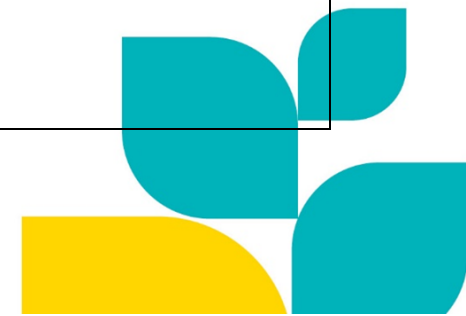


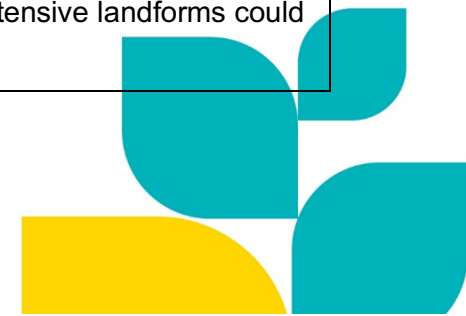
## Responses to Questions from MLRA Webinar: LVRRS Implementation Actions 1 and 3, 2 February 2021

The Department of Land, Water, Environment and Planning (DELWP) have prepared the following responses to the questions posed during the webinar, with the exception of questions denoted by (\*), which the MLRA prepared. Please note that the responses reflect the views of the individual responders and may not reflect wider viewpoints.

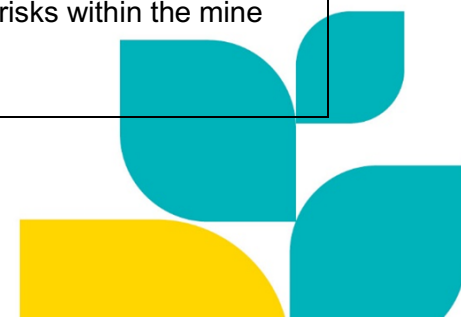
No.	Question	Answer
<b>Mine Rehabilitation</b>		
1	<b>If the mines pump the water, where does that water go to?</b>	Historically, the three mines extracted around 24 GL per year of groundwater to maintain the stability of the mine voids. Good quality groundwater was either stored on site for use in power station cooling towers or in Hazelwood cooling pond, or released into the Latrobe River system.
2(*)	<b>If there is a change in rehabilitation requirements who will pay the extra over cost on what was envisaged</b>	Under the current Mineral Resources (Sustainable Development) Act, the mine licensees are responsible for the costs associated with rehabilitation. Before the mining licence can be relinquished, each licensee must create a landform that is safe, stable and sustainable. Prior to relinquishment, the licensee is expected to provide a post-closure fund for the ongoing maintenance and monitoring costs once they have relinquished the licence. As such, it is in the interest of the licensee to create a sustainable landform with minimised ongoing maintenance requirements.
3	<b>How can the rehab strategy plan for increased variability in rainfall/runoff?</b>	Implementation Action 4 and 5 of the LVRRS are investigating climate resilient mine rehabilitation approaches including non-water based/ or less water-intensive mine rehabilitation options and the feasibility of climate-independent alternative water sources, such as recycled water. These actions are important to better understand how the risk of declining surface water and increased variability can be mitigated.



