

Water Management



No adverse impact to the supply of water caused by the mining operators to existing users and water dependant ecosystems

Groundwater

The existing environment's prime aquifer system is a Fractured Rock Aquifer, which comprises several rock types, namely, the Tapley Hill Formation, Brighton Limestone (Marble), Tarcovie Siltstone, Cox Sandstone and the Kanmantoo Formation to the east of the catchment.

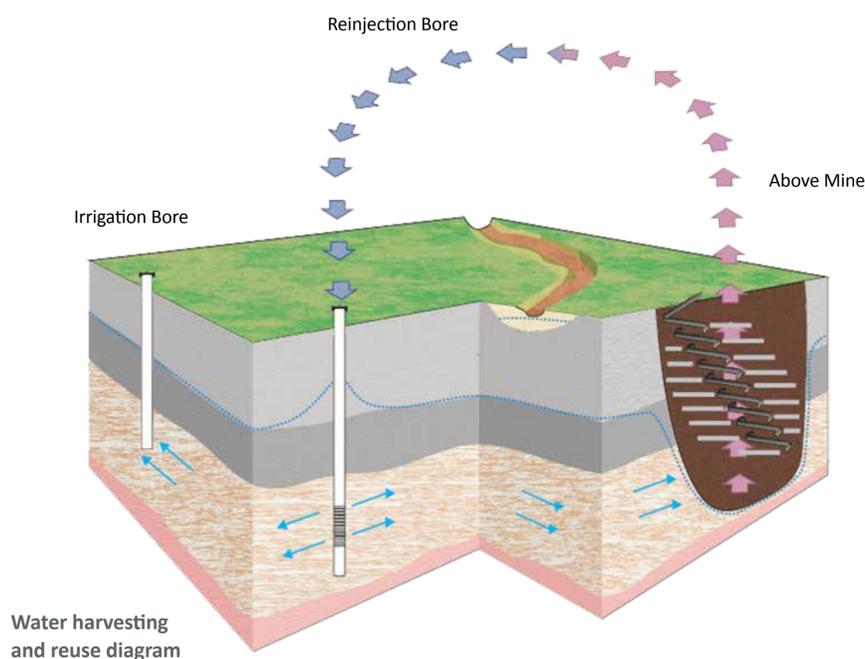
- The aquifer is capable of supplying groundwater at rates of 1-40 Litres per second to several operational bores and provides water to springs in Inverbrackie Creek, with a salinity of less than 1,500 mg/L.
- Salinity increases up to 4,000 mg/L to the east, in the less productive and older Kanmantoo Formation.

Groundwater Management

The Bird in Hand Gold Project is located near the boundary of the Eastern Mount Lofty Ranges (EMLR) and Western Mount Lofty Ranges (WMLR), where there is a natural groundwater divide between the two catchments.

- In the EMLR, groundwater salinities are slightly higher (up to 4,000 mg/L) than the groundwater salinities around the Bird in Hand Gold Project and the Inverbrackie Creek sub-catchment (typically less than 1,500 mg/L).
- Grouting the mine is expected to reduce inflows by 90%. The reinjection (MAR, managed aquifer recharge) of water back into the aquifers will limit drawdown to a radial distance of 600m. This will maintain groundwater levels in private bores and keeps the groundwater divide between the Western and Eastern Mount Lofty Ranges.
- Groundwater modelling showed that by the last year of underground mining, baseflows to the Inverbrackie Creek will be maintained throughout the mine life if managed aquifer recharge (MAR) is adopted with grouting the mine to reduce inflows by 90% into the mine voids.
- As a safety factor, the water system is designed to manage inflows at 70% effective grouting.

