available at: teck.com/elkvalley



Collaboration with U.S. Agencies

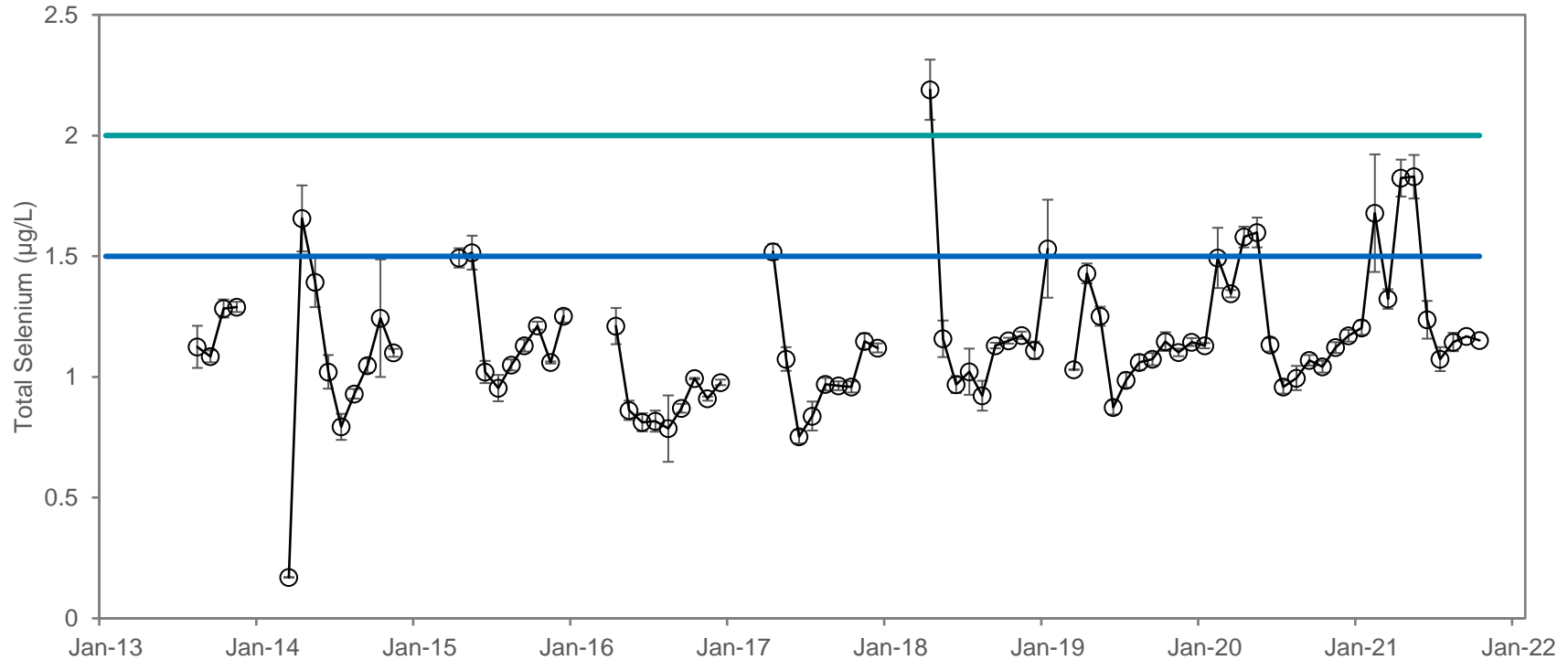
Actively participate in the binational forums including:

- Kooacanusa Monitoring and Research Committee
- Kooacanusa Reservoir Transboundary Monitoring Task Group to support alignment of monitoring efforts and sharing of data
- Continued engagement with U.S. State Department, EPA
- Monitoring reports available at: teck.com/elkvalley



