

MEETING NOTE

MEETING DATE: March 10, 2022

PREPARED FOR: Honourable George Heyman, Minister of Environment and Climate Change Strategy
Honourable Bruce Ralston, Ministry of Energy, Mines and Low Carbon Innovation

TOPIC: Water quality in the Elk Valley and an update on water quality mitigation progress

ATTENDEES: Marcia Smith, Senior VP, Sustainability and External Affairs, Teck
Marcella Munro, Head of Government & Regulatory Affairs, Teck
Jeff Hanman, VP, Sustainable Development, Teck
Scott Maloney, VP, Environment, Teck
Sheila Risbud, Director, FRX Project, Teck
Kevin Jardine, Deputy Minister of Environment and Climate Change Strategy
Laurel Nash, Assistant Deputy Minister, Environmental Protection
Elenore Arend, Associate Deputy Minister, Environmental Assessment Office
Mike Shepard, A/Assistant Deputy Minister, Environmental Assessment Office

KEY MESSAGES:

- **We acknowledge the extensive efforts to date by Teck to develop and implement new treatment facilities and other water quality mitigations in the Elk Valley. The treatment facilities are showing effective removal of selenium and nitrate, and we look forward to seeing further improvements as the additional facilities come online in the coming months.**
- **We understand that Teck is nearing completion of its next update to the Area Based Management Plan (ABMP) Implementation Plan, which we understand will propose continued substantial investments in new treatment facilities. We appreciate Teck's efforts to attain full compliance as soon as possible; however, we are concerned about predicted non-compliances at some locations for a few more years, and Teck is strongly encouraged to do everything possible to mitigate these.**
- **The ministry intends to amend the ABMP to reassess the Koochanusa reservoir selenium target, incorporate new knowledge, and improve processes for addressing impacts and managing water quality in the Elk Valley. Teck will be invited to participate in this process and I understand engagement with Teck staff has already commenced.**

- **We encourage Teck to continue focussing on building a strong and trusting relationship with the KNC, to support timely application reviews and effective outcomes from strategic projects including the ABMP amendment.**

KEY FACTS:

- In 2014 ENV approved an Area Based Management Plan (ABMP) for the Elk Valley to stabilize and improve water quality in the mainstem Elk and Fording Rivers. The Plan includes water quality targets for selenium (Se), nitrate (NO₃), sulphate (SO₄) and cadmium (Cd), as well as a schedule of mitigation activities that have become regulatory requirements in Teck's effluent discharge permit.
- In recognition of: a) the historical mining context, b) site-specific data; and c) the still-emerging science on how to best manage coal mining contaminants, the ABMP manages the environment on a watershed-wide scale and accepts a higher level of risk than is typically accepted downstream of other mines or industrial discharges. On its own, the ABMP is currently not managing on a tributary-by-tributary level where some localized impacts of mining activities to fish and benthic invertebrates have been observed.
- At present, Teck is operating two active water treatment facilities [Fording River Operations (FRO) –South, and West Line Creek at Line Creek Operations (LCO)] and one saturated rock fill (SRF) at Elkview Operations (EVO). The facilities remove Se and NO₃ and in January 2022, they treated 26,653 m³/day of water (see Appendix 1).
- The FRO-South facility is still being brought online and treatment capacity will increase in the coming months. Teck is also in the pre-commissioning stage of a second SRF at FRO-North. By the end of 2023, Teck is expected to be treating 77,500 m³/day, with stabilization and reduction of Se and NO₃ trends also expected (see Appendix 2 for treatment to 2023).
- SRF is a new technology that has been developed by Teck in the Elk Valley. The technology has been carefully reviewed and authorized by the *Environmental Management Act* (EMA) and *Mines Act* permits for use at EVO and FRO. Teck has submitted a Technology Readiness Assessment for SRF technology to document all of the research and development work that has been done, to confirm general applicability of this technology for planning purposes, and to support continued use of SRF technology in the Elk Valley.
- Implementation of the FRO-South treatment facility has been behind schedule, due to a combination of factors including a need to adjust the technology based on upsets and learnings from the first active water treatment facility at LCO, construction challenges, and COVID-19. Other treatment facilities have made progress in accordance with the current permit requirements.
- At present, Teck is updating their ABMP Implementation Plan and schedule for treatment and will be proposing additional SRFs and treatment capacity up to 193,500 m³/day by the end of 2042 (see Appendix 3). Teck has indicated their intent to be in full compliance as soon as possible, as well as to maintain compliance with the current Se target of 2 ug/L in the Kooocanusa reservoir.
- Se and NO₃ levels are now beginning to stabilize and reduce in some areas immediately downstream of operating treatment facilities. However, at times Teck continues to be out of

compliance at certain locations, including in the Fording River and Line Creek. They are developing strategies to address these areas. The updated Implementation Plan that Teck is finalizing predicts full compliance with Se and NO₃ limits at all compliance points by 2028.

