



**HUNTER VALLEY
OPERATIONS**



HUNTER VALLEY OPERATIONS CONTINUATION PROJECT

AMENDMENT REPORT
AUGUST 2025



HVO Continuation Project

Amendment Report

HV Operations Pty Ltd

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August 2025

Version	Date	Prepared by	Reviewed by	Comments
V1	5 August 2025	Samantha Hayes / James Wearne	Brett McLennan	Final

Approved by



Nicole Armit

Director
NSW Registered Environmental Assessment Practitioner (REAP) R80025
5 August 2025

Level 3 175 Scott Street
Newcastle NSW 2300
ABN: 28 141 736 558

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ABN: 28 141 736 558

Executive Summary

ES1 Background

Hunter Valley Operations (HVO) is a well-established multi-pit open cut coal mining complex in the Hunter Valley of NSW, comprising two mine sites separated by the Hunter River, HVO North and HVO South. HVO is owned by subsidiary companies of Yancoal and Glencore, as participants in the unincorporated HVO JV. HV Operations Pty Ltd is the appointed manager of the JV.

HVO North operates under Development Consent DA 450-10-2003 which was granted in 2004 and allows extraction of up to 22 million tonnes per annum (Mtpa) of run of-mine (ROM) coal until 31 December 2026. HVO South operates under Project Approval (PA) 06_0261 which was granted in 2009 and allows extraction of up to 20 Mtpa of ROM coal until 24 March 2030.

HV Operations Pty Ltd is seeking approval for the HVO Continuation Project (the Project) from the NSW Minister for Planning and Public Spaces, or delegate, under the provisions of Part 4 of EP&A Act and from the Federal Minister for the Environment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Project broadly comprises the continuation of mining at HVO North and HVO South, beyond the current approved mining completion dates of 2026 and 2030 respectively. Given that the two mine sites operate as one complex, one environmental impact statement (EIS, EMM 2022a) was prepared to support the two State significant development (SSD) applications for the Project, being SSD-11826681 (HVO North Open Cut Coal Continuation Project) and SSD-11826621 (HVO South Open Cut Coal Continuation Project).

Following the public exhibition of the EIS and receipt of submissions on the Project, HV Operations Pty Ltd completed a detailed review of the Project and is subsequently seeking to amend the SSD applications for the Project, as detailed in this Amendment Report, which includes, amongst other things, the removal of coal extraction in gas Domain 1 – herein referred to as the amended Project.

ES2 Amendment overview

HVO is seeking to amend the two SSD applications in the following ways:

- Reduce the project mine plan to avoid coal extraction within gas Domain 1 at HVO North and reduce the total ROM coal to be extracted by the amended Project by approximately 220 Mt.
- Maintain the current approved maximum annual ROM coal production from HVO North of 22 Mtpa but reduce the proposed maximum annual production limit at HVO South from 18 Mtpa (as proposed by the original Project) to 13 Mtpa.
- Propose a maximum annual production limit for the HVO Complex of 26 Mtpa ROM coal, compared to the current approved maximum annual production of 42 Mtpa.
- Reduce the proposed life of mining operations at HVO North by five years, from the end of 2050, as proposed by the original Project, to the end of 2045.
- Reduce the proposed life of mining operations at HVO South by three years from the end of 2045, as proposed by the original Project, to the end of 2042.
- Expand the HVO North ROM coal stockpile to improve coal management.
- Remove approval for the construction and operation of the LCPP and associated rail facilities, which is currently approved, but not constructed, under the HVO South Project Approval. This approval was proposed to be maintained by the original Project.

- Temporary transport of product coal by truck from the Howick CPP to the Liddell stockpile for transport to market via the Liddell coal handling and train loading facilities during upgrades of the Newdell LP.
- Establishment of a levee (Mitchell East levee) to provide flood protection for the final void in Mitchell Pit.
- Minor alterations to disturbance boundaries to accommodate construction activities such as Lemington Road and electricity transmission lines.

The key elements for which approval is now sought are summarised below for HVO North and HVO South.

ES2.1 HVO North

The key amended Project elements at HVO North for which approval is sought include those activities required to carry out open cut coal mining and processing and include:

- changes to the HVO North development consent boundary
- continuation of mining operations at HVO North until 31 December 2045
- production of up to 22 Mtpa with no separation of extraction limits between West Pit and Carrington Pit
- infrastructure upgrades, as listed below:
 - realignment of Lemington Road and construction of a new bridge over the Hunter River
 - relocation of the HVO North site access road off the existing Lemington Road
 - increase in the capacity of Parnells Dam from approximately 1 gigalitre (GL) to approximately 4 GL
 - realignment of transmission and telecommunication lines that are currently within the proposed mining area
 - upgrades to the HVO North MIA
 - expansion of the HVO North ROM coal stockpile to improve coal management
 - maintenance and ancillary activities as required to facilitate operations, including the replacement of plant and equipment, where required
 - construction of access roads to facilitate service provider access
 - use of demountable/temporary buildings and other ancillary temporary facilities to enable construction activities and mining operations, as required
 - access road establishment to an existing mine-owned property east of realigned Lemington Road
- transport product coal by truck or overland conveyor from all CPPs to loading points (HVLN and Newdell LP)
- receipt of ROM coal from HVO South via internal haul roads for processing at all CPP facilities approved for HVO North
- management of tailings in accordance with a Tailings Management Strategy
- upgrade of product coal infrastructure as follows:

- establishment of a new Newdell product stockpile and upgrade of the existing Newdell train loading facility or an extension of the product coal stockpile footprint at the HVLP to increase the total stockpile capacity of the load point
- construction of a haul road to enable ROM coal to be transported to the neighbouring Ravensworth Operations ROM pad via haul truck for processing, from where product coal is then transferred to the Ravensworth Coal Terminal for transport to market
- ability to temporarily transport product coal by truck from the Howick CPP to the Liddell stockpile for transport to market via the Liddell coal handling and train loading facilities during upgrades of the Newdell LP
- implementation of a revised water management system including construction of levees, clean water diversions and the Carrington West Wing low permeability barrier wall
- establishment of Mitchell East Levee to provide flood protection for the final void in Mitchell Pit
- continued employment of up to 1,500 full time equivalents (FTE) across the HVO Complex.

Other than as modified above, all activities that are currently approved under the existing HVO North development consent are intended to continue. Key aspects and outcomes of the approved development at HVO North (under DA 450-10-2003 as modified) that will remain the same under the Project include:

- the maximum allowable annual ROM coal extraction and processing rate of 22 Mtpa
- receipt of ROM coal from HVO South via internal haul road for processing at all CPP facilities approved for HVO North
- approved heights of overburden emplacement areas
- continued avoidance of the Aboriginal heritage site known as Carrington Mine – Colluvial Deposit 1 (CM-CD1)
- operating hours, annual workforce numbers and associated operational traffic generation.

ES2.2 HVO South

The key amended Project elements at HVO South for which approval is sought include those activities required to carry out open cut coal mining and processing and include:

- changes to the HVO South development consent boundary
- continuation of mining operations at HVO South until 31 December 2042
- a reduction in the approved maximum extraction rate from 20 Mtpa to 13 Mtpa
- removal of coal extraction from the mine plan for the Riverview South East Extension, and South Lemington Pit 1 and 2
- infrastructure upgrades including:
 - relocation of some 11 kV and 66 kV Ausgrid transmission lines
 - realignment of internal transmission lines to support mining activities

- HVO South access road relocation to join the realigned Lemington Road
- access roads to facilitate service provider access
- use of demountable/temporary buildings and other ancillary temporary facilities including laydown areas to enable construction activities and mining operations, as required
- removal of the approval for the construction and operation of the LCPP and rail facilities
- removal of the construction and operation of the approved conveyor from HVO South to the HVCPP at HVO North (the conveyor has not been constructed)
- continuation of integrated water management with HVO North and water transfers with other mining operations (where permitted under the development consents that apply to those other mining operations)
- construction of the Cheshunt and Riverview flood protection levees
- enlargement of Lake James from approximately 0.7 GL to 1.9 GL
- continued employment of up to 1,500 FTE across the HVO Complex.