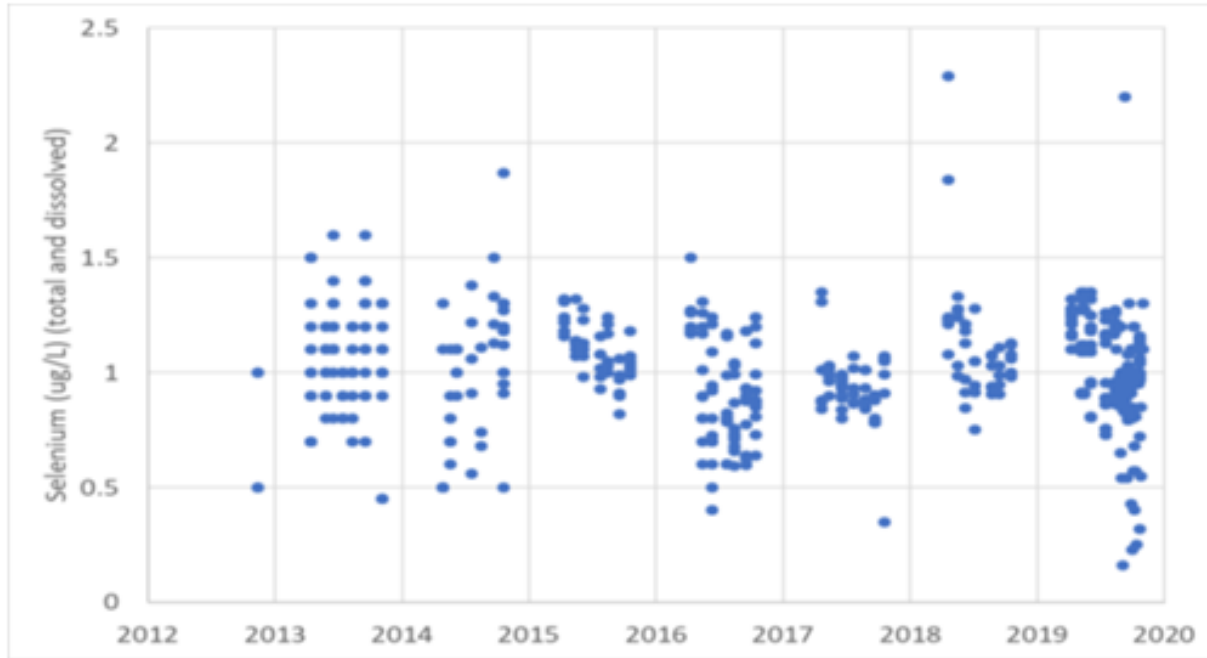
Water Quality Monitoring Results at RG_BORDER

Total Selenium (2013 – October 2021)