- Monitoring and assessment programs have revealed that aquatic ecosystems in most of the mainstems are functioning, but chronic toxicity impacts are present at some locations in the Elk Valley, in part because the full mitigation plans have not yet been implemented and in part because a higher level of risk to the environment was accepted when the original ABMP was approved. As water quality in the Elk Valley improves, we expect chronic impacts that we are currently observing will also improve.
- ENV staff are currently working on a draft Ministerial Order to amend the ABMP, including updating the Kooacanusa reservoir Se target to reflect the new learnings from the water quality objective (WQO) development process, and developing a new process to consider emerging contaminants and better support adaptive management and continuous improvement.
- BC's draft WQO for the Kooacanusa reservoir, which was co-developed by ENV and KNC, is expected to be released for public comment and then finalized at the start of the ABMP Amendment process. The WQO has been developed in accordance with ministry policy and procedures and, as an ENV policy, will inform the ABMP target reassessment. Along with the new WQO, the reassessment will also consider additional monitoring data and impact and risk assessment results, which were not available during the WQO development process, plus other relevant information such as feasibility/achievability and socio-economic factors that are not typically considered during WQO development.

Appendices:

- Appendix 1: January 2022 Treatment Data: Facility Performance Reporting for Selenium and Nitrate Provided By Teck
- Appendix 2: Treatment Facilities to 2023
- Appendix 3: Proposed Selenium and Nitrate Treatment Facilities Based on Teck's Draft 2022 Update to the Implementation Plan
- Appendix 4: Timelines

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Appendix 1: January 2022 Treatment Data: Facility Performance Reporting for Selenium and Nitrate Provided By Teck

WLC AWTF, EVO SRF and FRO-S AWTF Performance Summary

Note these calculations use the most recent data available and as such the data may not have undergone final QA/QC. Results may change as data undergoes final QA/QC.

	WLC AWTF	EVO SRF	FRO-S AWTF
Throughput**	7253 m ³ /day	16529 m ³ /day	2871 m ³ /day
Influent nitrate**	17.2 mg/L	20.9 mg/L	34.9 mg/L
Effluent nitrate**	0.22 mg/L	0.88 mg/L	1.56 mg/L
Daily average nitrate load removal**	122 kg/day	286 kg/day	95.0 kg/d
Influent selenium**	228 µg/L	171 µg/L	534 µg/L
Effluent selenium**	12.9 µg/L	8.48 µg/L	24.6 µg/L
Daily average selenium load removal**	1.55 kg/day	2.71 kg/day	1.45 kg/day
Effluent non-selenate*	0.834 µg/L	1.14 µg/L	0.18 µg/L

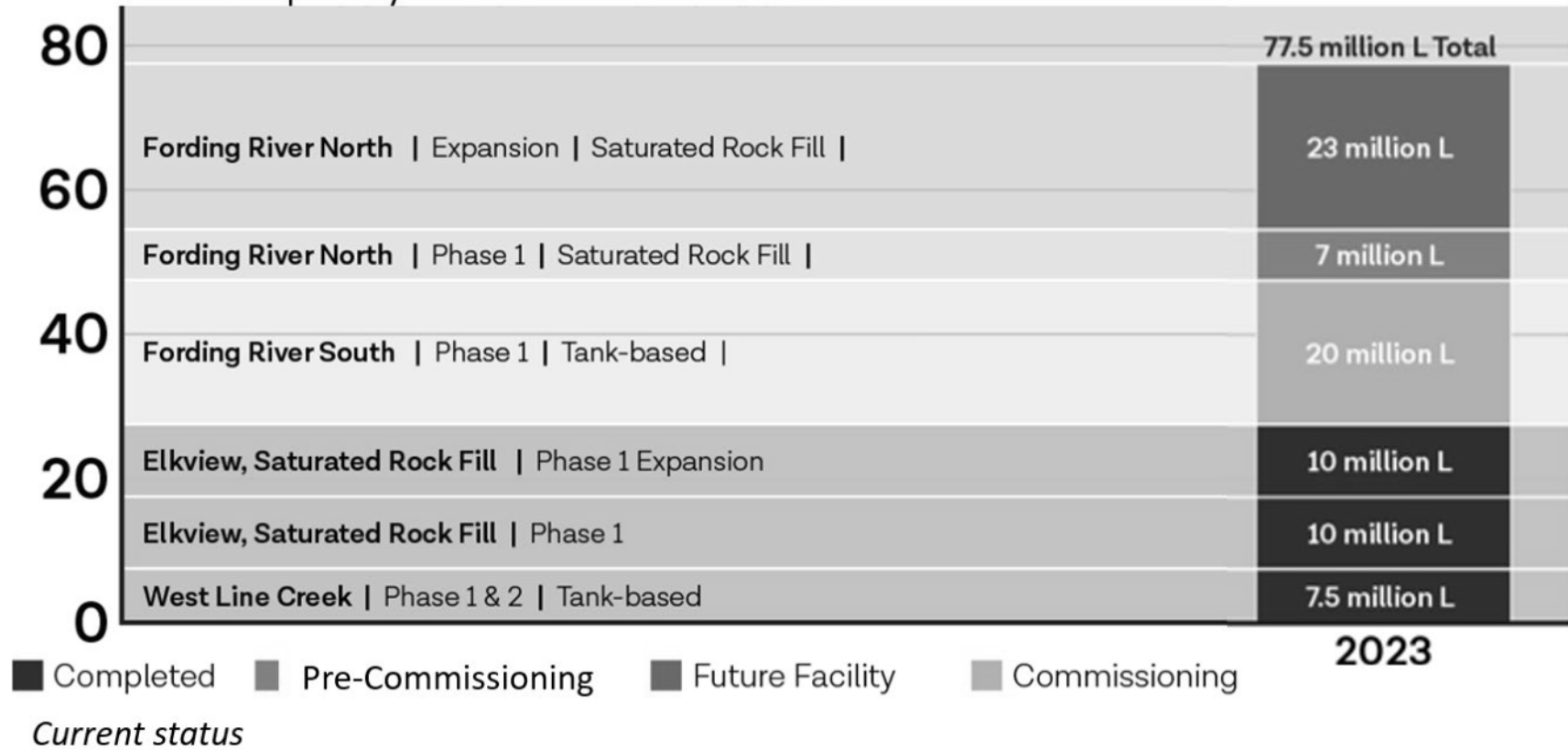
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*Since last update **January