Other than as modified above, all activities that are currently approved under the existing HVO South development consent are intended to continue. Key aspects of the currently approved development at HVO South (under PA 06_0261 as modified) that will remain the same for the Project include:

- no change to the receipt of HVO South coal at all CPPs approved for HVO North via internal haul road for processing
- no change to operating hours
- no change in annual workforce numbers or associated operational traffic generation
- no increase to approved heights of overburden emplacement areas.

ES3 Strategic context and Project need

Operations first commenced at HVO over 75 years ago, in 1949. Since its inception HVO has been, and continues to be, an important contributor to the Hunter Valley and NSW economy, producing high quality thermal and semi soft coking coal suitable for use in international and domestic markets. Significant coal resources remain across the HVO Complex beyond what is currently approved for extraction.

Consideration of the Project's need in the context of international and domestic coal markets are discussed further below.

ES3.1 Market need

The *World Energy Outlook* (WEO 2024) notes that continued investment in fossil fuels is essential and that whilst global coal demand is set to fall within the next few years, strong demand will remain for coal in the power sector out to 2050.

Current national and NSW policy recognises the ongoing demand for coal, particularly in the Asian export market and its importance to the NSW and Australian economy (IPC 2022a, and IPC 2022b). The current strategic direction relating to coal seeks to continue exploration, extraction and export (IPC 2022a, and IPC 2022b).

In NSW, the State government's Strategic Statement on Coal Exploration and Mining in NSW (strategic statement) recognises that mining will continue to be an important part of the State economy into the future. The strategic statement notes that coal remains a critical energy source globally, supplying over a third of all electricity, and predicts the global demand for thermal coal will remain strong to 2050.

The need for coal from the amended Project is driven by global energy demand, largely from developing Asian countries, and the lack of investment in new sources of supply of coal. It is clear that there is a short-term challenge of resolving the energy crisis as well as the longer-term challenge of an orderly transition to a low emission future. This transition is not linear or uniform across geographies and time and coal continues to have a role in meeting global energy needs.

ES3.2 Domestic context

The strategic statement indicates the balanced approach the NSW Government will take in relation to the future of coal mining in the State by setting a clear and consistent policy framework that supports investment certainty, so that the NSW coal sector can satisfy long-term global demand for coal, while giving NSW coal-reliant communities time to adapt to a low carbon future. The Project is consistent with the objectives and direction of the strategic statement supporting responsible coal mining in areas deemed suitable for mining, reducing impacts and supporting the diversification of the regional Hunter economy.

The Commonwealth Government's *Climate Change Act 2022* (Climate Change Act) commenced on 14 September 2022, which enshrines Australia's commitments under the Paris Agreement to reduce Australia's national greenhouse gas (GHG) emissions. The life of the Project (2042 at HVO South and 2045 at HVO North) is consistent with the assumptions which underpin the Commonwealth Government's commitment to net zero emissions by 2050.

HVO is a designated large facility under the *National Greenhouse and Energy Reporting Act 2007* and is, therefore, subject to carbon regulation in the form of the Safeguard Mechanism. HVO also proposes to implement measures that go beyond its Safeguard Mechanism obligations, committing to additional, voluntary contributions towards the NSW emission-reduction targets to reflect consideration of the *Climate Change (Net Zero Future) Act 2023* (NZF Act).

ES3.3 Project objectives and benefits

The primary objective of the Project is to efficiently and economically recover an additional approximate 430 Mt of ROM coal resources, over approximately 19 years, which are within existing mining tenements and predominantly within existing and approved disturbance areas across the HVO Complex while maximising the utilisation of existing infrastructure. Extensive investigations have been undertaken into a long-term plan for the complex beyond the approved mine life to achieve increased recovery of the remaining coal resources while balancing social, environmental, and economic outcomes.

The amended Project will:

- enable the continuation of a brownfield mining complex in a long-established coal mining and power generation precinct
- maximise resource recovery by mining to the deeper Barrett seam in HVO North, within environmental constraints and existing mining tenements and minimising further disturbance
- provide ongoing employment opportunities for the existing approximate 1,500 full time equivalent (FTE) workforce well beyond the life of the current planning approvals under which the complex currently operates, which will become increasingly important as the local and regional Hunter Valley economy continues to diversify beyond coal

- provide improvements in terms of reliability and accessibility of Lemington Road through periods of heavy rainfall through the realignment of the road, which will include the construction of a new bridge over the Hunter River
- provide the opportunity to contemporise the HVO final landform by incorporating natural landform design principles. Areas disturbed by mining activities as a result of the Project will reflect a landform that is sympathetic to the surrounding landscape
- reduce the area at HVO South approved for coal extraction, which in turn will reduce the impact of the Project on the Central Hunter Grey Box – Ironbark endangered ecological community (EEC) compared to that approved at HVO South, namely in South Lemington Pit 1, South Lemington Pit 2 and the Riverview South East Extension
- continue the ongoing contribution to the local, regional, and State economies from a well-established mining operation.

Further, the Project will contribute to meeting the ongoing demand for high quality thermal and semi-soft coal throughout a period in which there is expected to be a gradual decline of coal mining in the Hunter region, giving local communities time to adapt. The current geopolitical landscape and emerging energy crisis has led to governments placing a heightened priority on energy security, which is contributing to the continued demand for coal.

ES4 Environmental, social and economic implications

A summary of the environmental, social and economic impacts of the amended Project, and the key management measures proposed, is provided in Table ES1.

Table ES1 **Summary of key assessment outcomes and proposed measures**

Technical matter	Key assessment outcomes and proposed measures
Greenhouse gas	Measures to minimise or mitigate Scope 1 and Scope 2 GHG emissions have been considered throughout the development and assessment of the Project. The amended Project significantly reduces the estimated scope 1 emissions by 43% compared to the original Project as presented in the Submissions Report (EMM 2023a). The estimated annual average Scope 1 and 2 emissions from the Project are 806.3 kt CO₂-e, and annual average Scope 3 emissions are estimated to be 41,777 kt CO₂-e. HVO will continue to manage its contribution to Australian greenhouse gas (GHG) emissions inventories through reporting under the <i>National Greenhouse and Energy Reporting Act 2007</i> (NGER Act), as well as other government initiatives implemented to manage emissions at a national level. As a designated large facility under the NGER Act, the Safeguard Mechanism applies to HVO, and therefore ongoing operations at HVO will be subject to the emissions reduction requirements that are contained within it. HVO will also make additional, voluntary contribution towards the NSW emission-reduction targets to reflect consideration of the NZF Act. In effect, HVO will implement a net emissions decline rate for the amended Project that is more ambitious than the Safeguard Mechanism requirements, involving: • a reduction of 5.9% per year from 1 July 2023 to 1 July 2029 • a reduction of 4.0% per year from 1 July 2030 to 1 July 2034 • a reduction of 2.58% per year thereafter. The amended Project would be a relatively small contributor to GHG emissions in NSW. For example, for net emissions under the combined Safeguard Mechanism and NSW decline trajectory, it would represent between 0.25% and 0.81% (depending on the year) of state-wide emissions in the NSW current policy case. The HVO thermal product is high quality, high energy bituminous coal suitable for high efficiency power generation. Should this high-quality coal not be available for export, markets will turn to alternative sources which may include lower quality sub-bituminous and even lignite (brown coal) from Indonesia or India. HVO is committed to the ongoing consideration of reasonable and economically feasible technologies as they become available and will review technologies throughout the life of the mine to improve efficiencies and reduce emissions.
Air quality	The amended Project is unlikely to affect air quality beyond the range of historically measured fluctuations of key air quality indicators around the region. In addition, it poses a lower air quality risk than the original Project as presented in the EIS (EMM 2022a), due largely to the significantly (approximately 23%) lower quantities of material to be moved in each year. Compliance with cumulative annual average PM₁₀ and PM_{2.5} and deposited dust air quality criteria is expected to be achieved at all sensitive receptors that are not already subject to existing acquisition rights from HVO or other surrounding mines, apart from one receptor (121). It is anticipated this receptor will therefore be entitled to voluntary acquisition rights, as outlined in the <i>Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments</i> (VLAMP). Notably, the contribution of the Project to annual average PM concentrations at the nearest local communities is predicted to be low. Cumulative 24-hour PM₁₀ concentrations may continue to exceed air quality criteria from time-to-time; however, these events are predicted to be within the range of historically measured days above the criteria, excluding extraordinary events. Predicted TSP and deposited dust concentrations comply with the relevant air quality criteria. HVO will continue to implement best practice air quality management measures including proactive management of operations to minimise impacts in adverse conditions. HVO currently operates a near neighbour amenity resource program, which is a voluntary commitment to offer water tank cleaning or supply of water filters to neighbours that request such a service. HVO proposes to replace this program with a more structured program whereby private residences within 4 km of the proposed mining area will be eligible for tank inspections, cleaning and installation of first flush filter systems for residential water tanks and domestic taps.

