

Air Quality

Why was Air Quality a Material Topic in 2015?

Global Context: Increasing urbanization and growth of industrial development has created greater pressure on air quality through airborne emissions in some regions from sources such as personal and commercial transportation, manufacturing, energy generation and resource extraction. Other factors such as forest fires and burning of fuels for heating also impact air quality. Air pollution can have negative impacts on human health, and in some areas, it is a significant public health concern. In 2013, the World Health Organization's (WHO) specialized cancer agency, the International Agency for Research on Cancer, classified outdoor air pollution and particulate matter as carcinogenic to human health. Outdoor air pollution in both cities and rural areas was estimated to cause 3.7 million premature deaths worldwide in 2012. The WHO has called on governments to develop policies and implement measures to improve air quality. Communities are increasingly concerned about the quality of air. To address this global concern, businesses are required to monitor and mitigate their impacts to air quality and disclose their emissions publicly through inventories such as the Toxic Release Inventory (TRI) in the United States and the National Pollutant Release Inventory (NPRI) in Canada.

Industry Context

Air pollutants associated with mining and mineral processing can include particulate matter (e.g., fine and coarse dust that can include metals) and gases. Both of these may contribute to a range of potential health and environmental issues. Dust at operations is generated by a variety of sources such as vehicle traffic on mine roads, blasting and crushing. Dust can also be generated during the transportation of mineral products along the supply chain. The release of these materials has the potential to create health and environmental issues if not appropriately managed and can raise concerns associated with dust in communities.

Teck Context

Our communities of interest have increasingly identified air quality as a key concern at many of our operations. For example, in the Elk Valley, residents report one of their concerns with mine operations is dust. In Chile, residents in Carmen de Andacollo report dust and perceived health issues associated with dust exposure as being one of their primary concerns. Not only do we see increasing community concerns related to air emissions near many of our operations, but also along our supply chain through transportation of our products. There are increasing regulatory requirements associated with emissions that impact us.



What is in this Topic?

Emissions and air quality control and monitoring at our operations and in the transportation of our products. Includes particulate emissions, nitrogen oxides (NOx), sulphur oxides (SOx), other gas emissions and ozone-depleting substances.

Performance Highlights

65%

The percentage of fugitive dust to be reduced over the next two years through a comprehensive plan at our Carmen de Andacollo Operations.

Learn More

[National Pollutant Release Inventory — Environment Canada](#)

[Toxic Release Inventory — United States Environmental Protection Agency](#)



How Does Teck Manage Air Quality?

Our Targets and Commitments

We are working to improve monitoring and understanding of our releases to air, set air quality goals with corresponding action plans and strengthen the integration of air quality considerations into early-stage project development.

Managing air quality has been a part of the environmental management activities at our operations for many years. In light of increasing concern around potential health issues associated with exposure to particulate matter, combined with growing regulatory requirements and the relevance to our operations, we added 'Air' as a focus area in our sustainability strategy in 2015.

In conjunction with our efforts in the areas of energy and climate change, reducing emissions, monitoring air quality and reducing dusting events are important components of Teck's environmental management program.

Establishing Air as a Focus Area

In adding Air as a focus area to our sustainability strategy, we have established company-wide goals and activities to improve our performance in air quality. Air, similar to some of our focus areas that we established in 2010 such as Water and Communities, has had less-established company-wide processes and has primarily been managed on a site-by-site basis.

Focus areas create a more systematic approach to managing the issue consistently across the company. This requires us to create consistent monitoring practices, set baselines and develop greater capacity at operations before quantitative targets can be developed.

In 2015, we identified our 2020 goals and selected leaders across the company to implement the following activities in 2016: develop capacity, establish air release baselines and conduct risk assessments for air issues. These steps will set the foundation for setting air quality goals and action plans to achieve the goals.

Minimizing Emissions to Improve Air Quality

As part of our ongoing environmental management programs, we implement measures to minimize impacts on the local air quality within the vicinity of our operations. Depending on the activities at each operation, these measures may include:

- Wetting roads at operations
- Applying sealants and dust suppressants to material stockpiles, roadways and railcars
- Tailings management to minimize dust generation

- Using cover systems for trucks and railcars, where feasible
- Storing and handling materials indoors, where feasible
- Covering ore stockpiles with domes
- Using ventilation systems with particulate filtration for conveyors and buildings
- Modifying blasting practices to reduce dust

For example, we have extensive programs in place at our Red Dog Operations in northwestern Alaska and Trail Operations in southeast British Columbia to mitigate fugitive dust associated with transportation and refining. For more information about dust reduction at Red Dog Operations, see our case study on page 107. For more information about dust reduction at Trail Operations, [read this case study online](#).

Another example comes from our Carmen de Andacollo Operations in Chile, where we are working closely with the community and regulators to address concerns associated with dust related to mining activities including blasting. In late 2014, the Chilean government established requirements aimed at improving air quality (particulate dust levels) in the community of Andacollo. The plan, which came into force on January 1, 2015, sets out commitments, terms and responsibilities for Teck, for another local mining company and for local government towards improving air quality in the region.

Monitoring and Reporting

We regularly monitor and report on sources of air emissions and ambient air quality at our operations. Monitoring methods include real-time particulate monitors and high-volume monitors programmed to sample air over a 24-hour period, as well as dust fall jars, for assessing dust levels over longer periods of time.

