



**Global
Witness**

Murky Manganese

The Ghanaians who will be paying
the price for EV batteries

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An investigation by Global Witness has revealed that waste from a manganese mine in Ghana supplying material critical to the latest EV technology is creating a toxic environment for local people, with its operators aware but doing little to stop it. Meetings with more than 150 people living close to the giant manganese mine in Ghana, a key cog in the global supply chain, reveal communities living with chronic health problems and poisoned water supplies, and afraid of eating their own dust-covered crops.

The metal goes into the supply chain which supports some of the biggest EV manufacturers, including Tesla.

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The manganese mine's toxic waste water

The dense dark mass of the giant manganese mine tailings dump looms over the main dirt road to a village known as “New Tarkwa” in Ghana’s Tarkwa Bansa region.

Clouds of dust kick up around the car, and occasionally tankers go by, spraying water over the ground and droplets into the air. They pass close to people sitting beside the road selling fruit and vegetables.

Eric Gyimah, a lecturer with the University of Mines and Technology in Tarkwa, is travelling in the car, and points out the spray fanning behind the tanker. He says that trucks are deployed by the company operating the mine.

“They use [this water] to suppress the dust,” he says, “and you know where it’s from? The mine pit.”

This [mine pit water is highly toxic](#)¹.

A detailed study of the water in the mine pit was carried out in 2022. We interviewed one author of the paper, Dr Emmanuel Daanoba Sunkari, by telephone.



Toxic water from the mine pit is used to keep down dust from the mining operations, it's alleged. Global Witness

“We realised that the mine pit water was very, very concentrated in potentially toxic metals like arsenic,” he said. “And these metals were being... dispersed into the surface water and then eventually seeping down into the groundwater.”

Ingesting the manganese wastewater could cause cancer and stillbirths and, according to Dr Sunkari, may even be altering the DNA of unborn children.

In November 2025, Global Witness interviewed dozens of people in communities around the mine who testified to having skin, eye and breathing conditions, and who said they were living in fear from what the polluted water and the dust was doing to them.

Exposure to high levels of manganese has been scientifically proven to [cause serious health issues](#)².

Dr Sunkari and his co-authors made an urgent appeal in their report, calling for the health of local communities to be protected. He said that he had not seen any evidence that this research was being acted upon.

The Nsuta mine's global clientele

Ghana is the [fourth-largest producer of manganese](#)³ in the world, a metal [crucial to emerging EV technologies](#)⁴. Batteries which contain a higher percentage of manganese are [viewed as cheaper and greener](#)⁵ than current nickel or cobalt batteries.

Manganese is abundant in the Earth's crust, but it is classified as a critical raw mineral by many countries because production is concentrated in a [small number of places](#)⁶.

[Millions of tons](#)⁷ of manganese ore each year come from this single mine in Ghana's Tarkwa Bano region, on a deposit [uncovered by a British colonial official](#)⁸ more than a century ago.

[Operational since 1916](#)⁹, the metal from the mine helped to make steel for troops during the First World War, likely going into the [steel "Brodie" helmets](#)¹⁰. The Nsuta mine, as it was named, even appeared on Gold Coast stamps, as this part of Ghana was known when it was under British colonial rule.

Now it enters a global supply chain helping to create components for EV cars.

The principal destination for [Ghana's manganese is China](#)¹¹, which [produces more than 90%](#)¹² of the world's manganese products, from additives to strengthen steel to battery-grade compounds, including the high-purity manganese needed by manufacturers of EV cathodes.

The Nsuta mine is controlled by the Chinese giant Ningxia Tianyuan Manganese Industry Group¹³ (also known as TMI). TMI is one of the world's biggest suppliers of manganese products and [at the heart of](#)¹⁴ what's being seen as the evolution of power battery technology.

The [Ghana Manganese Company](#)¹⁵ (GMC) is the licence holder, which TMI owns 90% of via subsidiaries China Tian Yuan Manganese Limited and Consolidated Minerals (Consmin), with the remaining 10% held by the Ghanaian government.