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Appendix 2: Treatment Facilities to 2023

Millions of Liters per Day



Summary of Treatment, Diversions and Conveyance for Selenium and Nitrate

Site	Treatment Vessel / Associated Diversions	Abbreviation on Graphs	Hydraulic Capacity (m ³ /d)	Fully Effective Date	Sources Treated /Added
FRO	Kilmarnock Diversion		86,000	Dec 31, 2021	-
	FRO AWTF-S	FRO S	20,000	Sep 1, 2022	Swift/Cataract, Kilmarnock
	FRO-N 1 SRF Phase I	FRO N 1 SRF I	9,500	Dec 31, 2022	Eagle 4 Pit
	FRO-N 1 SRF Phase II	FRO N 1 SRF II	20,500	Dec 31, 2023	Clode, Liverpool, Swift Pit, Post Ponds
	FRO-N 1 SRF Phase III	FRO N 1 SRF III	10,000	Dec 31, 2025	Clode, Liverpool, Swift Pit, Post Ponds, Eagle Pond
	FRO-N 2 SRF	FRO N 2 SRF	20,000	Dec 31, 2026	FRO-N 1 SRF sources, Kilmarnock
	Eagle 6 South SRF	E6S SRF	6,500	Jun 30, 2033	Eagle 6 Pit North and South
LCO	WLC AWTF	WLC	7,500	Jan 1, 2020	West Line Creek, Line Creek
	WLC AWTF	WLC	-	June 30, 2023	MSAW
	NLC SRF Phase I	NLC SRF I	12,500	Dec 31, 2025	NLC, NLX, LCO Dry Creek
	NLC SRF Phase II	NLC SRF II	10,000	Dec 31, 2030	NLC, NLX, WLC groundwater
	NLC SRF Phase III	NLC SRF III	17,500	Dec 31, 2033	NLC, NLX, WLC groundwater, Line Creek, LCO Dry Creek
	Conveyance/Supplementation		Up to 30,000	Mar 29, 2023	-
	No Name, Horseshoe and Upper Line Creek Diversions		42,000	Dec 31, 2025	-
GHO	Cougar South Pit SRF	CSP SRF	5,000	Jun 30, 2042	Cougar South Pit, Leask, Wolfram, Thompson, Porter
	Greenhills Creek Treatment	GHC	7,500*	Dec 31, 2027	Greenhills Creek
EVO	EVO SRF Phase I		20,000	Sep 1, 2021	Erickson, Natal
	EVO SRF Phase II		4,000	Sep 30, 2023	EVO Dry
	EVO SRF Phase III		15,000	Dec 31, 2027	Erickson, Natal
	EVO SRF Phase IV		3,000	Dec 31, 2036	EVO Dry
	BRP SRF		5,000	Dec 31, 2042	Baldy Ridge Pit, Erickson, Natal



* For regional treatment to meet 107517 permit limits and SPOs, 3,000 m³/day of treatment is required. 7,500 m³/day is required based on the Federal Direction.