Mine Closure

Why was Mine Closure a Material Topic in 2015?

Global Context: There is an increasing global expectation that companies fully understand and manage the long-term economic, social and environmental impacts throughout the entire life cycle of their products and activities. Planning for the completion of activities and the effective implementation of those plans in consultation and collaboration with communities is a critical part of life cycle management.

Industry Context

As a result of the downturn in commodity prices, many companies in the industry announced the sale, temporary closure or acceleration of permanent closure of mines. Closure of an operation leads to decline in employment, local procurement, community investment and infrastructure development. If managed improperly, closed mine sites can also pose safety and environmental risks due to the equipment, tailings and facilities left following the activities of mining. Companies must plan effectively to mitigate these risks, and implement those plans diligently to support local communities and ecosystems.

Teck Context

Being in business for over 100 years, we have a large portfolio of legacy properties and a number of existing operations that are progressing towards closure. Responsibly closing our sites and managing our legacy properties is an essential element of our sustainability performance. We focus on responsibly ending mining operations by developing viable, long-term and appropriately diverse post-closure land uses and supporting communities, including former employees, in their "post-mine" transition.

In 2015, we had three significant events related to closure: we ceased operations at Duck Pond Operations in Newfoundland and Labrador, Canada, due to exhaustion of reserves and began implementing the closure plan; we suspended further work on the Coal Mountain Phase 2 project due to economic conditions, which means the current operations will cease in 2017, and accelerated closure planning activities; and we completed the bulk of our activities at our previously closed Sa Dena Hes property in the Yukon Territories.

What is in this Topic?

Planned or actual closure planning — and related impacts on workers, local communities and the environment.

Performance Highlights

33%

of our current operations have comprehensive closure plans, with the remaining operations working through the phases of closure planning as appropriate to mine life.[5]

198 hectares (ha)

of land were reclaimed and 524 ha were disturbed by our activities in 2015, compared to 101 ha reclaimed and 908 ha disturbed in 2014.

Learn More

Planning for Integrated Mine Closure Toolkit

Pictured above: Jaimie Dickson and Matt Bryan review a map of the closed Bethlehem Pit at Highland Valley Copper Operations

[5] Calculation is based on our 12 mine operations, and excludes our Trail smelting operations.

How Does Teck Manage Mine Closure?

Our Targets and Commitments

We are committed to responsibly ending mining operations by developing and implementing closure plans with communities of interest.

We are committed to responsibly ending mining operations by developing and implementing closure plans with communities of interest (COIs). There are three phases of mine closure that extend from the beginning of the mining life cycle until the mine is permanently closed: closure planning, closure and post-closure management.

Closure Planning

Given the long life of many of our mines, and to ensure that closure plans are relevant at the time that an operation ultimately closes, closure planning is a phased activity conducted in collaboration with our communities of interest.

Mine closure is supported by corporate staff and managed at a site level by a cross-functional group that typically includes experts in mine planning, community, Indigenous Peoples, water and biodiversity. Closure planning begins early in a mine's life, with development of a conceptual closure plan relevant to the particular operation. This plan is periodically updated over the life of the operation, and research into reclamation and other closure issues is conducted. Closure planning intensifies as a mine begins to near the end of its life, when all conditions of the operation and its effect on local economies and government are known.

Closure plans include consideration of:

- Water management including long-term quality
- Stability of landforms and water courses
- Socio-economic impacts on local communities
- Input from communities
- Biodiversity, ecosystems, and possible post-closure uses
- Post-closure management requirements
- Cost-effective execution

Each closure plan is developed to address unique characteristics of the site and regulatory requirements of the particular jurisdiction. We engage with COIs in the planning process to ensure the concerns and priorities of local communities and Indigenous Peoples are taken into consideration. Through closure and into post-closure management, our teams focus on achieving and maintaining the commitments outlined in the closure plan.

Community Engagement

At closure, community engagement activities focus on reducing the impact of workforce reductions, fewer procurement opportunities, decline in community investment and revenues from tax and royalties. We engage with employees, suppliers and government to effectively mitigate these social risks.