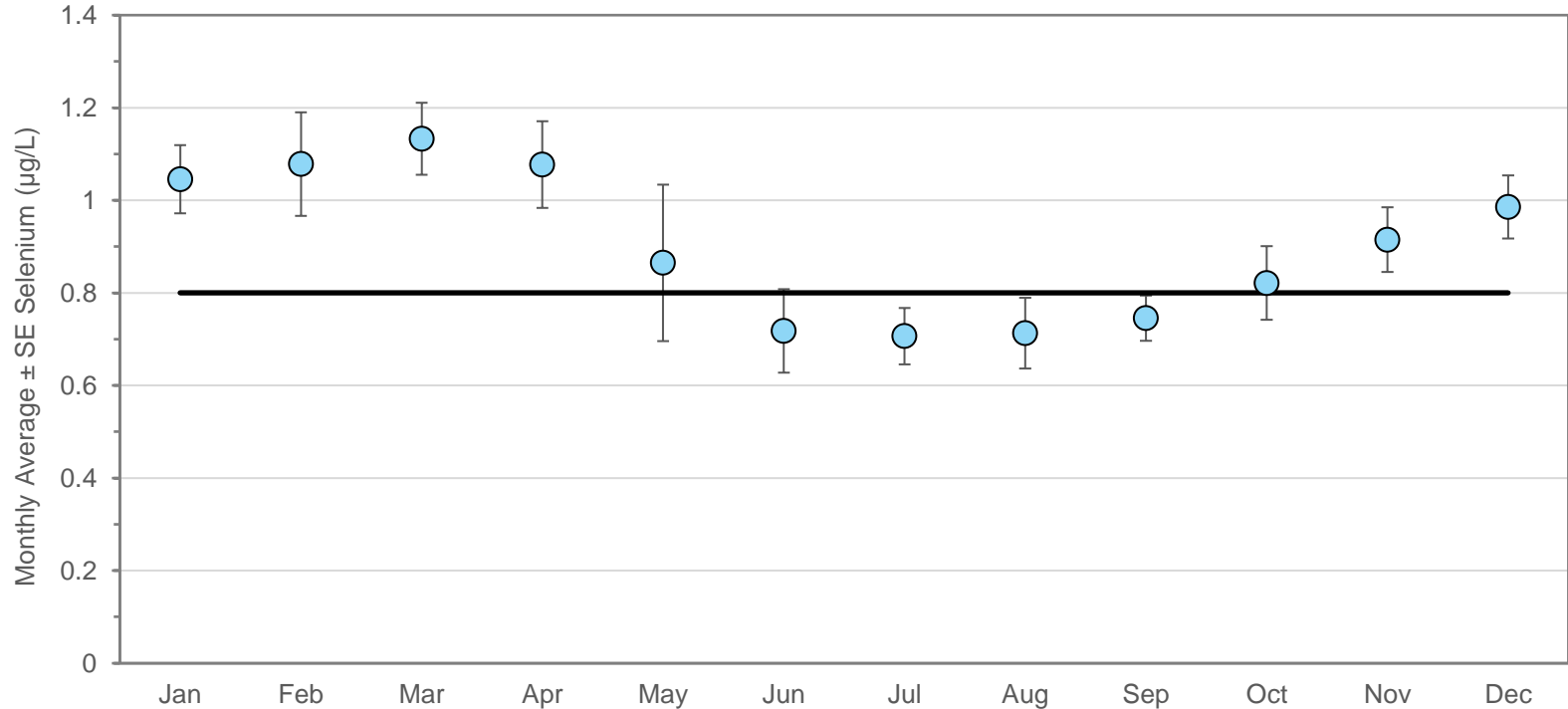


As Presented in DEQ's Derivation document

Total Selenium in Koochanusa (2012 – October 2020) stable since 2012



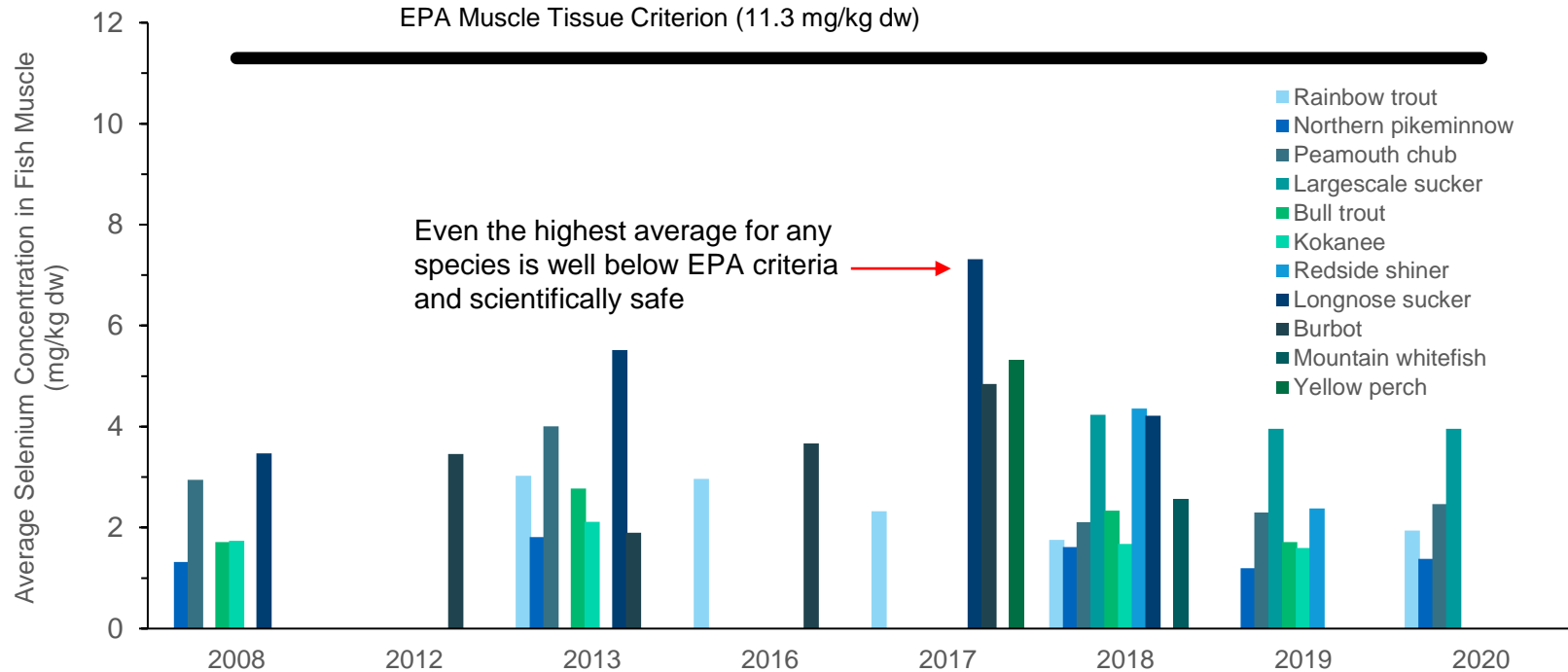
Background Selenium Levels – Elk River



Selenium Data for Fish Tissue Show Fish Are Safe

- U.S. EPA recommended selenium be measured in three ways with the following criteria levels:
 - Muscle tissue = 11.3 mg/kg (dry weight)
 - Whole body tissue = 15.1 mg/kg (dw)
 - Egg/Ovary tissue = 8.5 mg/kg (dw)
- Teck does not contest any of these three standards.
