



Teck Coal Limited
Sustainable Development
P.O. Box 1777
421 Pine Avenue
Sparwood, B.C. Canada V0B 2G0

Sheila Risbud
Vice President,
Sustainable Development,
Coal
sheila.risbud@teck.com

December 6, 2023

Mr. John M. Kilpatrick
Center Director, United States Geological Survey
Wyoming-Montana Water Science Center
3162 Bozeman Avenue
Helena, Montana
59601

Dear Mr. Kilpatrick

Reference: Recent Publication Authored by the United States Geological Survey

Teck Coal Limited (Teck) has reviewed the recent publication¹ authored by the United States Geological Survey (USGS). We are writing to express our concern about statements within the publication that could be seen as false or misleading, and what appears to be a departure from the expressed mission outlined in your October 5, 2022, letter which is “to provide objective and unbiased science”. Overall, the report contains too many misrepresentations, approximations, and mistakes to support any finding or conclusion related to implications or impacts to beneficial uses of the Koochanusa Reservoir (also called “Lake Koochanusa”). Moreover, we note the publication lacks consideration of the impacts that the operation of the Libby Dam has on overall aquatic health or the acknowledgment that non-mining activity impacts aquatic health. The report should therefore not be used or applied in any way to management of beneficial uses in the Koochanusa Reservoir.

To that end, we have outlined areas which we believe need to be clarified to avoid misleading the public, Indigenous organizations and governments, and media on both sides of the border.

KOOCANUSA RESERVOIR APPLICABLE REGULATORY STANDARDS

The publication inappropriately cites an invalid regulatory water column standard within the U.S. portion of Koochanusa Reservoir. As you are aware, the Montana Board of

¹ Storb, Meryl B., Ashley M. Bussell, Sara L. Caldwell Eldridge, Robert M. Hirsch, and Travis S. Schmidt. 2023. Growth of Coal Mining Operations in the Elk River Valley (Canada) Linked to Increasing Solute Transport of Se, NO₃⁻, and SO₄²⁻ into the Transboundary Koochanusa Reservoir (USA–Canada). *Environmental Science & Technology* 2023 57 (45), 17465-17480.

Environmental Review² invalidated the water column selenium standard for the Koocanusa Reservoir of 0.8 µg/L (micrograms per liter) set by the Montana Department of Environmental Quality and declared that the 0.8ug/L standard has been unenforceable since its inception.³ Because selenium is regulated by Montana, not the federal government, and because a state rule adopted in violation of state law cannot be enforced,^{4,5} Figure 3 and the text on page 17467 of your recent publication are incorrect.

The three fish tissue standards for Koocanusa Reservoir are not impacted by the legal error and remain valid. As a result of the Montana Board of Environmental Review's orders, the **current** water column standard for Koocanusa Reservoir from the US-Canada international boundary to the Libby Dam is **5 µg/L**.⁶ Please update your publication to correct the reference from an invalidated water column standard to the current valid state standard. In future, we encourage the USGS and its partners to reference and cite the appropriate and applicable water quality criterion and standards.

TECK'S DATA TRANSPARENCY

As outlined within our response to your October 5, 2022 letter, Teck has and will continue to openly share our data with agencies and the public. It is concerning when the USGS and/or its partners make statements that suggest otherwise. In fact, the data used within the recent publication were accessed from publicly available data sources managed by the Canadian government or shared directly by Teck.

The publication suggests that a hypothesis could not be evaluated because annual waste rock production data are not publicly available since 2010. In fact, tables outlining annual waste rock volumes by drainage are included in Appendix B of the 2020 Regional Water Quality Model Update Report (Teck, 2021) cited within the USGS publication. Furthermore, consistent with Section 9.9 of Permit 107517, the Regional Water Quality Model Update Report provides "**current and projected (through the next twenty years)** bank cubic meters of waste rock at the mine, detailed by affected drainage."

² The Board of Environmental Review is an Executive Branch Agency made up of seven Governor appointees. It performs a "quasi-judicial function," issuing orders that are legally binding upon issuance. §§ 2-15-3502, 2-15-102(10), MCA.

³ Board of Environmental Review, *Order Denying DEQ's Motion to Alter or Amend*, Case No. BER 2021-04 WA and Ber 2021-08 WQ, p. 3 (December 9, 2022); See also Board of Environmental Review, *Final Agency Action and Order of the Board of Environmental Review*, pp. 18, 20 (April 19, 2022) (ordering that ARM 17.30.632(7)(a) "and the rulemaking upon which it is based fail to comply" with Montana law).

⁴ 40 C.F.R. § 131.5(a)(6) requires that a state water quality standard must be promulgated in compliance with state law before the standard can be approved or relied upon for federal purposes.

⁵ In addition to these and other legal deficiencies, ARM 17.30.632(7)(a) suffers from multiple scientific and technical deficiencies. See Teck Ltr. to Board of Environmental Review (November 23, 2020); Montana Legislature, Water Policy Interim Committee, HJ37 Special Committee proceedings (2021-2022).

