



CASE STUDY

Enhancing Dust Management through Integrated Data at an Open-Pit Mine in Sweden



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About the Project

This case study explores a prominent European metals company with a long history in mining and smelting, producing vital metals such as zinc, copper, lead, gold, and silver.

The company has a rich heritage in the local area based on a dedicated commitment to sustainability and innovation. It has always prioritised high standards of environmental responsibility, occupational safety, and community engagement while balancing economic growth and ecological stewardship.

In 2022, the company partnered with Envirosuite to enhance operations by deploying a proactive solution at a key copper mine to reduce dust impact on workers and local communities.



The Challenge

As a vital copper mine for the region and Sweden, it has an imperative to minimise impact from operational dust emissions from their open-pit operations. The mine regularly encounters numerous operational challenges due to changes in weather that can impact their productivity and affect their neighbouring community.

Geographic challenges, including a cold and harsh environment with fluctuating temperatures, further complicate daily activities at the mine. Operational teams face significant hurdles due to unforeseen weather changes that trigger dust events—these occurrences are often unpredictable and may necessitate substantial resources for effective mitigation.

Additionally, the mine must carefully navigate operational sensitivities due to the proximity of nearby facilities to sensitive receptors including a local community and an airport. Dust events can lead to disruptions and result in operational downtime as investigations are conducted to ascertain the specific activities responsible for problematic emissions. The team is currently engaged in data collection using three onsite compliance monitors to effectively address this critical issue.



The Solution

The company has collaborated closely with Envirosuite to customise a site-specific Omnis implementation aimed at enhancing their dust management efforts. In addition to more data coverage from additional monitors placed at strategic locations across the site, Omnis provides the mine's Operations team with advanced insights specifically designed to support them in maximising productivity within difficult environmental constraints.

Dust particle levels often remain undetectable and can fluctuate over time, influenced by local weather conditions at the mine. To complement data from reference air quality monitoring stations, an additional sensor network including hardware with high durability has been deployed that can endure extreme winter conditions (-40°C). This provides hyperlocal coverage to facilitate continuous data collection on dust emissions and rapid analysis without disruption. Data feeds into Omnis to enable decision support across multiple areas of the site to inform resource allocation and targeted mitigation strategies on problematic areas.

Omnis is also supported by Metriqa™, a hyperlocal weather feed, to provide real-time and predictive insights on the root cause of dust emissions. By delivering real-time insights into dust concentrations, the platform enables proactive management of air quality, including trajectory analysis to accurately identify dust event sources, ensuring compliance with environmental regulations.

Additionally, Omnis empowers the copper mine to detect potential non-compliance risks and address environmental impacts promptly and effectively. Smart alerting offers real-time, intelligent notifications, prompting immediate responses to exceedances and assisting in the identification of emission sources. The mine also uses easily understood air quality data in Omnis to transparently demonstrate its commitment to environmental responsibility to regulators and communities. This comprehensive strategy not only advances sustainability initiatives but also fosters positive relationships with multiple stakeholders.



Fig 1: Example of Omnis Real Time Monitoring



Results

The implementation of the Envirosuite's Omnis platform is fundamentally transforming operations at the copper mine site through seamless data integration to proactively manage environmental risk. Fragmented data is consolidated into a unified platform, significantly enhancing situational awareness and facilitating informed decision-making.

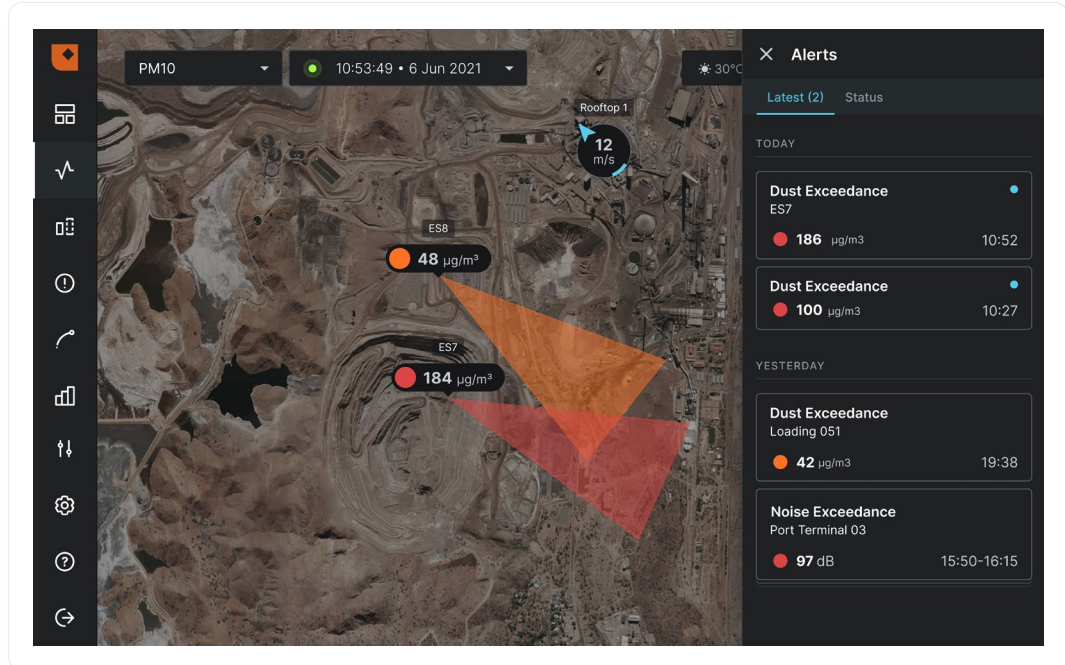


Fig 2: Example of Omnis Smart Alerts

Operational teams can now identify the causes of incidents with situational awareness of their site's impact at any time. This enables effective management of emissions, proactive planning for weather-related risks, and transparent engagement with all stakeholders. Consequently, the mine site has realised marked enhancements in operational efficiency and responsiveness.

In addition to being able to respond much faster than previously possible to ongoing dust and air quality issues, efficient reporting capabilities have streamlined transparent communication with the neighbouring communities. This is now allowing for timely updates to the community when needed with easily understood information, while also supporting compliance with regulatory standards.

Key Results

- Improved Operational Efficiency
- Proactive Management
- Enhanced Community Engagement