TMI is undergoing a bankruptcy restructuring but [is operating normally](#)¹⁶.

According to a GMC official, TMI is increasing production targets to meet rising demand from the EV industry.

Many car companies including Tesla, Ford and General Motors have made their growing use for manganese clear.

[In 2022, Elon Musk said](#)¹⁷ there was “interesting potential” for the metal, and in 2024 [Tesla acquired a patent](#)¹⁸ for a “doped manganese-rich cathode active material” that “enables energy storage devices with improved performances.”

[In 2025, General Motors announced](#)¹⁹ a “new battery technology breakthrough” for electric trucks and SUVs, which was “more affordable” than cobalt and offered “greater capacity”. [In 2025, a Ford executive](#)²⁰ also announced a breakthrough with LMR tech.

The supply chain is complex and opaque, but there is evidence that [TMI has shipped some manganese](#)²¹ products to Shenzhen Dynanonic, which in turn supplies Chinese battery giant CATL. [Tesla has a supply relationship with CATL](#)²², as do other major car companies.

While mostly used in steel and aluminum, it is this increasing use of manganese in EVs that is predicted to be a prime driver for a surge in demand. But while the metal is seen as a cheaper, greener option for battery components, its harmful impact on human health and the environment [is often overlooked](#)²³.

Living in the shadow of the tailings dump

Arriving at the "Tarkwa Banso Project", it looks different to the pictures on the Ghana Manganese Company (GMC) website.

Known by locals as New Tarkwa, this housing development was built so people could be moved to create space for the digging of another pit.

More than 300 families – nearly 2,000 people – were moved here by GMC in 2018. GMC's website shows bright, clean houses and neat streets. The reality is different. Chickens peck in oily black pools of raw sewage beside cracked pavements. The water that spouts from a communal pump is pale brown.

“They are killing us softly,” says Maryam Ackah, who was relocated here six years ago.

"They are polluting us with chemicals, the dust, the fumes. We have bad itching, inhaling of dust... You can't plant vegetables, like coconut or plantain, because the dust settles on the leaves. It makes you afraid to eat it."

Visible above the rooves is the tailings dump. At one edge we observe an active part of the mine site and 100-150 ton dump trucks raising dust into the air.

During our visit, around 60 people gather in the community centre to talk to the university researchers and Global Witness.

Blasting is conducted at the GMC mine site almost every day, along with drilling, loading and hauling.

"Shortly after blasting, I'm unable to breathe well," says a community member called James. "Sometimes I feel the explosives on my skin, and it makes it burn and itch."

"We are inhaling dust every day. We get scratching and rashes, coughing and asthma," says Jacob Ajelu, who has 32 members of his extended family living near the mine. "When they put the tailings and it's higher than the community, it really affects us."

Others report similar skin, eye and respiratory issues. Eric Gyimah asks the crowd: has everyone experienced this? There are dozens of nods and calls of "Yes!"



Maryam Akah wishes she could live far from the mine. Global Witness

Other community members describe the contamination of the water, and how the healthy streams that used to flow have been destroyed.

Isaaka Ayimbila says, “When we use the water from the streams, it destroys our crops.”

GMC says that it employs more than 1,000 people, 98% of which are Ghanaian. No current staff are present at the meeting – only one former employee who alleges he has been partially paralysed after a decade of working on the heavy trucks in the mine.

We hear allegations from another community member that GMC didn’t employ enough local people in senior positions, only “in the lowest ranking jobs.”

When asked about the employment that the mine brings, Maryam Ackah says: “If you employ me and give me money and a pension and at the end I have kidney, skin and lung problems, I will spend it all on medicine.”

Steep health and safety risks

The GMC office is in a leafy part of the mining centre of Tarkwa itself, not far from the offices of Anglo Gold Ashanti, Gold Fields Ghana and other large mining companies.