No.	Question	Answer																
<b>Water Fill Options</b>																		
4	I was led to believe last year that we would have to have the pits lakes half full at least to keep the pits stable - also they expected the pits to be at half in 15 years - is this not right now?’	<p>The three Latrobe Valley coal mines are scheduled to close as follows:</p> <table border="1"> <thead> <tr> <th>Mine</th> <th>Scheduled closure</th> <th>Volume needed to achieve weight balance</th> <th>Volume needed to fill to crest</th> </tr> </thead> <tbody> <tr> <td>Hazelwood</td> <td>Closed (2017)</td> <td>530 GL</td> <td>638 GL</td> </tr> <tr> <td>Yallourn</td> <td>2028</td> <td>0 GL</td> <td>725 GL</td> </tr> <tr> <td>Loy Yang</td> <td>2048</td> <td>1,111 GL</td> <td>1,418 GL</td> </tr> </tbody> </table> <p>The Latrobe Valley Regional Water Study stated that the Latrobe Valley’s brown coal mine voids may each take decades to fill. There is no set timeframe if a water-based mine rehabilitation approach was progressed. Given a likely drier climate, the volume of water available, as well as timeframes 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 the pit water bodies. If a water-based mine rehabilitation approach was progressed, an alternative water supply, such as recycled water could provide a more certain timeframe for mine rehabilitation. The community has expressed a desire to investigate rehabilitated landforms other than pit waterbodies. For these reasons, the LVRRS is also undertaking further studies to explore whether non-water based or less water-intensive landforms could be feasible.</p>	Mine	Scheduled closure	Volume needed to achieve weight balance	Volume needed to fill to crest	Hazelwood	Closed (2017)	530 GL	638 GL	Yallourn	2028	0 GL	725 GL	Loy Yang	2048	1,111 GL	1,418 GL
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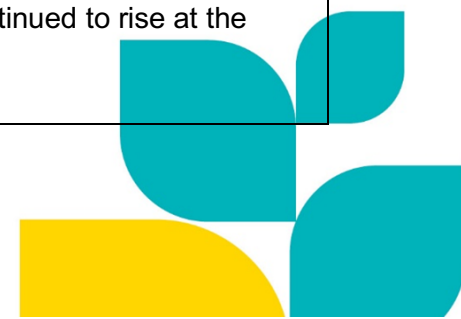
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5	<p><b>In the event where a full pit lake option is viable and has been achieved, do water availability prediction models indicate whether or not a full pit lake can be sustained?</b></p>	<p>The Latrobe Valley Regional Water Study found that the ongoing volume of water needed to maintain water levels in the mine voids to offset evaporation, should a water-based mine rehabilitation approach be taken for all three mines, is estimated to be around 15 GL per year, but could be higher depending on the future climate. This is more water than the volume supplied to all the towns across Central Gippsland combined. For comparison, the net usage of water supplied for power generation is 55 GL per year.</p> <p>The Regional Water Study found there are uncertainties associated with future water availability due to climate change and climate variability, and that mean annual water availability in the Latrobe River under a 'dry climate' scenario is projected to further decline to approximately 467 GL a year by 2050, and 334 GL by 2080. Under such a scenario, water from the Latrobe River system would not be available for mine rehabilitation because it would have unacceptable impacts on other existing entitlement holders and minimum environmental flows. Mine rehabilitation should plan for a drying climate. If water-based mine rehabilitation approach is progressed, water level in the mine void would need to be sustained from a source, other than the Latrobe River system, such as from a climate resilient alternative water source or possibly groundwater.</p> <p><i>(*)MLRA notes: Evaporative losses from lakes can be reduced through cover technologies such as floating solar, with the technology proven on coal mine pit lakes in China. Currently local energy operators, Energy Australia and AGL, are both investigating potential floating solar projects on existing water bodies at Yallourn and Loy Yang mines.</i></p>
6	<p><b>Considering the large amount of high-quality drinking water that the Victorian Desalination Plant at Wonthaggi can produce, are there options for it to produce a lesser quality of water that could be used for the pit lake options?</b></p>	<p>All water produced by the Victorian Desalination Project is allocated under bulk entitlements to the three Metropolitan water retailers for supply to Melbourne. Raw seawater or saline water may give rise to water-quality risks within the mine voids which must be considered.</p>



No.	Question	Answer
<b>Hazelwood</b>		
7(*)	<p><b>So we have been several years since closing Hazelwood and this seminar has told me there is</b>  <b>A) Climate change B) There are still no decisions about how the mine is being rehabilitated and considerations are going on?</b></p>	<p>ENGIE have been working on their proposed approach to rehabilitating Hazelwood for several years. This has involved a large number of studies for designing and demonstrating that their proposed approach is viable.</p> <p>Climate change has had a large impact on the way in which different stakeholders now think about the best way to rehabilitate a mine as it has raised significant questions over the viability of a pit lake as a final rehabilitated landform. For this reason further studies have been required to address climate change and to allow the best decision to be made. Rehabilitating the LV mines is not a simple issue and making sure that enough time is spent addressing and resolving the problems posed by a potential lack of water for rehabilitation is a key requirement for all stakeholders. As the solution that is eventually agreed will have state-wide significance for decades into the future, getting the solution right is worth the investment of time and effort now.</p>



