

June 23, 2020

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Dear Minister Wilkinson,

Re: Request for Designation of the Castle Project under s. 19(a) of the Schedule to the *Physical Activities Regulations* and s. 9(1) of the *Impact Assessment Act*

1. INTRODUCTION

We write on behalf of Wildsight Society (“Wildsight”) regarding a proposed expansion to a metallurgical coal mine in the Elk Valley of British Columbia. Teck Resources Limited (“Teck”) recently proposed a major expansion to their Fording River Operations mine (the “Castle Project”).

Wildsight submits that the Castle Project is a prescribed project pursuant to s. 19(a) of the Schedule to the *Physical Activities Regulations*, SOR/2019-285 (the “*Regulations*”), and in the alternative, that it warrants designation under s. 9(1) of the *Impact Assessment Act*, SC 2019, c 28, s 1 (the “*IAA*”).

The grounds for this request are that:

1. The Castle Project is an expansion of an existing coal mine that would increase the size of the area of mining operations by more than 50%, exceeding the threshold for prescribed projects under the *Regulations*; and
2. Alternatively, if the threshold under the *Regulations* is not clearly exceeded, the size and potential adverse impacts of the Castle Project warrant designation of this project under s. 9(1) of the *IAA*, as the project:
 - a. either exceeds or is near a threshold set out in the Project List;
 - b. is near an environmentally sensitive location;
 - c. involves the use of new technologies; and

- d. will impact areas of federal jurisdiction that may only be properly managed through federal impact assessment.

Given that the Castle Project either exceeds the allowable increase in area of mining operations or is very close to the threshold, the well-documented environmental impact of related projects in this area, adverse impacts to fish and fish habitat, effects on at-risk species such as westslope cutthroat trout, and the transboundary impacts of this project, it is essential that the Minister designate this project and conduct a full impact assessment.

2. BACKGROUND

a. Fording River Operations

The Castle Project is a proposed expansion to Teck's Fording River Operations ("FRO") coal mine in the Elk Valley; constituting a new open pit operation relying partially on the existing facilities of FRO.

FRO is located 29 kilometers northeast of Elkford, in southeastern British Columbia. It is one of four metallurgical coal mines in the area operated by Teck. FRO began operations in 1971, and as such pre-dates both provincial and federal environmental assessment laws. FRO presently has two operating areas, Eagle and Swift. The Castle Project would be the third operating area, named after the Castle Mountain where it is situated. As stated by Teck, the purpose of the Castle Expansion "is to extend the lifespan of FRO by many decades."¹

The first major expansion, the Swift operating area, was first proposed in 2011. The extension was to extend the overall life of Teck's FRO operations by approximately 23 years and begin construction in late 2015. A provincial environmental assessment certificate ("EAC") was issued for Swift in 2015.

The Swift extension did not undergo federal environmental assessment. The CEA Agency originally determined that an environmental assessment would be required: "On March 23, 2012, it was determined that an environmental assessment was required in relation to the project because Fisheries and Oceans Canada considered taking action in relation to subsection 35(2) of the Fisheries Act."²

However, following the implementation of the *Canadian Environmental Assessment Act, 2012* ("CEAA 2012"), this decision was reversed: "On July 6, 2012, the new *Canadian Environmental Assessment Act, 2012* came into force which replaced the former *Canadian Environmental Assessment Act*. As a result, there is no longer a requirement to complete the environmental assessment of this project."³ This decision was made by the federal government for 492 projects at the same time, including the FRO Swift Expansion.⁴

¹ Teck Coal Limited, "Initial Project Description: Castle Project" (March 2020), online: https://www.projects.eao.gov.bc.ca/api/public/document/5ede866ae321f30021a8ed3c/download/CASTLE_IPD_Final.pdf, [Castle Initial Project Description] at 6.

² CEA Agency, "Archived - Fording River Operations Swift Coal Mine Expansion", online: <https://iaac-aeic.gc.ca/052/details-eng.cfm?pid=67115>.

³ *Ibid.*

⁴ Larry Pynn, "Feds walk away from environmental assessments on almost 500 projects in B.C." (22 August 2012), *Vancouver Sun*, online: <http://www.vancouver.sun.com/technology/Feds+walk+away+from+environmental+assessments+almost+projects/7125419/story.html>.

As a result, no part of FRO has been subject to federal assessment.

b. Coal Mine Expansions under the IAA

The *Regulations* set out what designated projects require an impact assessment. Designated mine expansions are defined based on physical impact, production capacity, and area of active operations, as set out in the Schedule for the *Regulations*.

In section 19 of the Schedule, certain expansions of existing mines are set out as designated projects. For existing coal mines, expansions that result in an increase in the “area of mining operations of 50% or more and the total coal production capacity would be 5 000 t/day or more after the expansion” are considered designated projects requiring assessment.⁵

“Area of mining operations” is a defined term in the *Regulations*: “the area at ground level occupied by any open pit or underground workings, mill complex or storage area for overburden, waste rock, tailings or ore.”⁶

c. Teck’s calculation of footprint for the Castle Project

In Teck’s Initial Project Description for the Castle Project, provided to the BC EAO, it was determined that provincial environmental assessment would be required. Relying on the provincial threshold for prescribed projects, which is dependent on area not previously permitted for disturbance, Teck estimated a “possible disturbance of 2,550 ha of land not previously permitted for disturbance and an increase of the area of mine operations of 36.5%.”⁷ Teck acknowledged in the Initial Project Description that the exact footprint of the Castle Project was still unknown: “Since the Project is still conceptual, Teck has not determined the exact footprint for the Project.”⁸

Teck concluded that a provincial environmental assessment would likely be required: “the Project does not meet the percentage change threshold under Section 3 [of the BC regulations], but does meet the total area threshold under Section 4. This means that the Project will require a provincial environmental assessment.”⁹

Teck stated in their Initial Project Description to the BC EAO that the threshold for federal impact assessment was likely not met under the *IAA*:¹⁰

“Teck is in communication with the Impact Assessment Agency of Canada about the Project. Teck’s current understanding is that the Project does not meet the thresholds under Section 19(a) of the *Physical Activities Regulations* (SOR/2019-285) and the Project does not automatically require an assessment under the *Impact Assessment Act* (SC 2019, c 28).”

Communication between the Agency and Teck reveals how this determination was made. In a letter to the Agency, Teck described that certain components of the Castle Project and existing FRO would be included within the area of mining operations, while other facilities would not be included. Teck’s analysis was based on guidance from the Agency following a conference call:

⁵ [Physical Activities Regulations, SOR/2019-285](#) [*Physical Activities Regulations*] at s 19 of the Schedule.

⁶ *Physical Activities Regulations*, *supra* note 5 at s 1(1).

⁷ Castle Initial Project Description, *supra* note 1 at 40.

⁸ Castle Initial Project Description, *supra* note 1 at 40.

⁹ Castle Initial Project Description, *supra* note 1 at 40.

¹⁰ Castle Initial Project Description, *supra* note 1 at 43.

“The conference call between IAAC and Teck on February 10, 2020 and subsequent email exchange provided clarity on IAAC’s request and the approach Teck should use to respond.”¹¹

According to the Agency’s own information request to Teck, an excerpt of which was included in Teck’s response:

“Depending on project-specific circumstances, [the calculation of the area of mining operations] may include components of the existing mine that are under construction, constructed but not in operation, in operation, in the process of being decommissioned, or in care and maintenance. It may also include components for which regulatory approvals have been issued but construction has not yet started.”¹²

Teck determined the following facilities should be included under the definition:

- Pit (area where ore or waste rock is being mined);
- Mill complex and ore storage (area where ore is being stored, handled, and processed);
- Soil storage (area for soil stockpiles prior to use during reclamation – qualifies as overburden storage under the *Regulations*);
- Waste rock storage (area where rock that is mined to access the ore is stored);
- Tailings storage (area where fine materials washed off of the ore in the mill complex is stored); and
- Interim reclamation sites (area where soil and vegetation have been placed, but that might be repurposed for additional use as an area of mine operations).

Teck excluded all other components of the existing project and proposed expansion: “Any part of FRO or the Project that is not within one of the subcategories does not count as part of the area of mine operations under the *Regulations* and was not included in the calculations.”

¹¹ Teck Coal Limited, “Letter to the IAAC – Castle Project” (27 February 2020) [Letter from Teck to the Agency], attached as Appendix A.

¹² *Ibid.*

Based on these components, the following area of mining operations was calculated:

Table 1 Fording River Operations Area of Mine Operations based on *Physical Activities Regulations*

Fording River Operations	In-Use (Constructed) (ha)	Permitted (Not constructed) (ha)	Total (ha)
Pit	630	220	850
Mill Complex and ore storage	60	-	60
Soil Storage	30	-	30
Waste Rock Storage	2,970	1,010	3,980
Tailings Storage	120	-	120
Interim Reclamation	590	-	590
Total	4,400	1,230	5,630

Table 2 Castle Project Area of Mine Operations based on *Physical Activities Regulations*

Castle Project	Proposed (new) (ha)
Pit	1,520
Mill Complex and ore storage	-
Soil Storage	140
Waste Rock Storage	350
Tailings Storage	-
Interim Reclamation	-
Total	2010

As the existing footprint was stated to be 5,630 ha, and the expansion to be 2010 ha, Teck determined that the expansion would solely be an increase of 35.7%, falling below the 50% threshold and not requiring a federal impact assessment.

As can be seen in the tables above, two of the components that were included by Teck as part of the existing footprint area were 1,230 ha of areas of the existing FRO that are "permitted (not constructed)", and 590 ha of interim reclamation sites – areas where some reclamation had occurred, but may later be repurposed for additional use.

d. The Agency's Determination

Relying on the figures provided by Teck, the Agency determined the expansion will not be subject to a federal assessment under the IAA:

“Under the Act, a proponent is to determine if its proposed project is described in the Regulations ... The Agency reviewed the information you have provided that the physical works associated with the Project would increase the area of mining operations by an additional 35.7 percent, and that the expansion would have a total production capacity of 27 400 tonnes per day. The Project, as proposed and described in the material provided,

would be below the threshold described in the Regulations. As a result, it is the Agency's view that this proposed project would not be a designated project under the Regulations."¹³

This determination was based on acceptance of the figures as provided by Teck, and implicitly an acceptance of Teck's interpretation of what components fall under the definition of "area of mining operations."

3. ANALYSIS

a. The Castle Project is a prescribed project under the Regulations

Wildsight submits that there are significant issues with Teck's submissions on their existing footprints. Teck's calculations on the existing area of mining operations, at a minimum, lacks sufficient explanation and support, and is likely incorrect. It is Wildsight's view that the Castle Project should be considered a prescribed project under the *Regulations*. At a minimum, there are significant uncertainties around the calculation of area of mining operations as provided by Teck, and Agency should reconsider its determination of April 3, 2020 on this basis.

As described previously, whether a coal mine expansion is prescribed under the *Regulations* depends on whether there has been at least a 50% increase to the area of mining operations. In order to determine whether an expansion surpasses this threshold, the proponent of the expansion must provide accurate calculations of the area for both the existing facilities and for the proposed expansion.

If a proponent overstates the area of existing operations, then a large expansion can proceed without review. Similarly, a minor expansion to a small existing facility may exceed the 50% threshold. Where a proposed expansion is close to the 50% threshold, as with the Castle Project, it is critical to assess the accuracy of the provided existing footprint and expansion footprint as provided by Teck.

Wildsight submits that there are three ways Teck's submissions either do not conform to the definition of "area of mining operations" or are not supported on the information Teck submitted. Specifically, the Agency should reconsider their determination on three bases:

- 1 Teck has included interim reclamation sites as part of the area of existing operations, increasing the size of active operations to allow for the Castle Project to avoid review;
- 2 Teck has also included components of the existing mine "permitted (not constructed)", without providing particulars about planned development, again increasing the existing footprint; and
- 3 The final footprint of both the existing FRO and the Castle Project is conceptually uncertain, and discrepancies between the figures provided to the BC EAO and to the Agency are currently unaccounted for.

These three issues within Teck's submissions are discussed in detail in this section. Each issue requires further investigation by the Agency and information from Teck. Given these significant uncertainties around the size of both the existing facility and proposed expansion, the Agency

¹³ Impact Assessment Agency of Canada, "Letter to Teck Coal – Castle Project" (3 April 2020), attached as Appendix B.

should err on the side of caution and find the Castle Project to be a designated project under the *IAA*. Based on the apparent deficiencies in the information provided by Teck, the Castle Project may exceed the threshold for reviewable mining expansions under the *Regulations* and indeed be a prescribed project for the purposes of the *IAA*.

i. *Interim Reclamation Sites*

In their submissions to the Agency, Teck has included 590 ha of interim reclamation sites as part of the existing footprint: “area where soil and vegetation have been placed, but that might be repurposed for additional use as an area of mine operations.”¹⁴

Reclamation has been an ongoing process for the existing FRO and is a requirement through Teck’s provincial *Mines Act* permit (Permit C-3). To fulfill this requirement with the provincial regulator, Teck regularly submits reports describing the status of present and future planned reclamation. Teck recently submitted a 2019 Annual Reclamation Report (the “Reclamation Report”) where the area of existing operations for FRO was described, along with the area of reclaimed sites.

In the Reclamation Report, Teck describes the total area of reclaimed sites, as well as their long-term plan for progressive reclamation as operations continue:

Currently ~14% of the site’s disturbance area (4,956.37 ha) has been classified as reclaimed (685.58 ha). Much of the remainder of the site is generally active and therefore is unavailable for reclamation. However, progressive reclamation is planned to occur throughout the stages of active mining and closure. Progressive reclamation is focused on portions of the disturbance that are no longer necessary for the immediate operating requirements of the site.¹⁵

Teck went on in the Reclamation Report to describe the purpose and intention behind reclamation:¹⁶

Reclamation of the post-mining environment will re-establish basic ecological processes through relatively simple plant communities, but it could take decades to centuries to re-establish the complexity of ecosystems such as mature or old growth forests. Nonetheless, the overriding objective for all reclamation treatments is to promote NPI by establishing diverse ecosystems and habitats that will persist and continue to promote succession toward desired mid to late seral stages over time ... Reclamation will be scheduled in areas where mining and operations are complete and not planned for any future mining activities.

The clear intention behind Teck’s reclamation activity is on long-term re-establishment of ecosystems in areas not planned for future operations. Reclaimed areas do not fall under the definition of area of mining operations

Categorizing reclaimed sites as “interim” allows Teck to fulfill their obligations to the provincial regulator, while simultaneously taking advantage of a larger existing footprint to avoid assessment of the Castle Project. The characterization to the Agency that these sites may later be

¹⁴ Letter from Teck to the Agency, *supra* note 11.

¹⁵ Teck Coal Limited, “Fording River Operations 2019 Annual Reclamation Report” (31 March 2020) [Reclamation Report] at i. Excerpts of the Reclamation Report are attached as Appendix C.

¹⁶ Reclamation Report, *supra* note 15 at 4-5.

re-purposed for operations is not consistent with the characterization of sites as reclaimed to the provincial regulator.

Before the Agency can accept the figures as provided by Teck, clear delineation between sites permanently reclaimed (a total of 685.58 ha as stated to the province) and sites that may later be repurposed for active operations (an alleged 590 ha included as part of the existing footprint) should be required.

Whether these interim sites may be characterized as active area of mining operations should be scrutinized in detail by the Agency before these figures as provided are accepted. The Agency should be hesitant to accept such submissions that allow for a larger existing footprint. Reliance on reclaimed sites as potential area for future operations would allow proponents to significantly increase the original footprint, allowing for major expansions to escape review. This is doubly true for existing projects that have not yet been subject to federal assessment.

ii. *Permitted (not constructed) Areas*

Teck has also included 1,230 ha as part of the existing FRO footprint that has been permitted, but not yet constructed. The inclusion of components permitted but not yet constructed appears to be in response to the Agency's request to include "components for which regulatory approvals have been issued but construction has not yet started." These two categories are not necessarily the same. The Agency should not accept inclusion of areas planned for construction without specific details on future expansion, as the inclusion of this component would also allow for significant increases to the calculation of the existing footprint.

It is unclear how Teck is defining "permitted area" where future construction may occur. Teck may be relying on provincial regulatory approvals for FRO, such as through the *Mines Act*. However, permits under the *Mines Act* are often significantly larger than the actual footprint of the projects, and should not be used to calculate existing area. The federal definition of the "area of mining operations" under the *Regulations* is designed to capture the area of actual facilities, not the theoretical limit of operations as defined by the permitted area.

Again, "area of mining operations" is defined as "the area at ground level occupied by any open-pit or underground workings, mill complex or storage area for overburden, waste rock, tailings or ore" (*emphasis added*).

When this definition was first added in 2013 under the predecessor to the present *Regulations*, the *Regulations Designating Physical Activities*,¹⁷ the explanation for the addition of this definition was included through a Regulatory Impact Statement: "The entries for all expansions would be adjusted to use a consistent approach that specifies an increase of 50% or more in the size of the facility and that the resulting facility must meet or exceed the threshold size for a new facility of that type."¹⁸

¹⁷ Note: This definition was originally "area of mine operations", rather than "area of mining operations", however the content of the definition was the same.

¹⁸ Canadian Environmental Assessment Agency, "Regulatory Impact Analysis Statement" (2013), online: https://www.firstpeopleslaw.com/database/files/library/Regulations_Amending_the_Regulations_Designating_Physical_Activities.pdf.

Additionally, within the Regulatory Impact Statement it was stated that “entries for mine expansions would be modified to relate the size of the expansion to an increase in the area of disturbance rather than referring only to production capacity”¹⁹ (*emphasis added*).

This explanatory note provides clarity on the purpose behind the addition of this definition. The use of the word “facility” appears to capture the actual components of the mine, and not the entire permitted area that could potentially be used for later expansion. Additionally, the addition of an area threshold was designed to capture increases in the area of disturbance for mining expansions; area not intended for facilities or disturbance should not be captured under this definition.

The Agency should be hesitant to accept Teck’s figures about planned construction without detailed information about future operations. The definition of area of mining operations refers to the area occupied by present facilities, not to area theoretically reserved for eventual construction. Allowing proponents to rely on the larger permitted area, without explanation of planned development, would significantly increase the area of existing operations, allowing much larger mining expansions to escape review and undermining the purpose of the thresholds within the *Regulations*.

The Agency should be wary to allow this interpretation of the definition of the “area of mining operations” due to the precedent it would set for future major expansions to mining projects in Canada.

iii. *Teck’s proposed expansion is conceptual*

As noted above, Teck’s proposed expansion is conceptual, meaning that a precise determination of the percentage increase cannot be undertaken. Given the questionability of the inclusion of some of the components, the ultimate footprint of the expansion could be determinative of whether the Castle Project constitutes a designated project.

