



# Sudbury Operations Update

2020 – 2021

# Purpose + Values

## Our Purpose

**We exist to improve life and transform the future. Together.**

We believe mining is essential to the world's development. We only serve society when we generate prosperity to all and take care of the planet.

## Our Values

- **Life matters most**  
We believe that life is more important than material results and goods, and we incorporate this vision in our business decisions.
- **Act with Integrity**  
We build relationships of trust and we promote open and transparent communication, acting with respect and integrity.
- **Value the people who build our Company**  
We trust people and together we build a work environment admired by all. We seek lifelong learning and personal growth.
- **Make it happen**  
We are engaged, responsible and disciplined about generating results and overcoming challenges. We act in pursuit of the excellence, being sustainable and reliable.
- **Respect our planet and communities**  
We are committed to economic, social and environmental development in our business decisions.

### On the cover:

Cindy Grenier, Mines Technologist, Creighton Mine.

### On this page:

View of regreened slag hills and Smelter Complex stacks from regreened hill in Sudbury. Photo taken by Vale employee, Madonna Campeau.



# A message from Dino Otranto

A year ago, in this Community Report, I spoke of managing risks in our Base Metals business. At that time, I made a pledge to work tirelessly to understand them, and to put key controls in place to mitigate risks.

As part of this commitment, we have undertaken a new safety project called the Hazard Identification and Risk Assessment (HIRA), which delivers a detailed assessment of what needs to be improved within our operations and defines the critical controls.

While COVID-19 has caused delays in completing HIRA across all sites, we are back on track and will have the balance completed by the end of Q3 2021.

In addition to tackling existing risks in our operations, our commitment to health and safety has carried us through the throes of a pandemic as we continued to operate as an essential service across the North Atlantic.

I am proud that Vale's response to COVID-19 was immediate, aggressive and laser-focused on the safety of our employees and local communities.

Onsite, we implemented strict safety protocols aligned with public health guidelines. In addition, our employees developed innovative solutions, such as foot pedals to open doors hands-free and personnel separators in cages to ensure we could continue to safely transport groups underground.

The pandemic also presented opportunities to give back to our communities. At our North Atlantic operations, we donated a total of 400,000 N95 masks and \$135,000 to food banks and hospitals and other service providers in April 2020. Globally, Vale launched the US\$1 million COVID-19 Challenge to propel innovative solutions into the

worldwide marketplace. Thousands of entries later, 11 were selected, including two from Northern Ontario.

With respect to delivering safe production, I saw the hard work that our surface plant employees were doing, and thanks to them, we met our finished nickel target in 2020. Despite mine production being lower than planned due to the impacts of COVID-19, we are focused on driving key improvements in this area as we continue to invest in digital transformation and other innovative ideas to enhance our efficiency.

Rounding out this year's efforts is a reinvigorated commitment to make Vale a diverse and inclusive organization. I am a strong believer in the value that can be achieved by promoting diversity of thought and experience throughout our operations and ensuring it better reflects the diverse communities that we live and work in. While there is more work to do in this area, we are making good progress in driving change.

Despite the challenges presented by the COVID-19 pandemic, I am proud of all that we've accomplished over the past year as we continuously improve to become a more sustainable company. We are all in this together, and together, we will architect new and better solutions for our future.

**Dino Otranto**  
Chief Operating Officer, North Atlantic Operations and Asian Refineries



Dino Otranto,  
Chief Operating Officer,  
North Atlantic Operations  
and Asian Refineries

# Life matters most

It has been an unprecedented year at Vale's Sudbury Operations as we, along with the rest of the world, grappled with the implications of the COVID-19 pandemic. The health and safety of our employees and our community is at the forefront of everything we do and the pandemic strengthened our commitment to our most important company value, **Life Matters Most**.

When mining was deemed an essential service by the Province of Ontario, our employees sprang into action to create a safe working environment including screening stations, physical distancing, wearing face masks and working from home when possible. In addition, we used technology to help us, with all onsite employees wearing electronic contact tracing badges that alert individuals who are less than two metres apart, and also provide contact tracing data for positive COVID-19 cases.



Warehouse employees prepare donations of N95 masks.



In the community, Vale's global purchasing power was swiftly put into action. We provided N95 masks to local frontline healthcare workers at Health Sciences North, the City of Greater Sudbury's Emergency and Fire Services, North East Local Health Integration Network and long-term care homes. Our company also provided COVID-19 community crisis support with a \$100,000 donation to the United Way

North East Ontario and \$100,000 to the Sudbury Food Bank.