Technical matter	Key assessment outcomes and proposed measures
Noise	Some changes in predicted residual noise impacts are associated with the amended Project when compared to the noise impacts of the original Project, and are a result of revised mine plans, including changes to pit progression, fleet composition, and project duration. These operational changes have altered the distribution of noise but not the overall approach to its management or overall conclusions of the noise impact assessment regarding the acceptability of noise impacts of the original Project. Development of the amended Project design has been an iterative one undertaken in conjunction with the noise assessment, in which all reasonable and feasible mitigation measures have been considered in accordance with the NSW Government's <i>Noise Policy for Industry</i> (NPfI) to minimise noise impacts on sensitive receptors. These measures include progressive attenuation of the mining fleet, haul route selection to minimise exposure of significant noise generating mobile fleet, construction of a roadside bund on the exposed side of the haul road from the Mitchell Pit towards the Howick CPP, and equipment shutdowns during enhancing meteorological conditions. With all of these measures considered, achievable noise levels have been developed for HVO in accordance with the NPfI, which are proposed as the noise criteria for the amended Project. This assessment found that 13 receptors will be entitled to voluntary mitigation rights based on predicted marginal residual noise impacts associated with the amended Project, eight of which already have existing rights under existing HVO approvals. In addition, there are 17 receptors in the village of Jerrys Plains where marginal noise impacts are predicted; however, they do not qualify for mitigation as per Section 4.2 of the NPfI. Further, 12 receptors that already have mitigation rights in accordance with the HVO South project approval are not predicted to experience noise levels such that they would be entitled to voluntary mitigation rights for the amended Project; however, HVO proposes to retain mitigation rights for these receptors. Construction noise predictions are below the 'noise affected level' for all other sensitive receptors around HVO. Some sensitive receptors in Maison Dieu may experience noise levels that are higher than the 'noise affected' management level, but well below the 'highly noise affected' management level, as specified in the <i>Interim Construction Noise Guideline</i> (EPA 2009). No significant road traffic noise impacts during operation or construction are predicted for the amended Project.
Biodiversity	The amended Project does not result in significant changes to the additional disturbance areas from those presented in the Biodiversity Development Assessment Report (BDAR) (Umwelt 2023) which was submitted as part of the HVO North Amendment Report. However, the extension of the Project's assessment beyond 2024 has resulted in the requirement to address biodiversity data currency as per the requirements of Section 3.4 of the <i>Biodiversity Assessment Method (BAM) Operational Manual – Stage 1</i> (DPIE 2020). A revised BDAR (refer to Appendix H) presents the additional surveys completed over the amended Project's additional disturbance areas required for the amended Project (being largely the same as for the original Project) since the completion of the November 2023 BDAR (Umwelt 2023). Previous avoidance and minimisation strategies adopted for the original Project and the HVO North Amendment Report that have been implemented include refinement of the Lemington Road realignment to avoid Warkworth Sands Woodland EEC, careful consideration of proposed transmission easement alignment and habitat retention following decommissioning of existing transmission lines. In addition, the amended Project no longer seeks to maintain approval for the construction and operation of the LCPP and associated rail facilities, which is currently approved, but not constructed, under the HVO South Project Approval. This means that the amended Project avoids all direct impacts to the Warkworth Sands Woodland EEC, reducing the total direct impact of the Project on this community from 0.3 ha presented in the HVO North Amendment Report, to 0 ha (noting the original Project proposed to directly impact 5.2 ha of Warkworth Sands Woodland EEC). After accounting for the implementation of avoidance and minimisation measures, the Project will remove 179.2 ha of native vegetation (as defined by the <i>Biodiversity Assessment Method</i> (DPIE 2020)) which meets the offsetting threshold under the Biodiversity Offset Scheme (BOS). Of this, 86.8 ha conforms to Threatened Ecological Communities (TECs) under the <i>Biodiversity Conservation Act 2016</i> (BC Act) (84.5 ha in HVO North and 2.3 ha in HVO South). An assessment was undertaken to identify the biodiversity credits required to offset the impacts of the Project. A biodiversity offset strategy that appropriately compensates for the unavoidable loss of ecological values as a result of the amended Project will be developed in consultation with DPHI and CPHR and will be implemented prior to clearing occurring and in accordance with the process outlined in the BC Act.

Technical matter	Key assessment outcomes and proposed measures
Water resources	The modelling and assessments show the amended Project can operate within and meet the requirements of the water regulatory framework, consistent with the original Project. The impact on water resources associated with the approved Project is predicted to be mostly consistent with, or less than, that associated with the original Project, largely due to not progressing as close to the Hunter River, or as deep in the Carrington West Wing area. A summary of key findings are as follows. The amended Project will result in minimal to no changes to the annual flow and average duration of dry periods for Hunter River and most of its tributaries. There will be a positive impact on Hunter River streamflow when compared to approved operations and the original Project due to an increase in surface water catchment to the Hunter River. The duration of dry days in Wollombi Brook is predicted to be less for the amended Project than currently occurs as a result of the approved operations. The water quality of the Hunter River is also expected to remain within the existing range observed in the Hunter River with no significant adverse impacts due to the amended Project. The proposed Lemington Road realignment and new Hunter River bridge crossing will significantly improve the flood immunity of this road as it crosses the Hunter River. Flood modelling indicates potential impacts to third-party properties will be minor. Relative to baseline conditions these changes result in negligible changes to flood affected areas and will not have an impact on the use of the land. The proposed change to mining at HVO South will result in less groundwater drawdown in the Wollombi Brook alluvium in comparison to the approved operations, through the removal of mining in the South Lemington Pit 1 and 2 area from the mine plan. At HVO North, as mining will mainly be progressing deeper through previously disturbed or currently approved mining areas, the incremental drawdown effects of the amended Project on groundwater are expected to be minor. No incremental drawdown is predicted in the Hunter River alluvium due to the amended Project. This is a positive impact in comparison to the original Project. Less than 0.5 m incremental drawdown is predicted in a small area north of the Carrington Billabong, and up to 0.2 m at mapped river red gum stands. The area of predicted incremental drawdown (defined by the 0.2 m contour) is smaller than that predicted for the original Project, due to the amended mine plan not progressing as close the Hunter River or as deep. The alluvium along the main channel of the Hunter River is largely buffered from drawdown by low permeability groundwater barriers installed along sections of the aquifer. To limit seepage potential between emplaced spoil and alluvial sediments, a low permeability barrier wall (LPBW) will be constructed prior to undertaking mining operations within 100 metres of the remnant western arm of the Hunter River paleochannel in connection to the Hunter River. The barrier wall will be designed to meet the current development consent requirement of a permeability of 1×10^{-8} metres per second. Modelling indicates there are no known privately owned water supply bores situated within the zone where drawdown is predicted to exceed the <i>Aquifer Interference Policy</i> (NOW 2012) threshold for minimal impact of 2 m. No impacts are predicted on the aquatic ecology of the Hunter River, particularly as flow will be mitigated through regulated releases from Glenbawn Dam, and only minor impacts to the aquatic ecology in the tributaries to the Hunter River are predicted. The final voids are anticipated to remain long-term sinks (i.e. no discharge) with sufficient freeboard maintained under all modelled scenarios. Three voids will remain in the final landform for the amended Project, compared to two for the original Project. HVO holds considerable water entitlement in the relevant surface water and groundwater sources in the Project area, which is sufficient to account for the predicted direct and indirect takes in most water sources. HVO has identified a water licensing strategy, demonstrating a suitable pathway for securing additional entitlement that may be needed during operations and during closure.