For example, slight variation to the area of existing components permitted but not yet constructed would lead to the expansion surpassing the 50% threshold. Any changes to the conceptual footprint of the Castle Project would then make the requirement for assessment determinative.

Teck has already noted the uncertainty around anticipated area for the Castle Project. In the Initial Project Description to the BC EAO, Teck acknowledged the eventual footprint was still unknown: “Since the Project is still conceptual, Teck has not determined the exact footprint for the Project.”²⁰

There are also discrepancies between Teck’s submissions on the expansion footprint to the BC EAO as compared to the footprint provided to the Agency. The area of the Castle Project was stated to be 2,550 ha to the province (based on the area disturbed by the project outside of previously permitted areas), and 2,010 ha to the Agency (based on the area of certain categories of facilities). The difference in these two footprints is 540 ha. Additionally, the two maps provided to the BC EAO and the Agency are quite different, as there appears to be additional area included along the east and south edges of the proposed footprint.²¹

¹⁹ *Ibid.*

²⁰ Castle Initial Project Description, *supra* note 1 at 40.

²¹ See Castle Initial Project Description, *supra* note 1 at 42, and Letter from Teck to the Agency, *supra* note 11 at 6.

In Teck's submission to the Agency on the footprint of the Castle Project, Teck acknowledged that certain components were excluded: "Any part of FRO or the Project that is not within one of the subcategories does not count as part of the area of mine operations under the *Regulations* and was not included in the calculations."²² While a list of included subcategories was provided to the Agency, the precise list of excluded facilities was not. At least 540 ha of disturbed area was unaccounted for in Teck's submission to the Agency.

Given the conceptual uncertainty around the expansion footprint of the Castle Project, a lack of precise information provided on what facilities were excluded from calculation as provided to the Agency, and the potential errors in calculation of the existing FRO footprint, it is essential that the Agency re-assess the figures as provided by Teck to determine whether the Castle Project will constitute a larger than 50% increase in the area of mining operations.

The Agency has dealt with uncertainty about conceptual expansions for previous determinations around whether a mine expansion is a proposed project. On a recent determination regarding an expansion to the Vista Coal Mine in Alberta, the Agency relied on a range of estimated footprints as changes were anticipated to both existing operations and the proposed expansion: "Using proponent information, the Agency calculated that the Project would result in an increase in the area of mining operations between 42.7 to 49.4 percent, depending on how future anticipated changes to the Phase I footprint are considered in calculations."²³ The same uncertainty around existing and proposed footprint is present with the Castle Project – if the range of potential expansion is over the threshold of 50%, the Agency should proceed on the basis of caution when determining if the expansion is a prescribed project under the *Regulations*.

Both interim reclamation sites and permitted but not yet constructed areas should arguably not be considered as part of the area of existing operations. If these two components are to be included, more information from Teck is required to determine the extent of reclamation and the intended use for each of these areas.

If these two components were not included within the existing area of mining operations, the existing area of FRO would be 3,810 ha, rather than 5,630 ha. The increase in the area of mining operations would then be $2,010 \text{ ha} / 3,810 \text{ ha} =$ a 52.76% increase. The Castle Project would therefore be a designated project under the *Regulations* and would require assessment under the *IAA*.

Given these significant uncertainties, it is our submission that the Agency should reconsider their determination that the Castle Project is not a designated project under the *Regulations*. At the very least, further information from Teck is required before their figures can be accepted as determinative. To accept Teck's submissions, without further information and analysis, would be an error. The Castle Project may indeed constitute a larger than 50% increase in the area of mining operations, and therefore require assessment under the *IAA*.

b. The Castle Project should be designated pursuant to section 9(1) of the IAA

²² Letter from Teck to the Agency, *supra* note 11.

²³ Impact Assessment Agency of Canada, "Analysis Report: Whether to Designate the Coalspur Mine Ltd. Vista Coal Mine Phase II Project in Alberta" (December 2019), online: <https://iaac-aeic.gc.ca/050/documents/p80341/133221E.pdf>.

In the alternative, if the Castle Project is found not to exceed the threshold for prescribed projects under the *Regulations*, the Minister should designate the project pursuant to section 9(1) of the *IAA*.

A full impact assessment of the Castle Project is necessary for several reasons, as the project:

- either exceeds or is near a threshold set out in the Project List;
- is near an environmentally sensitive location;
- involves the use of new technologies; and
- will cause significant adverse impacts to areas of federal jurisdiction, impacts which have not yet been adequately addressed through other legislative and regulatory mechanisms, including:
 - impacts to fish, fish habitat, and other aquatic species;
 - impacts to terrestrial species at risk;
 - impacts to migratory birds;
 - impacts to federal lands;
 - international and interprovincial impacts;
 - cumulative impacts within the Elk Valley; and
 - greenhouse gas emissions that may impact Canada’s ability to meet its commitments in respect of climate change.

Each of these considerations is discussed in detail in this section.

i. *Proximity to a Threshold in the Project List*

As discussed in the previous section, if the Castle Project does not exceed the threshold for expansions to coal mines, it is very close to the threshold that would require federal assessment. Uncertainty around the figures as provided by Teck for the existing FRO footprint, as well as the conceptual uncertainty around the size of the expansion, indicate that the proposed project will be very close to the threshold if it is not as surpassed.

Once fully operational, the Castle Project would be the largest coal mine in Canada by annual coal production volume. FRO is currently the largest coal mine in Canada, with an annual production of 7.9 million tonnes (MT) in 2019 and a planned annual production rate of 10 MT.²⁴ Once Castle becomes the primary operation site for FRO by the early 2030s, the expansion alone will be the largest coal mine in Canada by production.

Despite the Castle Project being an expansion to an existing mine, the project’s annual production will be larger than the combined production of three new mines in the Elk Valley currently in the federal assessment process, and the disturbance footprint of the project is roughly equivalent to these three proposed mines.²⁵

²⁴ Reclamation Report, *supra* note 15 at 11, and Castle Initial Project Description, *supra* note 1 at 15. See also Teck Resources Limited, “2019 Annual Report” (26 February 2020) online: <https://www.teck.com/media/2019-Annual-Report.pdf> [Teck 2019 Annual Report].

²⁵ These three mines are the [Michel Coal Project proposed by North Coal Ltd.](#): 2.3-4MT/year production, 87.4 MT total production, and 1424 ha of disturbance reported to the Agency; the [Crown Mountain Coking Coal Project proposed by NWP Coal Canada Ltd.](#): 3.7 MT/year production, 56 MT total production, and approximately 1100 ha of reported disturbance; and the [Bingay Main Coal Project proposed by Centermount Coal Limited](#): 1 MT/year

Additionally, the historical lack of assessment for both the original mine and related projects in the area by the same proponent, and well-documented adverse environmental impacts in the Elk Valley, require the Castle Project to be assessed before further development can occur in the area. As stated previously, no part of FRO has been assessed federally, as the original mine pre-dates provincial and federal environmental assessment laws, and the Swift expansion was determined not to require assessment after the passing of CEAA 2012,²⁶ despite initially being designated in 2011.²⁷

The Swift expansion increased the area of mining operations of the Fording River mine by roughly 27-38% (depending on components included in the area of mining operations as detailed above) and will continue to be mined until the early 2030s.²⁸

In fact, none of the metallurgical coal operations in the Elk Valley have been subject to federal assessment. Major expansions at Teck's nearby Elkview and Line Creek mines, for decades of additional mining each, were also approved without federal assessment in 2016 and 2013 respectively.

Extensive coal mining has already taken place at the Fording River mine, the adjacent Greenhills mine and other nearby Elk Valley mines, now covering a permitted area of more than 150 square kilometers and an estimated 2020 production output of 24 MT of coal,²⁹ without any federal impact assessment having taken place.

The failure to assess any of the coal operations in the Elk Valley raises serious concerns around the cumulative impacts of these operations. Additionally, the well documented issues with selenium pollution, the adverse impacts of this pollution on areas of federal jurisdiction, and the failure of the federal government to consider the success of proposed mitigation strategies to address these adverse impacts, raises serious concerns. Each of these issues is discussed in detail further on in this letter.

ii. *Proximity to Environmentally Sensitive Location*

The project is located adjacent to the heavily-polluted upper Fording River, where a recent population crash saw adult westslope cutthroat trout ("WCT") reduced by 93%. Polluted water from waste rock storage at the Castle mine would flow primarily into the upper Fording River.

The upper Fording River flows into the Elk River and then into Lake Koocanusa, where significant impacts on fish are being investigated as part of the joint B.C.-Montana Lake Koocanusa process. Any increase in water pollution flowing into the upper Fording River may

production, 13 MT of total production, and 420 ha of disturbance. In total, these three projects would have an annual 7-8.7 MT/year production, 156.4 MT total production, and approximately 2944 ha of disturbance. Information about these projects is based on information provided by the proponents to the Canadian Impact Assessment Registry.

²⁶ See Pynn, *supra* note 4.

²⁷ See CEA Agency, "Archived - Fording River Operations Swift Coal Mine Expansion", online: <https://iaac-aeic.gc.ca/052/details-eng.cfm?pid=67115>.

²⁸ Estimate based on the figures and maps in Teck Coal Limited, "Fording River Operations Swift Project Environmental Assessment Certificate Application: Section A3 — Project Description" (November 2014), online: <https://projects.eao.gov.bc.ca/api/public/document/58868f56e036fb0105768100/download/Section%20A%20-%20A3%20Project%20Description.pdf> [Swift Project Description] at A3-3 and A3-4, as well as the figures in Teck Coal Limited, "Annual Reclamation Report 2014: Fording River Operations" (31 March 2015), online: <https://mines.empr.gov.bc.ca/api/document/5ba3bd5d225898003c82d86c/fetch> at vi and 1.

²⁹ Teck 2019 Annual Report, *supra* note 24 at 10.

cause significant additional adverse environmental effects in the Fording and Elk Rivers as well as Lake Kootanusa and the Kootenai/Kootenay River downstream.

In addition to impacting these waterways and the aquatic species within, the project would be located in grizzly bear and wolverine habitat, threatening connectivity for these species. It would destroy a significant area of high-elevation grassland habitat for Rocky Mountain bighorn sheep. The specific potential adverse impacts of the Castle Project on water, fish, other aquatic species, and terrestrial species, are discussed further on in this letter.

iii. *Use of New Technologies*

Teck has proposed the use of technologies for the Castle Project that are either new or untested. The Initial Project Description for the project considers the use of several strategies to control and mitigate water pollution: source control, Active Water Treatment Facilities (“AWTF”), Saturated Rock Fill (“SRF”) and in-situ treatment.

While these options are apparently all on the table, Teck’s public statements are clear about their intention to use SRF as their primary method, especially in presentations given by Teck and BC Ministry of Environment at the Lake Kootanusa Monitoring and Research Working Group meetings in November. Teck has indicated that the Fording River South AWTF facility currently under construction will be their last, and all future treatment will be done with SRFs.³⁰

The SRF technology is unproven, having only been trialed at scale since 2018 at Elkview mine. Data about the effectiveness of this technology is not public. However, as described in the next section, Teck has applied for a permit to discharge significant levels of selenium and nitrate from the SRF, indicating that it is not as effective as they have publicly claimed. A federal assessment is crucial to establish the effectiveness and appropriateness of the new SRF technology to the water pollution problem.

Even AWTF is a relatively new technology and far from proven. Teck currently operates one AWTF facility at their Line Creek mine and another is under construction at the Fording River mine. The existing facility was initially brought online in 2014, but soon released significant water pollution that killed fish downstream, resulting in a \$1.4M fine under the *Fisheries Act*.³¹

More recently, in 2018, the facility was shut down for approximately a year after it was discovered that speciation of selenium in the biological treatment process was releasing selenium downstream in a more bio-available form, increasing the effective risk for fish and aquatic life directly downstream. Because of these issues, the Fording River South AWTF, originally scheduled to be operating by the end of 2018, is now three years behind the schedule in the Elk Valley Water Quality Plan and still not active. As described in the next section, a recent permit application indicates the AWTF would discharge significant levels of selenium. Given the significant issues with the AWTF technology, the potential use of this new technology in the

³⁰ Teck 2019 Annual Report, *supra* note 24 at 13. Teck stated that their “current plan is that the Fording River AWTF will be the last full-scale AWTF and that future treatment facilities will be SRFs.”

³¹ Environmental Offenders Registry, “Teck Coal Limited - conviction information for 2017-10-05” (5 November 2017), online: <https://environmental-protection.canada.ca/offenders-registry/Home/Record?RefNumber=198> [Line Creek AWTF Fine]. ECCC laid 3 charges under section 36(3) of the *Fisheries Act* (deposit of a deleterious substance) against Teck following the death of 74 fish in Line Creek, including 52 Bull Trout and 22 Cutthroat Trout. Teck pled guilty to the three offences and was sentenced to a penalty of \$1,425,000.

proposed project should also be evaluated in a federal assessment, especially if it is intended as a backup for an unproven SRF.

For both AWTF and SRF, little information has been made publicly available. Teck has claimed the details of these technologies are confidential business information. Both of these technologies are highly complex, relying on biological processes. Past provincial environmental assessments have not attempted any significant evaluation of the technology.

Recently, Teck has been using anti-scaling additives to rivers for control of calcification. This practice has not been assessed in an environmental assessment for a project in the Elk Valley.

Similarly, source control has only been used in limited cases by Teck in the Elk Valley to date and detailed information on its effectiveness has not been made public. This would include clean water diversions, waste rock dump layering techniques, capping of waste rock dumps and so on. Source control would also include attempts to reduce nitrates by lining holes drilled for blasting before placing explosives, a process Teck is working on, but for which the effectiveness has not yet been quantified.³² In situ treatment appears to be largely theoretical. All of these options should be evaluated, if they will be used in the project, in the public sphere, through the federal assessment process.

Additionally, Teck proposes “the use of new and innovative technologies where they are technically and economically feasible” in the project,³³ which could include other new technologies, including potential treatment for nickel water pollution,³⁴ or treatment for sulphate water pollution which the company is currently piloting in the Elk Valley.³⁵ The company recently referred to “25 research and development projects underway” related to water quality³⁶ including a new type of water treatment technology called Gravel Bed Bioreactors.³⁷

When any of these technologies are being relied upon to protect fish and water quality downstream, assessment of these technologies is critical.

iv. Impacts to Areas of Federal Jurisdiction

Fish, Fish Habitat and other Aquatic Species

Selenium leaching from waste rock dumps associated with open-pit coal mine operations has created an ongoing environmental crisis in the Elk Valley, causing devastating effects on fish and fish habitat. Despite this situation worsening over time, none of Teck’s existing coal mines have been subject to federal assessment. It is critical that the Castle Project be assessed to

³² Teck Coal Limited, “Elk Valley Water Quality Plan 2019 Implementation Plan Adjustment” (31 July 2019), online: <https://www.teck.com/media/Elk-Valley-Water-Quality-Plan%E2%80%93Implementation-Plan-Adjustment.pdf> [EVWQP 2019 Implementation Plan Adjustment] at 14.

³³ Castle Initial Project Description, *supra* note 1 at 12.

³⁴ Castle Initial Project Description, *supra* note 1 at 56.

³⁵ EVWQP 2019 Implementation Plan Adjustment, *supra* note 32 at 81.

³⁶ Marcia Smith (Senior vice-president, sustainability and external affairs, Teck Resources), “Letter to the Editor” (18 May 2020), *The Globe & Mail*, online: <https://www.theglobeandmail.com/opinion/letters/article-may-18-the-new-normal-seems-to-be-that-debt-doesnt-matter-readers/>.

³⁷ Elk River Alliance, “ERA Questions & Teck Responses re: Teck 2019 IPA Adjustment” (18 April 2019), online: https://www.elkriveralliance.ca/era_qs_teck_2019_ipa.

determine the extent of additional selenium pollution from the project, and the impact to vulnerable fish populations in the area.

Selenium pollution levels in the Fording River, Elk River, Koocanusa Reservoir and Kootenai/Kootenay River continue to increase, despite Teck's commitments to reduce these pollution levels under 2014's Elk Valley Water Quality Plan (the "EVWQP") and the associated provincial permits. Selenium pollution has already had significant adverse effects on fish, including westslope cutthroat trout ("WCT") and bull trout.

Not only are fish and fish habitat the responsibility of the federal government under section 91(12) of the *Constitution Act, 1867*, WCT are listed as a species of Special Concern on Schedule 1 of the federal *Species at Risk Act* ("SARA").³⁸

Effects on fish and fish habitat from the Castle Project are likely to be significant. A 2012-2014 investigation and subsequent report by Environment and Climate Change Canada [the "2014 ECCC Report"] found significant impacts to WCT from selenium pollution, including the loss of more than half of the reproductive capacity of WCT in the upper Fording River and an increasing pollution trend that threatened the survival of the isolated upper Fording population and significant risk for WCT downstream in the Elk River.³⁹

In addition to the impacts on WCT in the upper Fording River and to many species in Lake Koocanusa and downstream in the Kootenai/Kootenay River, there are or could be significant cumulative effects from the existing and proposed coal mines in the Elk Valley on fish populations in the Elk River itself, including WCT, bull trout, mountain whitefish and smaller species.

The 2014 ECCC Report also touches on the Elk River WCT population, concluding that effects on reproduction could be significant and noting numerous reports of deformities.⁴⁰ However, as the majority of the Elk River is outside of ongoing monitoring study areas for the current mines, significantly less research has been done on the Elk River and resident fish populations. A very popular catch and release recreational fishery also takes place on the Elk River for WCT and bull trout, likely leading to cumulative impacts in combination with mine effects and water quality issues from logging.⁴¹

Despite significant effort on research and development over the last decade, Teck has yet to find mitigation strategies to substantially address the long-term effects of selenium pollution flowing into the Fording River and the Elk Valley watershed. Standard design features or mitigation measures as proposed do not address the adverse effects of selenium pollution in the long term.

While there is still a great deal of uncertainty about the time scale of the selenium leaching problem from waste rock dumps at Elk Valley coal mines, it is generally considered to continue

³⁸ [Species at Risk Act, SC 2002, c 29](#) [SARA] at Schedule 1.

³⁹ Dr. Dennis Lemly, "Review of Environment Canada's Teck Coal Environmental Assessment and Evaluation of Selenium Toxicity Tests on Westslope Cutthroat Trout in the Elk and Fording Rivers in Southeast British Columbia" (25 September 2014), online: https://www.teck.com/media/2014-Water-review_environment_canada-T3.2.3.2.1.pdf [Lemly Report] at 57-59.

⁴⁰ Lemly Report, *supra* note 39 at 54-56.

