

Air Quality



Pictured above: Highland Valley Copper Operations, Canada.

Air Quality

Air pollution continues to be a global health concern, costing the world more than US\$5 trillion from decreased productivity every year.⁸ Mining produces air emissions such as particulate matter (e.g., dust) and gases through drilling, blasting, crushing, processing and transportation along the supply chain. Governments require companies to monitor and mitigate their impacts on air quality and to disclose their emissions publicly through inventories such as the [Toxics Release Inventory](#) in the United States and the [National Pollutant Release Inventory](#) in Canada.

For Teck, effectively managing air quality is part of our sustainability strategy; it is also important for building positive relations with surrounding communities. In particular, dust has been identified as a key concern by local and regional communities around our steelmaking coal operations in the Elk Valley

and Trail Operations in B.C., Red Dog Operations (RDO) in Alaska and at Carmen de Andacollo (CdA) Operations in Chile. We continue to work closely with our communities and local stakeholders and Indigenous Peoples to explore initiatives to improve air quality across our operations, as described on page 38.

GRI Indicators and Topic Boundary

305-103, 305-7

This topic is considered one of the most material by our employees, Indigenous Peoples, local communities, government and regulators and society in the context of all of Teck's sites.

How Does Teck Manage This Topic?

Information about how we manage air quality, including relevant policies, management practices and systems, is available for [download on our website](#).

⁸ [The Cost of Air Pollution](#). The World Bank. 2016.

2020 Highlights

100%

of community-based stations recording annual average values were within World Health Organization (WHO) guidelines for ambient concentrations of particulate matter less than 2.5 microns in size

Implemented initiatives to improve air quality monitoring and to minimize impacts from our activities on communities at our operations in the Elk Valley, and at our Trail, Carmen de Andacollo and Red Dog operations.

Our Performance in Air Quality in 2020

Our Targets and Commitments

Key Performance Indicators

Indicator

Sulphur dioxide (SO₂) emissions from stacks, stationary and mobile fossil fuel combustion

2020: 3,812 tonnes

2019: 3,853 tonnes

2018: 3,659 tonnes

Indicator

% of community-based air quality stations with annual mean concentrations of ambient PM_{2.5} within the World Health Organization guideline value of 10 µg/m³

2020: 100% of stations

2019: 100% of stations

2018: 100% of stations

Indicator

% of community-based air quality stations with annual mean concentrations of ambient PM₁₀ within the World Health Organization guideline value of 20 µg/m³

2019: 75% of stations

2018: 75% of stations

2017: 50% of stations

Case Study: Reducing Fugitive Dust Impacts at Our Red Dog Operations

The process of mining and transportation can generate dust. Of particular concern for air quality is the impact of fugitive dust, which is dust particles that become airborne and are carried by wind. As part of Red Dog's Fugitive Dust Management Program, numerous projects have been successfully implemented in the past two decades to reduce the impacts of fugitive dust at the mine site, on the haul road and at the port site. In 2020, working under COVID-19 restrictions, the team at Red Dog worked on a number of projects and studies

to continue improving dust management, including establishing a new fill station water source to improve effectiveness of the road watering truck, completing project planning and reviews at Red Dog's port site to replace a concentrate storage building's roof and parts of the exterior shiploader conveyor enclosure system, and developing a protocol for delaying blasts during windy conditions. Read the full case study at teck.com/news/stories.

Minimizing Emissions to Improve Air Quality

In 2020, we implemented measures to minimize impacts on the local air quality within the vicinity of our activities.

Table 6: Air Quality Improvements in 2020

Operation	Activities
Elk Valley steelmaking coal operations	Continued to advance our dust management activities and evaluated air quality improvement initiatives. Programs evaluated in 2020 include real-time modelling to identify and control dust emission sources; various in-pit dust suppression activities, including fencing and water application systems; and implementation of trigger-action response plans for excessive risk sources of fugitive dust at operations.
Trail Operations	Continued to implement dust management initiatives to support additional reductions in the level of metals in ambient air in the surrounding community. A new road dust monitoring tool that was developed in 2018 was implemented and further improved in 2020. The tool includes instrument automation, the addition of sensors for road cleaning works and wireless data streaming to a customizable interface for dashboarding and reporting. Completed the first capital project of the SO₂ reduction program at Trail Operations (Trail) in October 2020 (see the Monitoring and Reporting section below for more detail). The \$4 million expansion of SO₂ scrubbing operations provides Trail with the operational capability of meeting the new permit limits for 2021. In 2020, work also continued to better understand how weather conditions influence the impact of our SO₂ emissions, guiding operational control and capital planning as Trail works to meet the next permit limit reduction in March 2023.
Carmen de Andacollo Operations	Advanced the operation of our first community-managed air quality monitoring station for PM ₁₀ in Chile at CdA. Community members received training regarding the operation of the equipment directly from a company specializing in air quality monitoring. Part of the training included managing the new equipment, interpreting and validating the data, and sharing with the community. Results showed that the data from the new monitoring station correlated with the existing PM ₁₀ monitoring stations: Urmeneta station and the Ministry of the Environment's Hospital station. Based on these results, community participants elected to conclude the operation of the community-managed air quality monitoring station in 2020.
Red Dog Operations	Continued to monitor and evaluate performance and evaluate opportunities for further improvement. Since mine operations commenced in 1989, RDO has invested more than \$25 million in a program to reduce fugitive dust emissions through operational and facility improvements and activities.

Monitoring and Reporting

The most material air quality issues relate to metals and SO₂ near our Trail Operations metallurgical facility, and particulate emissions at our mining operations. In addition to monitoring these two material indicators, our operations monitor and report on other air emission parameters in accordance with permit and regulatory requirements.