Technical matter	Key assessment outcomes and proposed measures
Aboriginal cultural heritage	A comprehensive Aboriginal Cultural Heritage Assessment (ACHA) was completed for the original Project in consultation with 33 Registered Aboriginal Parties (RAPs). The amended Project will result in limited changes to potential impacts previously outlined in the ACHA for the original Project (EMM 2022c) and ACHA addendum (EMM 2023c). Overall, the changes result in the removal of six Aboriginal objects and sites from the proposed disturbance activities and therefore will be avoided by the amended Project. These are all sites of low significance and considered part of the broader background scatter across the assessment area. The proposed impacts, avoidance and mitigation measures of the 27 high and moderate significant sites within the Project's assessment area, as outlined in ACHA addendum (EMM 2023c), would remain unchanged as a result of the amended Project. The amended Project will have an adverse impact on: • two sites assessed as having high significance (artefact scatters with archaeological deposits within the Lemington Road alignment) • 10 sites assessed as having moderate significance • 187 sites assessed as having low/low-moderate significance. The existing Aboriginal Cultural Heritage Management Plans will be revised for the amended Project and consolidated in consultation with the RAPs and Heritage NSW, to guide the mitigation and management of sites in the Project area and to avoid inadvertent impacts. HVO has also committed to meaningful social mitigation of Aboriginal cultural heritage impacts of the Project through a number of initiatives identified in consultation with RAPs, including job readiness programs, assistance relating to tendering for work at HVO by Aboriginal suppliers, and a commitment of \$1,000,000 over the first 10 years of the Project for funding programs that align with Closing the Gap initiatives. The Social Impact Management Plan proposed to be developed for the amended Project will further develop these initiatives and outline the proposed implementation plan.
Social	No new impacts or benefits were identified by the SIA for the amended Project, which concluded that the proposed amendments will not materially change the impacts and benefits assessed in the EIS (EMM 2022a) and the HVO North Amendment Report (EMM 2023b). All impacts and benefits remain unchanged for the amended Project, except for traffic, which went from a medium risk to low. This is due to the removal of the construction of the LCPP and associated rail facilities as part of the amended Project, and therefore the avoidance of all traffic associated with its construction. Consistent with the original Project, the impacts and benefits associated with the amended Project are likely to be experienced most acutely by those people who live nearby; however, they also extend throughout the broader region. No mitigated social impacts rated as a high risk have been identified for the amended Project, with all potential impacts ranked as medium or low. The key social impacts identified relate to the continued generation of dust and noise associated with ongoing operations, traffic congestion during construction activities, and issues relating to pest and land management. A number of social benefits have also been identified with a very high or high benefit rating, including the realignment of Lemington Road and the improved, safer road conditions and accessibility this will deliver to the community, ongoing employment and stability of the local population, continued royalty payments to the State government, ongoing provision of community grants, improved rehabilitation outcomes, continuation of procurement opportunities for local businesses, and the benefit of allowing more time for transition planning in the Hunter Valley through the ongoing provision of jobs and flow on benefits. Consistent with the original Project, key measures to mitigate the potential social impacts include the implementation of a tank inspection and cleaning program, for which all private residences within 4 km of the proposed mining area will be eligible. This program will include the installation of first flush filter systems for residential water tanks and domestic taps. Several Aboriginal social mitigation measures have also been identified in consultation with RAPs relating to a number of Closing the Gap themes. HVO will develop a funding framework to enable funding of programs and projects that align with Closing the Gap initiatives, to the value of \$1,000,000 over the first 10 years of the Project. These mitigation measures, including the funding framework described, will be detailed in a SIMP, which will be developed for the amended Project.

Technical matter	Key assessment outcomes and proposed measures
Economics	The results of the economic impact assessment (EY 2025) indicate that overall, the amended Project is expected to generate significant net benefits and is also expected to generate increased economic activity and employment within NSW and the local region. The estimated net benefit of the amended Project is \$5,692.4 million in NPV terms, which is a reduction of \$2,143.8 million from the net benefit of the original Project of \$7,836.2 million as reported in EY (2024). This is predominantly due to the reduction in ROM coal to be mined and market coal sold arising from the amended Project. Notwithstanding this, a net benefit of \$5,692.4 million remains significant. The amended Project is also expected to deliver a net benefit to the Lower Hunter Region of \$1,778.1 million in NPV terms. This is a reduction of \$403.76 million compared to an estimated net benefit of \$2,181.8 million associated with the original Project (EY 2024). Given the significant net benefits of the amended Project, the amended Project is desirable and justified from an economic efficiency perspective.
Rehabilitation and closure	Consistent with the original Project, the amended Project will provide the opportunity to contemporise the HVO final landform by incorporating natural landform design principles. Areas disturbed by mining activities as a result of the amended Project will reflect a landform that is safe and stable and sympathetic to the surrounding landscape. The proportion of land rehabilitated to native ecosystem will be greater than previously proposed due to the adoption of revised geomorphic landform designs for the overburden emplacements. The percentage of native vegetation to be established for the amended Project is approximately 40% while approximately 60% will be returned to grazing land. This is generally consistent with what is currently approved. The final landform also includes three pit lakes and a number of water storages in support of final land uses. Final rehabilitation and project closure requirements will be formulated in consultation with key government agencies and other relevant stakeholders during the detailed closure planning phase.
Traffic and transport	The amendments to the Project as presented in this Amendment Report do not alter the proposed operational workforce of 1,500 across the HVO Complex as per the original Project. Consequently, the proposed amendments are not anticipated to have any greater impact on the local road network beyond what was presented in the EIS, Submissions Report, and HVO North Amendment Report. In fact, due to the reduced project life and the omission of the LCPP and associated rail facilities, impacts are likely to be less. Therefore, consistent with the original Project, the impact of amended Project during continued operations on the local road network is anticipated to be minor. No changes to the existing approved workforce are proposed and therefore the amended Project will not change traffic movements associated with the operation. The amended Project will require the realignment of a portion of Lemington Road which will deliver an improved travel experience for users in terms of reliability, safety and average speed, and replacement of the existing single-lane low level bridge crossing over the Hunter River (Moses Crossing) with a new bridge. The new bridge across the Hunter River will substantially improve the flood resilience of the road, providing a significantly more reliable access between the New England Highway and Golden Highway, thereby improving access for the community. In terms of changes to travel time due to the Lemington Road realignment, it was found that: - trips to/from the west of the Lemington Road/Golden Highway intersection will increase between 1.40 minutes and 2.30 minutes indicating minor impact to travel time, affecting approximately 5% of the trips currently recorded on Lemington Road - trips to/from the east of the Lemington Road/Golden Highway intersection will decrease by approximately 9–10 minutes, which is an improvement in travel time.

Technical matter	Key assessment outcomes and proposed measures
Soil, land resources and agriculture	Consistent with the original Project, the disturbance area primarily consists of existing mining areas, existing rehabilitation areas and low intensity grazing land. The amended Project is not predicted to result in significant adverse impacts on surrounding private agricultural land and mining operations are expected to successfully continue to coexist with the surrounding agricultural land uses. Once the Project area is rehabilitated (i.e. to the final landform), the percentage breakdown for native ecosystem vs agricultural land across the HVO Complex will comprise approximately 40% native ecosystem and 60% agricultural land use.
Blasting	The amendments proposed will not result in additional impacts as a result of blasting, with blasting for the amended Project proposed to be undertaken as per the Blasting Impact Assessment (BIA) prepared for the EIS (Appendix J of the EIS) (EMM 2022a). Exposure to vibration and airblast overpressure can be effectively managed via the application of reduced charge masses. Consistent with original Project, no impacts are predicted to declared dams, adjacent mines or the Hunter Valley Gliding Club from vibration or airblast overpressure. As per the original Project, best practice blast management protocols will continue to be implemented at HVO. In addition to these measures: • three additional blast monitors will be installed at different stages of the amended Project at a location representative of private residence 317 or 311 in Jerrys Plains, the Great Lodge (heritage site), and at Oaklands Homestead (heritage site) • one additional portable monitor will be positioned at a location representative of the closest heritage site to the active blasting area out of the Carrington Homestead (heritage site) and Wandewoi Homestead (heritage site) • additional controls will be used to manage overpressure levels below the applicable criteria at residential receptors • when blasting within 1,500 m of the heritage site Great Lodge, Carrington Homestead and Wandewoi Homestead, blast design measures will be carried out to meet ground vibration criteria • increased ground vibration control measures will be required to manage vibration levels below applicable limits for some public infrastructure.
Historic heritage	Impacts to historic heritage items as a result of the proposed Amendments remain consistent with the original Project, as summarised below. At HVO North: • One unlisted item assessed as having local contributory significance, remnant stockyards, will be directly impacted by the amended Project at HVO North. Mitigation measures comprising archival recording are proposed for this item. No other historic heritage item will be directly impacted by the amended Project. • The State listed Chain of Ponds Inn is within the HVO North existing and proposed development consent boundary. However, this item is outside of the Project disturbance area and is more than 5 km from the proposed mining area. Therefore, amended Project related impacts are not predicted to occur to the Chain of Ponds Inn. At HVO South: • No historic heritage items will be directly impacted by the amended Project. • The Great Lodge, an ungazetted item but assessed as potentially State significant, has been identified within the HVO South proposed development consent boundary; however, it is outside of the Project disturbance area. No direct impacts will therefore occur because of the amended Project, and the blasting assessment found that potential impacts to the Great Lodge can be managed effectively via appropriate blast design. Given the nature of the item's condition, monitoring and further assessment to determine significance will be undertaken.