⁴¹ The Elk Valley is home to large Private Managed Forest Land holdings, unlike most of BC where forestry takes place primarily on Crown land. The logging regulations on private managed forest, including on downstream water quality impacts, are much weaker than for logging on crown land.

for a very long time. No reduction of selenium pollution levels has been detected in water flowing from existing waste rock dumps, despite no new waste rock added to some for more than three decades.⁴² On this basis, water quality modeling in the Elk Valley assumes the rate of selenium leaching is proportional to the amount of waste rock, with no decay term over time.⁴³ Similar data shows sulphate pollution is expected to continue over a comparable time scale.⁴⁴

One study found they could not measure any depletion of selenium from an Elk Valley waste rock dump after 30 years, and estimated that less than 1% of the total selenium in the rock leached out over 30 years.⁴⁵ Some experts have assumed selenium pollution will continue for centuries,⁴⁶ but longer time scales are also consistent given the limited data available. Estimates of time scales for selenium and other pollutant leaching from waste rock dumps for the Castle Project must be undertaken as part of a federal assessment.

Two pollution reduction technologies proposed by Teck for the Castle Project, active water treatment and saturated rock fills, are both active pollution reduction technologies that require constant management. Neither are appropriate solutions to the long-term selenium water pollution problem in the Elk Valley which will persist for centuries or longer. It is simply not reasonable to assume that Teck will be operating these treatment facilities, which will cost on the order of \$100 million per year operate,⁴⁷ for any significant period of time beyond the end of mining operations. No solutions implemented or even proposed would significantly mitigate long-term pollution from the Castle Project. Any reduction of water pollution levels due to treatment would only mask long-term impacts, which would return once treatment is inevitably discontinued.

We note that Teck plans for water treatment to continue for an “indefinite period after mining operations end.”⁴⁸ Teck has never made public any plans for pollution mitigation beyond water treatment, leading us to believe that the company does not have any appropriately long-term plans to mitigate the pollution problem. Recent provincial EAs for Teck mine expansions in the Elk Valley have not considered the full timescale of the selenium leaching problem.

⁴² Teck Resources Limited, “Elk Valley Water Quality Plan: Annex D.4 Geochemical Source Term Inputs and Methods for the Elk Valley Water Quality Planning Model” (June 2014), online: https://www2.gov.bc.ca/assets/gov/environment/waste-management/industrial-waste/industrial-waste/mining-smelt-energy/area-based-man-plan/annexes/d4_geochemical_source_term_inputs_methods.pdf at 37.

⁴³ *Ibid* at 42.

⁴⁴ *Ibid* at 37.

⁴⁵ Hendry et al., “Reservoirs of Selenium in Coal Waste Rock: Elk Valley, British Columbia, Canada” (3 June 2015), *Environmental Science & Technology*, online: [https://www.hendrygeosciences.com/uploads/1/8/0/6/18060125/hendry_et_al_2015_es_t_proof_ab\[1\].pdf](https://www.hendrygeosciences.com/uploads/1/8/0/6/18060125/hendry_et_al_2015_es_t_proof_ab[1].pdf) at E.

⁴⁶ A. Dennis Lemly, “Environmental hazard assessment of Benga Mining’s proposed Grassy Mountain Coal Project” (25 March 2019), *Environmental Science & Technology*, online: <https://aeic-iaac.gc.ca/050/documents/p80101/132193E.pdf> at 110.

⁴⁷ Teck 2019 Annual Report, *supra* note 30 at 13. The report also indicates an estimated long-term operating cost of \$3 per tonne and annual production of roughly 24 million tonnes, leading to an estimate of \$72 million annually. However, the report states that current operating costs are \$31 million (\$1.30 per tonne) with only two small facilities in operation and 14 or more additional facilities are planned. This estimate appears to be highly optimistic and the true cost may be hundreds of millions annually.

⁴⁸ Teck 2019 Annual Report, *supra* note 30 at 13.

An assessment of the proponent's plans to manage the selenium pollution problem over the appropriate timescale must be evaluated through federal assessment, in order for the impacts on fish and fish habitat to be properly considered and addressed.

Despite Teck's apparent plans for water treatment, their recent Elk Valley Water Quality Plan 2019 Implementation Plan Adjustment [the "EVWQP 2019 Implementation Plan Adjustment"] anticipates water pollution levels far above those considered safe for fish. Even with water treatment in place, Teck anticipates monthly average selenium levels in the Fording River of up to 60 micrograms/litre ($\mu\text{g/l}$) indefinitely directly downstream of the Fording River mine,⁴⁹ while the BC Water Quality Guideline for protection of aquatic life is $2\mu\text{g/l}$ and the corresponding CCME guideline is $1\mu\text{g/l}$. The Castle project would add additional selenium pollution to the upper Fording River, further increasing selenium levels at this site and downstream.

Source control is also contemplated in Teck's Initial Project Description for the BC EAO. While clean water diversions have been tested at operating Teck mines, continued increases in pollution levels indicate these are not very effective. Other options like capping of waste rock or layered waste rock dump construction techniques have not been tested, despite many years of discussion from Teck. Teck's public statements have not indicated that source control is a significant part of their selenium mitigation strategy in the Elk Valley at existing mines.

Nitrate pollution is also a significant threat to fish and other aquatic life downstream of Teck's mines. While nitrate pollution only flows from waste rock dumps over a timescale of decades after mining ends, even with planned treatment in place, nitrate levels are expected to be above BC Water Quality Guidelines and CCME guidelines for decades.⁵⁰

Recent permit amendment applications from Teck indicate their treatment facilities are not working as well as the company has indicated or planned. An application for expansion of Teck's Elkview saturated rock fill requests a monthly average selenium discharge limit of $41\mu\text{g/l}$ and a nitrate limit of 8mg/l , while an application for the under-construction Fording River South AWTF requests a selenium discharge limit of $37\mu\text{g/l}$, both with allowable 50% acute toxicity of daphnia magna and rainbow trout.⁵¹ These pollution limits not only pose clear danger to fish and other aquatic life, but they are far higher than Teck has indicated publicly (the company has repeatedly claimed "near-complete removal of selenium and nitrate" for their Elkview SRF)⁵² or

⁴⁹ EVWQP 2019 Implementation Plan Adjustment, *supra* note 32 at 64.

⁵⁰ EVWQP 2019 Implementation Plan Adjustment, *supra* note 32 at 58

⁵¹ See Teck Social Responsibility Office, "Environmental Protection Notice—Notice of Filing: Teck Coal Ltd Fording River Operations: Active Water Treatment Facility—South" (23 January 2020), online: https://www.teck.com/media/Public_notification_AWTF.pdf [Fording River AWTF Notice] and Teck Social Responsibility Office, "Environmental Protection Notice: Notice of Filing: Teck Coal Ltd Elkview Operations: Saturated Rock Fill—Phase 2" (11 June 2020, The Fernie Free Press, online: https://www.thefreepress.ca/editions/?iid=i20200611040009934&&headline=VGhllIEZyZWUgUHJlc3MsIEp1bmUgMTEsIDlwMjA=&&doc_id=200611110848-ac346b20324f342d21962637235f7ae1 [Elkview SRF Notice] at A15.

⁵² See for example Teck Resources Limited, "Taking Inspiration from Nature: Innovative and Efficient Water Treatment with Saturated Rock Fill Technology" (11 March 2020), online: <https://www.teck.com/news/stories/2020/taking-inspiration-from-nature-innovative-and-efficient-water-treatment-with-saturated-rock-fill-technology>.

has planned for in the past (the original EVWQP planned for 20µg/l selenium and 3mg/l nitrate discharge limits from the Line Creek AWTF).⁵³

Additionally, other water pollutants threaten fish and aquatic life including calcite, sulphate, cadmium and nickel. While anti-scaling agents are currently being added to polluted rivers to mitigate some of the effects of calcite, which causes cementation of riverbeds with impacts on fish reproduction and food supply, this is also not a long-term solution appropriate to the problem. There are currently no mitigations in place for sulphate, which has exceeded provincial limits under the EVWQP, and nickel, a pollutant that has only recently come to light.

With all of these pollutants expected to leach from waste rock for the long term and continue devastation to resident fish populations, it is clear that long-term solutions are needed. It is crucial for a federal assessment not only to investigate adverse effects due to these pollutants, but also the inevitable cumulative effects from multiple pollutants affecting fish and aquatic life.

Additionally, destruction of fish habitat is a significant concern with the Castle Project, as the project will cover a significant portion of Kilmarnock Creek with waste rock. While Kilmarnock Creek cannot be reached by WCT from the upper Fording River due to a few kilometres being buried by waste rock dumps just above the Fording confluence, there remains a population of WCT in Kilmarnock Creek above the mine,⁵⁴ and the tributary has been identified as a significant past spawning tributary of the Fording River.⁵⁵ Loss of the remaining lower, meandering portion of Kilmarnock Creek to waste rock dumps as anticipated in the Castle project is likely to have severe impacts on this population of WCT. Many tributaries of the upper Fording River have already been lost to mining or related water pollution, with significant cumulative impacts on WCT.

Finally, western toad, a species of special concern under *SARA*, are found in the area.⁵⁶ Little is known about the impact on this species,⁵⁷ but effects of water pollution on tadpoles is possible.⁵⁸

Terrestrial Wildlife and Species at Risk

⁵³ Ministry of Environment and Climate Change Strategy, “Permit #107517 Under the Provisions of the *Environmental Management Act*” (amended 25 August 2018), attached as Appendix D [BC Waste Discharge Authorization 107517].

⁵⁴ Westslope Fisheries Ltd., “Upper Fording River Westslope Cutthroat Trout Population Assessment and Telemetry Project, Final Report” (December 2016), online: [https://www.teck.com/media/Upper-Fording-River-Westslope-Cutthroat-Trout-Population-Assessment-and-Telemetry-Project-Final-Report-\(December-2016\).pdf](https://www.teck.com/media/Upper-Fording-River-Westslope-Cutthroat-Trout-Population-Assessment-and-Telemetry-Project-Final-Report-(December-2016).pdf) at 10. This report was prepared for Teck by Westslope Fisheries Ltd.

⁵⁵ Minnow Environmental Inc., “Data Report for the Tributary Evaluation Program (DRAFT)” (June 2016), online: <https://www.teck.com/media/Data-Report-for-the-Tributary-Evaluation-Program.pdf> [Minnow Report] at 49. This report was prepared for Teck by Minnow Environmental Inc.

⁵⁶ Minnow Report, supra note 55 at 50.

⁵⁷ Golder Associates Ltd., “Selenium Bioaccumulation Model 2017 Update Report” (30 January 2018), online: <https://www.teck.com/media/Selenium-Bioaccumulation-Model-2017-Update.pdf> at 1-2.

⁵⁸ Cadmium is known to reduce growth: COSEWIC, “COSEWIC Assessment and Status Report on the Western Toad 2012”, online: www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/western-toad-2012.html at 19. Additionally, selenium may reduce growth per ECCC & Health Canada, “Screening Assessment: Selenium and its compounds” (December 2017), online: <https://www.canada.ca/en/environment-climate-change/services/evaluating-existing-substances/screening-assessment-selenium.html> at 32.

The Castle Project will also result in significant potential adverse effects on terrestrial wildlife. Several of these terrestrial species are federal species of special concern under *SARA*, including grizzly bears and wolverines.

With three existing coal mines in the immediate area (FRO, Greenhills, Line Creek) and other existing and proposed mines along the important Rocky Mountain connectivity corridor, there is significant concern that connectivity for wide-ranging species like grizzly bears and wolverines could be impaired through the addition of the Castle Project to an area where significant large-scale destruction of habitat has already taken place.

In the long-term, it is unclear to what degree remediation efforts can restore this mountainous habitat, both because much of the mountain is removed in the mining process and because remediation efforts to date in the Elk Valley have not shown much success in restoring fully functioning ecosystems, a very challenging task when starting from an open-pit mine or waste rock dump. Federal assessment is a necessity before additional projects are added to this area.

Dr. Clayton Lamb, Liber Ero Fellow, University of British Columbia-Okanagan of the South Rockies Grizzly Bear Project wrote:⁵⁹

“The Continental divide region is a key connectivity corridor for large carnivores. The Chauncey, Kilmarnock, and Brownie drainages offer a travel corridor for carnivores travelling north-south along the BC Rockies. Most grizzly bears tend to avoid the active mine footprint in the Fording and Greenhills area, and the Continental divide itself is often too steep to traverse and cross, leaving Chauncey and Kilmarnock as alternative routes for animals to circumvent the current mine footprint.”

The Castle Project may cut off this travel corridor, particularly due to the use of the Kilmarnock Valley as a waste rock dump. In this case, grizzlies would be left only with the options of steep terrain along or over the Continental Divide, travelling over a mine area or travelling along the bottom of the Elk Valley. This could further limit connectivity in an area where other mines, recreational use (particularly on the Alberta side of the Rockies) and logging are already limiting habitat availability.

The loss of wolverine habitat and connectivity is another serious concern. Dr. Anthony Clevenger, WTI-Montana State University, who has conducted extensive research and tracking of wolverines in the Southern Rockies,⁶⁰ said:

“The Continental Divide is essentially the last continental life line for wolverines (and grizzly bears) connecting the two most important protected areas and source populations for wolverines: Banff-Kootenay National Parks and Waterton Lakes National Park / Glacier National Park in Montana. Our research has shown this is a critically important area for female wolverines, with detections highly constricted along the Continental Divide. Keeping female wolverines on the landscape and in the population is needed to keep the population viable over the long term. The Castle mine expansion threatens that

⁵⁹ Correspondence between Wildsight and Dr. Clayton Lamb.

⁶⁰ Clevenger et al., “Mapping the Wolverine Way: Understanding landscape and human effects on wolverine abundance, distribution and connectivity in the Canadian Crown of the Continent (CCoC) ecosystem: 2016 Summary Report” (June 2016), online: <https://www.wolverinewatch.org/wp-content/uploads/2015/05/2016-WolverineAnnualReport.pdf> at 14. This research indicates wolverines in close proximity to the project area

viability by fragmenting the population into two distinct subpopulations and will limit movement and genetic interchange in this important core refuge area in the Canadian Rockies.”⁶¹

The project area also includes more than three square kilometres of rare high-elevation grasslands, which are critical winter habitat for Rocky Mountain bighorn sheep. These sheep have already lost 28% of their high-elevation grassland habitat in the Elk Valley due primarily to coal mining.⁶² This habitat may also be used by American badgers, a SARA-listed endangered species.⁶³ This grassland ecosystem could likely not be re-created at the end of mine life, not only because of the difficulties inherent in establishing a rare and sensitive grassland ecosystem, but also because the project area may no longer include these high-elevation areas. Despite many decades of mining in high-elevation grasslands that are bighorn sheep habitat at FRO, Teck only began a trial of high-elevation grassland replanting in 2019,⁶⁴ so it is unknown if this kind of restoration is even possible.

The high-elevation mountain slopes of the project area are also home to whitebark pine, a SARA-listed endangered species. The project area is within the proposed designated critical habitat for whitebark pine.⁶⁵ Any whitebark pine within the Castle Project’s footprint would be removed; Teck has already removed significant amounts of whitebark pine in the Elk Valley.⁶⁶ Within the footprint the species may never recover due to the reduction of elevation due to mining, leaving little area of sufficient elevation for whitebark pine,⁶⁷ difficult growing conditions on mined areas, and the threat of white pine blister rust, which seedlings and young trees are most susceptible to,⁶⁸ as well as the 60-year period needed before the trees can reproduce.⁶⁹ Teck has a program to replant whitebark pine, however no information is available publicly about the

⁶¹ Correspondence between Wildsight and Dr. Anthony P. Clevenger, WTI-Montana State University.

⁶² Poole et al., “Kootenay Region Bighorn Sheep Management Plan – Draft for discussion”, online: <https://www.ferniergc.com/documents/Kootenay%20BHS%20Draft%20mgmt%20plan%202023Apr19.pdf> at 16. Prepared for the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development.

⁶³ SARA, *supra* note 38.

⁶⁴ Teck Resources Limited, “Biodiversity and Reclamation”, online: <https://www.teck.com/responsibility/approach-to-responsibility/sustainability-report-disclosure-portal/material-topics/biodiversity-and-reclamation/> at Table 34.

⁶⁵ Environment and Climate Change Canada, “Recovery Strategy for the Whitebark Pine (*Pinus albicaulis*) in Canada [Proposed]” (2017), online: https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/rs_whitebark_pine_e_proposed.pdf [Recovery Strategy for the Whitebark Pine].

⁶⁶ Teck logged more than 1231 cubic metres of whitebark pine in the Elk Valley between 2012 and 2018. See Ben Parfitt, “B.C. allows logging, mining companies to cut down thousands of endangered trees” (10 June 2019), *The Narwhal*, online: <https://thenarwhal.ca/b-c-allows-logging-mining-companies-to-cut-down-thousands-of-endangered-trees/>.

⁶⁷ The elevation range of whitebark pine is down to approximately 1700m in southern B.C.: see Recovery Strategy for the Whitebark Pine, *supra* note 65 at 4. Teck has not provided any information about the final elevation of reclaimed areas, however the map of coal seam elevations (Castle Initial Project Description, *supra* note 1 at 20) and the most recent pit map of the Castle Project provided by Teck (Letter from Teck to the Agency, *supra* note 11) suggest there could be little area above 1700 m remaining after mining, depending on pit depth and potential waste rock backfill into the pit.

⁶⁸ U.S. Forest Service, “High Elevation White Pines: White Pine Blister Rust”, online: <https://www.fs.fed.us/rm/highelevationwhitepines/Threats/blister-rust-threat.htm>.

⁶⁹ Recovery Strategy for the Whitebark Pine, *supra* note 65 at vii.

success of this program in establishing this slow-growing, sensitive and long-lived species on mined areas or waste rock dumps.

Additional endangered *SARA*-listed species may be found in the project area including Williamson's sapsucker, little brown myotis and northern myotis, as well as a number of threatened bird and amphibian species. It is unknown if any planned reclamation or other mitigation efforts would address impacts on these species.

In general, Teck's efforts to date in the Elk Valley have not demonstrated, at least in a publicly-available form, that full reclamation of waste rock dumps, mine pits or other areas is feasible. The potential significant impacts on *SARA*-protected species both during mining and post-closure alone warrant federal assessment. A federal assessment should review reclamation efforts to date and reclamation plans for Castle, both in general and with a focus on high-elevation grasslands for bighorn sheep, whitebark pine and other species.

We also note a long-standing promise from Teck for a net positive impact ("NPI") on biodiversity.⁷⁰ Despite years of discussion on this subject, it does not appear that NPI has any effect on current mine operations and it is unclear what effect, if any, it would have on future operations.⁷¹

Migratory Birds

There are many migratory birds that use the area that may be impacted by the proposed mine, which would include waterways in Canada and the US.

