

# Latrobe Valley Regional Rehabilitation Strategy – Regional Water Study

## Rehabilitating the Latrobe Valley's coal mines

The Latrobe Valley's three brown coal mines – Hazelwood, Yallourn and Loy Yang – have fuelled most of Victoria's electricity generation since 1924. Hazelwood closed in 2017 and Yallourn and Loy Yang are planned to close by 2032 and 2048 respectively. Each of the Latrobe Valley brown coal mine operators are required to develop a plan to rehabilitate the mine sites in order to achieve a safe, stable and sustainable landscape once mining activity ceases.

A reopened inquiry into a coal fire that burned for 45 days at Hazelwood in 2014 found that using water to create 'pit lakes' in the areas where coal has been mined is likely to be the most viable way to achieve safe and stable rehabilitation of the mines. However, the inquiry recognised that significant knowledge gaps existed in relation to this rehabilitation option, and recommended further investigations be carried out.

These investigations – geotechnical, water and land use planning studies – have been undertaken as part of the Victorian Government's preparation of the Latrobe Valley Regional Rehabilitation Strategy

The studies, which were carried out by technical specialists from 2017 to 2019, considered the regional benefits and risks associated with stabilising the mine pits (or voids) by creating full or partly full water bodies.

The Strategy will provide information on the:

- regional risks that need to be considered and addressed in rehabilitation plans;
- feasibility of supplying water for rehabilitation, if required; and
- possible future land uses for the rehabilitated sites in a regional context.

The Strategy will identify the risks to the natural and built environment that mine operators are required by legislation to address in their rehabilitation plans.

The final Strategy is due to be prepared by 30 June 2020.

## Latrobe Valley Regional Water Study

As part of the development of the Latrobe Valley Regional Rehabilitation Strategy, the Victorian Government is assessing the feasibility of using water to rehabilitate the Latrobe Valley brown coal mines to achieve safe, stable and sustainable rehabilitated landforms once mining ceases.

The Latrobe Valley Regional Water Study assessed the feasibility of filling the mine voids with water, continuing to make the mine voids safe and stable, without affecting the reliable access to water for residents, industry, farming, emergencies and the environment – including the water needs of rivers, wetlands and the Gippsland Lakes system.

The study improves our understanding of projected water availability and use in the Latrobe River system, potential alternative sources of water to those currently available; how water quality may change in the mine pits should water be required for mine rehabilitation and the water needs of rivers and wetlands.

The Study found that surface water availability in the Latrobe River system has decreased significantly in the past 20 years, from a long-term average of about 800 gegalitres a year to about 600 gegalitres a year since 1997. It found there are uncertainties associated with climate change and projected water availability. This means any potential water supply for mine rehabilitation will need to account for uncertainty around future climate and water availability and plan for the expectation of a drier future.

If dry conditions currently being experienced in Gippsland continue into the future and surface water is



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used to fill the mine voids to achieve a safe and stable landform, there is a risk of regional impacts if the mines are filled too quickly. However, water security for other water users including the environment could be protected if filling the voids took place slowly – or only during wetter periods. Currently, there are no alternative sources of water that would significantly hasten the filling of the mine voids or considered more feasible for rehabilitation than controlled groundwater inflows and surface water from the Latrobe River when available, though this may change in the future. Water quality risks should be monitored but are expected to be manageable.

Water access arrangements for mine rehabilitation would need to be adaptive and well-informed, and under conditions that protect other water users, the environment, cultural and other values. Under these conditions it may take decades to fill each mine void. It also means filling the voids would need to be restricted or halted during dry conditions to protect access for other users and the environment.

Any water taken for mine rehabilitation should not impact the minimum flows required to maintain the Latrobe River and any affected tributaries.

## If water is needed for mine rehabilitation, how much would be needed?

Depending on when each mine closes and if each void needs water, up to 3,000 gigalitres could be required, equivalent to six times Melbourne's annual water use. In comparison, in 2017-18 Gippsland Water supplied towns (excluding industry) with 12.8 gigalitres of water. The estimated ongoing volume of water needed due to evaporation is dependent on the future climate change, though it is estimated to be around 5-7 gigalitres per year for each mine, under current conditions.

One of the main purposes of the Regional Water Study is to understand whether the supply of these sorts of volumes of water from surface water and groundwater sources is achievable once water ceases to be used for power generation, considering climate change and the needs of other water users and the environment.

The Latrobe Valley power stations have historically access around 100 gigalitres per year of surface water from the Latrobe River system for power generation, and the operations have extracted around 30 gigalitres per year of groundwater to maintain the stability of mine

voids. The Regional Water Study found that filling the mine voids with water would pose significant demands on the Latrobe River system.

It may, however, be feasible to fill the mine voids over a number of decades if filling is restricted or halted under dry and drought conditions in order to prevent impacts on water security, other water users, rivers, the Lower Latrobe wetlands and Gippsland Lakes.

Due to the likelihood of a drier climate, the volume of water available, timeframe and extent to which each mine could be filled with water is uncertain, as is the availability of water needed to make up for evaporation from a pit water body, if created.

## Planning for the future

The Latrobe Valley Regional Water Study will help determine if and how water might have a role in the future rehabilitation of the Latrobe Valley's coal mines once mining operations cease – to achieve a safe, stable and sustainable rehabilitation.

The Latrobe Valley has experienced mostly dry conditions since 1997. Under recent conditions or a potentially drier future climate, average water availability could be less than that needed to supply all environmental and consumptive demands as well as mine rehabilitation, should water be needed for that purpose.

This highlights the need to plan for continued dry conditions to ensure that the needs of other water users and the environment are protected.

The Latrobe Valley Regional Rehabilitation Strategy will help us plan for the future by providing guidance to mine operators for the transition to a safe, stable and sustainable landform for the Latrobe Valley when its three brown coal mines are closed. This guidance includes how water may be allocated and accessed in the Latrobe Valley if determined to be required for mine rehabilitation.

The guidance will need to ensure any access to a water supply for the rehabilitation of the mine voids can be adaptive, depending on future climate trends, well informed and subject to conditions that protect all water users and the environment in dry times.

If water is proven to be essential for safe and stable mine rehabilitation, the mines' rehabilitation and closure plans will need to demonstrate how water levels are to

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be maintained in perpetuity (accounting for evaporative loss). Conditions on water access for this purpose would apply that prevent or minimise impacts on other consumptive users, the environment, cultural and other values.

For more information visit [www.water.vic.gov.au/waterways-and-catchments/our-catchments/RWS/](http://www.water.vic.gov.au/waterways-and-catchments/our-catchments/RWS/) or contact the Latrobe Valley Regional Rehabilitation Strategy project team at [lvrrs@ecodev.vic.gov.au](mailto:lvrrs@ecodev.vic.gov.au)

## Other study findings

- The water quality of any pit waterbody, if created, would mainly be influenced by the water sources used to fill the voids.
- Acceptable water quality standards are therefore expected to be achievable by the mine operators, and any discharge would be regulated by the Victorian Environment Protection Authority.
- Minimum flow requirements in the Latrobe River need to be maintained to protect the highly valued Ramsar wetlands and other fringing environments of the lower Latrobe River and Lake Wellington and the Gippsland Lakes system.
- At this stage, no alternative sources of water were found to be feasible for mine rehabilitation, although this may change in the future.
- Groundwater pumping at the mine sites is needed to maintain stability and will need to be continued by the mine operators until a stable landform is achieved.

## For more information

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