Developing Guidance for Community Engagement During Closure Planning Through the SMART Framework

Within the Social Management and Responsibility at Teck (SMART) Framework, our Social Closure Planning Tool provides sites with a process to identify issues, undertake engagement planning, and co-develop closure plans that address community concerns and priorities.

Table 13: **Community Engagement Through the Stages of Mine Closure**

Before Mining	During Mining	After Mining
Early engagement with communities of interest (COIs) · develop relationships · inform and involve before any activity · engage in closure planning for exploration activities · research and studies · site design and planning · permitting and approvals · biodiversity baseline development	**Engagement with COIs** · build on relationships · engage in progressively detailed closure planning · prepare employees and COIs for closure	**Engagement with COIs** · support employees and COIs through transition
Closure planning (conceptual) · identify closure objectives · outline progressive and post-closure reclamation · forecast mine life and closure date · assess social impacts and mitigation strategies · estimate cost of closure and reclamation	**Construction** · prepare land and erect infrastructure · store soil and waste rock for reuse in reclamation, operation and production	**Closure** · shut down operations and decommission site · remove and properly dispose of any hazardous materials · implement closure, which includes the following components: — wildlife conservation — Indigenous Peoples' subsistence activities (e.g., hunting and gathering) — recreation — agriculture — economic development projects
	Progressive reclamation · grow plants and trees for transplant · rehabilitate disturbed areas no longer required	**Reclamation** · slope and contour waste rock piles · cap or cover and revegetate with plants and trees · close or reclaim water features
	Closure planning (detailed) · in collaboration with COIs, expand upon closure and end land use plan · incorporate new issues, research and practices · begin detailed planning as closure nears	**Post-Closure** · manage water quality · conduct ongoing monitoring — identify further reclamation initiatives · ongoing care and maintenance · evaluate success of end land use objectives — maintain public access management and safety

Table 14: **Social Impacts of Closure Planning Tool**

Step	Description
Reach out internally and gather relevant information	· Establish a team who will be responsible for planning each component (e.g., environment, engineering/operations, legal, community engagement) and determine how social closure considerations will be integrated throughout the plan · Compile documents related to closure and social management to ensure that the team has the right data
Establish a post-mining vision, goals and objectives jointly with COIs	· Work with COIs to understand community priorities post-closure · Collaborate to define vision, goals and objectives
Identify closure-related risks, opportunities, commitments and impacts	· Identify the main drivers of social closure-related activities — *risks* (primary social and socio-economic risks) — *opportunities* (how closure can generate value for us and for our COIs) — *commitments* (how we have committed and are obligated to our COIs by law, through agreements, and through commitments we have made)
Develop engagement plan	· Develop Social Closure Engagement Plan
Assess viability of community/ communities without Teck	· Assess how the community changed from pre-Teck to current state and the level of dependency; if dependency risks exist, identify partners, capacity training, and resources as mitigation
Incorporate into closure plan	· Use the post-mining vision and goals to establish closure-related objectives with indicators of success and assign resources for implementation

Case Study

Closure Planning: Collaborative Land Use Planning at Highland Valley Copper Operations

As part of our ongoing process of planning for closure at each of our mines, we develop an End Land Use Plan (ELUP) to determine the objectives for reclamation after mining concludes. At our Highland Valley Copper (HVC) Operations in British Columbia, the previous ELUP was developed almost 20 years ago and required significant updates. As HVC is located within the traditional territory of the Nlaka'pamux Nation, it was essential that this new land use plan reflect the priorities of Nlaka'pamux communities.

In 2015, a collaboration and engagement process was initiated to bring together HVC, Nlaka'pamux community members and technical representatives. The goal of this work was to create a plan that is meaningful to the Nlaka'pamux community and to be guided by their feedback on what the post-mining landscape will look like and what uses the land should provide.

Two groups were established to guide the development of the ELUP. The first was a Community Working Group (CWG) with representation from HVC and Nlaka'pamux communities that discussed community interests and traditional land-use objectives, such as hunting, gathering and fishing, and shared information and concerns related to the mine. The second was a Technical Working Group (TWG) with representation from Nlaka'pamux Nation Tribal Council, Citxw Nlaka'pamux Assembly and the Lower Nicola Indian Band, which guided incorporation of community feedback into the ELUP and provided feedback on the draft plan.