Technical matter	Key assessment outcomes and proposed measures
Visual amenity	The Visual Impact Assessment (VIA) prepared for the original Project (Appendix S of the EIS) (EMM 2022) assessed the potential visual amenity impacts of the original Project. Based on distance to the Project area, existing view types and context, variable elevation and undulation in the landscape and the presence of vegetation, the assessment predicted: • no visual impact for viewpoints 8 and 10 (in Jerrys Plains) • a negligible visual impact for viewpoints 1 and 2 (in Camberwell), and 9, 11 and 12 (in Jerry Plains) • a slight/moderate visual impact for viewpoints 3, 4 and 5 (in Maison Dieu), 6 (in Long Point) and 7 (Hunter Valley Glider Club) • views would not significantly change from the existing baseline views at Coolmore and for thoroughbred breeding activities at Jerrys Plains. Visual impacts associated with HVO's existing mining operations have previously been assessed and approved and are considered as part of the existing environment. While it is acknowledged that there are privately-owned receptors and road corridors that are already subject to a high visual impact from HVO's existing mining operations and other surrounding mining operations, the level of visual impact on these properties will not materially change when compared with the currently approved operations. The findings remain applicable to the amended Project. Although there are minor changes in landform elevations compared to the original Project, all landform designs will remain below current approved heights and will not be materially different to the visual impacts of the original Project. The key potential for change to visual amenity associated with the amended Project is the removal of the LCPP and rail facilities approved for construction and operation at HVO South, and changes in final landform heights compared to the original Project. The VIA for the original Project (Appendix S of the EIS) found that if built, the LCPP would have been visible from residences in Long Point and Maison Dieu without screening. Impacts were expected to either be low or negligible. Removal of the LCPP and rail facilities will remove the visual impacts to these residences. Therefore, the changes proposed in this Amendment Report are not anticipated to have any greater impact on visual amenity beyond what was presented in the EIS, Submissions Report and previous HVO North Amendment Report.
Hazards, public safety and health	The proposed amendments will not result in a change that would influence the outcomes of the Preliminary Hazards Analysis (PHA) as detailed in Chapter 22 of the EIS. The PHA determined that there would be no incidents which would result in offsite impacts; hence, the potential for fatality or injury or environmental impact to occur would be negligible. Based on the information reviewed, contamination identified during previous investigations does not appear to present an unacceptable risk to off-site human and ecological receptors. Areas investigated are considered suitable for continued commercial/industrial (coal mining) land use. A hazard identification and consequence analysis was undertaken for the Project (as part of the EIS) based on the hazardous materials and quantities stored on site at HVO. The consequence analysis identified that there will be no incidents which would result in offsite impacts; hence, the potential for fatality or injury or environmental impact to occur will be negligible. Potential risks to human health resulting from the Project have been assessed against accepted safety or health-based assessment criteria established by the NSW Government. Risks to human health are determined to be low and no further detailed health risk assessment was determined to be required.

ES5 Justification and conclusions

The development of the amended Project design for which approval is sought has been an iterative one developed over a number of years. Detailed design studies considering both mining options and infrastructure arrangements were carried out, and each of these studies evaluated potential environmental and social impacts to inform the amended Project design as results from studies became available. The amended Project has, therefore, been developed to avoid and minimise impacts where reasonable and feasible to do so.

Numerous technical investigations have been carried out. These assessments identified residual impacts of the amended Project and appropriate mitigation measures to address these impacts. The amended Project's design and proposed management measures are based on a comprehensive understanding of the environmental conditions in and around the Project area, gained over a very long history of mining at HVO.

The amended Project will contribute to meeting the ongoing demand for high quality thermal and semi-soft coal throughout a period in which there is expected to be a gradual decline of coal mining in the Hunter region, giving local communities time to adapt.

The amended Project represents a brownfield mining proposal that aligns with the strategic direction and policy objectives at a local, state and national level. It will provide ongoing employment opportunities for up to 1,500 workers and will deliver significant economic benefits to the State and local region.

For these reasons stated above, the amended Project is justified and represents a net benefit to the local region and to NSW.

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1 Introduction

1.1 Background

Hunter Valley Operations (HVO) is a well-established multi-pit open cut coal mining complex, comprising two mine sites separated by the Hunter River, HVO North and HVO South. HVO is approximately 24 kilometres (km) north-west of Singleton in the Hunter Valley of New South Wales (NSW) (refer to Figure 1.1). While the two mine sites are approved under separate development consents issued under the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act), they operate as one complex with fully integrated environmental management systems.

Operations first commenced at HVO over 75 years ago, in 1949. Since its inception HVO has been, and continues to be, an important contributor to the Hunter Valley and NSW economies, producing high quality thermal and semi-soft coking coal suitable for use in international and domestic markets.

HVO North operates under Development Consent DA 450-10-2003 issued by the then NSW Minister for Infrastructure and Planning in 2004, which allows extraction of up to 22 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal until 31 December 2026. HVO North comprises the approved mining areas of West Pit, Mitchell Pit, Carrington Pit and North Pit, as well as the Hunter Valley (HV) and Howick Coal Preparation Plants (CPP) and the Howick and HVO North mine infrastructure areas (MIA). The Newdell Load Point (LP) and Hunter Valley (HVLP) train loading facilities are also at HVO North.

HVO South operates under Project Approval (PA) 06_0261 issued by the then NSW Minister for Planning in 2009 and comprises the approved mining areas of Riverview Pit, Cheshunt Pit, Riverview South East Extension and South Lemington Pits 1 and 2, as well as the MIA, and the Lemington CPP (LCPP) and rail loop (approved but not constructed). PA 06_0261 allows extraction of up to 20 Mtpa of ROM coal until 24 March 2030.

The key components and approved disturbance areas associated with the HVO Complex are illustrated in Figure 1.2.

HVO is seeking approval for the HVO Continuation Project (the Project) from the NSW Minister for Planning and Public Spaces, or delegate, under the provisions of Part 4 of EP&A Act. The Project broadly comprises the continuation of mining at HVO North and HVO South, beyond the current approved mining completion dates of 2026 and 2030 respectively. Given that the two mine sites operate as one complex, one environmental impact statement (EIS, EMM 2022a) was prepared to support the two State significant development (SSD) applications for the Project, being:

- SSD-11826681 – HVO North Open Cut Coal Continuation Project
- SSD-11826621 – HVO South Open Cut Coal Continuation Project.

The EIS was prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) issued for HVO North and South on 11 March 2021, and the *State Significant Development Guidelines* (DPIE 2022). The EIS was placed on public exhibition for a period of four weeks from Monday 30 January 2023 through to Monday 27 February 2023.

During the public exhibition of the EIS, a total of 1,060 submissions were received by the NSW Department of Planning, Housing and Infrastructure (DPHI) from individuals, organisations, public authorities, councils, and government agencies for the two SSD applications. Most community submissions supported the Project. Government submissions provided advice to DPHI on the applications.

To respond to matters raised in submissions on the Project, a Submissions Report (EMM 2023a) was prepared, along with an Amendment Report (EMM 2023b) outlining proposed amendments to the HVO North Project (the HVO North Amendment Report).

