



FACT SHEET

GROUNDWATER

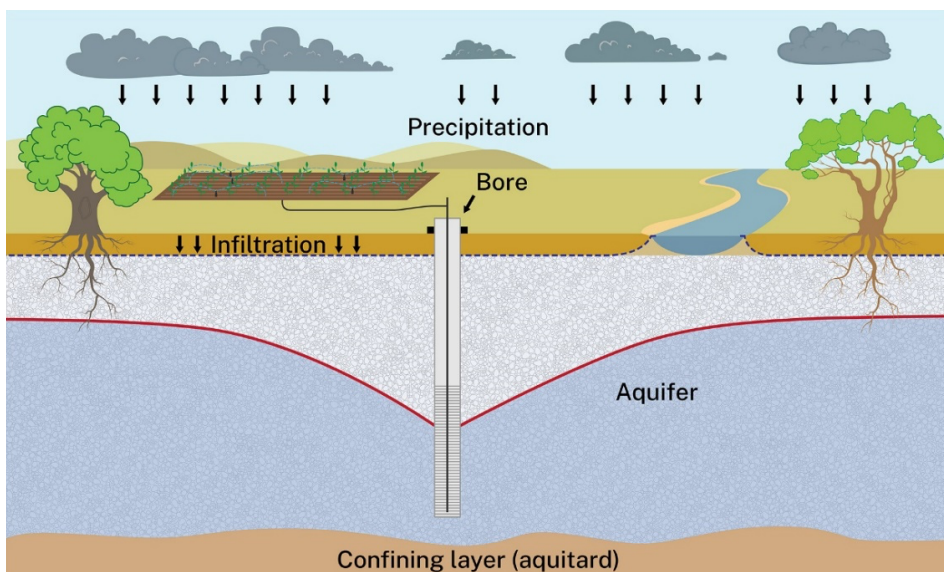
What is groundwater?

Groundwater is fresh water that is present between the small and large pore spaces of soil and rock beneath the earth's surface. Surface water recharges the groundwater system by moving between the spaces in the soil and rocks, travelling down from the surface, or sideways from waterways and wetlands. Once underground, the water will keep travelling down until it meets a layer too hard to penetrate (the aquitard). The water then gathers and builds up in the space between the soil and rock grains (an aquifer). Groundwater can be hundreds, thousands or even millions of years old.

Although groundwater occurs everywhere below the ground, its quantity and quality vary. The ability to extract water out of the ground (yield) and the quality of the water depends

on the geology and the climate. While some groundwater is fresh (30 percent of global water) and suitable for drinking, other groundwater can be salty or contaminated - due to the surrounding geology or from human activities introducing chemicals and making it unsuitable for human consumption or stock water supplies.

Under natural conditions, groundwater moves from areas of recharge to areas of discharge. Groundwater quality and levels can change naturally over time due to exposure to the surrounding geology, changes in weather patterns and climate. Groundwater levels are also affected by human extraction using wells or bores, which has the potential to alter the natural flow of groundwater.



GOSCHEN GROUNDWATER FACTS

The regional groundwater directly beneath the Goschen Project is known as the Loxton Parilla Sands aquifer. It is saline and therefore not fit for stock or domestic use.

There are no registered stock or domestic groundwater bores within ten kilometres of the mine footprint due to the poor water quality, including high levels of salinity – therefore there is no likelihood of any bores being impacted by mining activities.

Due to the depth of groundwater (greater than 30 metres) and its quality, no environmental values are affected. Environmental values include water-dependent ecosystems and species, water-based recreation-primary contact recreation, Traditional Owner cultural values, buildings/structures, geothermal properties.

Groundwater monitoring has already commenced to establish baseline data prior to construction commencing. Ongoing monitoring throughout the life of the Project will detect any changes to groundwater levels and chemistry in comparison to pre-mining conditions. If any changes are detected, groundwater data will be reviewed, and mining practices modified.

Why is it important to monitor groundwater?

Bores are used to monitor, map and measure groundwater across regions to determine the effects of season, climate, or human impact. Victoria has more than 1,400 bores providing live monitoring data which:

- indicate the likely groundwater systems in a specified area
- track direction of water level changes
- identify when groundwater recharge occurs and the effect of seasonal conditions on groundwater levels
- help evaluate the effect of land management practices on groundwater levels
- help assess the risk of increasing saline land.

How will groundwater be monitored and protected at the Goschen mine site?

Groundwater monitoring regime

VHM has completed groundwater studies and installed a network of environmental groundwater monitoring bores in 2021. This monitoring will continue throughout all phases of the Project.

A comprehensive groundwater assessment of the existing conditions using regional and on-site bores was completed as part of the Environment Effect Statement (EES).

Monitoring will be checked against the groundwater modelling predictions undertaken during the EES. After two years of operations, the model will be calibrated to review and potentially update the groundwater monitoring regime; and

to establish the extent of the natural attenuation process and provide prediction on groundwater quality changes during and post-mining operations.

After mine rehabilitation and closure, monitoring will continue to ensure groundwater quality and levels reflect outcomes detailed in the Closure and Groundwater Management Plans.

Mining practices

- All mining occurs above the regional water table.
- Optimise tailings water recovery to minimise seepage to the aquifer – recovering water from beneath tailings and pumping back into the process circuit.
- Implementing a Groundwater Management Plan as the framework to manage and mitigate potential risks to groundwater.

What legislation is in place to protect groundwater?

Commonwealth government:

- Environment Effects Act, 1978
- Environment Protection and Biodiversity Conservation Act, 1999
- Water Act, 2007

Victorian government:

- Environment Protection Act 2017 (EP Act)
- General Environmental Duties (GED) under the EP Act
- Environmental Reference Standard (ERS) 2021
- Water Act, 1989

Guidelines:

- Australian Groundwater Modelling Guidelines
- Guidelines for Assessing the Impact of Climate Change on Water Availability in Victoria
- EPA Victoria Publication 668 Hydrogeological Assessment (groundwater quality) guidelines
- EPA Victoria Publication 669 Groundwater sampling guidelines.

ADDITIONAL REFERENCES

What is groundwater? | Geoscience Australia (ga.gov.au)

About groundwater | Environment Protection Authority Victoria (epa.vic.gov.au)

Victoria Unearthed (environment.vic.gov.au)

840.2: The cleanup and management of polluted groundwater | Environment Protection Authority Victoria (epa.vic.gov.au)