

March 1, 2022.

Environment and Climate Change Canada
Regulatory Development and Analysis Section
Mining and Processing Division
351 boul. St-Joseph, 11th floor
Gatineau, QC K1A 0H3

Re: January, 2022: Proposed Approach for Coal Mining Effluent Regulations – Discussion Document

The Elk River Alliance (ERA) is pleased to submit comments on Environment and Climate Changes Canada (ECCC)'s *January 2022: Proposed Approach for Coal Mining Effluent Regulations – Discussion Document*.

The ERA is an environment and watershed focused not-for-profit charitable organization based in the Elk Valley. ERA uses education and outreach programs to raise watershed literacy, it undertakes monitoring of water quality, quantity and aquatic biota, and provides monitoring data in an accessible manner in order to inform decision making to support maintenance of the health of the Elk River and enable sustainable uses of the river. We prioritize community involvement in the protection, enhancement and restoration of aquatic ecosystems. We have a strong staff and broadly-based board of directors composed of individuals from civil society, municipal and provincial government, industry and user-groups, with education and experience in coal mining impacts and aquatic cumulative effects monitoring.

Summary

We present a summary of our key points and suggestions below. A more detailed explanation of each of our points then follows.

1. ERA is concerned about the stringency and urgency of proposed selenium regulations within the *alternative approach*.

We understand that regulations need to consider the legacy issues created by historical mining in the Elk Valley, and the major challenges associated with dealing with those issues. However, we are concerned that the proposed CMER limits do not reflect the steadily increasing risk of selenium concentrations to aquatic biota, particularly Westslope cutthroat trout (WCT) as well as to drinking water quality.

The current situation requires urgent and immediate action through a combination of regulations which are commensurate with the risk to WCT. Action includes:

- The willingness of regulators to permit the use of all feasible selenium management options, even if they have not yet been “proven” for the East Kootenays at large-scale.
- Public release of the modelling conducted by Teck which has served as the basis for provincial order station limits (also the proposed CMER limits)
 - Currently the basis for these limits is a “black box” which does not allow for critical evaluation of the level of precaution inherent in the proposed limits

2. We support continued monitoring downstream of all Elk Valley mining locations, all the way down to Lake Koochanusa (as per Teck's current provincial permit) and see value in including this type of monitoring in federal regulations as well, for both existing and new mines.
3. We strongly advise that all indicator species are included in sub-lethal testing throughout the life of the mine.
4. More frequent sampling is needed in order to indicate relative TSS from mines versus from other sources

Furthermore, we strongly recommend the inclusion of real-time TSS monitoring stations, particularly upstream and downstream of critical WCT habitat

5. ERA acknowledges that calcite monitoring is included in EEM as part of CMER, but sees a need for more regular assessments and the creation of calcite limits to act as a guide for mitigation treatments.
6. ERA recommends that in addition to the proposed 5- and 10-year reviews of the CMER, additional annual progress reports are performed outlining:
 - What each mine is doing to improve
 - The specifics of any exceedances of CMER limits
 - Whether the frequency of exceedances is triggering any concern
 - Overall success in reducing loadings and concentrations
7. We also recommend that in order to allow for increased progress in reaching CMER limits, that ECCC encourages research and development, pilot projects and full-scale implementation of new technologies as they become available, and provide support to industry in these initiatives.
8. ERA stresses the importance of data accessibility and data sharing.

All inputs, outputs and decisions taken should be made available to local communities and interested parties in a timely manner.

9. ERA notes that the discussion document lacks clarity regarding the consequences of not meeting CMER limits. More detail on the specific processes and consequences of exceeding CMER would be valuable.

Selenium Limits

ERA is concerned about the level of stringency and urgency in the proposed selenium regulations within the *alternative approach*. As a result of historical and current mining practices, concentrations of selenium have been steadily rising over time not only directly downstream of mining areas, but farther downstream in the Elk River mainstem to its mouth and in Lake Koochanusa.

We understand that regulations need to consider the legacy issues created by historical mining in the Elk Valley, and the major challenges associated with dealing with those issues. We further recognize the substantial scientific and engineering work and large financial investment Teck has made and is continuing to make in its phased roll out of water treatment facilities, with its contribution to eventually meeting the Elk Valley Water Quality Plan goal of stabilizing and reducing the selenium trend in the Elk Valley.