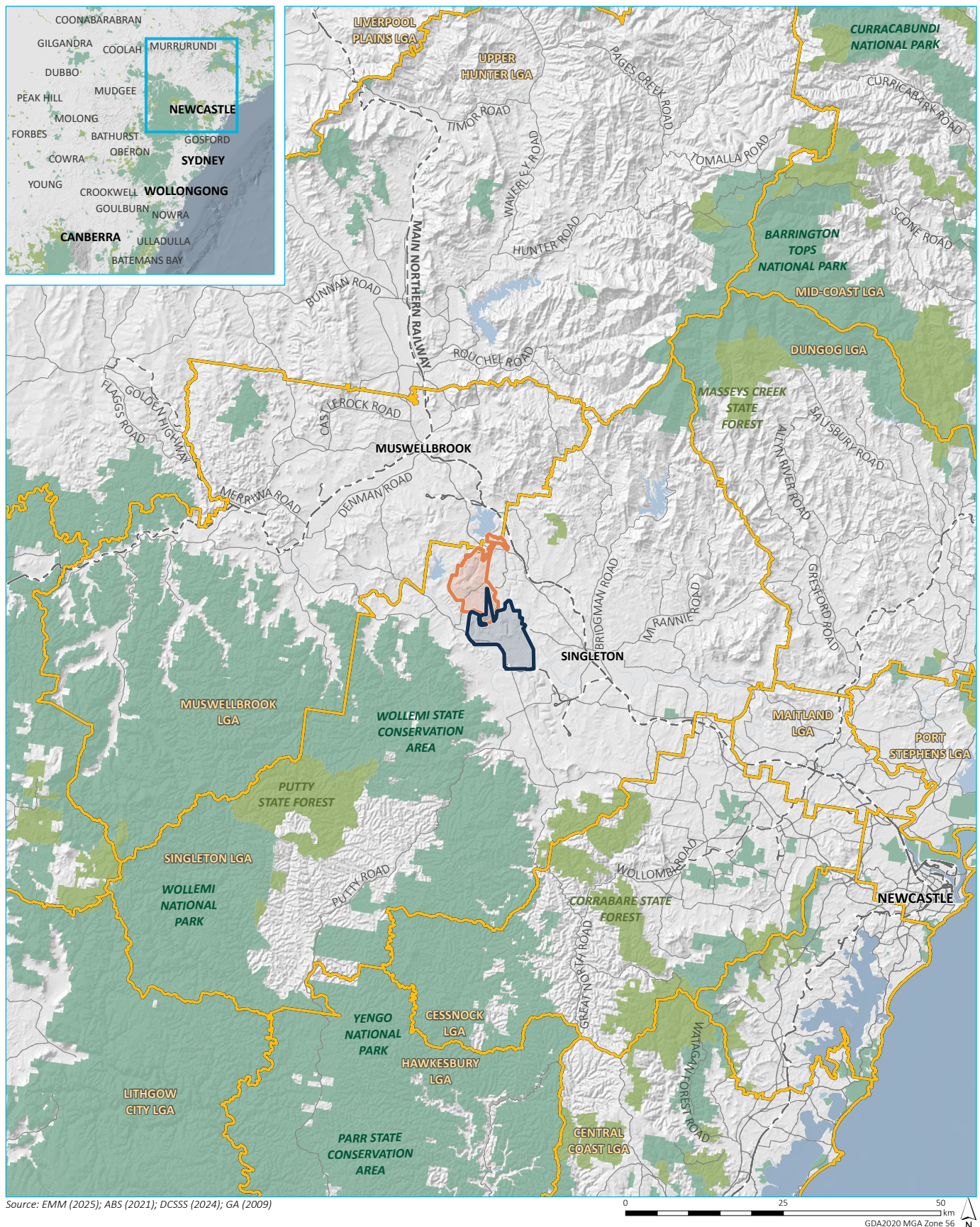
During the subsequent assessment of the Project by DPHI, the Department issued a number of requests for information (RFI) to HVO, who provided responses as required. In March 2024, DPHI requested the NSW Independent Expert Advisory Panel for Mining (IEAPM) conduct an assessment of the Project in respect to water resources and greenhouse gas (GHG) emissions. The IEAPM advice concluded that:

- in relation to water-related impacts, there is no reason why the Project should not be conditionally approved
- in relation to GHG emissions, the IEAPM acknowledged that the only fugitive emissions avoidance measure available is changes to the mine plan that restricts the areal extent of mining and that a significant fugitive emissions avoidance measure at HVO would be not to mine Zones 2, 3 and 4 in gas Domain 1.

On 5 July 2024, a further RFI from DPHI was received by HVO, which included supporting information made up of correspondence to the Planning Secretary from the Hon Paul Scully (Minister for Planning and Public Spaces) and the Hon Penny Sharpe (Minister for Climate Change, Minister for Energy, Minister for the Environment and Minister for Heritage) regarding consideration of the NSW *Climate Change (Net Zero Future) Act 2023* (the NZF Act) which was enacted after the SSD applications were lodged. In his correspondence to the Planning Secretary, the Minister for Planning and Public Spaces acknowledged that NSW is not on track to meet its 2030 and 2035 targets of the NZF Act without action by the NSW Government and private sector. Further, it was reiterated that agencies involved in the decision-making process within the planning system have regard to the NSW Government's emission reduction targets, the guiding principles for the NZF Act, and the then draft *NSW Guide for Large Emitters* (now finalised, EPA 2025) and the new climate change assessment requirements for large emitters.

The RFI from DPHI stated that, in light of the correspondence from the Minister and the conclusions of the IEAPM, the Department requested that HVO provide a response that further considered the implications for the Project if all coal extraction from gas Domain 1 at HVO North was avoided and for HVO to have further consideration of the guiding principles of the NZF Act.

In response to the RFI, HVO completed a detailed review of the Project and is subsequently seeking to amend the SSD applications for the Project, as detailed in this Amendment Report, which includes, amongst other things, the removal of coal extraction in gas Domain 1 – herein referred to as the amended Project.



KEY

- Existing HVO North development consent boundary (DA 450-10-2003)
- Existing HVO South project approval boundary (PA 06_0261)

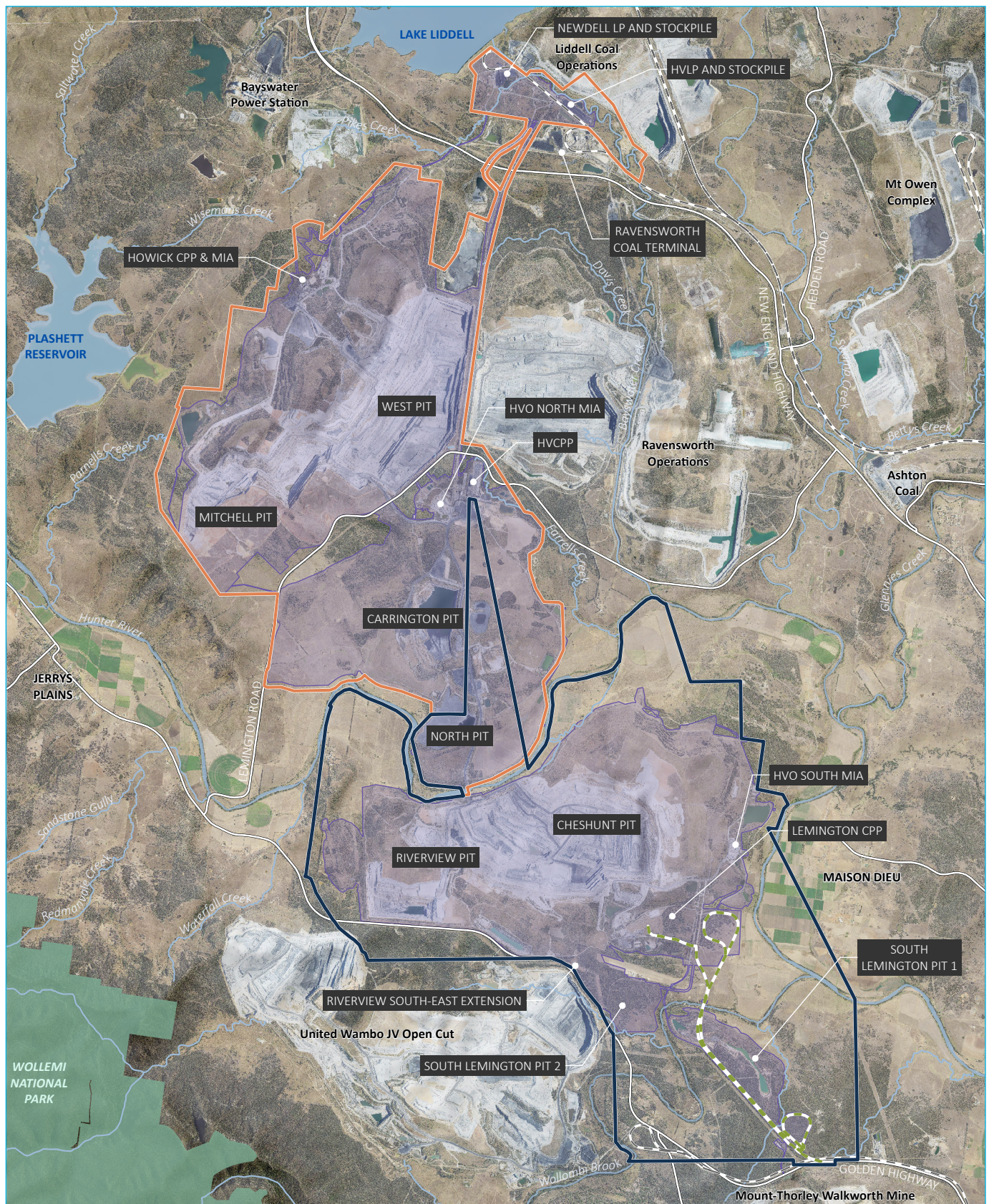
- Existing environment
- Rail line
- Major road
- Named watercourse
- Named waterbody
- NPWS reserve
- State forest
- Local government area

