

## The Jadar Project

# Mine waste and processing residue

**We are working hard to reduce the amount of mine waste and processing residue Jadar would generate.**

**There are understandable concerns among community members about whether we will effectively manage any potential health and environmental impacts from mine waste and processing residue.**

Mine waste and processing residue include materials that, if not managed adequately, could enter the soil and waterways, potentially affecting people's health and damaging the environment. Our goal is to reduce and repurpose as much processing residue as possible, but we have some more work to do towards further reduction of the waste and processing residue.

We recognise we must manage waste and residue in a way that protects communities and the environment. We are putting a range of measures in place, such as multiple protection barriers to protect ground water, that meet Serbian and EU standards.

### Managing potential impacts

- Minimising the amount of waste and processing residue and ensuring its safe disposal
- Preventing the soil and water from contamination
- Minimising dust generated by waste and processing residue handling and traffic at potential waste and processing residue management site

### Proposed measures

- Ongoing research and development to find new and better ways to reuse waste and processing residue
- Using multiple barriers to prevent contamination at waste management facility
- Installing a leachate collection system for water treatment and recycling
- Installing water diversion channels around the storage facility to reduce contact of clean rainwater with waste and processing residue
- Progressively capping and rehabilitating the waste storage facility
- Installing systems to monitor the effects of waste and processing residue on the environment
- Using the best available techniques, including dewatering with filter presses resulting in solid processing residue and progressive rehabilitation

## Types of waste

We're designing the project to minimise the amount of waste we produce.

Rock waste from the underground mine and processing residue is generated by the processing of Jadarite into lithium carbonate, sodium sulphate and borate. Both the mine waste rock and the processing residue waste contain water-soluble minerals, which may release contaminants when the material comes into contact with water. Extensive tests have shown that boron is the primary element we need to manage to prevent impacts on soil and water.

Studies conducted by our team in Australia and a certified Serbian laboratory show that Jadar's waste and process residue does not have acidic properties.

### Underground mine waste rock

Underground mining doesn't require removing large quantities of rock to be removed to gain access to the ore, therefore underground mining produces less waste than open pit mining. Over the life of the mine, we estimate that one tonne of waste rock would be mined for every seven tonnes of ore extracted. Although this may seem a large waste quantity compared to mined ore, this tends to be much lower than open pit mining. The waste rock would be transported to an engineered storage facility near the mine access shaft.

### Process residue

The processing residue primarily contains fine silt, clay and moisture, and needs to be managed carefully to prevent dust emissions and ensure the process residue facility is structurally stable.

## Researching processing residue reuse

Our goal is to develop alternative uses for the Jadar Project's processing residue, finding ways to reuse more this within the project and in other industries such as construction or agriculture. This would also help us minimise future storage requirements.

We're conducting research and testing, and this work would increase once we are operating and have produced enough processing residue to begin commercial scale testing.

### Filter technology for processing residue

The Jadar Project would generate dry residue, similar to wet soil which contain about 25% moisture. This is different to slurry residue, more common for this type of mine, which contains about 75% moisture and is stored in a tailings dam.

Dry residue is made by filtering the processing residue under pressure and then partially drying it in a rotary kiln, which reduces moisture to a point where it can be transported and stored safely. With most of the moisture removed, dry processing residue can be stacked and compacted to form a stable landform. Filtering, partially drying and then compacting our process residue will reduce residue volume, dust, and the risk of collapse, and by reducing permeability it will also lower the risk of groundwater contamination. Plus, it will allow a quicker and easier site rehabilitation. This storage method is an example of the best available technology for mine waste management and goes beyond the requirements of Serbian and EU legislation.



The residue from the ore processing process is dried and compacted in order to obtain dry waste like the one in the photo.





## Barrier and water management systems

The waste and processing residue storage facilities would include multiple barriers containing clay and synthetic layers to prevent seepage below the landform, and a leachate collection system for water treatment and recycling. We would also implement water diversion channels around the waste and processing residue storage facilities to reduce contact with clean rainwater.

We would design the facility to withstand earthquakes according to Serbian and international standards. We would continue to work with local and international experts on modelling, validation, monitoring and potential contingency measures.

## Dust prevention

The processing residue contains fine silt and clay. These have the potential to generate dust, and need to be managed to prevent impact on air quality.

We would use dust suppression techniques on-site, including mechanical compaction, spraying the waste surface with water and applying dust suppression reagents. Progressively capping and revegetating these areas will also help prevent dust emissions. We would install dust monitoring stations around the landfill area to monitor dust levels in real time. The project team would work closely with the local weather monitoring station to anticipate and prepare for changes in weather conditions.

## Monitoring and reporting

We understand there are concerns about the transparency of monitoring results of potential impacts. In collaboration with the local community, we would establish a joint monitoring group, which would include members of the community and independent experts.

We would regularly monitor all potential environmental impacts: water, air, noise, soil and waste. We are committed to transparency and dedicated to publishing all monitoring data in time intervals defined by regulations. We would publish monitoring results on the project website.

## Progressively rehabilitating processing residue

All the proposed Jadar Project waste facilities would be rehabilitated and revegetated. We would progressively “cap” the processing residue landfill by placing a specially designed waterproof cover and topsoil over the compacted material, and then revegetating it with native grasses. Importantly, we would not need to wait until mining is finished to rehabilitate the process residue storage site. This is different to typical slurry facilities, which may require a long waiting period before rehabilitation can be completed. Progressive rehabilitation would be a sustainable approach to mine closure and goes beyond Serbian and EU regulations.

## Global and industry standards, and Serbian laws we abide by:

- International Council on Mining and Metal's Global Industry Standard for Tailings Management (GISTM, 2020)
- Best Available Techniques (BAT) Reference Document for the Management of Waste from Extractive Industries in Accordance with Directive 2006/21/EC (MWEI, 2018)
- Rio Tinto D5 Group Procedure (Rio Tinto, 2021)
- Enactment on landfill waste storage (Official Gazette RS, No. 53/2017)
- Enactment on conditions and procedure of issuing waste management permits, criteria, characterisation, classification, and reporting on mining waste (Official Gazette RS, No. 92/2010)

## Jadar Project

The Jadar Project in Serbia is one of the largest greenfield lithium projects in the world. Jadar has the potential to produce battery-grade lithium carbonate, a critical mineral used in batteries for electric vehicles and storing renewable energy. In addition, Jadar would produce borates, which are needed for the development of renewable energy equipment such as solar panels and wind turbines.

**For more information, please contact:**

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