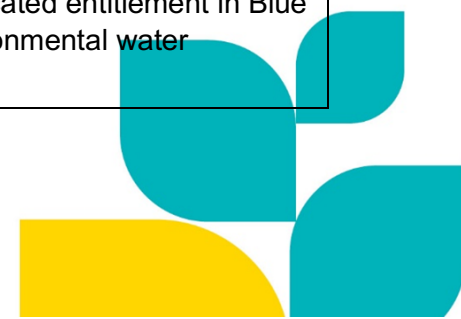
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8(*)	<b>Will we have access to the Pondage in the future?</b>	<p>Constructed in the 1960s as part of the power station complex, the Hazelwood pondage was used to circulate and cool water for reuse in the power station's thermal water cycle and as a source of water for mine operations. It was also a popular attraction for boating, fishing and swimming for many years. Hazelwood Power Station was closed in 2017 but the Pondage remained open for recreational access. The Hazelwood Pondage was permanently closed due to safety concerns on the 1 April 2019 by ENGIE, who are its owner and responsible for its ongoing management.</p> <p>The MLRA understands that ENGIE's current plans for the Pondage will not involve reopening it for public access to the water body. Furthermore, the Pondage is located outside the mine licence boundary for Hazelwood mine and is therefore subject to EPA regulation for remediation and future use and not within the purview of the MLRA or LVRRS. The groundwater currently released to the pondage will cease if approval to commence filling the Hazelwood mine void with groundwater is given.</p> <p>Lake Narracan and Blue Rock Lake are alternative lakes in the region available for recreational fishing, boating and other activities.</p>
<b>Climate change</b>		
9	<b>Has there been any notable effect on climate change yet by the closure of Hazelwood Power Station?</b>	<p>The Victorian Greenhouse Gas Emissions Report 2018 estimates that the net impact of Hazelwood's retirement was a reduction in Victoria's emissions of 11.8 mega tonnes of carbon dioxide equivalent — that's a reduction of over 20 per cent of the total greenhouse gas emissions from Victorian electricity generation at the time of Hazelwood's closure.</p> <p>Greenhouse gas levels in the atmosphere are a response to global emissions. Total greenhouse gas concentrations in the atmosphere have continued to rise at the global scale.</p>



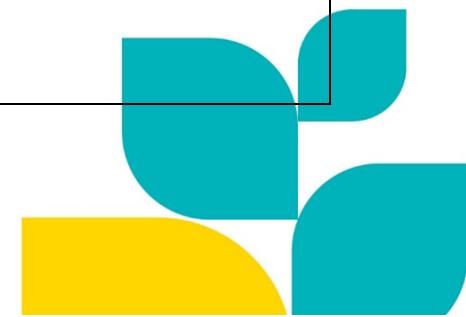
No.	Question	Answer
<b>Stream flow</b>		
10	<b>Significant reduction from 1995. Is there any other reason why stream flow could be affected eg diversion to dams?</b>	<p>Because our water is precious, DELWP measures and tracks it. Some of Victoria’s key streamflow gauging sites are upstream of major water diversions so we can be confident that the observed changes in streamflow since 1997 are driven by climate, not changes in how we manage our rivers. Climate conditions in Victoria have on average been much drier since 1997 than over the long-term.</p> <p>The Long-Term Water Resource Assessment for southern Victoria found that long-term surface water availability across southern Victoria has declined, with a possible step-change in average water availability from 1997 evident in most river systems.</p>
11	<b>There seems to be a definite change at 1997. Was there a change in how the rivers were managed at this point? E.g. change in pumping regulations.</b>	<p>The main cause of declines in surface water availability is drier conditions. The Long-Term Water Resource Assessment is available here: <a href="https://www.water.vic.gov.au/planning/long-term-assessments-and-strategies/lwra">https://www.water.vic.gov.au/planning/long-term-assessments-and-strategies/lwra</a></p> <p>DELWP does significant work to understand the impact of farm dams because farm dams can intercept large volumes of water before it reaches the rivers. Farm dams capture a relatively small proportion of the water in the Latrobe catchment, although there are local “hot spots” with high farm dam density. Land use change, such as new forestry plantations may also decrease the volume of run off to waterways.</p>
12	<b>How much does any changes in land use factor into reductions in streamflow?</b>	<p>Changes in land use can affect the volume of runoff reaching rivers. In the Latrobe catchment, there is large-scale changes to more water intensive activities, such as forestry plantations, that is likely to have contributed to declining streamflow, but climate is the major factor influencing change in streamflow.</p> <p>Given the uncertainties around each assessment method, the cumulative effects of each intercepting activity are difficult to quantify. The Long-Term Water Resource Assessment for southern Victoria found that the changes in land cover, runoff dams and licensed groundwater extractions are likely to have contributed to the reduction surface water availability seen in the Latrobe basin in recent decades. The Long-Term Water Resource Assessment is available here: <a href="https://www.water.vic.gov.au/planning/long-term-assessments-and-strategies/lwra">https://www.water.vic.gov.au/planning/long-term-assessments-and-strategies/lwra</a></p>