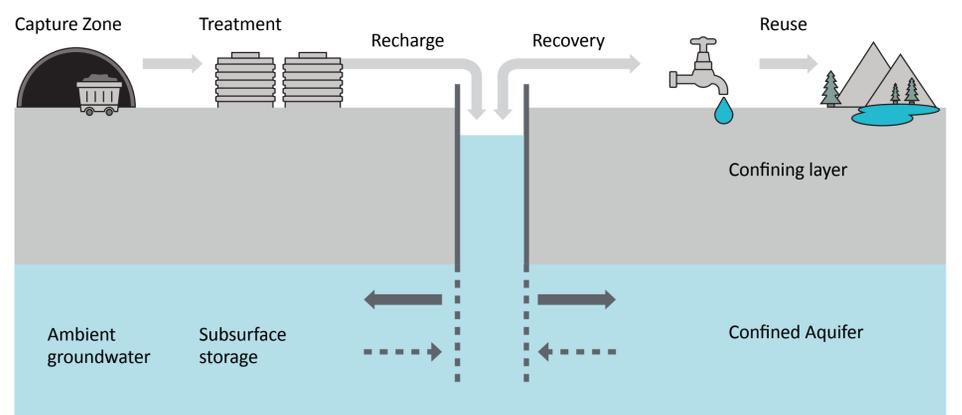
The risk of saline water migration was evaluated by solute transport modelling, which showed with MAR, where groundwater inflows are managed, no saline groundwater intrusion occurred thereby preserving the groundwater quality of the Inverbrackie Creek Subcatchment in the Western Mount Lofty Ranges.



- Reinjection creates a higher water level outside the mine to prevent impacts to other users.

Terramin commissioned a groundwater study in 2013 which began with a review of all current, historical and anecdotal information relating to the regional groundwater system. This was followed by a groundwater and bore census in co-operation with 37 local landowners.

Groundwater modelling shows that groundwater level impacts to private wells will be reduced by grouting ahead of development and eliminated by groundwater reinjection to offset drawdown around the mine.



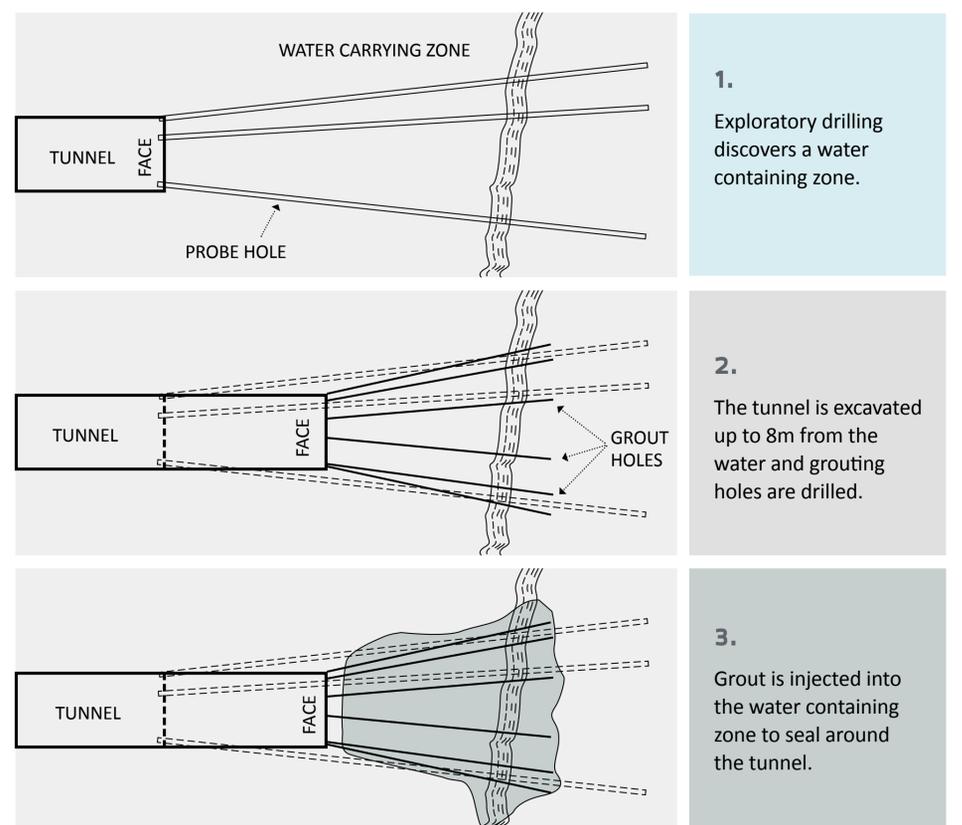
Managed Aquifer Recharge (MAR) diagram

Grouting

Projects such as road and rail tunnels through mountains, dam walls and underground mining tunnels all need an effective and safe method for managing inflows of ground water that occurs naturally within the rock.

Grouting is the filling of existing cracks or voids in the rock using cement. The cement used in this process is the same general purpose, locally sourced cement used commonly throughout the building and construction industries.

This method has been successfully used at the Ernest Henry Mine in Queensland where they adequately controlled high pressure inflows.



Tunnel grouting to protect from groundwater inflow