The CWG held four open community meetings, conducted a door-to-door survey of community members to gather feedback and conducted a mine site tour to learn first-hand about reclamation practices and land use planning. The TWG also held four meetings to guide engagement activities and review the ELUP. In 2016, the final ELUP was reviewed and supported by the TWG.

The new End Land Use Plan will now guide HVC's reclamation work and research for the next five years, throughout which we will continue to engage with the Nlaka'pamux community. In 2020, the plan will be reviewed and updated in cooperation with the Nlaka'pamux to ensure it remains relevant and continues to reflect their priorities for land use after mining is completed.

"Nlaka'pamux Nation Tribal Council and Teck are on a new path grounded in recognition and respect of Nlaka'pamux title and rights. Our Indigenous laws and knowledge were utilized throughout the collaborative end land use planning process and provided our communities the opportunity to contribute in the planning for a future landscape and environment that will help sustain our future generations once the mine is closed."

Matt Pascoe, Title Protector, Nlaka'pamux Nation Tribal Council

Pictured above: Illustration depicting Teck collaborating with the Nlaka'pamux Nation on end land use and closure planning

Closure

After operations end permanently, a site enters the closure phase and subcommittees that manage reclamation and community engagement are activated.

Reclamation

Our objectives for reclamation are to conserve and enhance biodiversity and to facilitate new, productive uses of areas disturbed by mining. At closure, reclamation activities return the remaining disturbed land to a stable state for post-mining land uses (e.g., wetlands, various wildlife habitats, outdoor recreation, and alternative industrial use). Activities include:

- Removing and properly disposing of any hazardous materials
- Removal of unneeded infrastructure
- Implementing long-term water management
- Ensuring stable landforms and water courses
- Resloping and contouring waste rock piles as necessary
- Capping or covering and vegetating waste rock piles
- Closing or reclaiming water features, including tailings facilities
- Managing any contaminated soil

Through reclamation, we can replace much of the structural and compositional diversity of the natural habitats that existed before we developed our mines. We implement leading reclamation practices and have created an internal community of practice to share knowledge across our operations. For example, we have won awards for our reclamation at numerous operations including Cardinal River, Highland Valley Copper, Elkview and legacy properties including Pinchi Lake, Sa Dena Hes and Sullivan. To plan for future reclamation obligations, we ensure that we allocate sufficient resources for reclamation in our mine budgets. For more information about reclamation and our approach to biodiversity, please see page 117 of the Biodiversity section.

Post-closure Management

Once our operating sites are closed, they are monitored and managed as required on a long-term basis by our Legacy Properties team with expertise in contaminated sites assessment and remediation, tailings storage facility management, reclamation, project management and water treatment. Their job is to ensure that our closure actions remain successful in achieving key objectives, which cover landform stability, habitat rehabilitation, public safety, and water quality protection, and include monitoring of structures such as dams and rock piles, water treatment, and access controls over portions of the site. We track more than 100 legacy properties, actively monitor 29 of these properties and carry out ongoing management actions on 23 sites, including the Sullivan mine in Kimberley, B.C., Louvicourt in Quebec and Sa Dena Hes in the Yukon.

In addition to monitoring sites closed in recent years, we continually assess and manage conditions at older mining and industrial operations that were operated by Teck or its predecessors and remain under our stewardship. Given the more than 100-year history of our company, some of our historical properties were closed during eras when the long-term risks associated with mining and industrial sites were not well understood. Consequently, the closure methods used at these sites did not always conform to currently accepted practices.

As such, we have developed a centralized legacy properties database for closed properties that helps us to better understand, prioritize and manage these sites. We assign priorities for assessment and management and in many cases we implement additional closure practices at these properties according to current practices.

How Does Teck Manage Mine Closure?

Case Study

Mine Closure: Implementing Collaborative Closure Planning at Duck Pond Operations

Our Duck Pond copper and zinc mine in central Newfoundland and Labrador closed in July 2015, after about eight years in operation. As the closure of a mine leads to a decline in employment, local procurement and community investment, it was important for us to plan for closure in a way that supported our employees through the transition and mitigated the impacts of closure on the local communities as much as possible.