Of particular concern are species that use aquatic environments in rivers and lakes downstream of the mine, where the cumulative effects of mining in the Elk and Kootenay/Kootenai watersheds are significant. Specifically, species that feed on fish, fish eggs, and aquatic invertebrates, where significant levels of selenium and other pollutants are found, are at the greatest risk.

Two examples of these species include spotted sandpipers and American dippers. Previous studies have raised concerns about both these species,⁷² and ongoing work at ECCC on American dippers has found elevated levels of selenium in dippers and their eggs,⁷³ though the impact of these selenium levels is still under study and little is known about the long-term implications on populations. Other potential migratory species of concern due to their aquatic diet include, but are not limited to, northern waterthrush, varied thrush, harlequin duck and Canada goose.

⁷⁰ Wildsight's internal records indicate this discussion has been ongoing since at least as early as 2013.

⁷¹ Teck's 2019 Sustainability Report indicates they only plan to have biodiversity plans in place five years in the future: Teck Resources Limited, "2019 Sustainability Report" (March 2020), online: <https://www.teck.com/media/2019-Sustainability-Report.pdf>.

⁷² For example, Teck's consultant, Minnow Environmental Inc., found egg selenium above the generally accepted adverse effects threshold for a significant number of samples, particularly those found in areas with high selenium levels in water and benthic macroinvertebrates. See Minnow Environmental Inc. "Evaluation of selenium sensitivity of spotted sandpipers breeding in the Elk River watershed of southeastern British Columbia" (February 2016), online: [https://www.teck.com/media/Evaluation-of-selenium-sensitivity-of-spotted-sandpipers-breeding-in-the-Elk-River-watershed-of-southeastern-British-Columbia,-2013-2014-\(February-2016\).pdf](https://www.teck.com/media/Evaluation-of-selenium-sensitivity-of-spotted-sandpipers-breeding-in-the-Elk-River-watershed-of-southeastern-British-Columbia,-2013-2014-(February-2016).pdf).

⁷³ "A Canary in a Coal Mine: The American dipper as a bio-indicator of selenium contamination in the Elk Valley", presentation by Helmi Hess of work by Helmi Hess, Christine Bishop, John Elliott, Kathy Martin, ECCC & UBC (November 27, 2017).

Impacts on Federal Lands

While the closest national park is located approximately 70km from the project, this distance is along the Rocky Mountains, an important connectivity corridor from Waterton-Glacier International Peace Park in Alberta and Montana and the Rocky Mountain parks complex for wide-ranging wildlife including grizzly bears and wolverines. Further damage to this connectivity link could have long-term implications for wildlife populations within the Rocky Mountain National Parks.

Interprovincial and International Impacts

The Castle Project would send water pollution downstream from the upper Fording River into the Elk River, which then flows into the international Kootenai Reservoir and into the US Kootenai River, which returns to Canada as the Kootenay River in Creston. This cumulative water pollution would impact fish populations in the Kootenai Reservoir, including in the US part of the reservoir, a subject under investigation in the B.C.-Montana Kootenai process. It also has the potential to impact fish downstream in the Kootenai River, including endangered white sturgeon, the subject of significant recovery efforts by US First Nations.

In Kootenai Reservoir, which is shared between Canada and the US, there is, as noted below, an ongoing process looking at the impact of selenium pollution on fish. In this lentic environment, significant accumulation of selenium in fish tissue and eggs/ovaries has been found in many species. There is also significant concern that selenium can take years to reach equilibrium in fish tissue for species at the top of the aquatic food chain in lentic systems like the Kootenai Reservoir,⁷⁴ not to mention that population-level impacts can develop slowly, and thus that future impacts may be more significant than those currently observed.

Some of the species of most concern include burbot, redbelt shiner, peamouth chub, northern pikeminnow, longnose sucker, mountain whitefish and westslope cutthroat trout.⁷⁵ All of these species and others have been found with selenium concentrations above BC Water Quality Guidelines and/or EPA Criteria in tissue and/or eggs. Elevated levels of other pollutants have also been found in the reservoir, especially nitrates, however less study has been done on their impacts or cumulative impacts of multiple pollutants. There is no doubt that there are effects on fish in the US portion of the Kootenai Reservoir,⁷⁶ but these transboundary environmental impacts have never been studied through provincial environmental assessment.

⁷⁴ There is need for study of this question in Kootenai Reservoir specifically, but studies from other systems have found lag times in the range of 1-4 years between changes in selenium loading input and peaks in selenium found in fish tissue at the top of the food chain, for example in a smaller lentic system in John U. Crutchfield Jr, "Recovery of a power plant cooling reservoir ecosystem from selenium bioaccumulation" (1 September 2000), Environmental Science & Policy, online: <https://www.sciencedirect.com/science/article/abs/pii/S1462901100000423> at S153; and in a lotic system in William N. Beckon, "A method for improving predictive modeling by taking into account lag time: Example of selenium bioaccumulation in a flowing system" (July 2016), Aquatic Toxicology, online: <https://www.sciencedirect.com/science/article/abs/pii/S0166445X16301230> at 175.

⁷⁵ A preliminary compilation of fish tissue and egg/ovary data is available online: <http://lakekootenaiconservation.pbworks.com/w/file/139586697/2020-04-14%20%20Fish%20Criteria%20Table.xlsx>.

⁷⁶ In fact, USGS data often shows greater selenium concentrations in sediment and particulate matter at the south end of the reservoir than at the international border. See Presser, T.S., et al., "USGS Measurements of Dissolved and Suspended Particulate Material Selenium in Lake Kootenai in the Vicinity of Libby Dam (MT), 2015-2017" (2018), U.S. Geological Survey, online: <https://www.sciencebase.gov/catalog/item/5b0446b6e4b0d8682b96311a>.

White sturgeon in the upper Kootenay/Kootenai River are listed as endangered under *SARA* and under the US *Endangered Species Act*. This population of sturgeon, which suffer from reproductive failures likely related to changes in flows associated with Libby Dam, spawns only in the US portion of the river, near Bonner's Ferry in Idaho, but overwinter in the Creston area in Canada. They are found as far upstream as the Libby Dam, the outlet of Lake Kooconusa in Montana. Studies are ongoing to evaluate the effects of present and future selenium pollution levels on white sturgeon, which has not been considered in any provincial environmental assessment of coal mining in the Elk Valley.

Other fish species may also suffer adverse effects in the Kootenai/Kootenay River, though relatively little is presently known about these effects. Elevated selenium levels are found in the Kootenai/Kootenay River, with relatively constant water selenium levels from Libby Dam through the length of the Kootenai River back into Canada at Creston. Throughout this roughly 200km length of river, various fish species have been found with significant selenium concentrations in tissue or eggs, including mountain whitefish, northern pikeminnow, redbelt shiner and slimy sculpin, all of which have been found with selenium concentrations above BC Water Quality Guidelines and/or EPA Criteria.⁷⁷ Westslope cutthroat trout, rainbow trout and other species have been found with selenium tissue levels near BC's Water Quality Guideline. Though only limited data is currently available, these high tissue concentrations have been found throughout the length of the United States' Kootenai River. There are also concerns about burbot in the Kootenai River as the species has been seen to be a high accumulator of selenium in Lake Kooconusa.

These impacts have been of significant concern in the United States and have been the subject of correspondence and conflict between B.C./Canada and the States of Montana and Idaho, the US EPA, Fish & Wildlife Service, and USGS, US First Nations including the Confederated Salish & Kootenai Tribes and the Kootenai Tribe of Idaho, and all US federal senators from Montana and Idaho.⁷⁸

In recent years, there has been concern from both sides of the border about possible violation of the Boundary Water Treaty of 1909,⁷⁹ which prohibits pollution of shared waterways,⁸⁰ and the need for an International Joint Commission reference to resolve the cumulative transboundary water pollution issue due to the Elk Valley coal mines.

⁷⁷ Mebane, C.A., and Schmidt, C.G., Selenium and mercury in the Kootenai River, Montana and Idaho, 2018-2019" (2019), *U.S. Geological Survey*, online: <https://www.sciencebase.gov/catalog/item/5d6d38efe4b0c4f70cf62b74>.

Note that there is no CCME guideline for selenium in fish tissue.

⁷⁸ Sarah Cox, "U.S. senators to Horgan: clean up B.C.'s mining mess" (13 June 2019), *The Narwhal*, online: <https://thenarwhal.ca/u-s-senators-to-horgan-clean-up-b-c-s-mining-mess/>.

⁷⁹ For example, concerns have come from US IJC Commissioners and the BC Auditor General: see "Letter from Lana Pollack, Chair U.S. Section and Rick Moy, Commissioner, U.S. Section to Cynthia Kierscht, Director, Office of Canadian Affairs, U.S. State Department" (20 June 2018), online:

<https://www.scribd.com/document/383221661/US-IJC-Commissioners-Letter-to-Dept-of-State-on-Selenium-Report>; and BC Auditor General, "An Audit of Compliance and Enforcement in the Mining Sector" (May 2016),

online:

<https://www.bcauditor.com/sites/default/files/publications/reports/OAGBC%20Mining%20Report%20FINAL.pdf> [BC Audit of the Mining Sector] at 10.

⁸⁰ *Treaty Between the United Kingdom and the United States of America Concerning Boundary Waters and Questions Arising Along the Boundary Between Canada and the USA* (1909), online: <https://www.treaty-accord.gc.ca/text-texte.aspx?id=100420>, at article IV.

B.C. environmental assessments for past mine expansions have not and cannot properly consider impacts downstream of the US border, which includes not only the US portion of the Kootenai Reservoir and the US Kootenai River, but also the Canadian Kootenay River around Creston. A federal assessment is clearly needed to evaluate these transboundary impacts. Additionally, a federal assessment is required to ensure Canada does not violate (or further violate) the longstanding Boundary Waters Treaty.

The Castle Project is also located approximately 5 km from the BC-Alberta border. Effects on terrestrial wildlife, as discussed above, would be geographically broad and would include impacts on species that travel widely along the important Rocky Mountain wildlife corridor, especially grizzly bears and wolverines. For these species, this area of the Rocky Mountains is an important connectivity link for wildlife travelling from Glacier National Park in Montana and even Yellowstone National Park to the Canadian Rocky Mountain parks complex and beyond. The Crown of the Continent Region, as the area around the proposed mine is called, is an important connectivity link in the Yellowstone to Yukon corridor and increasing fragmentation of this landscape threatens the long-term viability of species that rely on the corridor, including grizzly bears and wolverines.

Potential for Cumulative Impacts

There are five existing large coal mines in the Elk Valley, all owned by Teck, and four of these continue to extract coal and dump waste rock, resulting in increasing water pollution levels and further destruction of wildlife habitat. Significant expansions for roughly 12-25 years of mining are already permitted at three of these mines (Fording River, Line Creek and Elkview). Three additional coal mines in the Elk Valley are in the EA process, which would also increase cumulative impacts. Teck's expansion plans for their Greenhills mine, adjacent to Fording River and the Castle expansion have not been made public, but their most recent quarterly report notes expansion plans for Greenhills as well as Elkview.⁸¹ It is unknown if expansion of the Greenhills mine or the Elkview mine would require a federal assessment. Federal assessment of further expansion through the Castle Project is crucial to consider the cumulative impacts of all current mines, ongoing expansion and potential future mining projects in the Elk Valley.

The presence of multiple adjacent mines and other mines in the immediate area, totaling more than 150 square kilometres of permitted mining, has significant impacts on connectivity for species like wolverines and grizzly bears, while bighorn sheep have already lost a significant portion of their important winter high-elevation grassland habitat in the Elk Valley to mining. Cumulative effects are also possible due to logging in the Elk Valley, where private ownership of forest lands has resulted in significant clearcutting in recent years, and the impact of motorized recreation, especially on the Alberta side of the Continental Divide.

Greenhouse Gas Emissions

The potential greenhouse gas ("GHG") emissions associated with the Castle Project may hinder the Government of Canada's ability to meet its commitments in respect of climate change, including Canada's 2030 emissions targets and forecasts.

⁸¹ Teck Resources Limited, "News Release: Teck Reports Unaudited First Quarter Results for 2020" (20 April 2020), online: <https://www.teck.com/media/Q1-2020-NR-Quarterly.pdf> at 12.

Teck estimates that total emissions from the Castle Project will be equal to current emissions at FRO, with an estimated total of 0.67 million tonnes CO₂ equivalent at full production.⁸² These emissions are made up of CO₂ from fuel used in mining operations (primarily diesel for heavy equipment and natural gas for drying of coal) and of fugitive methane emissions found within the coal formations, which make up nearly half of total emissions. Teck also anticipates additional initial methane from opening up the new Castle pit.⁸³

Along with the estimated emissions for the project being significant, there are also uncertainties around emissions that critically need to be assessed.

Fugitive methane emissions from coal mining are poorly quantified, as emissions from Elk Valley coal mines are estimated based on data from a coal mine elsewhere in the province.⁸⁴ It is well known that fugitive methane from coal mines varies widely, and there is some evidence that methane emissions from coal mines in the upper Elk Valley exceed the provincial average.⁸⁵

The global warming potential of methane also varies greatly depending on the timescale considered. A shorter timescale for warming effects would be warranted when considering methane emissions from the project decades into the future, when global warming will be much more advanced.⁸⁶ Federal assessment is necessary to evaluate the climate impacts of the project given the poor current understanding of fugitive methane emissions.

Given Canada's commitment to a 30% reduction from 2005 GHG emissions by 2030, the project may well hinder Canada's ability to meet its 2030 commitments under the Paris Agreement. Additionally, as the Castle Project is anticipated to operate for several decades, project emissions would also significantly hinder Canada's commitment to net-zero emissions by 2050.

Teck has made two recent statements indicating they will be carbon neutral by 2050 and will reduce carbon intensity by 33% by 2030.⁸⁷ However, the company has not made public any details on how it will meet these goals. Given the major needs for energy in mountaintop-removal coal mining, currently mostly supplied by diesel and natural gas, plus the significant contribution of fugitive methane to total emissions, it is unclear how Teck could meet these commitments. In the Initial Project Description for the Castle Project, Teck did not provide any plans to reduce its current emissions by an amount that is consistent with Canada's 2030 target. A federal impact assessment should require Teck to provide detailed plans to reduce their carbon

⁸² Castle Initial Project Description, *supra* note 1 at 38.

⁸³ Castle Initial Project Description, *supra* note 1 at 37.

⁸⁴ ECCC, "2019 National Inventory Report 1990-2017: Greenhouse Gas Sources and Sinks in Canada" (2019), online: http://publications.gc.ca/collections/collection_2019/eccc/En81-4-1-2017-eng.pdf at 40.

⁸⁵ Based on high emissions from upper Elk Valley coal storage piles shown in Western Climate Initiative, "Final Essential Requirements of Mandatory Reporting, Amended for Canadian Harmonization" (17 December 2010), online: <https://www2.gov.bc.ca/assets/gov/environment/climate-change/ind/quantification/wci-2011.pdf> at Table 100-1.

⁸⁶ The above emissions estimate is based on a global warming potential of 25 for methane (i.e. methane is 25 times as potent as carbon dioxide). Current IPCC global warming potentials for methane are 28 over 100 years and 84 over 20 years, not including climate-carbon feedbacks. See Intergovernmental Panel on Climate Change, "Synthesis Report: Climate Change 2014" (2014), online: <https://www.ipcc.ch/report/ar5/syr/>.

⁸⁷ Teck Resources Limited, "News Release: Teck Announces 33% Carbon Reduction Target and Updated Sustainability Strategy" (12 March 2020), online: <https://www.teck.com/news/news-releases/2020/teck-announces-33-carbon-reduction-target-and-updated-sustainability-strategy>.

emissions in line with their commitments and Canada's commitments, and then to fully evaluate the effectiveness of these plans as proposed.

Teck has also stated that their steelmaking coal "has among the lowest carbon intensities in the world".⁸⁸ The company has not provided any information to back up this statement, but we note that the high degree of uncertainty in fugitive methane emissions and the significant transportation emissions associated with bringing Elk Valley coal to market, primarily in Asia, compared to other major producers, especially Australia, cast doubt on this assertion.

Additionally, steelmaking coal, when burned in the steelmaking process, is a major source of carbon emissions, accounting for 5% of total worldwide emissions. It is clear that to reduce the impact of global climate change, these steelmaking emissions will need to be drastically reduced. Fortunately, natural gas and electricity based steelmaking processes are already in use around the world today, with significantly lower carbon emissions than coal-based steelmaking. Partially hydrogen-based steelmaking is already possible and fully renewable hydrogen-based steelmaking is being developed at pilot facilities.⁸⁹

The total emissions from Teck's Elk Valley coal mines, including end use of the coal, are approximately 66 MT annually, slightly more than all emissions in the province of B.C.⁹⁰ The Castle Project would account for roughly one third of these emissions. Federal assessment should evaluate the overall carbon impact of the project, including end use, especially as the project is intended operate for several decades, at which point global emissions must be significantly reduced to avoid catastrophic climate change with devastating impacts across Canada.

v. Inadequacy of other Legislative and Regulatory Mechanisms

Unfortunately, the various regulatory mechanisms already in place in the Elk Valley have not adequately managed adverse effects from existing mines and will not manage adverse effects for Castle. Despite regulatory mechanisms on both the federal and provincial levels, increases in water pollution and adverse effects on fish have been ongoing and worsening downstream of Teck's Elk Valley mines.

Recent adverse impacts from these projects include the loss of 93% of the isolated adult WCT population in the upper Fording River,⁹¹ directly downstream of the proposed expansion, and the

⁸⁸ Marcia Smith (Senior Vice President, Sustainability and External Affairs, Teck Resources Limited), "Letter to the Editor: Teck committed to support transition to low-carbon economy" (2 June 2020), online: <https://www.eknow.ca/regions/elk-valley/teck-committed-to-support-transition-to-low-carbon-economy/>.

⁸⁹ A detailed article on this issue with sources is available on Wildsight's website: Lars Sander-Green, "Do We Really Need Coal to Make Steel?" (1 June 2020), online: <https://wildsight.ca/blog/2020/06/01/do-we-really-need-steelmaking-coal/>.

⁹⁰ *Ibid.* The figure of 66 MT was arrived at using the 24 MT of coal exported annually from the Elk Valley, subtracting 28% for non-carbon content in the coal (both moisture and other elements), and subtracting 1% for carbon that ends up in the steel. Carbon dioxide is 3.67 times the mass of carbon itself, so we estimate a rough total of 63 MT, not including extraction and transport emissions of roughly 3 MT. BC's total emissions in 2017 were 64.5 MT CO₂e according to the province: See Environmental Reporting BC, "Trends in Greenhouse Gas Emissions in B.C. (1990-2017)" (2019), online: <http://www.env.gov.bc.ca/soe/indicators/sustainability/ghg-emissions.html>.