However, we are concerned that the proposed CMER limits do not adequately reflect the steadily increasing risk of selenium concentrations to aquatic biota, particularly Westslope cutthroat trout as well

as to drinking water quality. Figure 1, created for ERA’s Community-based Water Monitoring (CBWM) program, provides a visual example of the trends in selenium concentrations that the Elk Valley is experiencing. For example, in the Elk River at Highway 93, just upstream of the mouth of the river at its confluence into Lake Koochanusa (BC08NK0003) selenium concentrations have increased by approximately 430% between the first decade recorded (1984-1994) and the latest decade (2011-2021). Selenium levels have exceeded the BC Water Quality Guideline limits for freshwater aquatic life (2ug/L), and continue to rise (British Columbia Ministry of Environment and Climate Change Strategy 2021). Similarly, further upstream in the Elk River, just below Sparwood (BC08NK0004) a similar trend is occurring but at much higher concentrations. This site, which is much closer to the mines, consistently exceeds the guidelines for aquatic life and regularly exceeds BC drinking water guidelines (10ug/L). Levels of Se in non-mine affected tributaries of the Elk River (Alexander, Boivin, Coal, Lizard and Morrissey Creeks) are all below the BC Water Quality Guideline limits for freshwater aquatic life.

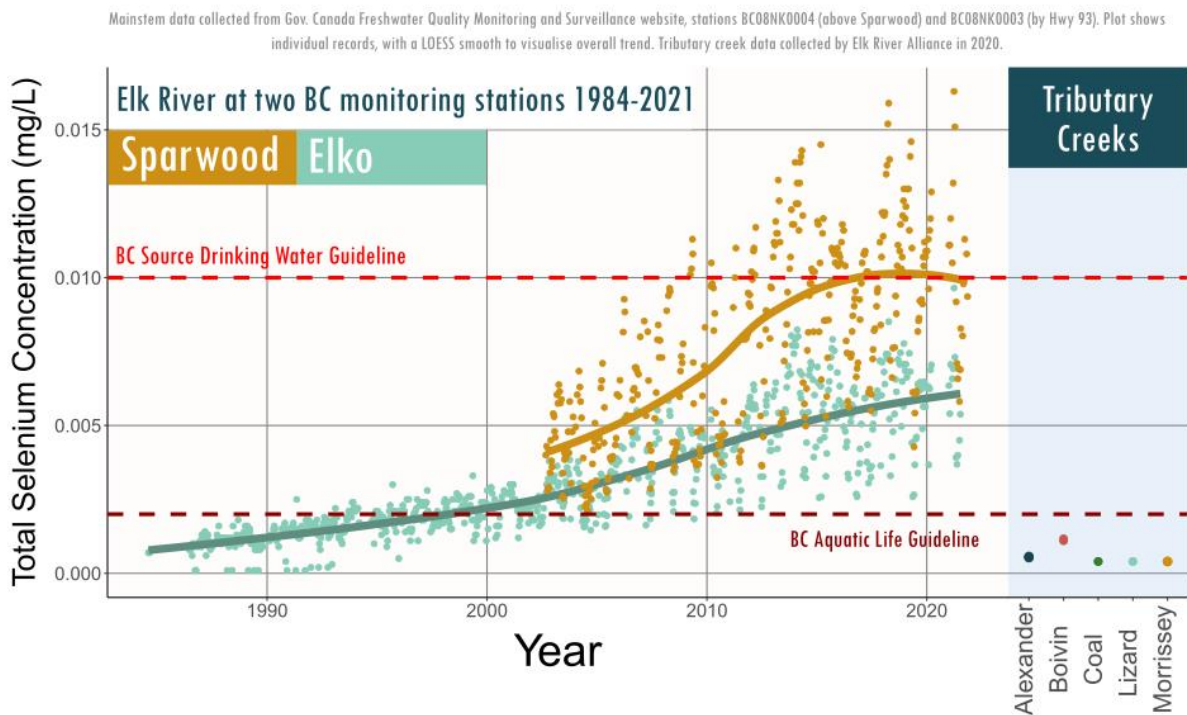


Figure 1. Comparison of Selenium concentrations in the Elk River in Sparwood (orange) and at the confluence into Lake Koochanusa (green) with non-mining affected tributaries (Alexander, Boivin, Coal, Lizard and Morrissey Creeks).