INSET KEY

- NPWS reserve
- State forest

Regional locality

HVO Continuation Project
Amendment Report
Figure 1.1



KEY

- Existing HVO North development consent boundary (DA 450-10-2003)
- Existing HVO South project approval boundary (PA 06_0261)
- Existing and approved disturbance area
- South Limestone Rail Loop and haul route (approved, not yet constructed)

- Existing environment
- Rail line
- Major road
- Named watercourse
- Named waterbody
- NPWS reserve

Existing and approved operations

HVO Continuation Project
Amendment Report
Figure 1.2

1.2 Amendment overview

In response to the RFI dated 5 July 2024, HVO is seeking to amend the two SSD applications in the following ways:

- Reduce the project mine plan to avoid coal extraction within gas Domain 1 at HVO North and reduce the total ROM coal to be extracted by the amended Project by approximately 220 Mt.
- Maintain the current approved maximum annual ROM coal production from HVO North of 22 Mtpa but reduce the proposed maximum annual production limit at HVO South from 18 Mtpa to 13 Mtpa.
- Propose a maximum annual production limit for the HVO Complex of 26 Mtpa ROM coal, compared to the current approved maximum annual production of 42 Mtpa.
- Reduce the proposed life of mining operations at HVO North by five years, from the end of 2050 to the end of 2045.
- Reduce the proposed life of mining operations at HVO South by three years from the end of 2045 to the end of 2042.
- Expand the HVO North ROM coal stockpile to improve coal management.
- Remove approval for the construction and operation of the LCPP and associated rail facilities, which is currently approved, but not constructed, under the HVO South Project Approval.
- Temporary transport of product coal by truck from the Howick CPP to the Liddell stockpile for transport to market via the Liddell coal handling and train loading facilities during upgrades of the Newdell LP.
- Establishment of a levee (Mitchell East levee) to provide flood protection for the final void in Mitchell Pit.
- Minor alterations to disturbance boundaries to accommodate construction activities such as Lemington Road and electricity transmission lines.

A summary of the proposed amendments is provided in Table 1.1 for HVO North and Table 1.2 for HVO South and illustrated on Figure 1.4 and Figure 1.6, for HVO North and HVO South respectively. The proposed amendments are further detailed in Chapter 3.

Table 1.1 **Amendment overview – HVO North**

Aspect	Current approved	Previously proposed / original Project (EIS and HVO North Amendment Report)	Proposed amended Project (HVO North)
Project area	Development consent boundary as shown in Figure 1.2.	Increase in the development consent boundary as shown in Figure 1.3 to accommodate an extension to the approved mining area, as well as the areas covered by proposed infrastructure to support the Project (including the Lemington Road and transmission and telecommunication line realignments).	Proposed minor increase in the development consent boundary (as shown in Figure 1.3) to accommodate additional disturbance areas associated with the construction of transmission lines across the Project area and to provide flexibility with the location of transmission lines associated with the EnergyCo Hunter Transmission Project.
Mining method	- Open cut mining operation, primarily using truck and shovel. The use of a dragline is also approved. - Blasting – 7.00 am to 6.00 pm Monday to Saturday inclusive (except public holidays) up to a maximum of three blasts per day and 12 blasts per week.	No change.	No change.
Mining area	- Coal extraction to the base of the Barrett seam in West Pit and Mitchell Pit. - Coal extraction to the base of Bayswater seam in the Carrington area.	- Extension of open cut mining from the approved West Pit and Mitchell Pit areas, through Lemington Road into the Carrington Pit area. - Mining to the base of the Barrett seam in the Carrington Pit area. - A reduction in the proposed mining area within the Carrington West Wing area, compared to the approved mining area.	- Mining area as proposed in Figure 1.4. - Removal of coal extraction in gas Domain 1 for HVO North. - Coal extraction to the base of the Barrett seam in West, Mitchell and Carrington Pit areas. - Coal extraction to the base of the Bayswater seam in the Carrington West Wing area. - A reduction in the proposed mining area within the Carrington West Wing area, compared to the approved mining area (consistent with the original Project).

Aspect	Current approved	Previously proposed / original Project (EIS and HVO North Amendment Report)	Proposed amended Project (HVO North)
Disturbance area	- Existing and approved disturbance area of approximately 4,965 hectares (ha). - Avoidance of heritage site CM-CD1. Mining operations and associated activities are not permitted within 20 metres (m) of CM-CD1.	- An assessed additional disturbance area of approximately 926 ha to that currently approved. - Relinquishment of approximately 6.7 ha of currently approved disturbance area. - Avoidance of CM-CD1 will be maintained.	- Minor additional disturbance areas associated with the construction of transmission lines. - A total additional disturbance area of approximately 903 ha to that currently approved as illustrated on Figure 1.4. - Relinquishment of approximately 6.7 ha of currently approved disturbance area. - Avoidance of CM-CD1 will be maintained.
Total resource recovery	Approval to extract up to 498 Mt of ROM coal.	Extraction of approximately an additional 400 Mt of ROM coal over that currently approved for extraction.	Extraction of approximately 307 Mt of additional ROM coal to that currently approved for extraction over the life of the Project comprising approximately 200 Mt in areas beyond those currently approved for extraction.
Annual production	- Up to 22 Mtpa of ROM coal, comprising: 12 Mtpa from West Pit 10 Mtpa from Carrington Pit.	- No change to total annual ROM extraction rate (up to 22 Mtpa). - Removal of the currently approved separation of extraction limits between West Pit and Carrington Pit.	- No change to total annual ROM extraction rate (up to 22 Mtpa) - Removal of the currently approved separation of extraction limits between West Pit and Carrington Pit. - Propose a HVO Complex limit of 26 Mtpa ROM coal whilst maintaining limits of: - up to 22 Mtpa from HVO North - up to 13 Mtpa from HVO South.
Mine Life	Mining operations approved unto 31 December 2026.	Mining operations at HVO North up to 31 December 2050.	Reduction in the proposed life of mining operations compared to the original Project. Proposed end date of mining reduced from 31 December 2050 to 31 December 2045.