⁹¹ Westslope Fisheries Ltd., "Upper Fording River Westslope Cutthroat Trout Population Monitoring Project: 2019" (March 2020), online: https://www.teck.com/media/UFR_WCT_Monitor_Final_Report_April_9_2020.pdf at ii.

recent loss of 96% of juvenile WCT in Harmer Creek,⁹² downstream of the recently approved Baldy Ridge expansion of the Elkview mine.

Federal impact assessment is critical to address the inadequacies in the present legislative scheme and to properly address the impact of the proposed expansion.

Federal Legislative and Regulatory Mechanisms

On the federal level, the *Fisheries Act* prohibition on depositing deleterious substances into waters frequented by fish certainly applies in the Elk Valley. However, despite the 2014 ECCC Report finding significant impacts on WCT from selenium pollution,⁹³ as detailed in the section describing impacts to fish and fish habitat, no enforcement action has been taken by ECCC.⁹⁴ Since 2014, pollution levels have continued to increase significantly. Currently, the *Fisheries Act* is not being used to manage these adverse impacts to fish and fish habitat. Teck has publicly conceded that “We cannot operate our Elk Valley coal mines in compliance with the *Fisheries Act* and its current associated regulations.”⁹⁵

ECCC has also been developing the *Coal Mining Effluent Regulations* (the “*CMER*”) under the *Fisheries Act*, which would presumably apply to this project. While still under development, the regulations as proposed would limit selenium and nitrate water pollution from the Castle Project. ECCC has indicated that the *CMER* will be brought into force in fall 2021 or early 2022;⁹⁶ likely during the impact assessment process for the Castle Project should it be designated. Federal assessment is required to evaluate if the project would be compatible with the *CMER*.

For new mines and new mine expansions in the Elk Valley, the *CMER* would limit direct effluent discharge, rather than regulating pollution limits in downstream rivers as is the provincial regulatory approach. Teck has requested selenium discharge limits for their Fording River South AWTF and Elkview SRF trial approximately four times higher than would be allowed under the draft *CMER*.⁹⁷

⁹² Teck Resources Limited, “Responsible Mining in the Elk Valley”, online: <https://www.teck.com/responsibility/sustainability-topics/water/water-quality-in-the-elk-valley/>, under the ‘Monitoring’ tab.

⁹³ Lemly Report, *supra* note 39 at 57-59

⁹⁴ Note: ECCC did issue a fine related to a fish kill at the Line Creek AWTF, a separate issue. See Line Creek AWTF Fine, *supra* note 31.

⁹⁵ Teck Resources Limited, “Annual Information Form” (February 26, 2020), online: <https://www.teck.com/media/2020-AIF.pdf> at 80.

⁹⁶ ECCC, “Update – Proposed Coal Mining Effluent Regulations, Technical Information Sessions” (February 2020), online: <https://www.scribd.com/document/456414693/Environment-Canada-Coal-Mining-Effluent-Regulations-Draft-2020> [February 2020 *CMER* Updates] at 34. ECCC indicates Canada Gazette I publication in Fall 2020 and final publication in Canada Gazette II in Fall 2021. A more recent email from ECCC on April 27, 2020 indicates Canada Gazette I publication will be delayed to early 2021 due to coronavirus, but does not indicate any change of schedule for final publication.

⁹⁷ The ECCC has indicated a monthly average selenium discharge limit for a mine expansion with a new mining area and a new waste rock pile in the Elk Valley of 10µg/L, while the limit for a new mine would be 5µg/L: February 2020 *CMER* Updates, *supra* note 90, at 14 and 32.

Teck has recently requested a permit limit of 37µg/L monthly average selenium discharge for the Fording River South AWTF and a permit limit of 41µg/L monthly average selenium discharge for the Elkview SRF Phase II: see Fording River AWTF Notice and Elkview SRF Notice, *supra* note 51.

If the Castle Project were to rely on SRF to reduce selenium pollution levels, or indeed AWTF, it would not meet *CMER* limits that will be in place once the expansion is operational in 2026.

The *CMER* would also regulate water pollution limits in waterways directly downstream of existing mines, including in the upper Fording River for Fording River Operations and Greenhills Operations as well as downstream in the Elk River for all of their mines. The Castle Project will add additional water pollution to the upper Fording River and the Elk River. Given Teck's publicly stated plans in the EVWQP 2019 Implementation Plan Adjustment, Teck would not meet the currently proposed regulatory limits in the *CMER* for their existing mines,⁹⁸ including the Fording River and Greenhills mines, in the Fording River and downstream in the Elk River – even without additional water pollution from the Castle Project or additional expansions in the Elk Valley.

It is crucial that a federal assessment ensure Teck's plans are in line with the *CMER*, which a provincial assessment is unlikely to do. Without a strong assessment of Teck's ability to meet future obligations under *CMER*, it is likely that those obligations would not be met.

Additionally, as discussed in a previous section of this request, the *Species at Risk Act* has inadequately addressed impacts to several federally-protected species that will be impacted by this project, including WCT and grizzly populations, plus endangered whitebark pine. Federal impact assessment is required to fully determine the potential impacts on these species.

Provincial Legislative and Regulatory Mechanisms - Aquatic

Provincially, B.C. has a water quality guideline of 2µg/L for protection of aquatic life for selenium in fresh water.⁹⁹ However, levels up to 65 times this guideline have been approved in the Fording River at the Fording River Mine under the EVWQP,¹⁰⁰ and associated permits and many levels far above 2µg/L have been permitted in the Elk Valley.

⁹⁸ The ECCC has indicated that the *CMER* would establish a baseline of the monthly average over years 2 and 3 after promulgation. Six years after promulgation (starting in 2027), the monthly average limit would be set at 20% less than the baseline and a further 10 years later (starting in 2037), the monthly average limit would be set at 36% less than the baseline. See February 2020 *CMER* Updates, *supra* note 90, at 27.

Teck's EVWQP 2019 Implementation Plan Adjustment anticipates selenium concentrations at the FRO Compliance Point of approximately 50µg/L for 2022-3, leading to a monthly average limit of 40µg/L in 2027 and 32µg/L in 2037. For 2027-2036, Teck predicts peak selenium annually between 50-59µg/L with levels above 40µg/L for the majority of the year in all years. For 2037 to the end of modeling in 2053, Teck predicts peak selenium annually between 32-59µg/L with levels above 32µg/L for the majority of the year in most years. As a result, FRO would be significantly out of compliance with *CMER* selenium limits indefinitely. See EVWQP 2019 Implementation Plan Adjustment, *supra* note 32 at 64.

Selenium levels would therefore be above *CMER* limits at other compliance points downstream in the Fording and Elk Rivers, most notably in the Fording at the next mine downstream, Greenhills (up to double the limit) and in the Elk River downstream of the Fording River (upstream of Grave Creek). Nitrate would also be above limits in some years in both the Fording and Elk Rivers, most notably in the Fording at Greenhills. Note also that Teck's above predictions rely on 12 additional water treatment facilities entering operation between 2022 and 2040.

Additionally, the draft *CMER* anticipates further changes to selenium limits beyond 2046, based on monitoring of fish populations. See ECCC, "Signal Check: Proposed Coal Mining Effluent Regulations" (2018), online: <https://awc-wpac.ca/wp-content/uploads/2019/01/Coal-Mining-Effluent-Signal-Check-Fall-2018-v3.pdf> at 31.

⁹⁹ BC Ministry of the Environment, "Ambient Water Quality Guidelines for Selenium Technical Report Update" (April 2014), online: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterqualitywater-quality-guidelines/approved-wqgs/bc_moe_se_wqg.pdf at 164.

¹⁰⁰ BC Waste Discharge Authorization 107517, *supra* note 53 at 2.1.1 for Fording River Compliance Point.

By Ministerial Order, the EVWQP was to immediately begin to stabilize concentrations of pollutants and to reduce pollutant concentrations in the medium-term.¹⁰¹ However, neither of these has taken place as pollutant concentrations downstream of the mines have continued to increase since that time.

In a 2016 report by the BC Auditor General, it was stated that it “is not clear how [the EVWQP’s] high selenium levels will meet government’s objective to protect the health of aquatic ecosystems, groundwater and humans in the Elk Valley.”¹⁰² Even with these very high permitted selenium levels, actual selenium levels have increased above permitted levels and remained high seasonally for years, not only in the Fording River, but also in the Elk River and in the transboundary Koochanusa Reservoir.

While some enforcement action from B.C. has taken place on issues related to acute water pollution issues, there have been no fines or other enforcement action to date for these long-term, repeated pollution limit exceedances. Meanwhile, Teck’s EVWQP 2019 Implementation Plan Adjustment shows planned exceedances of permitted limits for many years into the future.

It remains unclear what the province may do with regard to permitting the changes indicated in the EVWQP 2019 Implementation Plan Adjustment and/or enforcing the continued lack of compliance with current limits, though experience to date suggests the province will at least tacitly accept this increased pollution, if they do not simply accept it formally. Clearly, the EVWQP and associated permits are not adequately managing adverse effects in the Elk Valley and will not adequately manage adverse effects of this proposed mine expansion.

The 2016 BC Auditor General report illustrates the failure of the provincial regulatory process.¹⁰³ Ministry of Environment staff concluded that they could not approve permits for Teck’s Line Creek mine expansion due to risk to fish and the aquatic environment, specifically citing the risk to SARA-listed WCT and potential violation of the Boundary Waters Treaty. However, Cabinet granted the permit regardless.

Similar issues arose when the Ministry issued permits for the Baldy Ridge expansion and the Fording River Swift expansion, despite rising pollution levels in the watershed, and severe effects of the expansions on fish habitat (in the case of Swift) and the addition of significant selenium to Harmer Creek (in the case of Baldy Ridge). It is likely that a chilling effect from the Cabinet decision to override Ministry staff has prevented the Ministry from appropriate regulatory action. It is very likely that the same will occur with the Castle Project; it is widely expected that BC will approve the project.

In general, the Auditor General identified that both the BC Ministry of Mines and Ministry of Environment suffered from weak permitting, compliance and enforcement related to mines.¹⁰⁴ In particular, she identified shortcomings with respect to regulatory oversight of the Elk Valley mines, stating that “[the Ministry of Environment] has not publicly disclosed the risks associated

¹⁰¹ Minister of Environment, “Ministerial Order No. M113 under Section 89 of the *Environmental Management Act*” (15 April 2013), online:

https://web.archive.org/web/20181109215044/http://www.bclaws.ca/civix/document/id/mo/mo/2013_m113 at 6.

¹⁰² BC Audit of the Mining Sector, *supra* note 79 at 101.

¹⁰³ *Ibid* at 95.

¹⁰⁴ *Ibid* at 6-7.

with permitting coal mines in the Elk Valley”.¹⁰⁵ These shortcomings have not been significantly addressed in general or with respect to the Elk Valley.

B.C. and Montana have attempted to establish a shared water quality standard for the Koocanusa Reservoir through the Lake Koocanusa Monitoring and Research Working Group. While a shared standard is planned to be adopted by both governments by the end of 2020, it is unclear how such a standard will be met by Teck or enforced by the province.

The current EVWQP limit for Koocanusa is 2µg/L, while the shared standard is widely expected to be 1.3 or 1.5µg/L, based on extensive research on selenium in fish tissue and eggs/ovaries in the reservoir. In recent years, selenium levels in the Koocanusa Reservoir have been, at times, above 3µg/L and Teck’s EVWQP 2019 Implementation Plan Adjustment anticipates selenium levels likely above 1.5µg/L for a number of years and in dry years above 1.5µg/L indefinitely (again, before considering additional pollution due to Castle or additional mining). Note that in the long-term, if ongoing water treatment were discontinued, selenium levels in Lake Koocanusa would be expected to reach to even higher levels than those recorded to date. It is not clear how the Koocanusa process will in fact manage these potential adverse effects in the reservoir.

Provincial Legislative and Regulatory Mechanisms - General

B.C.’s mine reclamation bonding system is failing to ensure funds are available for long-term cleanup of the Elk Valley coal mines including the proposed Castle Project. While Teck’s reclamation cost estimate, accepted by the province, is \$1.4 billion, the province holds less than \$0.9 billion in reclamation security from Teck.¹⁰⁶

The estimate of \$1.4 billion is clearly too low as Teck has already spent hundreds of millions of dollars on water treatment, but has only completed one of over a dozen planned water treatment facilities, with plans to spend \$1 billion by 2024. It is clear that \$0.9 or \$1.4 billion is insufficient for long-term water treatment to last indefinitely. Meanwhile, Teck reclaims an insignificant area of their mines each year relative to the newly disturbed area,¹⁰⁷ so the eventual terrestrial reclamation costs will be very significant. B.C.’s reclamation bonding system requires mines to estimate their own reclamation liability and does not make any information about reclamation plans and cost estimates public, making it impossible for others to evaluate these plans or estimates. It is clear that B.C.’s reclamation bonding system does not create proper incentives for long-term clean up and in fact may allow mining that would not proceed if full environmental costs were accounted for up front, which puts fish and wildlife at risk in the long term.

As for cumulative effects, Teck often points to their involvement in the Elk Valley Cumulative Effects Management Framework (the “CEMF”). While the CEMF has resulted in some data

¹⁰⁵ *Ibid* at 9-10.

¹⁰⁶ According to the most recent figures available in Chief Inspector of Mines, “2018 Annual Report” online: https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/mineral-exploration-mining/documents/health-and-safety/ci-annual-reports/2018_ci_annual_rpt.pdf at 18.

¹⁰⁷ For example, no areas have been revegetated at the Fording River mine in the last three years according to the 2017, 2018 and 2019 Annual Mine Permit Reports for Teck’s Fording River Operations. Over the same period the company reclaimed less than 100 hectares compared to new disturbance of more than 3000 hectares across all of their operations globally, of which the Elk Valley is approximately half. See Teck Resources Limited, “Biodiversity and Reclamation”, online: <https://www.teck.com/responsibility/approach-to-responsibility/sustainability-report-disclosure-portal/material-topics/biodiversity-and-reclamation/>.

gathering in the Elk Valley, it does not in any way manage cumulative effects. Currently, the CEMF has no direct regulatory impact and it is unclear whether it will have a regulatory role. The assessment was completed some time ago, however Teck and another resource company involved refused to sign on to the CEMF, leaving it in limbo since 2018. Furthermore, the CEMF has been designed to largely ignore the cumulative impacts of coal mining, as the assessment report selects the aquatic environment as a valued component but ignores the impacts of water pollution, instead choosing to focus on logging, resource roads and other factors.¹⁰⁸

Federally-protected terrestrial species have also not been adequately protected through provincial management. Regarding protection of grizzly bears from cumulative impacts and especially loss of connectivity, provincial measures have been weak. In 2017, the BC Auditor General completed an audit of grizzly bear management and found that “there has been little effort to address the issue of connectivity for grizzly bears or to provide wildlife corridors and safe transition areas for those populations in the south”¹⁰⁹ of the province, concluding the province did not have an “adequate management framework for grizzly bears.”¹¹⁰ Little has changed since that time.

Wolverines also suffer from a lack of protection of habitat and connectivity. The provincial wolverine management plan dates from 1989. Whitebark pine has no provincial management strategy and continues to be harvested in significant volumes in the Elk Valley.¹¹¹

Provincial Environmental Assessment

B.C. will likely carry out an assessment of environmental effects of the project. However, provincial assessment will not adequately cover the international issues related to the Kootenai Reservoir and the Kootenai River, the need to protect fish and fish habitat, or the impact of the federal *Coal Mining Effluent Regulations* on the project.

Additionally, the cumulative impacts of the proposed project alongside five existing mines within the same watershed, which include significant approved but not yet constructed mining areas, and three additional proposed mines in the EA process, have not been properly considered in past provincial assessments and will not be considered in the provincial assessment for Castle.

Recent provincial assessments have relied on the EVWQP to manage cumulative impacts. However, the plan is not suited for this task as it allows high pollution levels with weak justifications, considers pollutants individually, and therefore fails to consider cumulative impacts of multiple pollutants and destruction of fish habitat. Many pollution limits in the plan will continue to be surpassed according to Teck’s EVWQP 2019 Implementation Plan Adjustment, with no enforcement action taken by the provincial government to date.

Past provincial EA processes have not adequately addressed these issues, including the Fording River Swift expansion, Line Creek Phase II and Elkview Baldy Ridge expansion, as can be seen

¹⁰⁸ Elk Valley Cumulative Effects Management Framework (EV-CEMF) Working Group, “Elk Valley Cumulative Effects Assessment and Management Report” (December 2018), online: https://www2.gov.bc.ca/assets/gov/environment/natural-resource-stewardship/cumulative-effects/final_elk_valley_ceam_12122018.pdf.

¹⁰⁹ BC Auditor General, “An Independent Audit of Grizzly Bear Management” (24 October 2017), online: <https://www.bcauditor.com/pubs/2017/independent-audit-grizzly-bear-management> at 9.

¹¹⁰ *Ibid* at 25.

¹¹¹ Ben Parfitt, “Thousands of B.C.’s endangered whitebark pine logged on private land” (5 September 2019), *The Narwhal*, online: <https://thenarwhal.ca/thousands-of-b-c-s-endangered-whitebark-pine-logged-on-private-land/>.

in rising pollution levels and in the growing cumulative impacts on fish and habitat immediately downstream of the mines and in Koochanusa Reservoir.

Existing provincial and federal legislative and regulatory provisions have failed to address the impacts from Teck's mines in the Elk Valley. Federal assessment of the Castle Project is critical to evaluate Teck's proposed plans and mitigation strategies to address further effects, and to address the cumulative impacts of development within this area.

4. CONCLUSION

For the reasons set out in this letter, Wildsight submits that the Castle Project exceeds the 50% allowable increase for expansions to coal mines before they are considered designated projects under s. 19(a) of the Schedule to the *Regulations*, and as such is a prescribed project.

Additionally, the numerous potential adverse effects to areas of federal jurisdiction resulting from the Castle Project warrant designation under s. 9(1) of the *IAA*. The Castle Project as proposed will significantly worsen the environmental crisis present in the Elk Valley and downstream, increasing impacts to fish and fish habitat, federally-protected terrestrial species, transboundary pollution issues and hindering Canada's ability to meet its GHG emission targets in respect of climate change. Existing legislative and regulatory mechanisms have failed to address these impacts individually or to consider them on a cumulative basis. Federal assessment of the Castle Project is essential to critically evaluate Teck's proposed mitigation measures and plans to address these long-term adverse impacts.

On the basis of the above information, we request that the Minister or the Agency find the Castle Project is a designated project pursuant to s. 19(a) of the Schedule to the *Regulations*, or alternatively, that the Minister designate the Expansion Phase for impact assessment under s. 9(1) of the *IAA*.

