

Sulfur Dioxide (SO₂) FAQ



What is Sulfur Dioxide (SO₂)?

- 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 heats 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.

Where is the SO₂ at Red Dog coming from?

Sulfur Dioxide (SO₂) is naturally present at Red Dog due to the metallurgical characteristics of the ore and associated waste rock. As these materials are excavated and exposed to air, oxygen can react with these sulfur- and iron-rich materials in a process known as oxidization.

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. To protect the continued health and safety of personnel, Red Dog works closely with the federal Mine Safety and Health Administration (MSHA), as well as external experts, to monitor emission levels and take action to reduce SO₂ emissions at site.
- We have strengthened our monitoring systems, raised fresh air intakes to higher elevations, and installed carbon air filters on air handling units in buildings to reduce emissions in facilities.
 - We have a robust program for assessing when respirators are required on site and dedicated subject matter experts who administer the respiratory protection program.
 - 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.
 - In the event SO₂ levels exceed mine safety and health standards, 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.
 - Personnel who are required to work onsite but have concern for potential health risks will be evaluated by medics to determine whether they have elevated risks to exposure.
 - If the medic finds the employee has an elevated risk from exposure, they will be put on Administrative Leave with Pay until the human health risk to employees is sufficiently resolved.
 - If the medic finds the employee does not have an elevated risk of exposure, they have the option to be put on unpaid leave.
 - Red Dog adheres to the NIOSH exposure limits of 10 hours TWA (Time Weighted Average) at 2ppm and 15 minutes STEL (Short Term Exposure Limit) at 5ppm. This is a stricter (more conservative) exposure limit than federal standards require.

How is Red Dog working with NANA to address the SO₂ events at site?

- Red Dog works 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 ensure the continued health and safety for workers.
- Red Dog Operations formed the Self Heating Reactive Rock (SHRR) SO₂ technical work group to develop an integrated SHRR management plan that supports safe, reliable production and aligns with other key Red Dog initiatives including evaluating risks with the upcoming spring freshet, support for Red Dog Mine Life Extension (MLE), and SO₂ mitigations through closure. The SHRR group meets weekly and includes a representative from NANA.

What progress has Red Dog made in lowering SO₂ risks at site?

- Waste rock stockpiles Main Pit Dump #4 (MPD4) were identified as hot spots for SO₂ emissions. To mitigate these emissions, we are cooling hot spots with water and snow, and excavating and transferring reactive material to the Main Pit Water Reservoir (MPWR) for permanent underwater storage.
- 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.
- Air intakes for the Personnel Accommodation Complex (PAC) were relocated to reduce ingress of SO₂ into living accommodations.
- Activated carbon filters have been installed in the air handler units in support of enhanced SO₂ removal.

How is Red Dog monitoring SO₂ levels on site?

Red Dog has strengthened our SO₂ monitoring capabilities to support early detection and response. As of April 2026, over 28 stationary indoor monitors and 10 outdoor stationary monitors were installed throughout site and 30 SO₂ detectors were installed in air handlers intakes with automatic shut off controls.

To improve real-time data access, a new dashboard was developed to provide shift-level reports and alerts for elevated SO₂ levels. These reports are displayed throughout site for personnel to view.

How is Red Dog working with regulators to ensure compliance?

- Monitoring and MSHA inspections show that emission levels are within federal mine safety and health standards for SO₂ exposures.
- Additionally, the MSHA inspector reviewed Red Dog's risk assessment for the mitigation plan to cool the material reacting in Main Pit Dump 4 (MPD4). The inspector was satisfied with the methodology and risk controls proposed to mitigate the hazards and protect the miners while performing mitigation activities.
- Additional monitoring systems, including new stationary and HVAC-integrated units, further support ongoing regulatory compliance and safe operations across the site.

Is the food served at Red Dog safe to eat?

- Yes. The Food and Drug Administration (FDA) allows SO₂ and other sulfites as food preservatives but requires mandatory labeling if food items contain greater than 10 parts per million (ppm). No readings in the food preparation and distribution areas have exceeded 10 ppm.
- Out of an abundance of caution, NMS has engaged the Alaska Department of Environmental Conservation (ADEC) and is following best practices recommended by ADEC.

Who may be sensitive to the effects of SO₂?

- Impacts of SO₂ may be determined by several factors including the dose (amount) and method of contact (for example, by breathing, eating, drinking, or touching). Other considerations include your age, sex, diet, family history, lifestyle, and health.
- Under low concentrations (<5ppm), 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.
- Unprotected exposure to high concentrations of SO₂ can cause permanent damage to the lungs.
- Symptoms can be worsened by pre-existing health conditions like asthma.
- Health effects can be prevented or mitigated with respiratory protection equipment with appropriate cartridges.
- Monitoring and MSHA inspections show that emission levels are within federal mine safety and health standards for SO₂ exposures.

What are the regional environmental impacts of SO₂ events at RDO?

- There are no community health concerns related to SO₂ at RDO.
- SO₂ testing at the permit boundary of RDO shows concentrations drop significantly with distance and monitoring shows levels drop to at or near zero away from pit waste rock areas.
- Out of caution, we will continue to monitor air quality.

Is there an impact on caribou?

No. There is no evidence of harm to caribou or other wildlife from SO₂.

Is there a risk of acid rain?

No. The SO₂ levels at RDO are localized and are not high enough to create acid rain.

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.