⁶ Circulate DEQ-7 Montana Numeric Water Quality Standards.

Teck has and continues to believe in openness and transparency. There has been no change in our data sharing practices. Water quality data collected under Permit 107517 are publicly available at the Ministry of Environment and Climate Change Strategy's website.⁷ To illustrate the breadth of data collected and publicly available please see Figure 1. In consideration of the tremendous efforts made to ensure that data are transparent and readily accessible, we trust, given USGS's commitment to providing objective and impartial science, that you will clarify the publication accordingly.

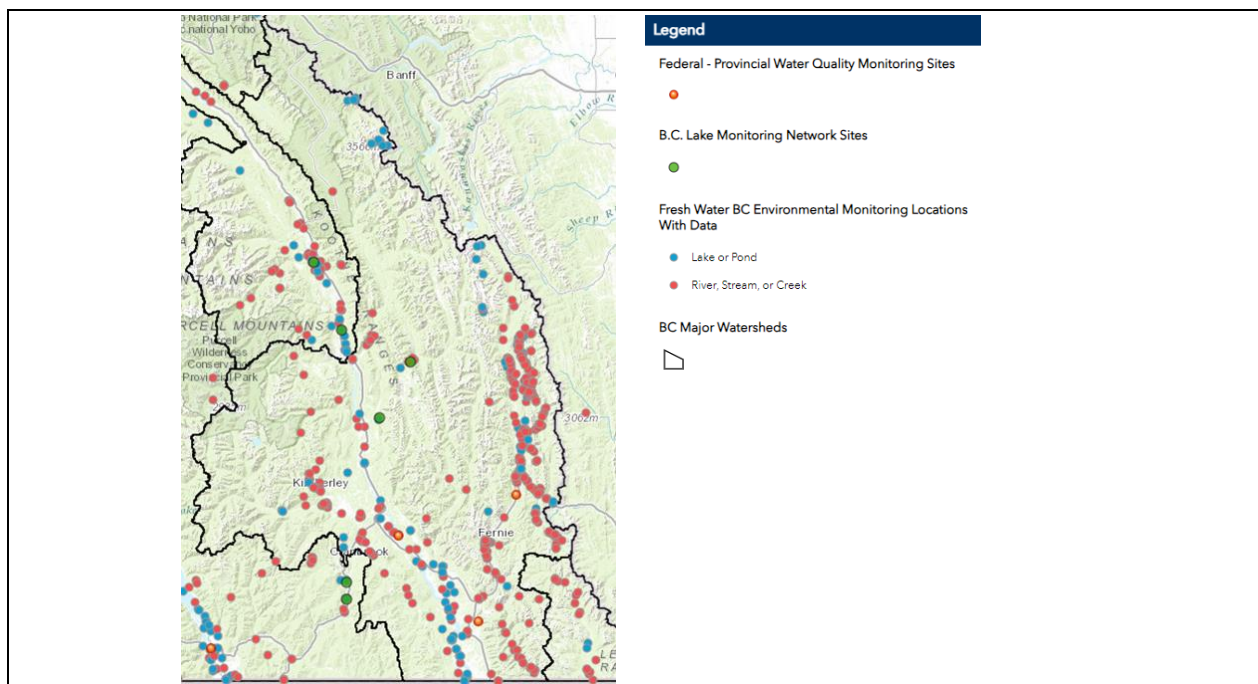


Figure 1. Surface Water Quality Monitoring Sites and Publicly Available Data within the Elk Valley Watershed.

PRESENTATION OF ELK RIVER WATER QUALITY CONCENTRATION

There are many instances within the recent USGS publication that suggest modelling results are empirical data (i.e., measured concentrations) when no data exists. For example, the publication claims to quantify 1979 nitrate concentrations and loads in both the Kootenay and Elk Rivers. In consideration that nitrate data were first collected in the Kootenay River on “1984-05-02 16:20:00 MST”⁸ and from the Elk River on “1984-05-02 17:40:00 MST”⁹ concentration “data” presented prior to 1984 are model estimates and not empirical data as implied.

⁷ <https://governmentofbc.maps.arcgis.com/apps/webappviewer/index.html?id=0ecd608e27ec45cd923bdcfefba00a7>

⁸ <https://aquatic.pyr.ec.gc.ca/webdataonlinenational/en/Home/Details/BC08NG0009>

⁹ <https://aquatic.pyr.ec.gc.ca/webdataonlinenational/en/Home/Details/BC08NK0003>

Similarly, the publication suggests that the 1985 mean selenium concentration within the Elk River was 0.89 µg/L. Given that no selenium data were collected from this sampling location in 1985, it would have been more appropriate and transparent to identify the value as estimated. Furthermore, it is concerning to see the estimated 1985 concentration being compared to a neighboring watershed given that the referenced citation¹⁰ for the neighboring watershed also contains data for the Elk River upstream of all mining activities, a more appropriate comparator.