Sincerely,

Randy Christensen
<Original signed by>

Barrister & Solicitor

Daniel Cheater
<Original signed by>

Barrister & Solicitor

Encls.

*cc. Fraser Ross
Impact Assessment Agency
Fraser.ross@canada.ca*

*Wildsight Society
Lars Sander-Green
lars@wildsight.ca*

Appendix A



Impact Assessment
Agency of Canada

Agence d'évaluation
d'impact du Canada

Pacific and Yukon Region
757 West Hastings Street
Suite 210A
Vancouver BC V6C 3M2

Région du Pacifique et du Yukon
757 rue Hastings Ouest
bureau 210A
Vancouver (C-B) V6C 3M2

April 3, 2020

David Baines
Senior Lead, Regulatory Approvals
Teck Coal Ltd.
421 Pine Avenue, Bag 2000
Sparwood BC V0B 2G0

Dear Mr. Baines:

RE: Castle Project

Thank you for contacting the Impact Assessment Agency of Canada (the Agency) regarding the proposed Castle Project (the Project). Teck Coal Ltd. (the proponent) provided the Agency with a draft Initial Project Description on January 16, 2020, to assist the Agency in providing its view as to whether the proposed project was likely to be described in the *Physical Activities Regulations* (the Regulations) made pursuant to the *Impact Assessment Act* (the Act). You provided additional information to support the Agency's analysis on February 27, 2020.

Under the Act, a proponent is to determine if its proposed project is described in the Regulations. The Regulations identify the physical activities that constitute designated projects that may require an impact assessment. The Agency reviewed the information you have provided that the physical works associated with the Project would increase the area of mining operations by an additional 35.7 percent, and that the expansion would have a total production capacity of 27 400 tonnes per day. The Project, as proposed and described in the material provided, would be below the threshold described in the Regulations. As a result, it is the Agency's view that this proposed project would not be a designated project under the Regulations.

We note that it is anticipated that the Project will undergo more detailed design work. Should the proposal be modified such that the Project that is proposed meets the description of a physical activity listed in the Regulations, you (as the proponent) will be required to submit an Initial Project Description to the Agency.

We would further note that for physical activities not described in the Regulations, there is the possibility that the Minister of Environment and Climate Change (the Minister), on request, or on his or her own initiative, could designate a project for an impact assessment under section 9 (1) of the Act if the Minister is of the opinion that the carrying out of the Project may cause adverse effects within federal jurisdiction or adverse direct or incidental effects, or if public concern related to those effects warrants that designation.

Please note that in proceeding with the Project, the proponent may still be required to obtain or seek amendment to other federal regulatory permits, authorizations and/or licences.

Further information regarding the Act and the Regulations is available on the Agency's website at www.canada.ca/iaac. In addition, please do not hesitate to contact me at 778-951-5106 or via email at Stefan.Crampton@canada.ca should you have any questions regarding this matter.

Sincerely,

<Original signed by>

Stefan Crampton
Project Manager
Pacific and Yukon Region

c.c.: Todd Goodsell, British Columbia Environmental Assessment Office
Katherine Morris, Ktunaxa Nation Council

Appendix B



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Fording River Operations
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February 27, 2020

Stefan Crampton
Project Manager
Pacific Yukon Region
Impact Assessment Agency of Canada
757 W Hastings St Suite 210A
Vancouver, BC V6C 3M2

Dear Stefan,

Reference: IAAC Information Request for Fording River Operations Castle Project – Calculation of Change in Area of Mine Operations

Thank you for the opportunity to provide the Impact Assessment Agency of Canada (IAAC) with additional information about the Castle Project (the Project) as per your request by email dated February 4, 2020. The conference call between IAAC and Teck on February 10, 2020 and subsequent email exchange provided clarity on IAAC's request and the approach Teck should use to respond. The requested revised calculation determined that the Project would result in an approximately 36% change in area of mine operations for the existing mine (Fording River Operations or FRO).

IAAC Information Request:

The Physical Activities Regulations (the Regulations) define the term “area of mining operations” as “the area at ground level occupied by any open-pit or underground workings, mill complex or storage area for overburden, waste rock, tailings or ore”. The calculation of increase in area of mining operations must look at the change in area of these components only. Depending on project-specific circumstances, this may include components of the existing mine that are under construction, constructed but not in operation, in operation, in the process of being decommissioned, or in care and maintenance. It may also include components for which regulatory approvals have been issued but construction has not yet started.

Provide revised calculations for increase in area of mining operations associated with the Project, utilizing only the components captured by the definition in the Regulations (see above). To calculate the increase in the area of mining operations, determine the area occupied by the components of the existing mine that are listed in the definition, determine the area of mining operations that would result from the proposed expansion, and then compare the two to estimate the percentage increase. The areas should be calculated on a two-dimensional basis.

It may be useful to tabulate the size of each of these components for the existing mine, and compare them to the size of the components that meet this definition associated with the Castle Project, to provide clarity in these calculations.

Teck Response:

Teck has calculated the increase in area of mining operations associated with the Project using a classification based on the definition in the *Regulations*. The classification includes three categories for parts of the mine that are:

- in use (constructed),
- permitted (not constructed), and
- proposed (new).

The classification includes subcategories based on specific mine components including:

- Pit (area where ore or waste rock is being mined)
- Mill complex and ore storage (area where ore is being stored, handled, and processed)
- Soil storage (area for soil stockpiles prior to use during reclamation – qualifies as overburden storage under the *Regulations*)
- Waste rock storage (area where rock that is mined to access the ore is stored)
- Tailings storage (area where fine materials washed off of the ore in the mill complex is stored)
- Interim reclamation (area where soil and vegetation have been placed, but that might be repurposed for additional use as an area of mine operations)

Any part of FRO or the Project that is not within one of the subcategories does not count as part of the area of mine operations under the *Regulations* and was not included in the calculations.

All parts of FRO (Appendix 1) were classified into categories and subcategories based on their current use or on their permitted use if no construction had occurred there. Parts of the mine that have a future permitted use, but are currently in use for another purpose were classified using their current use. Fording River Operations has a long history of mining and many areas of mine operations have been repurposed for new activities. For example, many areas that once were a mine pit are now used for waste rock storage.

The parts of the Project were classified using Teck's current understanding of the Project. The Project is still conceptual, but is based on one pit with waste rock likely being placed into FRO¹ or backfilling the Project pit. Some waste rock would be stored between FRO and the Project. Tailings storage would not require any new area. Instead it would be stored within FRO or the Project itself (i.e. part of pit backfilling). The Project would not require any new area for a Mill or for interim reclamation.

The area of mine operations for the Fording River Operations was calculated to be 5,630 ha including 4,400 ha of in use area of mine operations and 1,230 ha of permitted but not constructed area (Table 1). The area of mine operations for the Project was calculated to be 2,010 ha (Table 2).

¹ Project waste rock would only be placed in portions of FRO classified as 'area of mine operations' under the *Regulations*.

The percent change in project area is approximately 36% (2,010 ha / 5,630 ha = 35.7%) which is below the threshold in Item 19(a) in the Schedule to the *Regulations*:

“The expansion of an existing mine, mill, quarry or sand or gravel pit in one of the following circumstances: in the case of an existing coal mine, if the expansion would result in an increase in the area of mining operations of 50% or more and the total production capacity would be 5 000 t/day or more after the expansion”.

Table 1 Fording River Operations Area of Mine Operations based on *Physical Activities Regulations*

Fording River Operations	In-Use (Constructed) (ha)	Permitted (Not constructed) (ha)	Total (ha)
Pit	630	220	850
Mill Complex and ore storage	60	-	60
Soil Storage	30	-	30
Waste Rock Storage	2,970	1,010	3,980
Tailings Storage	120	-	120
Interim Reclamation	590	-	590
Total	4,400	1,230	5,630

Table 2 Castle Project Area of Mine Operations based on *Physical Activities Regulations*

Castle Project	Proposed (new) (ha)
Pit	1,520
Mill Complex and ore storage	-
Soil Storage	140
Waste Rock Storage	350
Tailings Storage	-
Interim Reclamation	-
Total	2010

Thank you for your consideration. If you require further information, or would like to schedule a meeting regarding this matter, please contact Dave Baines, at +1.250.425.8465 or david.baines@teck.com.

Sincerely,

<Original signed by>

Dave Baines
Senior Regulatory Approvals Lead, Environment and Social Responsibility
Teck

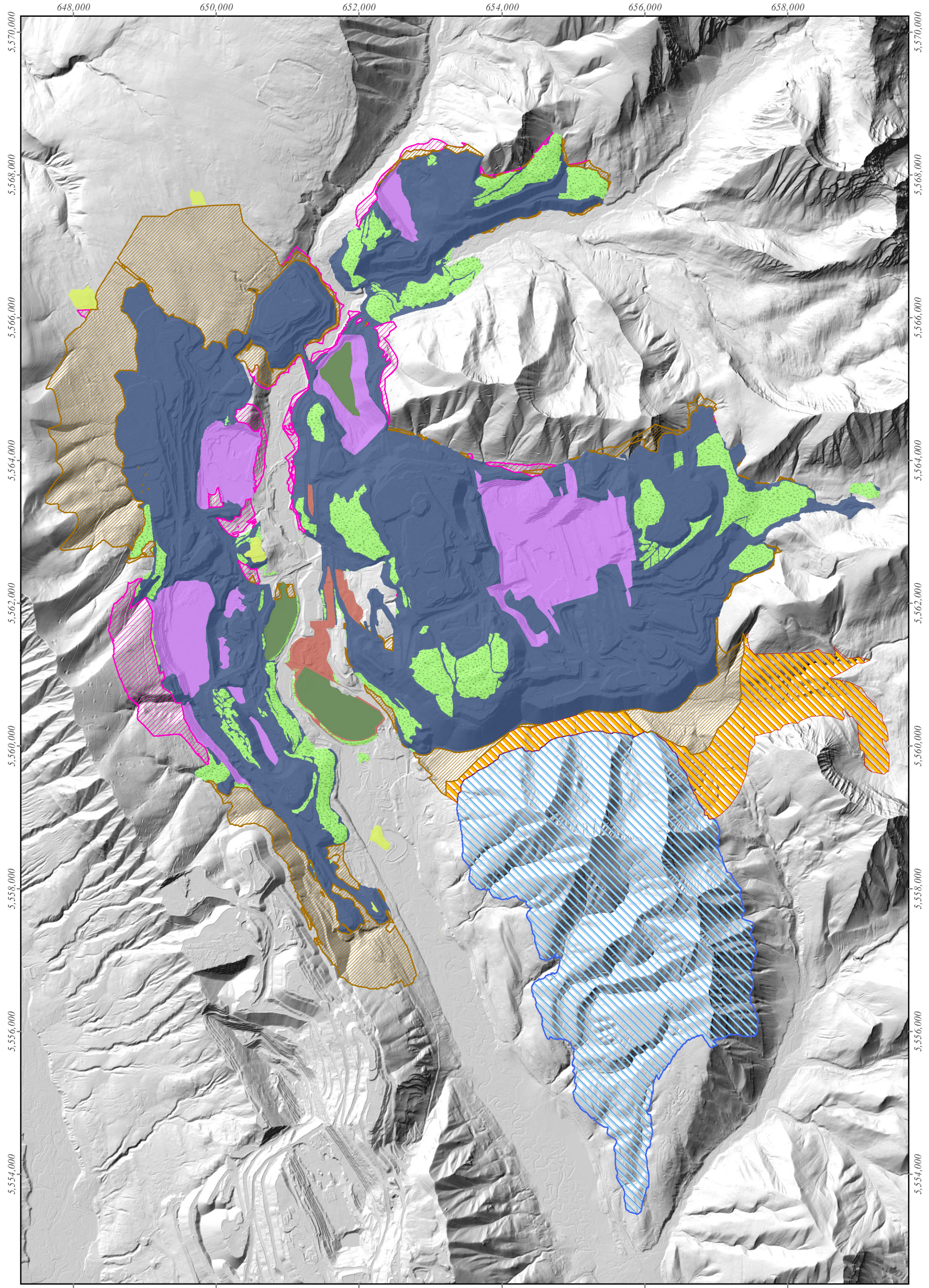


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Appendix 1:

Fording River Operations and Castle Project Area of Mine Operations
classification map based on *Physical Activities Regulations*



<p>Teck</p>	Fording River Operations		
	<p><i>Proposed Castle Development</i></p>	<p><i>Permitted</i></p>	
	<p><i>Current Development</i></p>		

Annual Mine Permit Report for 2019

Fording River Operations

March 31st, 2020 – Submitted April 8th, 2020



Teck

Executive Summary

This report describes the various activities and management programs carried out during the 2019 calendar year as they relate to the requirements within the Health, Safety and Reclamation Code for Mines in British Columbia; as well as site specific requirements detailed in the Ministry of Energy, Mines and Petroleum Resources (EMPR) Mine's Act Permits C-3. This report summarizes completed mining, environmental protection, and reclamation activities to December 31, 2019 and describes the proposed reclamation activities and development in the future as outlined in the annual reclamation report format requirements.

The 2019 reclamation program at Fording River Operations (FRO) consisted of contouring 3.8 ha, site preparation of 27.7 ha, and planting 350,720 seedlings over an area of 76.9 ha. This planting occurred at various locations in the Henretta area as well as around Fording River riparian areas. There was 1.1 ha of soil placement in the Henretta area; the placement volume was approximately 3,300 m³. Seeding occurred at Henretta and the soil stockpile areas to mitigate erosion and to limit the establishment of invasive plants. A comprehensive invasive plant management program was conducted at FRO in 2019, with a focus on gathering inventory data in areas that had no previous inventory information or in areas where existing information was outdated. Treatment of priority areas was also a goal in 2019. The majority of invasive plant treatment work was conducted at existing reclaimed areas, sediment ponds, soil stockpiles, and areas near the South Tailings Pond, Office Complex, Lake Mountain Creek, Clode Pond and Henretta Ridge. A total of 50.3 ha of soil salvage operations occurred at two general areas: North Swift Spoil development and South Swift Spoil development. In 2019, a total of 249,153 m³ was salvaged and sent to stockpiles for future use in reclamation treatments. Progressive reclamation is focused on portions of the disturbance area that are no longer necessary for the immediate operating requirements of the site.

Fording River Operations has an extensive reclamation program supported by various operationally focused management plans intended on delivering effective reclamation treatments. Our Biodiversity Program guides our reclamation efforts and reclamation research as we work to achieve a net positive impact on biodiversity in areas affected by our activities.

In 2019, a major focus of Teck's Applied R&D program was execution of the *In situ* Water Treatment program which included the development of the FRO Eagle 4 SRF, and planning for a trial of a gravel bed bioreactor.

Fording River Operation's current operations are focused on Eagle Mountain Pits on the east side of the operation, as well as the Swift and Lake Mountain pit areas on the west side of the operation. Current operating areas are expected to provide economic coal resources at FRO until approximately 2040.

Moving forward, Fording River Operations will continue to manage, promote and maintain a robust reclamation program to further establish and enhance long term progressive reclamation activities now and into the future. Currently ~14% of the site's disturbance area (4,956.37 ha) has been classified as reclaimed (685.58 ha). Much of the remainder of the site is generally active and therefore is unavailable for reclamation. However, progressive reclamation is planned to occur throughout the stages of active mining and closure. Progressive reclamation is focused on portions of the disturbance that are no longer necessary for the immediate operating requirements of the site. The process for assigning areas available for reclamation considers the current permitted mine plan, the conceptual life of mine plan and the

operational requirements for an active mining operation. Refer to Table 2-1 for a summary of disturbed, reclaimed and exempt areas.

1. Introduction

1.1. Overview

Teck Coal Limited's (Teck) Fording River Operations (FRO) is located within the front ranges of the southern Canadian Rocky Mountains, approximately 29 kilometers northeast from the community of Elkford, British Columbia. The FRO property consists of 7 Coal Leases (17,336 ha), 11 Coal Licenses (2,849 ha) and 15 Crown Grants (2,968 ha) for a total of 23,153 ha of which 6,933 ha have been permitted for mining related activities.

The mine property is situated within the asserted traditional territory of the Ktunaxa Nation. Ecologically, using the BC Biogeoclimatic Ecosystem Classification (BEC) system the mine is located within two biogeoclimatic zones, the Engelmann Spruce-Subalpine Fir (ESSF) and Montane Spruce (MS), and the majority of areas occur in four subzones; ESSFdk1, ESSFdk2, ESSFdkw, and MSdw in areas with an elevation range of 1600m-2250m. Additional BEC subzones include the ESSFdkp, and a minor component of MSdk.

Mining operations at FRO commenced in 1971, with the primary focus on producing steelmaking coal, although a small amount of thermal coal is also produced. The current annual production capacities of the mine and preparation plant are approximately 10 million tonnes of clean coal.

In 2019, production mining occurred in Swift and Eagle Mountain. In the current Life of Mine plan, Eagle Mountain will be mined continuously up to approximately 2026, at which point mining will be complete. The Swift coal reserves (estimated at 170 million metric tonnes of clean coal) will be mined continuously until approximately 2040.