No.	Question	Answer
<b>Alternative water sources</b>		
13	<b>How does the Desalination plant impact on the overall strategy and what would the costs be of producing additional water from this facility?</b>	<p>As noted above, the water produced by the Victorian Desalination Plant located in Wonthaggi is fully allocated and contributes toward the security of water supplies to Greater Melbourne.</p> <p>Given the rate of population growth and drier conditions throughout southern Victoria, we expect all water from the Desalination Plant to be fully used to meet urban water supply needs in the coming years. No pipeline exists connecting the Victorian Desalination Plant to the Latrobe Valley. Nevertheless, production of additional desalinated water and its distribution is a climate independent, but costly, alternative water supply.</p>
14	<b>Has consideration been given to capturing steam in cooling towers?</b>	<p>This option was raised through a process of identifying potential alternative sources of water and has been included along with a range of other options as part of a long-list. There is currently not enough information available about whether this would be a feasible option and this water source would only be available while the power stations are operational, which also is a consideration.</p> <p>This does not preclude the capturing of steam from cooling towers to be progressed by others, including through the Integrated Mines Research Group which forms part of LVRRS Implementation Action 6. This group identifies and investigates opportunities to bridge rehabilitation knowledge gaps. The Department of Jobs Precincts and Regions is committed to supporting this group with oversight from the Mine Land Rehabilitation Authority.</p> <p>This water source would only be available while the power stations are operational.</p>
15	<b>Has there been an increase in water licences granted/ irrigation and/or water taken from the rivers by third parties over the last 20 years?</b>	<p>The volume of entitlements has been capped at least since 2004, when Our Water Our Future policy capped many surface water basins across southern Victoria. So there has not been any large increase in water allocations and use, although there has been changes in entitlements. For example, the unallocated entitlement in Blue Rock reservoir was reshaped into drought reserve, an environmental water entitlement and some additional water for consumptive use.</p>



No.	Question	Answer
16	<b>Should landowners using water from a waterway under section 51 water licence also have a licence to operate works under section 67?</b>	A licence to construct works (section 67 licence) and/or a licence to operate works (section 67) licence may be required in combination with a licence to extract and use surface water (section 51 licence). Contact Southern Rural Water for further information or to discuss your specific circumstances.
17	<b>What's the decrease in water for power generation following closure of Hazelwood?</b>	Since 2005-06, the Latrobe Valley power stations have used, on average, around 78 GL per year of surface water from the Latrobe River system for power generation, and mine operations have extracted around 28 GL per year of groundwater to maintain the stability of the coal mine voids during mining activities. (23 GL year of water used is later returned to the Latrobe River system.) Gippsland Water historically supplied water to Hazelwood for power generation, and is one of several water sources for the power generators in the Latrobe Valley. While the volumes supplied to individual customers are commercial in confidence, Gippsland Water supplied 40.6 GL all up to all its major customers from Moondarra Reservoir in 2015/16 – the last year that Hazelwood was fully operational. In contrast, Gippsland Water provided 26.7 GL all up to its major customers in the Latrobe system during 2019/20 - since 2015/16 there has been various changes to the major customer demands.
<b>Recycled water</b>		
18	<b>Will the overall water strategy from Geelong to East Gippsland include Melbourne using recycled water as a drinking water source?</b>	The Central and Gippsland Region Sustainable Water Strategy will plan for all water needs across the region and will consider fit for purpose uses of different sources of water. Drinking recycled water is not Government policy.