Globally, Vale launched an international COVID-19 Challenge, which offered up to \$1 million in financial support to propel innovative pandemic solutions into the marketplace. More than 1,800 entries were received, including 300 from Canada. Eleven submissions were selected to receive support, including two from Northern Ontario: FloSonics Medical and First Team 1305.

FloSonics Medical is a start-up that develops and supplies wearable sensors that improve the clinical management of critically ill patients both inside and outside the hospital. With the funding provided, the company will be able to scale up production from 100 to 1,000 devices per week. The monitors will be donated directly to hospitals across Canada.



## First Team 1305

First Team 1305 is a high-school student robotics team that invented a UV sterilizer box that can be built by health centers (the kit with the equipment and instructions is bought and assembled in the unit). The use of an open source (unpatented) technology combined with the concept of "do it yourself" makes the solution accessible. The funding will enable the production of 50 kits, which will be donated to small and medium medical clinics across Canada.





Autonomous scoop operation at Coleman mine.

# Innovating for the future

A number of Information Technology (IT) initiatives are underway to make our Sudbury Operations safer, more productive and cost competitive.

## Let there be LTE

The backbone of our IT system is the installation of **one of the world's largest private underground Long-Term Evolution (LTE) networks**. This network provides the infrastructure necessary for wireless technology underground.

With LTE, employees can use wireless phones and tablets to share information and data in real-time, optimizing safety and productivity. LTE is also paving the way for increased use of semi-autonomous equipment like scooptrams, drills and trucks, which can be operated from surface between shifts.

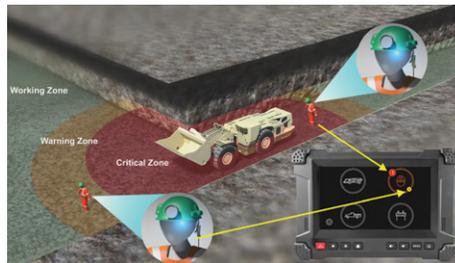


Photo credit: Jannatec Technologies

Connectivity also facilitates integrated planning between our Operations and Maintenance teams, providing a shared platform for the status and progression of tasks.

Technology is also helping to manage risk and create safer work environments for our employees, including proximity detection and collision avoidance on underground mobile equipment. This technology performs in much the same way many passenger cars do — alerting operators to vehicles and, in the case of collision avoidance, automatic application of brakes if required.

## Cutting-edge cutting machine

A remote controlled, all-electric, cutting machine has arrived at Garson Mine for trials. It's **the first of its kind** for underground mining and has the potential to eliminate traditional drill and blast drift development, including the use of explosives (and associated vibrations). Since the machines are powered by electricity – rather than diesel – work conditions will be improved and greenhouse gas (GHG) emissions will be reduced.



Photo credit: Komatsu

# Seeing green

We are **trialing a fleet of various electric and hybrid Green Energy Vehicles (GEVs)** that also have the potential to significantly reduce Greenhouse Gas (GHG) emissions and improve operating conditions and workplace air quality. GEVs are expected to make an important contribution to Vale's Sustainability Agenda, which includes a 33% reduction in GHG emissions by 2030, and zero-net GHG emissions across our global operations by 2050.



Photo credit: Rokion

## Partnering with NORCAT

Innovation is a key focus at Vale as we look to find new ways of delivering value to the business, for both safety and productivity. To this end, Vale teamed up with NORCAT to establish an Innovation Challenge, which will bring new technologies into our operations and accelerate the rate of adoption.

The Open Innovation Challenge was available to innovative startups, entrepreneurs and problem solvers from across Canada. The Challenge was designed to identify technology-enabled solutions for three critical business issues including smelter acid management, underground operator alertness and excessive water and run of material in underground mines.



# Focused on sustainability

We undertook some major initiatives at our Sudbury Operations this year in support of our sustainability agenda.

## It was a super moment

At the start of 2020 (pre-COVID-19), In October, Vale marked an historic occasion at our Copper Cliff Smelter Complex as the burners for the Superstack shut down for the last time. This event marks an important milestone in our company's history and demonstrates how we are contributing to our company's sustainability and low carbon agenda.



By changing to two smaller and more efficient stacks, **natural gas consumption is estimated to drop by nearly half, which will reduce GHG emissions from the Superstack by 40%**. This energy savings is equivalent to the average fuel consumption of approximately 2,400 homes.

