

Sulfur Dioxide SO₂ Emissions at Red Dog – Factsheet

NANA



Teck

Overview

Sulfur Dioxide (SO₂) emissions are naturally present at Red Dog due to the nature of the ore. Recently, increased iron sulfide in the material being mined has led to higher emission levels.

This increase, coupled with recent low temperatures and low winds, has caused emissions to settle in lower-lying areas near the mining operation.

Red Dog is working closely with NANA, external experts and the federal Mine Safety and Health Administration (MSHA), to monitor emission levels and take actions to reduce emissions and protect continued health and safety for workers.

This includes



Increased monitoring



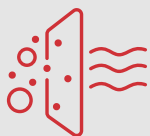
Reducing the number of personnel on site until key mitigation measures are in place



Raising fresh air intakes for buildings to higher elevation



Cooling reactive ore using water trucks to reduce the SO₂ generating reaction



Installing carbon air filters in air handling units to reduce concentrations in facilities



Exploring options for disposal of highly reactive waste rock in ways that minimize the potential for oxidation and SO₂ release.



Fitting all personnel with respirators



Reducing production from certain areas of the pit

Monitoring is being conducted to confirm emission levels are within federal mine safety and health standards for SO₂ exposures. Monitoring data and mitigation plans were reviewed with MSHA during recent inspections. No citations related to SO₂ were issued.

What is Sulfur Dioxide?

SO₂ is a colorless gas that is heavier than air and has a pungent odor. It is not flammable. SO₂ is generated when oxygen in air reacts with iron-rich rock (oxidation). Normally this would not be an issue while in the ground, however when the rock is mined and exposed to air, it may heat up and can release SO₂ gas. A similar reaction occurs with packet-style hand warmers, which contain iron. When opened, they are exposed to oxygen in the air, which reacts with the iron and creates heat.

Who may be sensitive to the effects of SO₂?

The impacts of SO₂ may be determined by several factors including dose (amount), duration (time), and method of contact (for example, by breathing, eating, drinking, or touching). Other considerations include age, sex, diet, family history, lifestyle, and health. Young children, elderly people, and people with chronic respiratory diseases may be more sensitive to the effects of SO₂.

Under low concentrations, less than 5ppm (parts per million), inhaling SO₂ can cause irritation to the nose, eyes, throat, and lungs.

Those with preexisting respiratory conditions may experience symptoms at concentrations as low as 0.25ppm.

Red Dog Mine follows the stricter guidelines set by the National Institute for Occupational Safety and Health (NIOSH), rather than the standards set by OSHA and MSHA.

- NIOSH exposure limits are 10 hours TWA (Time Weighted Average) at 2ppm or STEL (Short Term Exposure Limit) of 15 minutes at 5ppm, while OSHA and MSHA's exposure limit for TWA are 8 hours at 5ppm.

How is Red Dog prioritizing the safety of site personnel?

At Red Dog, the safety and health of the personnel on site is our top value. Red Dog is working closely with the federal Mine Safety and Health Administration (MSHA), as well as external experts, to monitor emission levels and take actions to reduce emissions and protect continued health and safety for workers, and we are keeping NANA informed.

This includes increased monitoring, raising fresh air intakes for buildings to higher elevation installing carbon air filters in air handling units to reduce emissions in facilities, fitting all personnel with respirators, and limiting the number of personnel on site.

In the event SO₂ levels exceed Red Dog safety and health limits, emergency response personnel have protocols in place to move personnel from an area of higher concentration to safe muster areas of low concentration until the SO₂ levels reduce sufficiently.

What is Red Dog doing to mitigate SO₂ at site?

- Main Pit Dump #4 (MPD4) has been identified as a hot spot for SO₂ emissions. To reduce emissions, a water truck is being used to cool MPD4. A pipe bench is also being developed to provide an increase of water to the area.
- All air handlers have been moved to recirculation mode with only the minimal make up air being drawn to maintain positive pressure in the facilities. This set up helps reduce the potential for SO₂ ingress into site facilities.
- Air intakes for the Personnel Accommodation Complex (PAC) are being relocated to reduce ingress of SO₂ into the living accommodations.
- Activated carbon filters have been installed in the air handler units in support of enhanced SO₂ removal.
- We are securing enhanced media filtration systems to install in the HVAC to scrub more SO₂ out of the air intakes.

For more information and updates about SO₂ at Red Dog

Visit www.teck.com/RedDogUpdate.

For questions or concerns

Contact Red Dog Community Relations at rd-ca@teck.com or call 907-758-5168.