- None of the Egg/Ovary tissue data collected in Montana is “*representative of what was going on in the lake.*” – USGS (Feb. 28, 2022)
- Montana FWP collects the data, but has “*never had a gravid fish*” – FWP (Feb. 28, 2022)
- Whole body and muscle data are usable and confirm selenium levels found in Koocanusa are safe and have been safe for as long as data has been collected.
- Montana FWP has confirmed that it has seen no fish population declines in Koocanusa, and that it has no evidence of deformities, due to selenium.

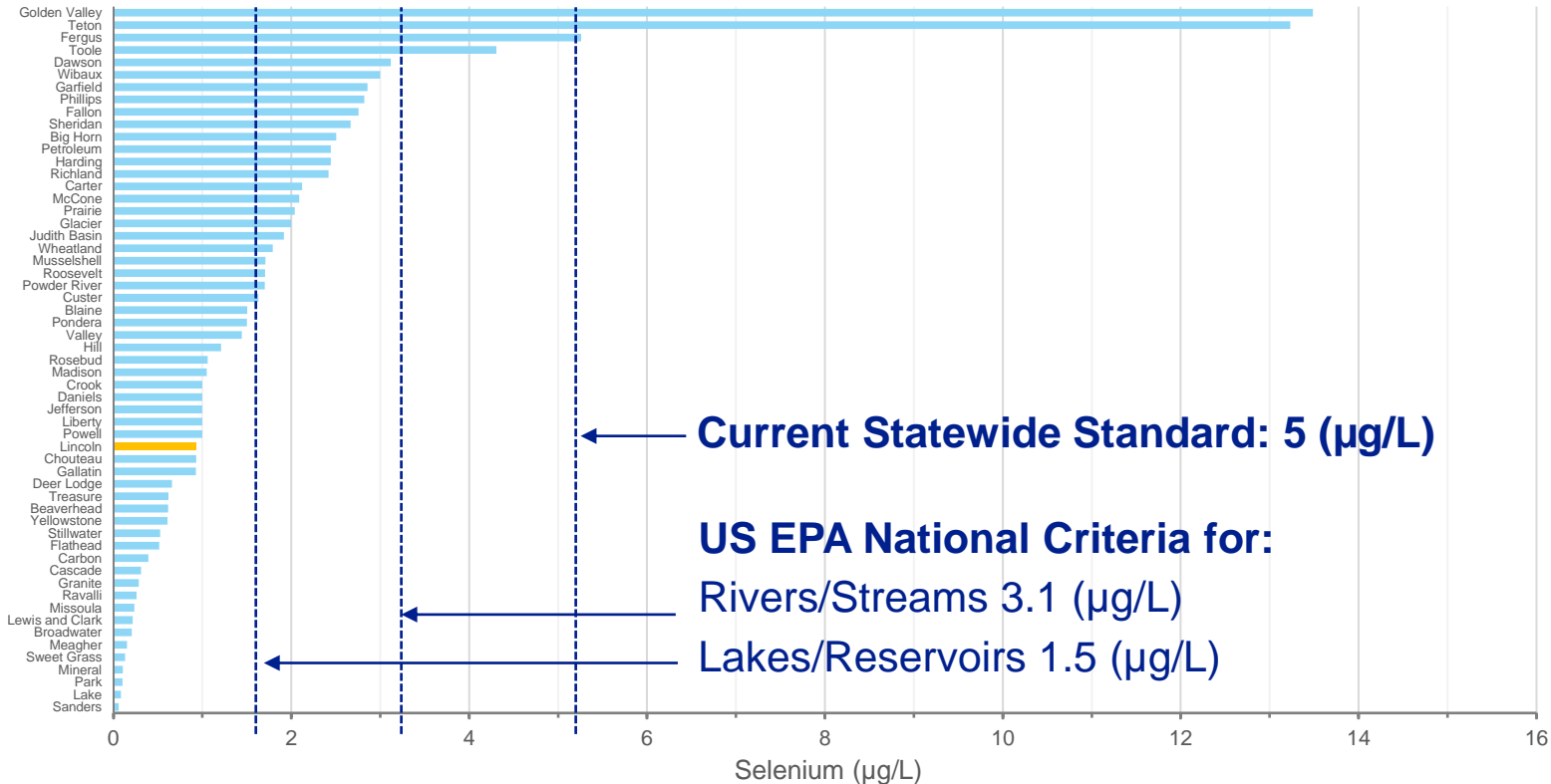
Koocanusa Fish Data Shows Selenium Well Below US EPA Criteria and Considered Safe For All Fish