The plan was created in collaboration with communities and governments, and included support for employees such as severance, resumé assistance and help identifying employment opportunities at other Teck operations in Canada or other companies in the region. We have connected with more than 60 vendors to collaborate on strategies for how they could participate in the various stages of closure and reclamation and continue to generate local economic benefits. In addition, we are promoting the sale of the Duck Pond mill to potential buyers, in an effort to create new employment and economic opportunities in other areas.

In the years and months leading up to closure we held a series of information sessions in the six local communities to seek input on closure plans. We also scheduled regular meetings and site visits with municipal governments and local organizations. The feedback we received throughout this process was largely concern over lost employment and a desire for information on Teck's plans to return the land to a pre-mining state for end land uses including hunting, fishing and logging.

The three-phase closure process at Duck Pond began in June 2015. The first phase (2015–2018) includes infrastructure removal and reclamation; the second (2018–2024) constitutes water management and treatment; and the third (2024) phase involves the end of most activities at the site. To ensure the environment is protected during that time, we developed a water quality monitoring program, which was approved by the Newfoundland Department of Environment and Conservation. An application for a new water usage licence was approved.

In 2015, as a result of our performance and community engagement, Duck Pond received the Corporate Citizen of the Year Award from the regional Chamber of Commerce and the Miner of the Year from the local branch of the Canadian Institute of Mining, Metallurgy and Petroleum.

We continue with decommissioning and reclamation activities at Duck Pond, with a focus on maintaining engagement with our communities of interest to keep them informed and identifying further opportunities to create benefits.

"The strong relationship built between Duck Pond, local communities and the local government over the years continued through the end of operations and into closure, and played an important role in the development of the closure plan for the operation."

Larry Bartlett, General Manager, Duck Pond

Pictured above: Former Duck Pond Operations

What was Our Performance in Mine Closure in 2015?

We report on the annual area of land distributed, reclaimed and yet to be reclaimed as well as the total area of land reclaimed and our total footprint in 2015. Furthermore, we provide a summary of provisions and closure plans.

At the end of 2015, Teck had a total footprint of 29,301 hectares (ha) of which 22,808 ha are yet to be reclaimed and 6,493 ha had been reclaimed. During 2015, 478 ha of land were disturbed while 198 ha were reclaimed. As this data relates to active operations, the area of land yet to be reclaimed will generally increase over time until the mining areas are closed and reclaimed.

Table 15: **Area Reclaimed and Distributed**[1,2,3]

	2015	2014	2013
Area reclaimed during the current year (ha)	**198**	77	434
Area disturbed during the current year (ha)	**478**	908	310
Area of land yet to be reclaimed (ha)	**22,808**	22,414	20,791
Total area of land reclaimed (ha)	**6,493**	6,438	6,357
Total footprint (ha)	**29,301**	28,852	27,148

(1) The area of land disturbed in the current year may include land that was previously reclaimed and has been re-disturbed. The area of land reclaimed during the current year may include land that was previously reclaimed but subsequently disturbed. The total area of land reclaimed may decrease in a year due to unsuccessful reclamation attempts or the mining of a previously reclaimed area. Total footprint is the sum of total area of land yet to be reclaimed and total area of land reclaimed.

(2) Data has been restated due to changes in our accounting approach for our footprint.

(3) This data only applies to active operations with the exception of Duck Pond Operations which closed in June 2015.

Update From Our Subject Matter Experts

"In 2015 I was particularly pleased with our accomplishments in two areas. Our Elkview Operations developed a comprehensive closure plan that will act as a template as updated plans are developed at our other mines. As well, we worked collaboratively with the government of Newfoundland and Labrador to implement a new mine closure review process for our Duck Pond Operations. This process appears to be working well and meeting the needs of both the province and the Operation as closure activities continue at the site."

Mark Freberg,
Director, Permitting and Closure

Outlook for Closure Planning

Addressing mine closure issues, including early engagement with COIs on closure planning, is helping us to align Teck's business interests with local priorities and we anticipate that this alignment will bring better and more cost-effective outcomes. We will continue to ensure that our mine closure activities — from closure planning to progressive reclamation to post-closure management — effectively manage risk and meet or exceed our commitments. In 2016, we will focus on mine closure planning at Coal Mountain Operations and implementation of the closure plan at Duck Pond Operations.