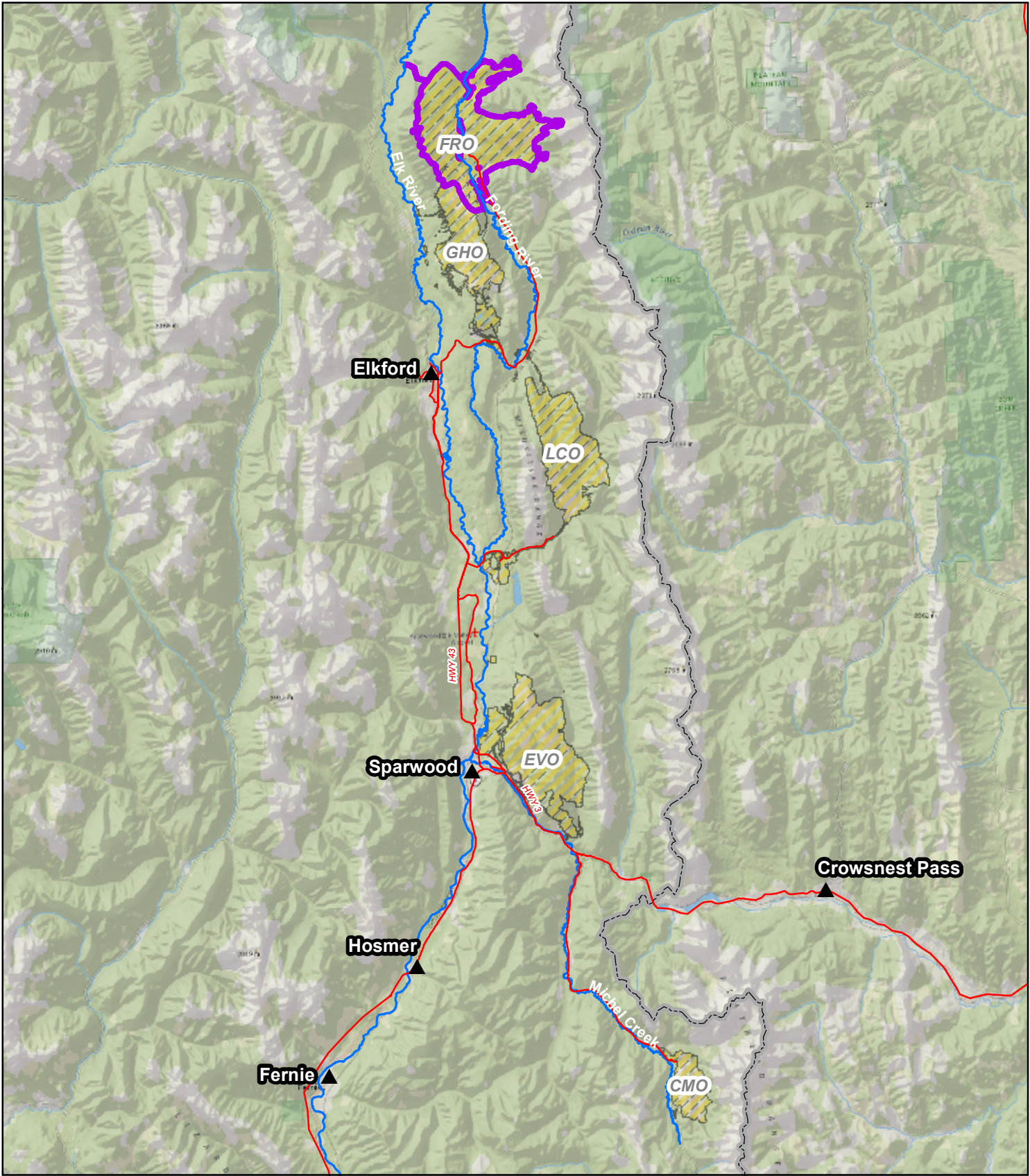
Based on the 2019 conceptual Life of Mine (LOM) plan, the FRO reserves in Eagle Mountain, Swift, Henretta, Turnbull and Castle would support mining to 2069.

FRO uses many management plans to determine and implement mitigations associated with mining; regional management plans include:

- **Grizzly Bear Denning Management Plan:** The focus of the Grizzly Bear Denning Management Plan is to implement management activities and procedures that reduce the likelihood of interactions with grizzly bears during the active denning period. This includes defining high potential grizzly bear denning habitat through a Habitat Sustainability Index (HSI), defining actions and methods to further refine the identification of grizzly bear denning sites and ensuring sites develop management actions in the event of locating a grizzly bear den in an active or imminently active mining area.
- **Invasive Plant Management Plan:** The focus of the Invasive Plant Management Plan is to detail the manner in which our operations within the Elk Valley will act to identify infestations, reduce the spread of noxious weeds/invasive plants, mitigate their impacts where present, and control populations with the goal of containment, reduction, and eradication where feasible.
- **Species Management Plans:** The completion of the technical guidance for designing mitigation strategies for rare and at-risk plants and wildlife led to the development of six species management plans in 2016. These species-level action plans outline mitigation measures, using the biodiversity mitigation hierarchy, which demonstrates how the operation will work to achieve

Net Positive Impact (NPI) for that species. Included in these plans is information about the ecology and distribution of the species, mitigation strategies and metrics to measure implementation success. The management plans specific to FRO include American badger, Gillette's checkerspot, and whitebark pine.

- **Soil Salvage Management Plan:** The Plan presents the management approach to soil salvage activities so that a consistent and logical approach is followed to developing site-specific soil salvage plans. A key function of the Plan is to guide soil salvage activities to ensure that mitigations are included for erosion and sediment control, soil compaction and admixing that may occur during operations.
- **Teck's Bird Guidance:** The objective of this document is to provide a framework that integrates bird biodiversity conservation for application at Teck's operations. The intent is to assist Teck management, site supervisors, consultants and contractors, and anyone overseeing or conducting activities that could impact birds or bird habitat at Teck sites by reducing the risk of impacts to birds and their habitats through the mitigation hierarchy. This document applies throughout the year to birds that are specifically listed in applicable regulations or are species cited as being of specific conservation concern.
- **Teck's Fish and Herptile Salvage Operations Guidance Document:** The objective of this document is to provide guidance to Teck Management, site supervisors, consultants and contractors and anyone overseeing or conducting activities that could impact fish and/or herptiles (amphibians and reptiles) or their habitat at Teck sites. This document helps to ensure safety and environmental risks associated with projects are identified, mitigated, and managed and provides guidance for planning, implementation and reporting for projects involving fish and herptile salvage and relocation.
- **Elk Valley Water Quality Plan (EVWQP):** This Plan is intended to address increasing selenium and nitrate water concentrations, assess and track levels of sulphate and cadmium, while at the same time allowing for continued sustainable mining within the watershed. The EVWQP also lays out a strategy to address calcite formation associated with historical and current mining activities. Permit 107517 issued under the Environmental Management Act (EMA) takes an area based approach to authorizing and managing water quality constituents of interest (CI) originating from current and historical mining activities in the Elk Valley. To do so, requires an extensive surface water monitoring program that includes authorized discharges, receiving environment and other sampling sites, eight authorized discharge Compliance Points, and seven Order Stations for which Site Performance Objectives (SPO) have been established. These permitted sampling locations are used to evaluate compliance, and overall effectiveness of the EVWQP.

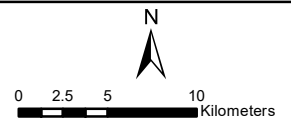


Teck

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Elk Valley Overview

- ▲ Communities
- State - Province Boundaries
- Highway
- Mine Permit Boundaries
- River
- Fording River Operations



DATE: 3/31/2020	MINE OPERATION: Fording River Operations
SCALE: 1:425,000	COORDINATE SYSTEM: NAD 1983 UTM Zone 11N

1.2. Reclamation Objective

As part of our sustainability strategy, biodiversity has been defined as a key focus area at all our operations. At Teck, we are working to achieve a Net Positive Impact (NPI) on biodiversity in areas affected by our activities. This vision is a critical component of reclamation and closure planning for FRO and will, in part, guide the development of reclamation prescriptions to support closure objectives.

Our NPI commitment applies to ecosystems, critical landscape functions, and Ecosystem and Biodiversity Elements (EBEs), prioritized with input from regulators and communities of interest. The EBEs may include populations, species, ecosystem services, and sites with high irreplaceability and/or vulnerability such as culturally important sites. The specific EBEs that have been identified for FRO are tracked through the Biodiversity Management Plan Workbook.

A Biodiversity Management Plan (BMP) provides an overview of the various actions, planning processes, and plans that together, represent a Teck operation's plan to work to achieve NPI. The BMP for FRO will evolve over time reflecting improved understanding of impacts and the effectiveness of mitigation actions. Although the individual components of FRO's BMP may change over time, the high-level approach to work to achieve NPI adopted by our operation will remain relatively consistent.

The reclamation program component of the Biodiversity Program is based on a philosophy of ecological rehabilitation, resulting in pre- and post-mining landscapes that have similar ecological characteristics and function, but this does not imply that they will be the same (Cooke & Johnson, 2010). Our reclamation philosophy for FRO is focused on establishing geotechnically stable landscapes with appropriate drainage and water quality that support a mosaic of ecosystems to provide the widest range of options for the future (National Research Council, 1981).

Our approach to reclamation planning is evolving in line with the NPI commitment. Post-mine disturbance ecosystem mapping is conducted by integrating knowledge of post-closure material characteristics and landform topography to estimate soil moisture and nutrient regimes, and to derive slope and aspect-based modifiers. Post-mine disturbance ecosystems are expected to be similar to ecosystems found in the region, though distribution will change to account for existing material characteristics, new landforms, slopes and aspects. We believe that by reclaiming disturbed land to stable, functioning, locally appropriate ecosystems that can reasonably be expected to thrive on a specific landform or location, a variety of end land use objectives can also be met. Please see section 4.1 for more detailed information on end land use objectives.

Reclamation of the post-mining environment will re-establish basic ecological processes through relatively simple plant communities, but it could take decades to centuries to re-establish the complexity of ecosystems such as mature or old growth forests. Nonetheless, the overriding objective for all reclamation treatments is to promote NPI by establishing diverse ecosystems and habitats that will persist and continue to promote succession toward desired mid to late seral stages over time. Accomplishing this objective will require adhering to basic ecological principles, along with the application of specific treatments and treatment combinations that are effective and consistently successful. This functional approach to reclamation is appropriate because it aims at establishing desirable physical, chemical, and biological processes (Smyth & Deardon, 1998).

Progressive reclamation is planned to occur throughout the stages of active mining and closure. Reclamation will be scheduled in areas where mining and operations are complete and not planned for

any future mining activities. The process for assigning areas available for reclamation considers the current permitted mine plan, the conceptual life of mine plan and the operational requirements for an active mining operation.

The general planning sequence for reclamation activities is to conduct contouring and/or site preparation activities once an area is available followed by a spring or fall revegetation program; depending on the area, reclamation activities (i.e. site preparation, soil placement, fencing, surveys and sampling, seed collection, seedling propagation and planting, etc.) could span 3-7 years. Updates to vegetation prescriptions have increased the planting densities as well as species selection which could result in extending planting programs over multiple years to meet the required numbers and assemblages in a planned ecosystem. Due to the differences in the elevation and aspect range specific to areas planted within a given year, seeding is generally planned for a fall application in the year following planting so that germination can begin immediately following snow melt in the spring; timing of this melt often differs between sites. Due to the variable rate of germination between seed lots and species, fertilizer is generally planned to be applied in the spring after the fall seeding to maximize the effectiveness of the fertilizer treatment. Germination will be confirmed prior to applying fertilizer and delayed if necessary.

2. Mining Program

The required Surface Development Map including mines act permit boundary, disturbed areas, mine components/facilities, waste disposal locations and soil stockpiles at a scale of 1:10,000 will be submitted digitally in Appendix 1.

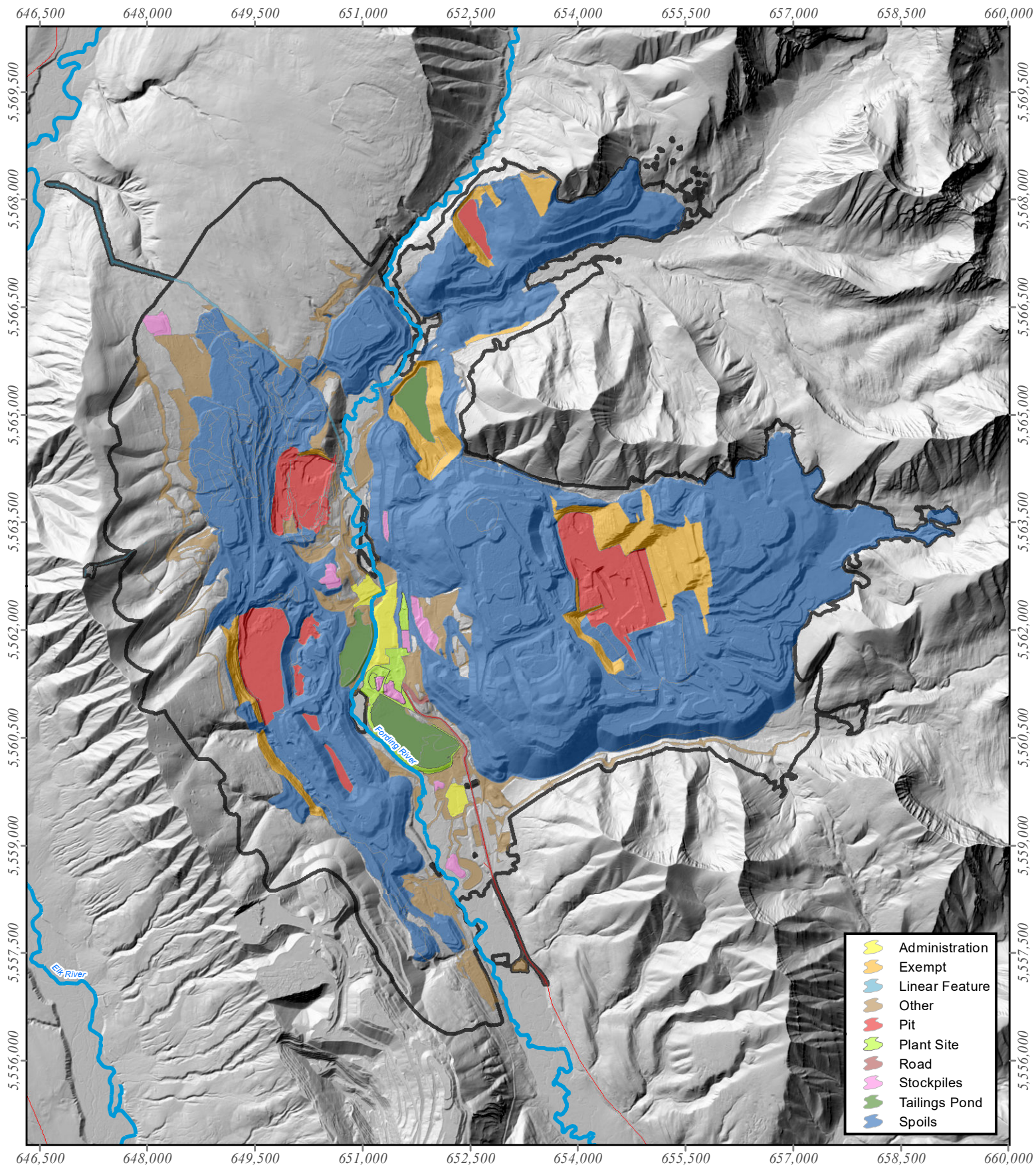
2.1. Surface Development to Date

Total surface development at FRO is 4,956 ha with a total of 686 ha reclaimed. Table 2-1 is a summary of the disturbed and reclaimed areas at FRO up to December 31, 2019. The volume of waste rock to date is 3.2 billion BCM, all placed within the operating area of FRO. Approximately 8.1 million BCM of coarse coal rejects has been placed in active and completed dumps to date.

Areas disturbed within the exempt category is composed of a 310 ha of highwall and footwall from current and completed pit development. Areas reported as seeded and planted in Table 2-1, are the area for which each of these activities have been completed. The area reported within the re-vegetated category may include one or both of these treatments. Areas will be reported as re-vegetated based on EMPR guidance in the general information requirements for Table 1 as “supported vegetation that will lead to the designated land use objective for at least one year”. A decrease from 2018 of 12.6 ha in the re-vegetated category primarily occurred from pit and spoil development activities which removed areas previously reclaimed. Stockpiles in Table 2-1 refer to coal and soil stockpiles.

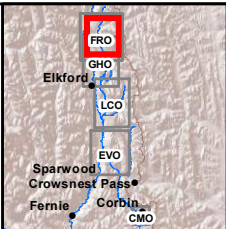
Table 2-1 Summary of Disturbed and Reclaimed Areas

	Area Disturbed		Area Recontoured		Area Seeded		Area Planted		Area Fertilized		Area Revegetated	
	2019	Total	2019	Total	2019	Total	2019	Total	2019	Total	2019	Total
Administration	0.0	51.0	0.0	2.5	0.0	2.3	0.0	2.5	0.0	0.0	0.0	3.7
Waste Dump	51.9	3512.4	3.8	898.9	14.0	1020.8	60.4	756.3	0.0	542.8	0.0	575.9
Stockpiles	1.2	47.6	0.0	1.8	20.7	45.6	0.0	4.0	0.0	1.2	0.0	1.6
Tailings Pond	0.0	122.4	0.0	1.3	0.0	18.9	0.0	0.0	0.0	3.6	0.0	2.4
Road	0.0	20.8	0.0	0.5	0.0	1.7	0.0	0.8	0.0	0.5	0.0	2.6
Pit	2.7	352.2	0.0	12.2	0.0	25.8	0.0	16.0	0.0	0.0	0.0	0.0
Linear	0.0	26.5	0.0	0.0	0.0	3.1	0.0	1.2	0.0	1.1	0.0	16.1
Exempt	0.0	310.4	0.0	7.2	0.0	22.7	0.5	4.8	0.0	2.0	0.0	1.9
Other	87.9	459.6	0.0	16.8	0.8	202.6	16.0	34.1	0.0	92.1	0.0	73.9
Plant Site	0.0	45.1	0.0	7.1	0.0	14.7	0.0	4.2	0.0	11.1	0.0	7.1
Total	143.6	4956.4	3.8	948.2	37.2	1358.2	76.2	823.9	0	654.6	0	685.6



Teck

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Surface Development to Date

- Stream
- Paved Road
- C-3



0 350 700 1,400 2,100 Meters

DATE: 4/1/2020 MINE OPERATION: Fording River Operations

SCALE: 1:70,000 COORDINATE SYSTEM: NAD 1983 UTM Zone 11N

2.2. Current Life of Mine Plan

The Life of Mine (LOM) Plan represents a 21-year period from 2019 to 2040 and details the mining sequence for the current proven and permitted reserves. The overall plan mines the existing, permitted reserves in Eagle Mountain, Henretta and Swift mining areas.

In 2019, production mining was split between Swift and Eagle Mountain. In the current Life of Mine plan, Swift will be mined continuously until 2040, being the only active phase from 2026 to 2037. Swift phases 1-3 and Lake Mountain, formerly known as Lago Pit, are the main mining areas until 2024 at which time Swift 4 will begin. Lake Mountain Pit is accelerated to allow for completion in 2021 enabling backfilling opportunities. Swift South Spoil is the main dumping location for Swift 2 North while Swift North Spoils and Lake Mountain backfill remain the main dumping location for all other Swift phases. Eagle Mountain will be mined continuously up to 2026 at which point mining will be complete. The Eagle mining sequence offers backfilling opportunities into Eagle 4 and Eagle 6. Henretta mining will commence in 2038 and be complete along with Swift Pit in 2040. Fording River will continue to evaluate future mining areas adjacent to Eagle Mountain, including Turnbull and Castle Mountain as well as additional mining potential in Eagle Mountain.

2.3. Surface Development in the Past Year

Production waste mining and spoiling was conducted in both Eagle Mountain and Swift in 2019. Waste volumes (both waste and rehandle mined) are identified in Table 2-2 and Table 2-3. Table 2-2 indicates volume of spoil material placed, by drainage, from both mining areas. Table 2-2 also identifies the volume of coarse coal rejects produced. All coarse coal reject in 2019 reported to Eagle 4 South Backfill CCFR Spoil, with a total of 1.7MBCM placed. (Table 2-2).