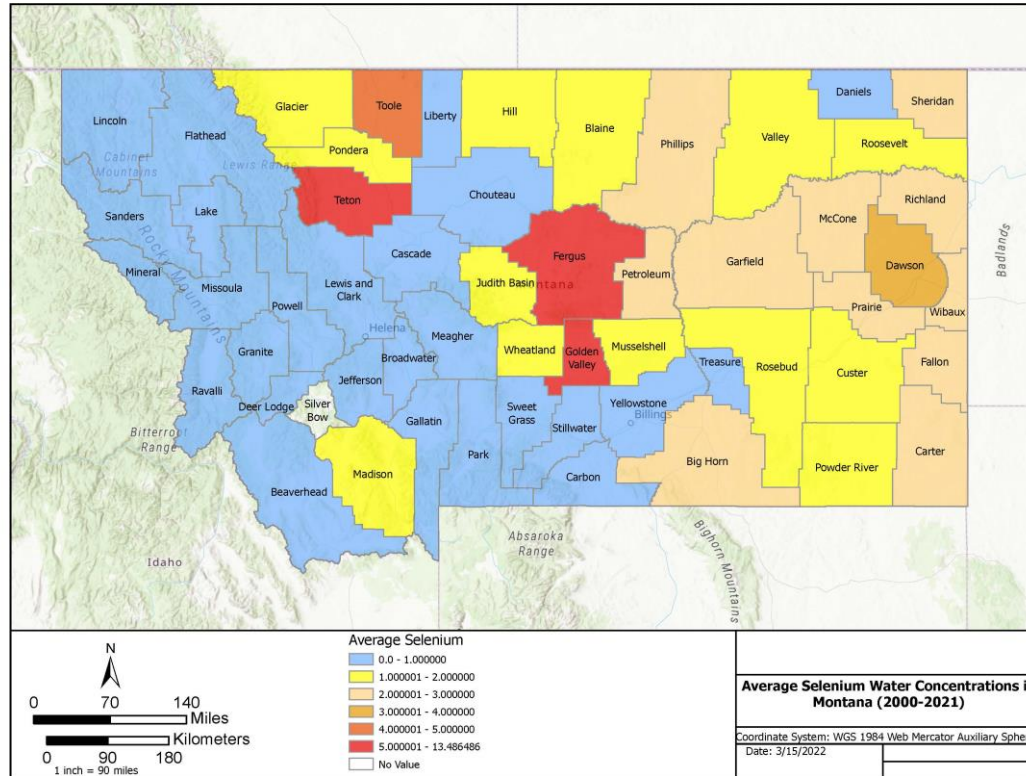
Other Important Considerations For Aquatic and Human Health

- Was the USGS model accurately calibrated and used properly during DEQ's rule making?
 - Dr. Sam Luoma (co-author of the model) testified that it was not accurately calibrated or used properly.
 - No consensus among experts on model inputs.
- Do the water releases from Libby Dam impact selenium concentrations in the reservoir?
 - Not considered
- There is no fish consumption advisory for selenium in Koochanusa
- There are fish consumption advisories for Arsenic and Mercury

Average Selenium Concentrations Per County in Montana



Average Selenium Concentrations Per County in Montana



Summary

- Data confirms selenium levels in the Koocanusa Reservoir are safe
- Data confirms selenium concentrations in the Koocanusa Reservoir are not increasing and have been stable since 2012
- Water treatment is removing nearly all (~95%) selenium from treated water upstream, improving water quality
- Data is publicly available

Summary - All Information Publicly Available

We encourage others to review the data and requirements for selenium in Koochanusa Reservoir and draw your own conclusions. Information can be found at the following websites:



- [DEQ's new selenium standard](#) (for the new selenium standard go to ARM 17.30.632(6))
- [DEQ's "Derivation of a Site-Specific Water Column Selenium Standard for Lake Koochanusa"](#)
- [Montana Legislature special committee testimony](#)
- [For documents related to the legislative special committee](#)
- [EPA's Water Quality Portal Lake Koochanusa data](#)
- [Fish consumption guidelines](#)
- [Teck's Elk Valley Water Quality Plan](#)
- [BC Ministry of Environmental and Climate Change Strategy EMS Web Reporting database](#)

Questions

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