Specifically, Hauer and Sexton (2013) collected and reported water quality data from “ERB4” which was described as the “Elk River above All Coal Mines”. Selenium concentrations at “ERB4” ranged from 0.6 – 1.2 µg/L. As a result, the reported 1985 mean selenium Elk River value (0.89 µg/L) does not reflect an increase from upstream background selenium concentrations; and the speculation that selenium concentrations within the Elk River “may have been increasing since before concentrations were initially measured” is simply not supported by the data. Failure to use data that were clearly available and more relevant and appropriate for the comparison being made, appears contrary to providing objective and unbiased science.

TECK’S WATER TREATMENT

Teck was encouraged to see efforts within the publication to acknowledge that selenium and nitrate concentration trends at the mouth of the Elk River have indeed stabilized (i.e., plateaued and decreased). This recent effort confirms earlier work completed by the USGS and its partners where the reduction and positive effect associated with upstream water treatment was first recognized and acknowledged. At that time, modeling completed by the USGS identified “the decrease in selenium and nitrate/nitrite loads in 2015 indicates water treatment activities in Elk Valley have been successful in removing selenium and nitrogen.”¹¹ However, we have noted below that there are also statements in the publication that could be misleading with respect to past and future treatment in the Elk Valley and which should be clarified.

Timing of Water Treatment. When evaluating the reduction in trends it is stated that the “first treatment system was not fully operational until 2018”. This is not accurate as the first treatment system was fully operational in 2015. Teck acknowledges that there have been challenges and learnings associated with our water treatment facilities, but considerable selenium and nitrate mass have been removed since 2015. This is confirmed by the mass removal data made available to the USGS and your analysis of trends in the absence of treatment (i.e., refer to Figure 6 of the publication).

¹⁰ Hauer, F. R. and Sexton, E. K. 2013. Transboundary Flathead River: Water Quality and Aquatic Life Use Final Report. Flathead Lake Biological Station, The University of Montana: Polson, MT. March 4, 2013. https://files.cfc.umt.edu/cesu/NPS/UMT/2008/08Hauer_GLAC_water_quality_fnlprt.pdf

¹¹ Final Meeting Notes Lake Koocanusa Monitoring and Research Working Group, Monitoring and Research Committee Face-to-Face Meeting #3, October 25-26, 2016, and associated PowerPoint Presentation.

Effect of Water Treatment on Downstream Concentrations. Teck's water treatment facilities are operated to maximize the removal of nitrate and selenium, they do not target nor are operated to remove sulphate (sulfate). As a result, it was disappointing and unclear why the USGS did not account for the removal of nitrate and selenium by water treatment facilities prior to proposing alternative hypotheses to explain the tapering in both concentration and yield trends for nitrate and selenium since 2015. This is critically important given that nitrate and selenium concentrations recorded at the mouth of the Elk River inherently account for upstream water treatment removals, and do not simply reflect solute dynamics due to watershed flushing and dilution processes. Alternatively, it is uncertain why the study did not consider sulphate when assessing alternative hypotheses for reduced selenium and nitrate concentrations given that sulphate is not removed by upstream water treatment.

Importance of Concentration vs Load. An aspect of efficiently operating Teck's water treatment facilities and the very foundation of the Elk Valley Water Quality Plan and associated Permit 107517 is to target and reduce the highest concentrations ensuring the continued protection of the receiving environment including Koochanusa Reservoir. Concentration, not load, is what matters in terms of potential effects. To that end and consistent with your findings, the highest concentrations occur during months of low flow which is where you have estimated mass removal rates approaching 40 percent. We are confident that this will continue to increase as more treatment is brought online.

Plan for Groundwater Treatment. The publication notes that current plans only include treatment for surface water into the future. However, the 2022 Implementation Plan Adjustment (IPA)¹² includes treatment of groundwater and not just surface water as suggested within the publication. The 2022 IPA clearly identifies the collection of groundwater for treatment from Kilmarnock Creek in 2026 and from West Line Creek in 2030.

CONCLUSION

Overall, the report contains too many misrepresentations, approximations, and mistakes to support any conclusion related to impacts to beneficial uses of the Koochanusa Reservoir. The report should therefore not be used or applied in any way to management of beneficial uses in the reservoir. Again, no scientific or technical evidence supports impairment of the aquatic life beneficial use in the reservoir now or in the future.

We look forward to your prompt correction of this publication. Should you have any questions or require any additional information at this time, please do not hesitate to contact me at (Sheila.risbud@teck.com).

¹² https://www.teck.com/media/EVWQP_2022_ImplementationPlanAdjustment_Main_Report.pdf

Sincerely,

A handwritten signature in black ink, appearing to read 'Sheila Risbud', with a long horizontal stroke extending to the left.

Sheila Risbud
Vice President, Sustainable Development, Coal
Teck Coal Limited