Removal of the Superstack's steel liner is now underway and will take approximately two years to complete.

There is no immediate need for the concrete shell to be demolished and it is expected to remain a part of the Sudbury skyline for several years to come.

## Nickel Site-Specific Standard application

In September, Vale applied for a new nickel site-specific standard (SSS), which allows a facility time to assess and, where possible, implement continuous improvement solutions — focusing on actions that reduce ground level concentrations from air emissions as much as possible, and considering best available technologies. We provided information on a dedicated web page and invited community comments and feedback via local advertising and direct mail to include in our application to the Ministry of Environment, Conservation and Parks. Thank you to those who provided valuable feedback. The information remains available to the public on our website at [www.vale.com/nisss](http://www.vale.com/nisss).



## Talking about tailings and dams

Vale's Sudbury Operations is planning to invest \$500 million over the next 10 years to improve our Central Tailings Area. This year, a sheet pile wall was installed to dredge the M-Area pond, and next year, buttressing work will begin and continue over the course of the next eight to 10 years.

In addition, we're implementing a global connectivity platform that will enable virtual real-time collection of dam performance information, monitor the status of tailings dams including remote wireless piezometers, which are tools that measure water levels. We are also exploring use of satellite-based systems such as orbital radar to monitor any potential but unlikely tailings dam displacement.

## Introducing NAOC

In September, we opened our new North Atlantic Operations Centre (NAOC) at 337 Power Street in Copper Cliff. Formerly the Central Engineering building, this renovated space now serves as the physical and virtual hub of Vale's North Atlantic operations. This flexible workspace is designed to promote creativity, collaboration and integration. The facility is operating with up to 30% capacity during the pandemic to ensure physical distancing. For a virtual tour of the North Atlantic Operations Centre, visit: <https://youtu.be/scB1OBNxWVI>.



# Emergency Preparedness and Response

This year we updated our Emergency Preparedness and Response Page to include more information about the hazards associated with our operations and the measures we have in place to mitigate those risks. You can also download our emergency preparedness plan, learn what to do in the unlikely event of a hazardous material release from Vale's Operations and sign up for the City of Greater Sudbury's Sudbury Alerts emergency mass notification service. Check it out [here](#).