We pass a fenced-off area with dozens of trucks parked up, part of a 200-strong fleet employed by GMC. With no refinery in the area, the ore mined here is transported swiftly down the road south to the port of Takoradi on the “Gold Coast” – originally built by British colonial authorities in the 1920s.

The scale of the haulage operation can be seen by the number of manganese-laden trucks on the dusty road out of town. Over five minutes, we count 35 thundering past.



Trucks laden with manganese ore ply the route between Tarkwa and the dock at Takoradi. Global Witness

We meet GMC’s Chief Sustainability Officer, Wisdom Adjei Mensah, and some of his team.

Mr Mensah confirms that “the Chinese are the owners and buyers of the product... It is to make EVs – they need manganese for the batteries.”

GMC’s mining licence extends for 175 square km, [less than 3%](#)²⁴ of which has been mined so far.

[TMI is scaling up its operations](#)²⁵. In 2024, it set a production target of 5.7 million tonnes of ore, of which “100% was shipped to China.” The 2025 target was 8 million tonnes of ore, which Mr Mensah says would create 30 million tonnes of waste. “The target in 2026 is 10 million tonnes.”

Ghana's Minister for Land and Natural Resources, Emmanuel Armah-Kofi Buah, visited the TMI complex in China in 2025 where he saw "a refinery park featuring three advanced plants that produce battery-grade manganese," according to a government press release.

The plan, which has been in the pipeline for several years, is for TMI to build [a refinery in Tarkwa](#)²⁶.

Increased mining to meet this demand is likely to have an increasing impact on the local communities and the environment.

There are 17 communities within the concession, according to GMC. They are colour-coded red, yellow and green, with communities in the "red zone" the most affected.

Global Witness visited one of the communities in the red zone, called Nsuta Zongo.

The tailings dump is very close to the buildings here. We are shown five homes with serious cracks in the walls, which residents say were caused by the constant blasting. We are told there are many more with similar structural damage.

Resident Eric Asante shows us one with particularly severe cracks. "When they are blasting you can feel it," he says, balling his fist and slamming it into the opposite palm. "It's heavy."

We gather photographs and later show them to geophysicist Dr Steven Emerman, who in the past has given expert evidence on mine sites to [the European Parliament](#)²⁷

He says: "This [tailings dump] looks like a very dangerous kind of facility to me... It is not a stable structure... It is way steeper than the industry standard."



A researcher standing close to the tailings heap reveals its scale. Global Witness

Dr Emerman says it has “a lot in common” with a mine in Brazil he previously visited and alerted the Brazilian government to, which helped lead to [three waste piles being shut down](#)²⁸ in January 2026 over safety concerns.

There is a narrow gully between the homes and the steep mass of waste black rock. We are taken down into the gully to a stagnant muddy pond with a trickle of water running away from it.

“This is where we used to get our water,” explains one resident. “At first it was very clean, then they started dumping here. You used to be able to drink it, it was fresh.”

Eric Gyimah confirms that the rainwater falls on the waste dump high above the gully before draining through it, making the water toxic.

We point out that some of the manganese mined here will end up in EV cars, which are said to be more environmentally-friendly.

“But look at where it’s coming from,” he says, “and what the people are going through.”

Despite the concerns, the full extent of the harm being done by the mining operation is not yet clear as there has been no systematic health surveillance, Eric Gyimah says.

The Ghanaian governmental bodies responsible for monitoring operations are the [Minerals Commission](#)²⁹ and the newly strengthened [Environmental Protection Authority](#)³⁰.

Dr Sunkari accuses them of being ineffective, believing that they only carry out “cosmetic regulation.”

James Aidoo, who runs a transport enterprise out of Takoradi, is frequently here in the Tarkwa region. He does not blame the companies.

“It’s the government. We are not seeing any impact for the community,” he says. “There are the laws, but they don’t work. The communities just get ‘chicken change.’ It’s been 100 years (since mining started here) and look where people are living.”

The benefits of living close to a manganese mine’s waste pile already look slim with the potential health impacts recorded – and it turns out that the financial payoff remains patchy for communities too.

