# Elk Valley Water Quality Plan

Five Year Update



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### Elk Valley Water Quality Plan: Five Year Update

More than 4,000 Teck employees live and work in the Elk Valley and are committed to protecting the environment. That's why we are taking action to ensure that water quality is protected in the valley now and for generations to come.

Over the five years since it was launched, significant progress has been made towards achieving the objectives of the Elk Valley Water Quality Plan, a long-term approach to address the management of substances released by mining activities in the Elk Valley.

Our goal is to stabilize and reverse the trend of selenium and other substances to ensure the ongoing health of the watershed, while at the same time allowing for continued sustainable mining in the region.

The first water treatment facility was built and is now successfully operating at our Line Creek Operations. We are applying what we've learned to build a larger tank-based plant which is under construction now at our Fording River Operations. As a result, we are seeing reductions in selenium and nitrate concentrations downstream of the Line Creek facility and we expect further significant reductions in other areas as future facilities come on line. One of the most exciting advancements has come from our Research and Development program, which has developed a new form of water treatment using Saturated Rock Fills (SRF). Our first SRF has been commissioned at Elkview Operations and is achieving near complete removal of selenium and nitrate. SRF water treatment technology can help to achieve water quality objectives more quickly and efficiently than other forms of treatment. The SRF at Elkview is treating up to 10 million litres of water each day and we have plans to expand the Elkview SRF to treat 20 million litres per day.

#### The Challenge

Water quality challenges in the Elk Valley are connected to the long history of mining in the region. The mining process generates large quantities of leftover rock that contains naturally-occurring substances such as selenium, an element that is essential for human and animal health in small amounts. Water from both precipitation and runoff flows through these rock piles and carries selenium and other substances,

such as nitrate, into the local watershed. If present in high enough concentrations in the watershed, these substances can adversely affect aquatic health.



## We are building water treatment facilities at our Elk Valley operations to ensure the health of the watershed.



#### We are using innovative water treatment technologies to achieve the objectives of the Elk Valley Water Quality Plan.





#### **Tank-Based Plants**

This biological treatment process removes nitrate and transforms selenium into a solid form through a process that includes the following steps:

- 1. Biological treatment to convert dissolved forms of selenium to solid form
- 2. Nitrate is converted into inert nitrogen gas and safely released
- 3. Solid selenium is extracted and safely disposed of in a secure onsite facility
- 4. Safely treated water is discharged

#### Saturated Rock Fill

Saturated Rock Fills use naturally-occurring biological processes in former mining areas that have been backfilled with rock and saturated with water to remove selenium and nitrate:

- 1. Water for treatment is injected into the SRF
- 2. Natural bacteria convert dissolved forms of selenium into a solid form which remains securely stored in the SRF and nitrate to inert nitrogen gas which is safely released
- 3. Safely treated water is pumped out of the SRF and discharged

The benefits of SRF over other forms of water treatment:

- Quicker to build and less complex to operate
- Lower cost and more sustainable
- Treat larger volumes of water
- Use less energy
- Smaller environmental footprint

#### Water Diversions

Clean water diversions involve the construction of earthen dikes, channels or other physical barriers and/ or pipes to direct clean water around mining activities.





## Monitoring

We are conducting extensive studies and monitoring of water quality and aquatic health which includes regular water quality sampling at approximately 100 stations in the Elk Valley. To date, regional monitoring indicates that current levels of selenium and other substances are not impacting populations of fish or birds.

Monitoring shows that selenium concentrations have been reduced downstream of our operational water treatment plant at Line Creek as a result of water treatment and we expect further significant reductions as the Fording and Elkview facilities come on line.

#### **Sharing Monitoring Results**

Teck is committed to being transparent with stakeholders as we implement the Elk Valley Water Quality Plan. We make data and results from ongoing water quality, aquatic and animal health research and monitoring undertaken as part of the Plan available, and we will continue to share those results going forward. This includes Annual Reports completed by an Environmental Monitoring Committee comprised of an independent scientist and representatives from the B.C. Government, Ktunaxa Nation Council, Interior Health Authority, and Teck.

Monitoring reports related to the Elk Valley Water Quality Plan can be found at: **teck.com/elkvalley** 

## **Research and Development**

Teck is investing \$30 million this year in over 20 research and development projects. These include projects to continue to improve our understanding of water quality, source control and treatment options.

Three examples of this work are:

Alternative treatment technologies

We are exploring the use of smaller water treatment facilities that can be built much closer to where the treatment is needed.

Nitrate prevention

This includes using liners that prevent explosives that contain nitrate – used in the mining process – from coming in contact with water.

Waste Rock Covers

We are continuing to evaluate different forms of physical covers for waste rock piles ranging from vegetative to geosynthetic covers.

## **Community Engagement**

Throughout 2019, we'll be providing opportunities for you to learn more about the Elk Valley Water Quality Plan, our progress and our challenges, and to provide input into the ongoing implementation of the plan.

The Elk Valley Water Quality Plan is an adaptive plan that will continue to be updated based on new technology and learnings as well as feedback we receive along the way.

We will be holding public information sessions in the region in Fall 2019. More details will be provided.

To learn more and provide feedback please visit **teck.com/elkvalley** or contact us at

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If you leave your contact details, we will respond directly to you.