As shown in Table 7, SO₂ emissions from stacks and fossil fuel emissions in 2020 were approximately 3,804 tonnes,

compared to 3,853 tonnes in 2019. Over a four-year period, SO₂ emissions decreased in 2018 and since then have continued to follow a stable trend. Trail Operations is the most significant source of SO₂ emissions for Teck and, as a result, all other operations have been aggregated in Table 7. Full results per operation are available in the [2020 Sustainability Performance Data](#) spreadsheet.

Table 7: SO₂ Emissions from Stacks, Stationary and Mobile Fossil Fuel Combustion (tonnes)^{(1),(2),(3),(4)}

Operation	2020	2019	2018	2017
All other operations	28.7	42.0	61.4	80.4
Trail Operations	3,783.5	3,811.0	3,598.0	4,814.0
Total	3,812.2	3,853.0	3,659.4	4,894.4

(1) Aggregate data for all other operations presented here, as numbers are insignificant compared to Trail. See our website for the full set of data.

(2) Information current at time of publication. However, values will be added, confirmed and/or changed once regulatory reporting for the 2020 period is complete. See our website for up-to-date information.

(3) Requirements and methods for determining air emissions can vary widely. Not all sites have monitoring equipment in place to measure releases from all sources and activities, and the frequency of sampling can vary.

(4) Our Canadian sites report annually to the National Pollutant Release Inventory (NPRI) and American operations report to the Toxics Release Inventory (TRI); NPRI and TRI have different reporting requirements and calculation methods. Information in this table may not reflect exactly the contents of NPRI and/or TRI reports, due to different reporting definitions concerning site boundaries as well as the inclusion of mobile equipment in the above table, which is not required in some regulatory reporting requirements.

Trail has been driving down lead levels in the air for a decade. Improvement projects, including investments of over \$40 million, have resulted in a 72% reduction since 2016.

Trail's air permit was reissued in 2019 with more stringent ambient SO₂ requirements included by the B.C. Ministry of Environment and Climate Change Strategy. In response to these new requirements, Trail is working on several SO₂ reduction projects, with an estimated investment of \$40–\$60 million. This includes developing an improved air dispersion model, the advancement of scrubber improvements, dryer temperature reduction, and evaluating other SO₂ reduction projects and associated resourcing.

Ambient Air Quality Monitoring

As part of our ambient air quality monitoring program, we measure the concentration of particulate matter of a size less than 10 microns (PM₁₀) and particulate matter of a size less than 2.5 microns (PM_{2.5}) at monitoring stations. These monitoring stations use standardized equipment, per permit and regulatory requirements, and are located on our sites

and in a number of community centres. Tables 8 and 9 summarize the ambient air quality during 2020 as measured at a number of community-based monitoring stations that we manage. Two values are presented:

- The annual average concentration that is based on the daily 24-hour average concentrations; this value reflects prolonged or repeated exposures over longer periods
- The annual peak 24-hour indicator that is based on the 98th percentile of the daily 24-hour average concentrations; this value reflects immediate exposures

At these monitoring stations, ambient air quality not only reflects the activities at our operations, but also other activities in the area such as other industries, vehicle traffic, firewood burning, forest fires and waste burning.

For all of the stations listed in Table 8, the annual average concentration of PM_{2.5} was below the WHO Guideline value of 10 µg/m³. For the annual average concentration of PM₁₀ at the stations listed in Table 9, 75% of the stations were below the WHO Guideline value of 20 µg/m³.

Table 8: Ambient Particulate Matter of Size Less Than 2.5 Microns ($\mu\text{g}/\text{m}^3$)

Station	Nearest Operation	2020		2019		2018	
		Average Annual	98th Percentile	Average Annual	98th Percentile	Average Annual	98th Percentile
Urmeneta	Carmen de Andacollo	9	14	7	14	8	12
Downtown Sparwood	Elkview	6	15	7	14	8	52 ⁽¹⁾
Elkford High School	Greenhills	5	31	4	16	7	52 ⁽¹⁾

(1) Incomplete hourly data set, per the Canadian Council of Ministers of the Environment: Criteria ii. Second and third quarters are not complete (<60% valid daily data sets in this quarter) for Elkview Operations, and third quarter is not complete for Greenhills Operations.

Table 9: Ambient Particulate Matter of Size Less Than 10 Microns ($\mu\text{g}/\text{m}^3$)

Station	Nearest Operation	2020		2019		2018	
		Average Annual	98th Percentile	Average Annual	98th Percentile	Average Annual	98th Percentile
Urmeneta	Carmen de Andacollo	35	57	34	59	33	51
Downtown Sparwood	Elkview	11	34 ⁽¹⁾	13	44	17	82
Elkford High School	Greenhills	9	47	10	43	11	57
Butler Park	Trail	15	63	14	28	26	165

(1) Incomplete hourly data set, per the Canadian Council of Ministers of the Environment: Criteria ii. Second and third quarters are not complete (<60% valid daily data sets in this quarter) for Elkview Operations, and third quarter is not complete for Greenhills Operations.

For more information about our emissions to air, such as nitrous oxides, volatile organic compounds, and mercury, visit the [National Pollutant Release Inventory](#) for our Canadian operations and the [Toxics Release Inventory](#) for our American operations.

Significant Incidents and Non-Compliance Related to Air Quality⁹

We assess the severity of environmental incidents based on the potential environmental, safety, community, reputational and financial impacts. Based on our incident severity criteria, there were no significant incidents related to air quality in 2020. There were also no significant charges, fines and penalties for non-compliance related to air quality in 2020.

⁹ Definition of significant environmental incidents is on page 14.