

Soil

In respect to Alcoa's Proposed mining expansion

Mining damages the soil profile from the **open cut, strip mining** used to mine bauxite. **Bauxite is found in the top 5 metres** of the soil. To mine bauxite, **all trees and undergrowth are cleared** and the **topsoil removed**. The bauxite layer is then removed. The topsoil is stored.

Alcoa says they start rehabilitation within 12-18 months of mining, but this is from the **end of the life of a mining pit**. The time between commencing mining and rehabilitation starting has been up to **8 years**, a very long time between the topsoil being removed and replaced.

OUR CONCERNS



Dwellingup forest included in the proposed mining expansion area (Photo: Jess Beckerling)



Willowdale bauxite mine, March 2022 (Photo: Jess Beckerling)

1. Change in soil profile

Bauxite mining causes a change to the soil profile so that it **does not, and may never again, have the moisture carrying capacity of the original bauxite layer**. The rehabilitated forest after mining is a "start over forest" of evenly aged trees in soil that is very different from the original native forest.

SOIL PROFILE

BEFORE mining
- deep rooted trees

AFTER mining
- Shallow roots

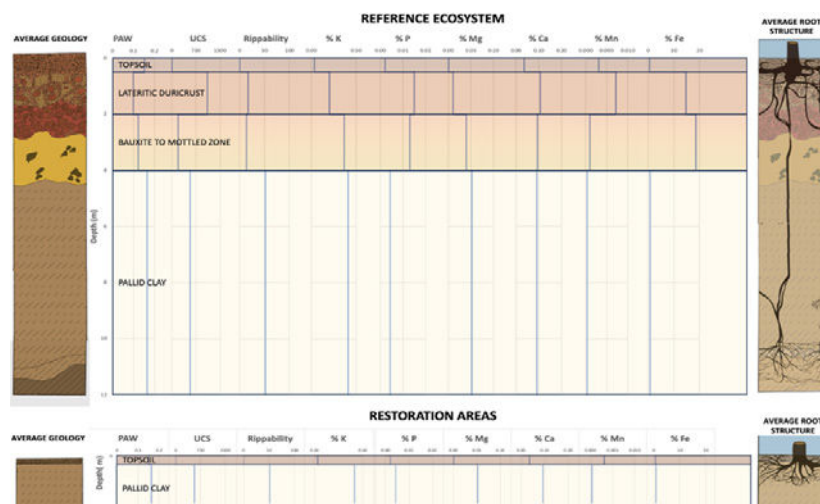


Figure 4. Typical pre- and post-mining geological, geochemical and jarrah root structure profiles. Data compiled from Anand et al. (1991), Kew et al. (2007a, 2007b); Kimber (1974), Soltangheisi et al. (2023), and Szota et al. (2007). PAW is plant available water (kPa), UCS is uncompress strength (nKm²).

2. Spills

Small spills of oil and other chemicals don't have to be reported. There is community concern that spills and hazards are not well reported and disclosed, for example, the recent potential PFAS spill related to an unauthorised pipeline across a dam wall.

3. Erosion

Erosion can be caused by harrowing and deep ripping used in the rehabilitation process. Erosion may get worse due to the more intense rain downpours.

4. Dieback

Dieback is caused by a fungus like organism called Phytophthora that affects tree roots. It can be introduced, spread and intensified in the forest by exploratory drilling for bauxite. Movement and mixture of soils in the mining and rehabilitation process can also occur, further spreading the Phytophthora

5. Salinity

Clearing causes the salt in the soil to rise towards the surface, making streams salty, affecting aquatic animals and plants and affecting agriculture. The Murray River is now salty from the Peel Harvey Estuary right up to the Pinjarra Weir at times during the year. This could continue to extend up the Murray River, having an impact on water quality affecting plants and animals.

6. Soil microorganisms, fungi-take a long time to recover. Soil microorganisms are critical to forest health. It can take up to 40 years for soil micro-organisms to be completely regenerated to pre-mining levels. This is a long time to wait in a drying climate and may be longer in future.



Example: A 3000-litre spill of diesel in the water catchment (Presentation to Water Corporation Board March 2023)

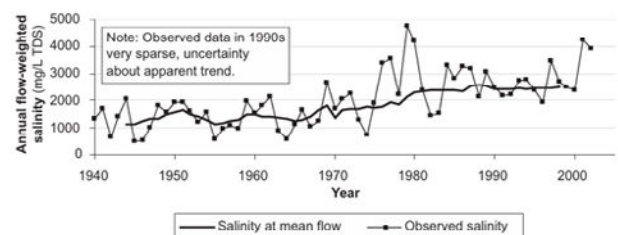


Figure 3.24 Salinity trend at the Baden Powell Water Spout (614-006) on the Murray River



Example: Drainage failure that could allow a dam to be contaminated (Presentation to Water Corporation Board March 2023)

For these reasons the DDFD believes that Alcoa's mining proposal for expansion of mine sites (Holyoake, Myara and O'Neil) and Pinjarra refinery should be rejected by the EPA.

Have your say by signing on to WA Forest Alliance's submission with a quick and simple form or find out more about writing your own at endforestmining.org.au/alcoa. The comment period is now open and closes on 21 August 2025.