Information collected from both on- and off-site weather stations, in conjunction with data collected from our air monitoring

programs, allows us to determine relationships between dust levels, wind patterns and precipitation. In addition, these local weather stations facilitate timely responses to changes in weather patterns that may affect the surrounding air quality.

Collaborating with Partners to Reduce Dusting During Transportation

The transportation of our products can result in dust generation. For example, we work with our railway transportation

partners in Alberta and British Columbia to prevent dust during the transportation of our steelmaking coal by managing load levels, creating a compacted surface and applying sealant sprays to materials in railcars. We also work with our port terminal suppliers to manage dust on-site, including the use of automated dust-suppression systems. Finally, we have programs in place, along with other partners in our supply chain, to monitor the performance of and continuously improve our dust management systems.

Case Study

Improving Air Quality: Reducing Fugitive Dust near Red Dog Operations

Activities such as mining, milling and transportation at our Red Dog Operations, located in the territory of the Iñupiat people of Northwest Alaska, generate dust, which has the potential to affect the environment.

The Iñupiat have long engaged in subsistence hunting, fishing and gathering on their lands. A Subsistence Advisory Committee, made up of residents from the communities of Noatak and Kivalina meets regularly with NANA and Teck representatives to review all subsistence-related issues and to guide subsistence protection activities at the mine and associated facilities, including the management of fugitive dust.

We recognize that dust mitigation is important in order to ensure the Iñupiat people's way of life is protected and, as such, we take measures to protect air quality through our fugitive dust mitigation program.

Since mine operations commenced in 1989, Red Dog has invested more than \$24 million in an aggressive program to reduce fugitive dust emissions through operational and facility improvements and activities including:

- Designing engineering controls to either prevent dust from occurring or to keep it contained

- Installing air quality control devices, such as baghouse dust collectors, in storage and transport buildings to more efficiently remove dust from the air
- Enclosing buildings and conveyors at Red Dog's port and mine to keep the amount of dust on-site to a minimum
- Applying a mixture of non-toxic calcium chloride and water to the 52-mile road between our mine and the port to control dust generation
- Changing the truck fleet to hard-covered trailers to transport concentrate

As a result of these measures, a risk assessment conducted in 2007 concluded that it is safe to consume subsistence foods in all areas without restrictions. Dust monitoring studies in the two communities closest to the mine — Noatak (35 miles away) and Kivalina (50 miles away) — also concluded that the level of dust present in the environment does not pose any health concerns to humans. We recognize the need to continually monitor and test water quality, air emissions, fish, local caribou populations, plants and berries, and other potential food sources to ensure that subsistence foods are safe to eat. These assessments and studies were developed and implemented in collaboration with NANA and shared with communities.

We continue to monitor and evaluate our performance and look for opportunities for further improvement. For example, trials for potentially more effective road dust suppression products are planned for 2016 and we continue to invest in dust control products. Protecting air quality through continual reduction of dust is just one of our commitments to the communities near our operations and our employees to safeguard human health and the environment.

"We are focused on continuing to take the steps necessary to manage fugitive dust emissions and ensure that traditional subsistence activities are protected."

Henri Letient, General Manager, Red Dog Operations



What was Our Performance in Air Quality in 2015?

Outlook for Air Quality

Managing air quality will continue to be an integral part of the environmental management activities at our operations. By establishing Air as a focus area in our sustainability strategy, we have now set specific goals to continue to improve our performance in this area and create more consistent practices across the company. In 2016, we will focus on improving our air quality monitoring and understanding of our releases to air, and the potential impacts on people, communities and the environment.

In this section, we report on emissions to air and progress on improving air quality near Carmen de Andacollo Operations.

Emissions to Air in 2015

In addition to monitoring particulate matter, our operations monitor and report on other air emission parameters in accordance with permit and regulatory requirements. In 2015, our operations generated approximately 28,000 tonnes of particulate matter of a size less than 10 microns and 5,000 tonnes of particulate matter of a size less than 2.5 microns. In late June 2016, information relating to other air emissions will be available [in the Air Quality section of www.teck.com](#).

Progress on Improving Air Quality near Carmen de Andacollo Operations

In response to regulatory requirements set out in 2014 by the Chilean government and as part of Teck's ongoing efforts to improve air quality and reduce dust in the Andacollo region, Carmen de Andacollo Operations launched a detailed Atmospheric Decontamination Plan with Chile's Ministry of Environment and municipal government officials in 2015. The plan's objective is to lower dust emissions by 65% over the next two years.

The Atmospheric Decontamination Plan outlines reduction measures such as application of dust suppressants on plant, mine and other internal roads, the construction of stockpile domes to cover ore and prevent dust from escaping into the air, increased meteorological monitoring and the implementation of double-layer blasting. Double-layer blasting is a procedure endorsed by Chile's National Geology and Mining Service that significantly reduces the amount of particulate matter generated by blasting. Analysis to date has shown that compared to conventional blasting, double-layer blasting provides a 33% reduction in the amount of particulate matter emissions.

In recognition of our use of double-layer blasting at Carmen de Andacollo to improve air quality, Teck received the 2015 National Environment Award by the Recyclápolis Foundation in recognition of the efforts of Chilean and multinational companies for their commitment to sustainability and the environment.