[Official figures show](#)³¹ that in 2023 Ghana exported around 3 million tonnes of manganese ore, with export proceeds of US\$185 million. Yet the Ghana Extractive Industries Transparency Initiative states that “the distribution of mining revenues to local communities remains erratic in some regions.”

Threat to Ghana's biodiversity “ark”

It's not just people that are being harmed by the manganese extraction around the Nsuta mine; the natural world is also suffering.

Along with the damage to water bodies exacerbated by illegal gold mining in the area – by far [the biggest cause of river pollution](#)³² – there is the threat to the surrounding forest, which is one of the last fragments of the Upper Guinean Forest, classified by scientists as a [“globally significant biodiversity hotspot.”](#)³³

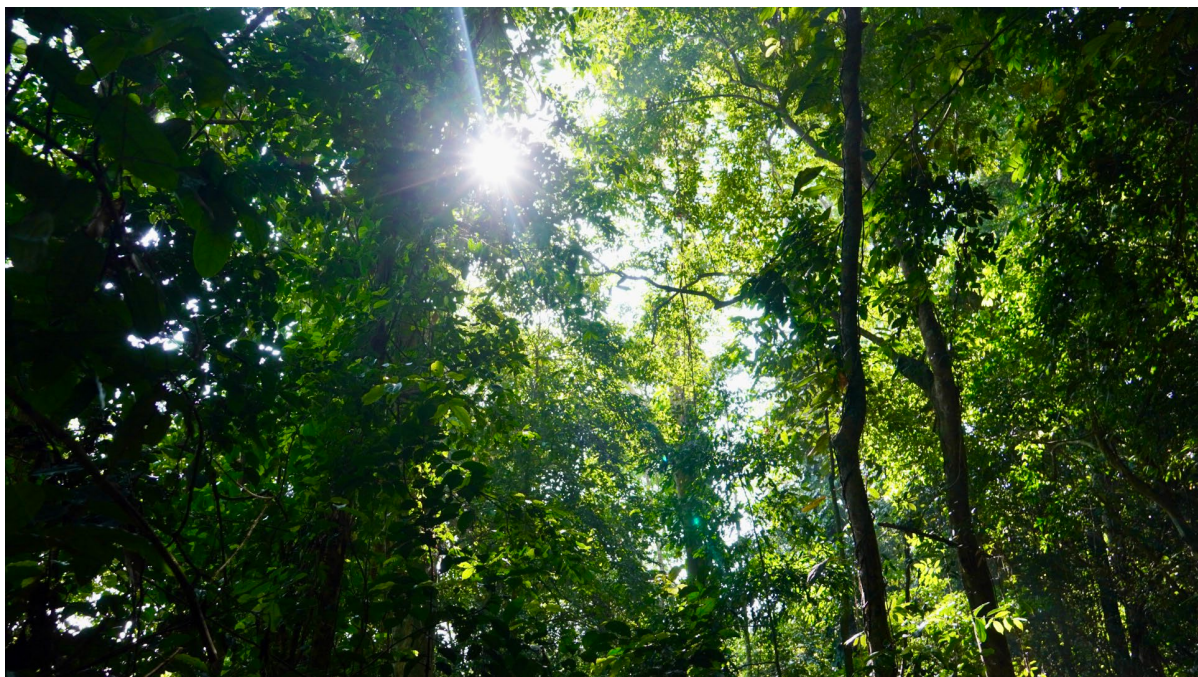
According to the World Resources Institute, Ghana has “little primary forest remaining” and in 2022 it “experienced the [largest percent increase in primary forest loss](#)³⁴ in recent years.”

The manganese mining at Nsuta is open-cast, which involves clearing topsoil and any vegetation on it, before scraping it away to get at the ore underneath.

Less than 3% of the 170 square km concession has been mined so far. If the operation were to extend to its full legal boundary, it would cut into the Neung Forest Reserve.