A total of 108.8 MBCM of material (waste and raw coal) was mined in 2019, all from Eagle and Swift. This includes 99.6MBCM of waste, and 8.6MBCM of raw coal. The FRO plant processed a total of 8.0M tonnes of clean coal (Table 2-3), with 0.6M tonnes of clean coal being produced for the Greenhills Operation (GHO).

For reference, the required Table 4 Monthly Custom Milling Production has not been included as it does not apply to coal mining operations.

Table 2-2 Quantities of waste rock, tailings, low grade ore, coarse reject and other mine waste

Name of Drainage	Acid Generating Waste (MBCM)		Potentially Acid Generating Waste (MBCM)		Non- Acid Generating Waste (MBCM)		Total Waste (MBCM)	
	2019	Total	2019	Total	2019	Total	2019	Total
Henretta Creek					0	178	0	178
Clode Creek				2	16	502	16	504
Eagle 6 Pit					12	91	12	91
Eagle Pond					0	136	0	136
South Tailings Pond					0	61	0	61
Kilmarnock Creek					20	1,176	20	1,176
Post Ponds					6	71	6	71
Lake Mountain Creek			0.004	0.004	35	129	35	129
Liverpool Ponds (swift Pit)					6	200	6	200
Swift Creek/ Cataract Creek					4	58	4	58
Total			0.004	2.004	100	2,603	100	2,605
Low Grade Ore/ Coarse Reject/ Other Mine Waste								
CCR					2	7	2	7
Total						7		7

Table 2-3 Monthly Mining and Milling Production

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Mining Production (bcm)													
Total Waste (bcm)	8,988,045	7,969,040	8,086,571	7,929,105	9,320,710	8,005,174	7,976,486	7,649,538	8,427,917	8,507,978	8,516,388	8,253,341	99,630,292
Total Coal (bcm)	798,246	703,929	758,914	822,218	835,996	603,107	758,303	813,772	731,697	632,079	660,478	1,068,375	9,187,114
Mining Total (bcm)	9,786,291	8,672,968	8,845,485	8,751,322	10,156,705	8,608,281	8,734,789	8,463,311	9,159,614	9,140,057	9,176,866	9,321,716	108,817,406
Milling Production (clean tonnes)													
FRO Coal Processed (mtcc)	61,1198	688,863	652,397	732,322	729,302	514,979	740,513	702,670	570,468	581,471	559,758	799,435	7,883,376
GHO Coal Processed (mtcc)	52,417	20,635	57,904	52,201	37,320	29,390	26,644	46,178	72,360	113,176	69,467	16,870	594,562
Milling Total (mtcc)	663,615	709,498	710,301	784,523	766,622	544,369	767,157	748,848	642,828	694,647	629,225	816,305	8,477,938
Milling Capacity	44,000	Raw tonnes per day											

2.4. Surface Development Projected Over the Next Five Years

Over the next 5 years, production mining will occur in both Swift and Eagle Mountain. Swift mining will be focused in Swift 1, 2N and 2S and Lake Mountain for these five years. Waste is scheduled to go the Swift North and South spoils during this time. In order to spoil onto the Swift South Spoil, a toe berm is required. In 2019, a portion of this toe berm was constructed, after which a small portion of the north end of the Swift South Spoil was utilized. Swift South and North spoils will continue to be primary dumping locations, along with Lake Mountain Backfill. Eagle Mountain mining will continue in established mining areas. Waste from Eagle will be backfilled into completed pits, as well as the Kilmarnock Valley. In addition, options for Turnbull West Pit (TBW) are currently being explored, this pit is a pushback to the previously completed Turnbull South Pit (TBS). TBW is projected to increase the FRO disturbance footprint by approximately 100ha. Spoiling locations for that area would consist of the Clode Creek area, Swift North Spoil, existing Eagle spoils and backfilling of TBS.

Appendix D



August 25, 2018
Authorization Number: 107517

Tracking Number: 371604

REGISTERED MAIL

Teck Coal Limited
3300-550 Burrard ST
Vancouver, BC V6C 0B3

Dear Permittee:

Enclosed is Amended Permit 107517 issued under the provisions of the *Environmental Management Act*. Your attention is respectfully directed to the terms and conditions outlined in the permit. An annual fee will be determined according to the Permit Fees Regulation.

This permit does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority rests with the permittee. This permit is issued pursuant to the provisions of the *Environmental Management Act* to ensure compliance with Section 120(3) of that statute, which makes it an offence to discharge waste, from a prescribed industry or activity, without proper authorization. It is also the responsibility of the permittee to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties, and comply with other applicable legislation that may be in force.

This decision may be appealed to the Environmental Appeal Board in accordance with Part 8 of the *Environmental Management Act*. An appeal must be delivered within 30 days from the date that notice of this decision is given. For further information, please contact the Environmental Appeal Board at (250) 387-3464.

Administration of this permit will be carried out by staff from the Environmental Protection Division's Regional Operations Branch. Plans, data and reports pertinent to the permit are to be submitted by email or electronic transfer to the Director, designated Officer, or as further instructed.

Yours truly,

<Original signed by>

Douglas J. Hill, P.Eng.
for Director, *Environmental Management Act*

Enclosure



MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE STRATEGY

PERMIT

107517

Under the Provisions of the Environmental Management Act

Teck Coal Limited

3300-550 Burrard ST
Vancouver, BC V6C 0B3

is authorized to discharge effluent to the land and water from five coal mine sites located within the Elk Valley near Elkford and Sparwood, British Columbia, subject to the terms and conditions listed below. Contravention of any of these conditions is a violation of the Environmental Management Act and may lead to prosecution.

The terms and conditions included in this permit are intended to supplement the commitments and processes contained in the Elk Valley Area Based Management Plan approved November 18, 2014. Should any conflict exist between this permit and the Elk Valley Area Based Management Plan, the permit requirements take precedence.

1. DEFINITIONS AND GLOSSARY

Unless otherwise defined, all terms used in this permit are defined as in the Elk Valley Area Based Management Plan (ABMP), approved November 18, 2014. The ABMP is also referred to as the Elk Valley Water Quality Plan.

ABMP: Elk Valley Area Based Management Plan or the Elk Valley Water Quality Plan or EVWQP.

AMP: Adaptive Management Plan

AWTF: Active Water Treatment Facility

BCWQG FWAL: British Columbia Water Quality Guideline for Fresh Water Aquatic Life

CMO: Coal Mountain Operations as described in the latest approved Mines Act Permit C-84

Compliance Point: an effluent monitoring location specified in the permit at which discharge limits apply

Date issued: November 19, 2014
Date amended: August 25, 2018
(most recent)

<Original signed by>

Douglas J. Hill, P.Eng.
for Director, Environmental Management Act

Constituents of Interest: an element or ionic compound that may pose a threat to ecological or human health when present at sufficient concentrations including selenium (Se), cadmium (Cd), nitrate (NO₃) and sulphate (SO₄).

Designated Area: a portion of southeastern British Columbia that contains the Elk Valley Watershed and the portion of Koochanusa Reservoir within Canada, and is geographically defined by Ministerial Order M113 (references to the Elk Valley are references to the Designated Area)

Elk Valley Area Based Management Plan: Teck Coal Limited was required under Section 89 of the Environmental Management Act, to prepare an Area Based Management Plan. The Elk Valley Water Quality Plan (EVWQP) was approved by the BC Minister of Environment on November 18, 2014.

EMC: Environmental Monitoring Committee

ENV: Ministry of Environment and Climate Change Strategy

EVO: Elkview Operations as described in the latest approved Mines Act Permit C-2

FRO: Fording River Operations as described in the latest approved Mines Act Permit C-3

GHO: Greenhills Operations as described in the latest approved Mines Act Permit C-137

LAEMP: Local Aquatic Effects Monitoring Program

LCO: Line Creek Operations as described in the latest approved Mines Act Permit C-129

Order (the): Ministerial Order number M113, which was the directive issued by the B.C. Minister of Environment in April 2013 requiring Teck Coal Limited to develop the Elk Valley Area Based Management Plan.

Order station: a monitoring location specified by the Order to monitor water quality in the Designated Area, at which site performance objectives apply

RAEMP: Regional Aquatic Effects Monitoring Program

Regulatory Document: any document submitted to the Director as required by this permit

SPO: Site Performance Objective

WLC: West Line Creek

Date issued: November 19, 2014
Date amended: August 25, 2018
(most recent)

<Original signed by>

Douglas J. Hill, P.Eng.
for Director, *Environmental Management Act*

2. AUTHORIZED DISCHARGES (COMPLIANCE POINTS)

The compliance points in this Section correspond to locations where all or most of the point and non-point discharges from a mine site or portions of a mine site are expected to accumulate. These accumulated discharges are subject to the limits.

For Sections 2.1 to 2.5, the limits are expressed as monthly average concentrations as well as specified daily maximums. The monthly average concentration is defined as the average of all samples collected in a calendar month at the sample location. For months where only one result is collected, that result shall be compared to both the monthly average and daily maximum limits.

2.1. FORDING RIVER OPERATIONS - FORDING RIVER COMPLIANCE POINT

This section applies to effluent from Teck Coal Limited mine operations (Fording River Operations and the Greenhills Operations into the Fording River watershed) upstream of FRO Compliance Point (EMS E300071). The FRO Compliance Point (EMS E300071) is located approximately 525 m downstream of Cataract Creek as shown in Appendix 1.

2.1.1. The characteristics of the effluent at the compliance point must not exceed the following monthly average limits:

MONTHLY AVERAGE			
PARAMTERS	Immediately	By Dec. 31, 2019	By Dec. 31, 2023
Total selenium ($\mu\text{g/L}$)	130	90	61
Nitrate as N (mg/L)	27	19	13
Sulphate (mg/L)	580	620	650

2.1.2. The characteristic of the effluent at the compliance point must not exceed the following daily maximums:

DAILY MAXIMUM			
PARAMETERS	Immediately	By Dec. 31, 2019	By Dec. 31, 2023
Total selenium ($\mu\text{g/L}$)	155	106	71
Nitrate as N (mg/L)	32.5	23	15

Date issued: November 19, 2014
Date amended: August 25, 2018
(most recent)

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2.1.3. The authorized works include tailings impoundments, sedimentation and infiltration ponds, diversions, ditches, pipelines and pumping, sewage treatment plants, and related appurtenances.

2.2. GREENHILLS OPERATIONS – FORDING RIVER COMPLIANCE POINT

This section applies to effluent from Teck Coal Limited mine operations (Fording River Operations, Greenhill Operations and Line Creek Operations) upstream of GHO Fording River Compliance Point (EMS 0200378). The GHO Fording River Compliance Point (EMS 0200378) is located 205 m downstream of Greenhills Creek as shown in Appendix 1.

2.2.1. The characteristics of the effluent at the compliance point must not exceed the following monthly average limits:

MONTHLY AVERAGE			
PARAMETERS	Immediately	By Dec. 31, 2019	By Dec. 31, 2023
Total selenium (µg/L)	80	63	57
Nitrate as N (mg/L)	20	14	11

2.2.2. The characteristics of the effluent at the compliance point must not exceed the following daily maximums:

DAILY MAXIMUM			
PARAMETERS	Immediately	By Dec. 31, 2019	By Dec. 31, 2023
Total selenium (µg/L)	100	78	62
Nitrate as N (mg/L)	29	17	15

2.2.3. The authorized works include tailings impoundments, sedimentation and infiltration ponds, diversions, sewage treatment plants, and related appurtenances.

2.3. GREENHILLS OPERATIONS – ELK RIVER COMPLIANCE POINT

This section applies to effluent from Teck Coal Limited mine operations (Greenhills Operations into the Elk River watershed) upstream of GHO Elk River Compliance Point (EMS 300090). The GHO Elk River Compliance Point (EMS 300090) is located 220 m downstream of Thompson Creek as shown in Appendix 1.

2.3.1. The characteristics of the effluent at the compliance point must not exceed the following monthly average limits:

Date issued: November 19, 2014
 Date amended: August 25, 2018
 (most recent)

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MONTHLY AVERAGE		
PARAMETERS	Immediately	By Dec. 31, 2027
Total selenium ($\mu\text{g/L}$)	15	8
Nitrate as N (mg/L)	3	3

2.3.2. The authorized works include tailings impoundments, sedimentation and infiltration ponds, diversions, sewage treatment plants and related appurtenances.

2.4. **LINE CREEK OPERATIONS – LINE CREEK COMPLIANCE POINT**

This section applies to effluent from Teck Coal Limited mine operations (Line Creek Operations into the Line Creek Watershed) above LCO Compliance Point (EMS E297110). The LCO Compliance Point (EMS E297110) is located approximately 1500 m downstream of the West Line Creek Active Water Treatment Facility (WLC AWTF) outfall as shown in Appendix 1

2.4.1. The characteristics of the effluent at the compliance point must not exceed the following monthly average limits:

MONTHLY AVERAGE			
PARAMETERS	Immediately	By Dec. 31, 2015	By Dec. 31, 2033
Total selenium ($\mu\text{g/L}$)	80	50	29
Nitrate as N (mg/L)	14	7	3

2.4.2. The characteristics of the effluent at the compliance point must not exceed the following daily maximums:

DAILY MAXIMUM			
PARAMETERS	Immediately	By Dec. 31, 2015	By Dec. 31, 2033
Total selenium ($\mu\text{g/L}$)	95	58	33
Nitrate as N (mg/L)	20	9	4

2.4.3. The authorized works include tailings impoundments, sedimentation and infiltration ponds, diversions, sewage treatment plants, and related appurtenances.

2.5. **ELKVIEW OPERATIONS – HARMER CREEK COMPLIANCE POINT**

This section applies to effluent from Teck Coal Limited mine operations (Elkview Operations into the Harmer Creek watershed) above EVO Harmer Compliance Point (EMS E102682). The EVO Harmer Compliance Point (EMS E102682) is located at the Harmer Spillway as shown in Appendix 1.

Date issued: November 19, 2014
 Date amended: August 25, 2018
 (most recent)

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2.5.1. The characteristics of the effluent at the compliance point must not exceed the following monthly average limits:

MONTHLY AVERAGE			
PARAMETERS	Immediately	By Dec. 31, 2017	By Dec. 31, 2021
Total selenium (µg/L)	45	57 (interim) ¹	Requires Development ¹
Nitrate as N (mg/L)	4	16	8
Sulphate (mg/L)	300	380	450

¹ The limits for total selenium are determined following the process outlined in Section 2.7.1. Establishment of the limits requires written approval by the Director.

2.5.2. The authorized works include sedimentation and infiltration ponds, tailings impoundments, diversions, sewage treatment plants, and related appurtenances.

2.6. ELKVIEW OPERATIONS – MICHEL CREEK COMPLIANCE POINT

This section applies to effluent from Teck Coal mine operations (Elkview Operations into the Michel Creek watershed) above EVO Michel Creek Compliance Point (EMS E300091). The EVO Michel Creek Compliance Point (EMS E300091) is located at the Highway 3 bridge over Michel Creek as shown in Appendix 1.

2.6.1. The characteristics of the effluent at the compliance point must not exceed the following monthly average limits:

MONTHLY AVERAGE			
PARAMETERS	Immediately	By Dec. 31, 2021	By Dec. 31, 2025
Total selenium (µg/L)	28	20	19
Nitrate as N (mg/L)	6	6	6

2.6.2. The authorized works include sedimentation and infiltration ponds, tailings impoundments, diversions, sewage treatment plants, and related appurtenances.

2.7. COAL MOUNTAIN OPERATIONS (CMO)

This section applies to effluent from Teck Coal Limited mine operations (Coal Mountain Operations) above CMO Compliance Point (EMS E258937). The CMO Compliance Point (EMS E258937) is located 50 m upstream of Andy Goode Creek as shown in Appendix 1.

Date issued: November 19, 2014
 Date amended: August 25, 2018
 (most recent)

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2.7.1. The characteristics of the effluent at the compliance point must not exceed the following monthly average limits:

PARAMETERS	Immediately
Total selenium (µg/L)	19
Nitrate as N (mg/L)	5
Sulphate (mg/L)	500

2.7.2. The authorized works include sedimentation and infiltration ponds, diversions, sewage treatment plant, and related appurtenances.

2.8. WEST LINE CREEK ACTIVE WATER TREATMENT FACILITY

This section applies to the discharge of effluent from the West Line Creek Active Water Treatment Facility (WLC AWTF) Phase 1 to Line Creek. The site reference number for this discharge is E291569 as shown in Appendix 1.

2.8.1. The maximum authorized rate of discharge is 8,300 cubic meters per day.

2.8.2. The characteristics of the discharge at the treated effluent outlet of the WLC AWTF must not exceed:

PARAMETER	LIMIT
Ammonia	1.0 mg/L
Biological Oxygen Demand	25 mg/L
pH Range	6.5-8.5
Nitrate	3.0 mg/L
Total Phosphorus	0.3 mg/L
Total Selenium	0.02 mg/L, Monthly Average
Total Suspended Solids	10.0 mg/L

2.8.3. The authorized works are West Line Creek intake structure and pipeline, active water treatment plant, the advanced oxidation process facility, combined Line Creek intake and outfall structure and pipeline, leachate influent from biosolids residual management facility, buffer pond, buffer pond overflow spillway and wet pond, and groundwater diversion, and related appurtenances.

2.8.4. The location of the facilities from which the discharge originates and the location of the point of discharge is District Lot 6772, District Lot 4588, Kootenay Land District.

Date issued: November 19, 2014
 Date amended: August 25, 2018
 (most recent)

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2.9. RE-EVALUATION OF LIMITS

2.9.1. EVO Harmer Compliance Point Selenium Evaluation

The interim limit for selenium of 57 ug/L effective December 31, 2017 is confirmed.

A proposed timeframe and long term limit for total selenium must be re-submitted for consideration and approval by the Director no later than December 31, 2018. The re-submission must include a proposed monthly average total selenium at the EVO Harmer Compliance Point (EMS E102682) appropriate to meet the intentions of the approved Elk Valley Water Quality Plan, and must consider and address the following:

- 1) The comments provided by the EMC in the input table dated June 12, 2015 and the Ktunaxa Nation Council (KNC) in their letter dated January 25, 2016;
- 2) Information derived from the Tributary Evaluation Program;
- 3) The results from updated water quality modelling due October 31, 2017 as per section 10.9;
- 4) An assessment of means to exclude fish from sediment ponds in general and the Harmer Dry Creek Sediment Ponds in particular. Methodology for exclusion should be evaluated by the Elk Valley Fish and Fish Habitat Committee; and
- 5) Clarification regarding how Teck has modified the BRE mine plan to reduce selenium loadings at the Harmer compliance point.

Date issued: November 19, 2014
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