No.	Question	Answer
<b>Water allocation</b>		
19	<b>There has been a summary of what water is used. There has been nothing mentioned regarding the water allocation that was put aside for the proposed site for further power generation sites (3 and 4). how does this non used allocation play into this plan?</b>	In 1996, the Latrobe Loy Yang 3-4 Bench bulk entitlement allocated 25 GL per year of water to meet future power generation needs. DELWP is working to understand how water is shared and emerging demands for water across the Gippsland and Central Region area. The Gippsland and Central Region Sustainable Water Strategy is concerned with long-term water security, including in the Latrobe Valley, for all users.
20	<b>How much water does Australian Paper at Maryvale use and where do they get their water from?</b>	Gippsland Water supplies raw water to the Opal Maryvale mill and other major customers from the Moondarra Reservoir, which is supported by transfers from the Blue Rock Reservoir. While the individual amounts are commercial in confidence, Gippsland Water supplied 26.7 GL all up to major customers in 2019/20.
	<b>And where does the water factory water go after it has treated water from Australian Paper?</b>	It's ultimately discharged to Bass Strait, via the Regional Outfall System.
<b>Groundwater</b>		
21	<b>Why couldn't you do both? Provide access to surface and groundwater when available and do 'something else' the same time?</b>	Ultimately, mine rehabilitation might be best achieved by a mix of solutions, rather than a single "magic bullet". DELWP — in collaboration with DJPR and the mine operators/electricity generators — is also further assessing the feasibility of using alternative water sources for mine rehabilitation in the Latrobe Valley. It's possible that water-based mine rehabilitation solutions may eventually be implemented that draw on a variety of water sources. Potential alternative rehabilitation options that do not involve filling the mines partially or fully with water are also being investigated, however, these will only be viable if a safe and stable landform can be achieved.



No.	Question	Answer
22	<b>Groundwater pressures have been in long term decline in the aquifers around the mines. Can the presenters comment on how this aligns with the definition of 'sustainable 'in the future strategy?</b>	<p>The mines' groundwater entitlements are currently used for depressurisation of the surrounding aquifers to minimise safety and stability risks of the coal mine void and, while in operation, to facilitate mining to supply coal for power generation and a secure electricity supply for Victorian communities. Unless stability risks are controlled differently in the future, through appropriate rehabilitation landform design, groundwater pumping will need to continue in perpetuity. The stability risks and sustainability of the future use of groundwater by mine licensees on aquifer pressures will be considered in the decision-making processes for future groundwater entitlements.</p> <p>The Latrobe Valley Regional Groundwater Management Committee oversees monitoring and reporting of regional subsidence, and projection of potential future subsidence. The results from this program indicate that subsidence in the Latrobe Valley from the 1950s to date has been generally gradual (both spatially and temporally), and the impacts to the built and natural environment have been manageable.</p>
23	<b>Is the ground and water allocation apart of the 75GI?</b>	<p>Historically, Latrobe Valley power stations have used, on average, 78 GL/year of water from the Latrobe River and released around 23 GL/year back to the system as return flows. In addition, 24GL per year of groundwater has historically been taken, on average, by the three coal mines to reduce the aquifer pressure and maintain the stability of the mine voids.</p>
<b>Flooding</b>		
24	<b>It has been seen before that under flood situations that we have a lot of flow through the like of the Morwell river. What consideration has been put to using these sites as flood mitigation storages/sites?</b>	<p>Floods are naturally occurring and a necessary part of the Latrobe region's environment cycle. Studies have determined the Ramsar-listed wetlands on the lower Latrobe River, and floodplains along the river require a dynamic water cycle, including flooding, to stay healthy.</p>