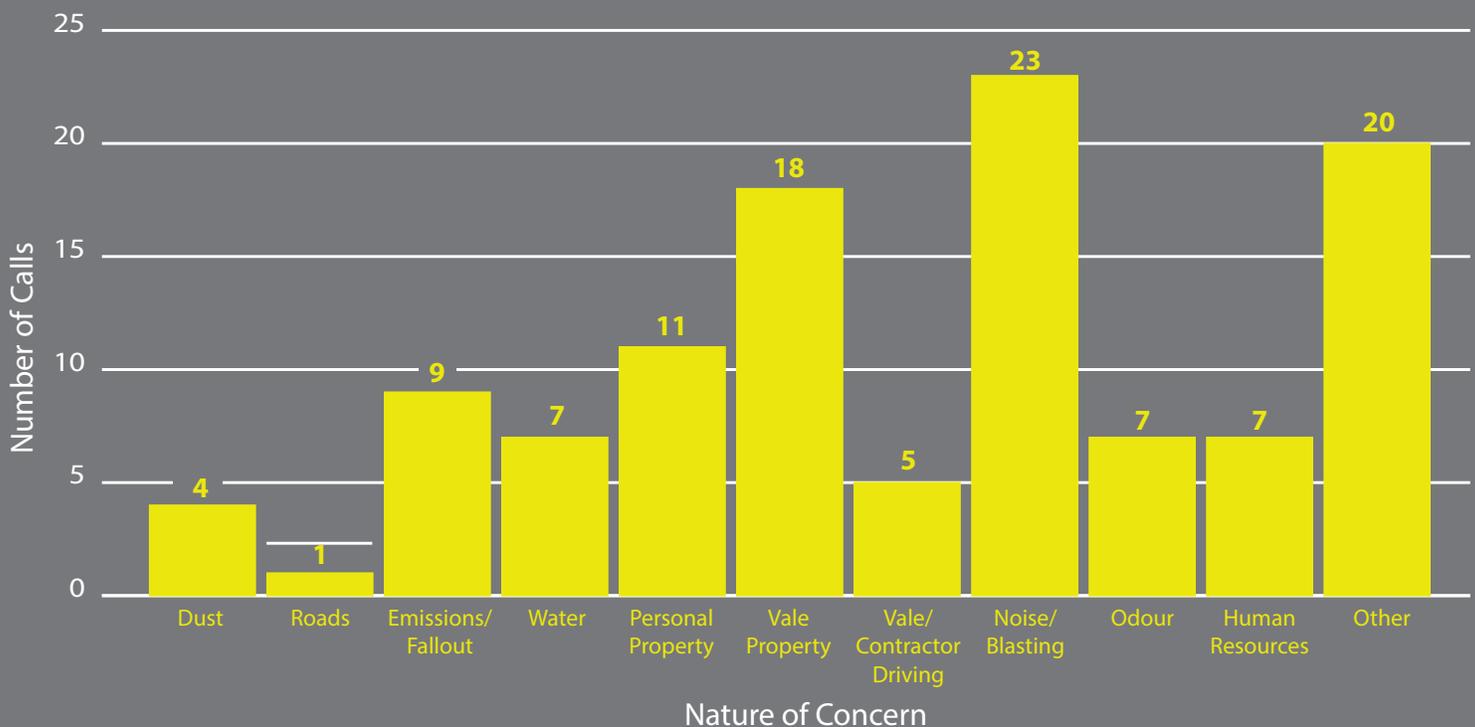
## Vale Community Concerns Line

The Vale Community Concerns Line (705-222-VALE) is a 24/7 number for concerned residents to reach the company and receive a timely response.

Each concern is assigned to the appropriate Vale subject matter expert, who will respond to the concerned citizen within one business day. The Vale representative will resolve the concern or escalate the matter for further action as required to properly address the concern.

Vale appreciates the time concerned residents take to call the Community Concerns Line, which we view as a vital communication channel between our company and the community.

## 2020 Community Concerns Line





Stobie Mine Number 9 Shaft site demolition.



Stobie Mine Number 9 Shaft blast.

# Make it happen

This year saw many changes from demolitions to milestone birthdays to expansions.

## Stobie Mine: it was a blast

After more than 100 years in operation, we demolished several buildings and headframes at the Stobie Mine site last year, including the iconic Number Nine Shaft in December. This activity will reduce maintenance costs and pave the way for potential new development currently being studied at the site, which has been on care and maintenance since 2017. To view a video of the Number Nine shaft being blasted down visit: <https://vimeo.com/489505572>.

## Coleman Mine celebrates a major milestone

Coleman Mine, located in Levack, celebrated 50 years of operations in 2020. The mine began operations in 1970 and is home to some of our company's richest orebodies. Many phases of development have occurred over the past half century including multiple expansions.



Coleman Mine has also been home to new technologies such as the first electric haulage vehicles in our Sudbury Operations, and the installation of an underground 4G LTE network. Currently, Coleman Mine employs 545 people.

## Copper Cliff Mine Extension Project is in full swing

Phase I of Vale's \$USD 710 million Copper Cliff Mine Extension Project was in high gear in 2020 with more than 10,000 feet of development, shaft refurbishment and installation of the ventilation system.



Copper Cliff Mine South headframe. Photo credit: Vale employee, Marie Fjordell

Phase 1 of the Project is expected to be completed by the end of this year and handover to operations will occur in January 2022. Feasibility studies are also currently underway for future phases of development at Copper Cliff Mine.

## Diversity and Inclusion is getting better and better



With Phase 1 of the Copper Cliff Mine Extension Project coming into operation in 2021 and many retirements expected in the coming year, our operations have high workforce demands. Vale is committed to enhancing diversity within our operations, specifically increasing the number of women and Indigenous people in production and maintenance roles.

As such, we established a Miner In Training program at our new Underground Training Centre near Copper Cliff Mine North. At this centre candidates who may not have previously considered a career in mining receive on-the-job training in a modern, inclusive and supportive work environment. For more information, visit [www.valejobs.ca](http://www.valejobs.ca).

Jordan Bennett, Miner at Totten Mine and member of Sagamok Anishnawbek First Nation.

For more information, visit [www.valejobs.ca](http://www.valejobs.ca).



## Contact Us

We want to hear from you! Sudbury residents may call our 24 hour, 7 days a week Community Concerns Line at: 705-222-VALE (8253) or [ontario.operations@vale.com](mailto:ontario.operations@vale.com).