[Research by the Tyndall Centre for Climate Change Research](#)³⁵ has shown that this reserve is an “ark”, which could potentially withstand the worse impacts of climate change, creating a refuge for multiple species.

Jeff Price, who led the analysis, informs Global Witness that the Neung Forest is “one of the remaining patches of moist high elevation evergreen forests (Upper Guinean Forests) in southern Ghana,” and that it is important to “secure its integrity.”



A glimpse of Ghana's pristine rainforest, which acts as a safeguard for the water supply of the region. Global Witness

Net zero at what cost?

We travel to the place where all this started – where the manganese was reportedly first found – close to the village of Akyem.

At another community meeting, we hear more testimonies of the mine's impact on the health of the people who have lived here for generations. Around 60 people attend, and many report polluted water sources and eye and skin problems.

Nana Akosua Arfuoo, revered as the community's Queen Mother, laments the loss of Indigenous cultural practices, and the creation of poverty. "They are taking what they can from us," she says, "and leaving nothing."

Chief Nana Kofi Amo walks us down a grassy track, over a disused railway line, to an overgrown area close to the forest.

"This is the spot where manganese was discovered," he says. "It was a British man in 1914. He was looking for gold."

There's not been mining here for 30 years, but community members fear that it may return. If so, the people living here would have to be relocated to allow the operation to expand.

"We have the mortal remains of our grandmothers and great-grandmothers and grandfathers out there, so this a place we cherish so much," the chief says.

He says that while he understands the need for a transition to net zero, and the part that manganese could play in this, "we will have to plead with (the authorities) that certain places will not be destroyed."

Richard Ellimah, Programme Officer (Minerals and Development) of Ghana's Public Interest and Accountability Committee, tells Global Witness in a separate phone interview that all the attention so far has been on gold and bauxite, despite the country's income from manganese.

He calls on the Environmental Protection Authority and the Minerals Commission to act to protect those living around the Nsuta mine, whom he describes as an "orphan community".

"No-one is responsible, no-one is listening," he says. "It is the tragedy of our time."

Global Witness reached out to all of the parties mentioned in this investigation for comment but received no response.

Recommendations

Drawn up by Global Witness, ACEP, and Earthworks:

GATHERING DATA ON THE IMPACT ON COMMUNITY HEALTH AND THE ENVIRONMENT

While crucial academic work has been done on the impact of the pollution of water bodies to communities living close to manganese mining sites, there are significant gaps, including the impact of airborne pollution. In order to help government bodies and operating companies work to guarantee the safety of Communities, funding needs to be made available and partnerships with expert institutions established to gather more data.

GUARANTEE REGULAR ONGOING SURVEILLANCE OF COMMUNITY HEALTH

A long-term programme of regular Community contact to assess health would measure the impact of any mitigating measures adopted and could help to inform future practices.

ADDRESSING THE WEAKNESSES IN THE ENFORCEMENT OF MINING ENVIRONMENTAL POLICIES AND TAILINGS DAM SAFETY

The enforcement of the existing legal and regulatory instruments designed to mitigate the impact of mining on Communities and the environment would help guarantee progress – as recommended by [GHEITI in its 2022 report](#)³⁶.

ALIGN TAILINGS REGULATIONS WITH THE INTERNATIONAL BEST PRACTICE IDENTIFIED IN [SAFETY FIRST: GUIDELINES FOR RESPONSIBLE MINE TAILINGS MANAGEMENT](#)³⁷

Including increasing the amount required for buffer zones between tailings dumps and communities. Buffer zones should be large enough to ensure mining companies are able to guarantee the safe and timely assisted evacuation of any population that lives downstream from the dump.

ESTABLISHMENT OF ENVIRONMENTAL COMMUNITY OVERSIGHT GROUPS

Effective Community participation and engagement with environmental issues and decision-making is crucial to ensuring the success of any monitoring and evaluation.

Given the proximity of communities to tailings dumps, effective community participation in the development of Emergency Management and Response Plans, and regular training and drills for community members to understand how to evacuate in the case of an emergency.

Endnotes

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