Our primary concern is that the proposed regulatory limits outlined in draft CMER using the “step-down” approach, including a potential 36% reduction in selenium concentrations at ECP’s over 15 years, will not be stringent nor timely enough to curb these rising selenium levels (~430% in the last 30 years). ERA understands that ECCC has drafted these regulations in an attempt to balance the achievability of limits with enough time to add more treatment facilities. However, we are concerned that it does not adequately address the urgency of this issue. Further the proposed regulations do not acknowledge that a range of selenium management technologies and approaches are available and can be tested and

implemented in the near future. We are concerned that further delays in implementation of feasible management measures, including full-scale pilot demonstrations, will result in continuously increasing risks of exceeding thresholds for population-level effects – especially on Westslope cutthroat trout.

Swift Action was Recommended Twelve Years Ago

In 2010, the Strategic Advisory Panel on Selenium Management stated that while there were still several areas where more data were required regarding selenium management technologies, “the Panel believes that these data needs are insufficient grounds for delay” (Swanson et al. 2010). Yet since this statement was made, selenium concentrations continued to rise.

The Panel noted that implementing *sustainable* management of selenium requires a weaving of economic, social, and environmental considerations into every decision. This was not happening in 2010 and it does not appear to be happening now. For example, if mine planning (for ore production and waste rock management) truly was incorporating selenium management as a key objective and performance metric, the observed increase in selenium concentrations over the past twelve years should have at least started showing a levelling off. The Panel suggested that a set of formal selenium management “rules” that guide mine operation decisions about cut-off strip ratios, waste rock dump construction, the use or re-use of selenium-affected water, the management of clean water, and the shape of mined out pits, as well as mine development decisions about the sequencing of ore development, and plans to mine certain areas, were needed.

The Panel presented ten selenium management options in 2010. It acknowledged that economic and social values would almost certainly be at risk if each of these options were used across all Teck Coal operations. Widespread adoption of these options would be expensive and would require a high level of maintenance, leaving long-term sustainability in question. Therefore, the Panel suggested that Teck Coal should deploy the recommended suite of ten management actions in a fashion that is tailored to specific site conditions. “It is only by focussing on individual sites that the selenium management objectives will be achieved”.

There is no evidence that Teck has developed a customized approach for each of its operations. To date, active water treatment is the primary selenium management tool – with all of its demonstrated challenges and delays in implementation. The saturated rock fill approach took years to implement (due in part to regulatory delays), and while results are encouraging (reduction of selenium concentrations of about 95% for the Elkview mine), the specifics of it are not publicly available, and it would have been much better to have seen those results earlier and at more than one operation. Meanwhile, waste rock is still being deposited via end-dumping, continuing to fill valleys and generate selenium. Avoidance of cross-valley fills was one of the top three short-term recommendations of the Panel.

We are particularly concerned about the ability of the proposed regulations to protect populations of Westslope Cutthroat trout (WCT; *Oncorhynchus clarkii lewisi*), currently listed as Special Concern under Schedule 1 of the federal Species at Risk Act (SARA). WCT populations have experienced dramatic population declines throughout their historic range due to habitat loss and degradation, overexploitation, competition, predation by non-native salmonids, and introgressive hybridization with other trout species (Shepard et al. 1997; Government of Canada 2016). The Elk River is one of seven streams designated as Class II Classified Waters and is a stronghold with limited introgression for WCT across its populations (Rubidge 2003; Rubidge and Taylor 2005; Lamson 2018). Unfortunately, this watershed, and these WCT populations, still face many threats such as degraded water quality from coal mining, riparian clearing due to industrial and urban development, and an increase in angling pressure (Tepper 2008; B.C. Ministry of Environment 2014a; 2014b). WCT are sensitive to the effects of selenium and elevated levels can result in reproductive impairment, reduced growth and increased mortality rates (Hilton and Hodson 1983; Lemly 1993; 2014).

The companion document to the BC selenium water quality guideline (B.C. Ministry of Environment 2014a) states that “it is generally accepted that as Se concentrations in water increase, so does the risk of increased Se concentrations in biota, even if the absolute relationship is not well-understood”. The document goes on to say “bioaccumulation and toxicity of Se to organisms cannot always be predicted consistently from the concentration of Se in water”. The guideline was set at 2 ug/L to be protective of all aquatic life, in other words, the guideline is precautionary. However, the degree of precaution represented by this guideline may not be sufficient, given the uncertainties associated with site-specific bioaccumulation and toxicity and the status of WCT as a species of Special Concern.

The proposed CMER limits for ECPs in the Elk River system are even less precautionary, despite the status of WCT as a species of Special Concern, the continuing increase in selenium concentrations, and extremely limited knowledge of the current status of the WCT population in the Elk River. Thus, we have no way of knowing how vulnerable the WCT population is to reductions in recruitment due to selenium. Nor do we have the information to help us understand the risk to WCT from multiple stressors and whether ever-increasing selenium concentrations may push the population past a tipping point.

In summary, the current situation requires urgent and more stringent action through a combination of regulations which are commensurate with the risk to WCT. Action includes the willingness of regulators to permit the use of all feasible selenium management options, even if they have not yet been “proven” for the East Kootenays at large-scale. Informed action also requires the transparent and accessible sharing of information generated by Teck regarding the modelling of WCT populations, and recognition of the need to study the current status of the WCT population. We note that Environmental Effects Monitoring (EEM) will not be sufficient. Fish health indicators used in EEM are non-specific, often resulting in prolonged cause/effect investigations. Meanwhile, population-level shifts can go undetected. The focus must be on source control. Waiting for effects from selenium will be too late.

Basis for Effluent Limits

ERA would also like to express concern over the methods for creating the “baseline” for the concentrations of pollutants within effluent. A baseline averaging period of January 1, 2015 to December 31, 2018 is too recent and not an appropriate point to jump off of in terms of setting limits. By setting the

“baseline” so high, the resulting limits are not as strict as they need to be to quickly reduce the levels of harmful pollutants accumulating in our waterways. Additionally, the baseline for the proposed ECP for Fording River Operations/Fording River only includes selenium and nitrate measurements from March 16, 2021 to September 28, 2021. We understand that EMS information is not available at this location further back than March 2021, but Teck does have more long-term data sets available at this location from prior to its establishment as an official “compliance point”. These data could be used to increase the measurements included in the “baseline period”.

ERA is also concerned with the robustness and validity of the limits outlined in CMER. In the information session it was stated that these limits were based on those associated with the order stations included in Teck’s provincial permit (107517). These order station limits are based on modelling that Teck has done but unfortunately Teck has not released the specific details of this modelling model to the public. Without knowing the driving assumptions and confidence levels associated with this modelling, we are unsure of how much confidence can be placed in these limits, and therefore the CMER limits as well. Although we understand that Teck’s models indicate that at current levels in the receiving environment, selenium concentrations are not likely result in changes to the WCT population, without knowing the details of these models, we are unsure of how much confidence can be put into these results and how protective they are of WCT populations.

Cumulative Effects Monitoring – Length of the River

Currently the regulations only call for monitoring (both water quality and EEM) within each mine’s initial effluent area, but there is concern over the more downstream effects as well. We support continued monitoring downstream of all Elk Valley mining locations, all the way down to Lake Koocanusa (as per Teck’s current provincial permit) and see value in including this type of monitoring in federal regulations as well, for both existing and new mines. The discharge from all of these mines within the area eventually flows into the Elk River and assessments capturing the downstream effects of all effluent sources combined should be considered in environmental monitoring plans. This would allow for better monitoring of the ability of these regulations to protect the watershed, aquatic habitats and important fish populations.

Sub-lethal Testing

We strongly advise that a range of indicator species be included in sub-lethal testing throughout the life of the mine. These ecosystems are incredibly complex, and the conditions within them are dynamic and constantly changing. In order to accurately represent the ecosystem and identify potential negative effects from effluent, more than one lab indicator species is needed for testing. Different indicator species have varying tolerance levels for specific types of pollution or disturbance. By testing only one species deemed as the most sensitive during initial tests, effects resulting from changes to the system (ie. new pollutants, different concentrations) may be missed. For example, Teck recently discovered issues resulting from high nickel concentrations in the water. These effects were discovered through invertebrate chronic toxicity testing and were not seen in other indicator species (ie. fish) (Teck Resources Ltd. 2021). If invertebrates hadn’t been tested and only fish were included in sub-lethal testing, then this issue may not have been caught, or would could have taken much longer to see the effects in other

indicators. Consistently including multiple indicator species in testing is essential to discovering and mitigating any problems in a timely manner.

Total Suspended Solids

In section 1.3.1 of the CMER discussion document, ECCC proposes that total suspended solids (TSS) is to be sampled quarterly over the first year. Quarterly sampling is not frequent enough to establish whether or not a mine is depositing significant amounts of TSS into the receiving environment. More frequent sampling is needed in order to indicate relative TSS from mines versus from other sources. ERA suggests initiating weekly sampling at CIF.

Furthermore, we strongly recommend the inclusion of real-time TSS monitoring stations to catch different weather or disturbance events, as they occur and collect enough data to prove whether or not the mine is a major contributor to total TSS loads in the receiving environment. Real-time TSS monitoring would be particularly valuable in areas where there is critical habitat downstream of a mine – ie. spawning habitat for WCT, bull trout, etc. This would enable Teck to better understand the relative impact of their TSS loadings on these habitats and act quickly if monitoring indicates action is required.

Calcite

ERA acknowledges that calcite monitoring is included in EEM as part of CMER, but sees a need for more regular assessments and the creation of calcite limits to act as a guide for mitigation treatments.

Although calcite precipitates occur naturally, especially in areas like the Elk Valley where the geomorphology primarily consists of calcite-rich limestone, the waste rock produced from mining has high concentrations of both calcium and carbonate which can solidify on large stretches of stream (Golder Associates Ltd. 2014). Calcite concretion in streambeds, specifically downstream of local coal mining operations, has become an increasing concern in the Elk Valley. Supersaturated conditions cause concretion of the streambed which negatively affects aquatic life by actively eliminating benthic invertebrate habitat and effecting fish spawning potential (Barrett, Weech, and Orr 2016). High amounts of calcite precipitate correlate with decreased %EPT and %*Ephemeroptera* (Golder Associates Ltd. 2014). Calcite concretion can also impact the ability of WCT to spawn, with higher calcite concretion correlating with decreased redd presence (Zathey, Mitchell, and Robinson 2021).

Teck has been monitoring calcite since 2008, and now performs annual calcite assessments. They are seeing increases in the amount of calcite at sites and are finding it increasingly difficult to remove calcite concretions once they have occurred – in areas with high amounts of concretion, streambeds may need to be completely removed and recreated in order to remediate the area. To better manage calcite issues associated with mining, we recommend that ECCC create federal monitoring requirements for calcite and include triggers for calcite treatment. CMER need to explicitly address increases in calcite above the baseline norm for an area. Regulations should encourage the use of pro-active treatments and using water chemistry parameters and modelling to create limits that trigger rapid mitigation methods.

Reviews and Progress Reports

The CMER discussion document suggests that reviews of the regulations will be undergone at the 5, 10, and 15-year mark. ERA recommends that in addition to the proposed reviews, additional annual progress reports are performed outlining what each mine is doing to improve, to address the specifics of any exceedances of CMER limits, if the frequency of exceedances is triggering any concern, and overall success in reducing loadings and concentrations. ECCC and the mining companies should be transparent with this information and ensure that these reports are made available to the public.

We also recommend that in order to allow for increased progress in reaching CMER limits, that ECCC encourages research and development, pilot projects and full-scale implementation of new technologies as they become available, and provide support to industry in these initiatives.

Data Sharing

ERA would also like to stress the importance of data accessibility and data sharing. Data and reports submitted under the CMER should be publicly available in a timely manner. Data collected by industry and ECCC should be available and easily accessible on a free and open basis, and monitoring results should be communicated in understandable forms to tell an accessible story of the health of these mining-affected waterways. It is important for the public to have access to this information and be included on progress. All inputs, outputs and decisions taken should be made available to local communities and interested parties in a timely manner.

Consequences of Exceedances

ERA would like to note that the discussion document lacks clarity regarding the consequences of not meeting CMER limits. More detail on the specific processes and consequences of exceeding CMER would be valuable.

ERA appreciates the opportunity to provide comments on these regulations. Please do not hesitate to contact ERA representatives, if there are any questions or clarifications.

Sincerely,



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