Aspect	Current approved	Previously proposed / original Project (EIS and HVO North Amendment Report)	Proposed amended Project (HVO North)
General infrastructure	• HV MIA and Howick MIA. • Maintenance and ancillary infrastructure required to facilitate operations.	• Realignment of a section of Lemington Road from Comleroi Road in the south to the existing Lemington Road in the north, joining the existing road alignment approximately 2.3 km south of the existing New England Highway/Lemington Road intersection. • HVO North access road to be realigned from the existing Lemington Road. • Closure of a small section of Liddell Station Road to accommodate the HVLP product stockpile extension (if constructed), which is not currently accessible to the public. • Realignment of sections of Ausgrid's transmission lines, and AGL transmission lines. • Realignment of internal transmission lines to support mining activities. • Realignment of Telstra telecommunication lines. • HVO North MIA upgrade. • Maintenance and ancillary activities as required to facilitate operations, including the replacement of plant and equipment where required. • Access roads to facilitate service provider access. • Use of demountable/temporary buildings and other ancillary temporary facilities to enable construction activities and mining operations as required. • Access road establishment to an existing mine-owned property east of realigned Lemington Road. • Maintenance and ancillary infrastructure required to support construction activities and mining operations within the Project disturbance area, including communication towers, installation and maintenance of water supply works and works on waterfront land, construction and use of buildings for construction or mining operations, installation of environmental monitoring equipment including piezometers, and explosives storage and transport.	• As proposed for the original Project with an expansion of the HVO North ROM coal stockpile.

Aspect	Current approved	Previously proposed / original Project (EIS and HVO North Amendment Report)	Proposed amended Project (HVO North)
Beneficiation	• ROM coal may be transported via internal haul roads to either HVCPP or Howick CPP for processing. • HVCPP is approved to process up to 20 Mtpa ROM coal (not receiving more than 16 Mtpa ROM from HVO South). • Howick CPP is approved to wash up to 6 Mtpa ROM coal. • Both HV and Howick CPP can use flotation to process ROM coal.	• Use of temporary coal stockpiles assembled in new mining areas, within the Project disturbance area prior to processing or transport. • Receipt of ROM coal from HVO South via internal haul roads for processing at all CPP facilities approved for HVO North. • Construction of a haul road to enable ROM coal to be transported to the neighbouring Ravensworth Operations ROM pad via haul truck until the end of Ravensworth Operations approved mine life.	• As proposed – no change from the original Project.
Management of mining waste – overburden emplacement	• Ability to dispose of overburden within all pits and out-of-pit emplacement areas across HVO. • Maximum overburden emplacement area height of approximately 240 m to Australian Height Datum (AHD).	• No change. Overburden will continue to be emplaced across HVO within the Project disturbance area. However, the sequence of overburden emplacement has been revised to reflect the extended mine life and additional mining areas (i.e. between Mitchell/West Pit and the Carrington area).	• As proposed; however, the sequence of overburden emplacement has been revised reflecting the variances in the amended schedule.
Management of mining waste – coarse reject	• Ability to emplace coarse rejects within overburden emplacement areas across HVO.	• No change.	• No change.
Management of mining waste – tailings	• Emplacement of tailings within approved tailings storage facilities (TSFs) at HVO and Ravensworth Operations, including Carrington Pit TSF at HVO North, and the Cumnock Void 3 TSF at Ravensworth Operations. • Intermittent deposition of tailings occurs in Dam 6W TSF, Bobs Dump TSF and Central TSF as part of ongoing management towards decommissioning. • Capping and rehabilitation of TSFs following completion of emplacement activities.	• Additional tailings pipelines and pumps. • Removal, relocation and/or reprocessing of tailings from historic TSFs as required, including the Carrington TSF. • Emplacement of tailings within the northern extent of West Pit. • Emplacement of tailings at approved tailings facilities at LCO. • Over the life of HVO, the tailings and reject management strategy will continue to be refined to meet operational needs. This may also include trial or testing facilities in the Project approved disturbance area to inform the strategy.	• As proposed except for the removal, relocation and/or reprocessing of tailings from Carrington TSF is no longer required.

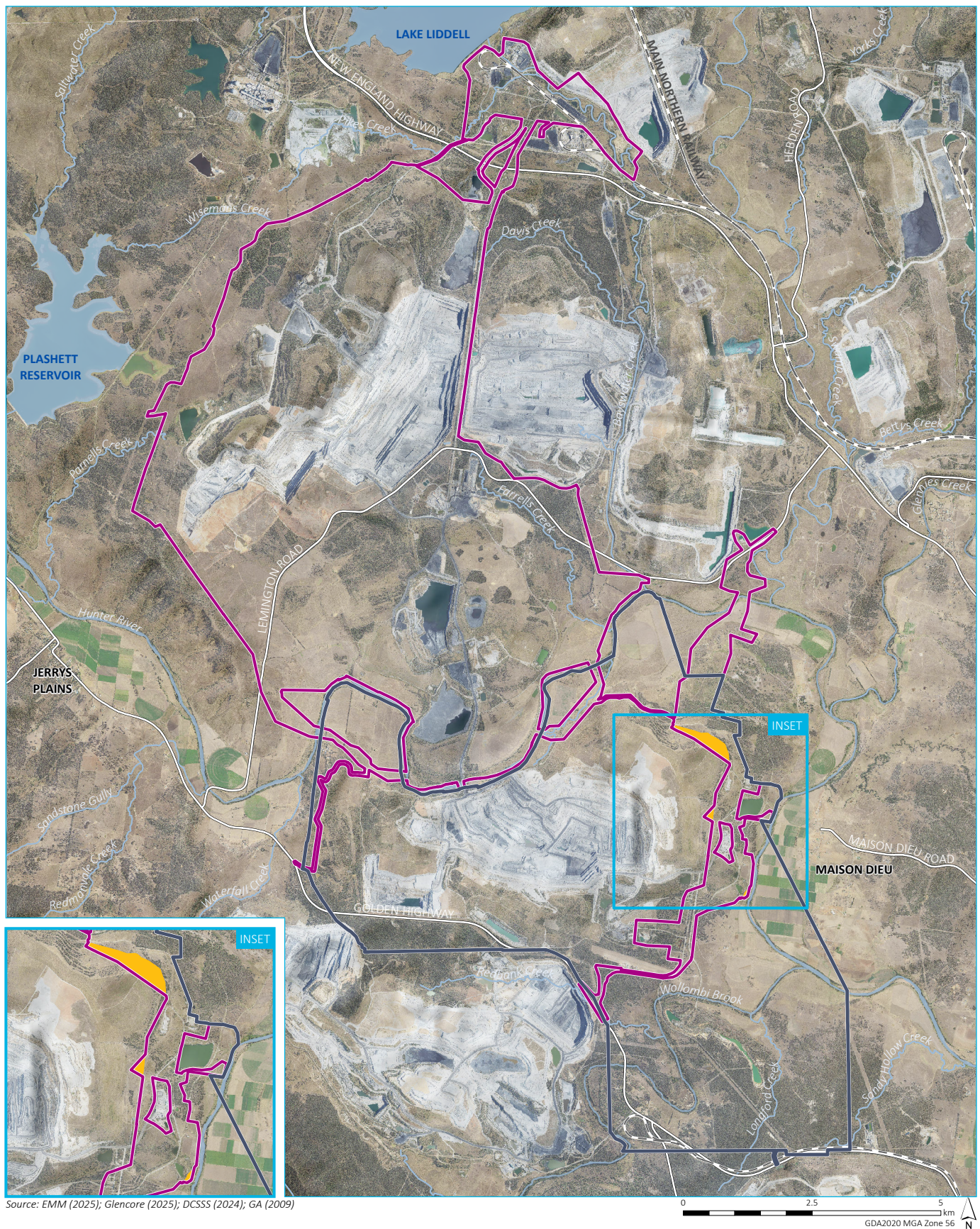
Aspect	Current approved	Previously proposed / original Project (EIS and HVO North Amendment Report)	Proposed amended Project (HVO North)
Product transport	• Transport of product coal from HVCPP by overland conveyor and or truck to HVLP or Newdell LP. • Transport of product coal from Howick CPP by overland conveyor to power stations or by truck to HVLP or Newdell LP. • Intermittent haulage of coal between HVCPP, HVLP, Newdell LP and Ravensworth Coal Terminal (RCT). • In the event of an emergency or issue with coal conveyance infrastructure, coal can be transported via truck between noted CPPs, LPs and the RCT.	• Upgrade of product coal infrastructure as follows: – New Newdell product stockpile and upgrade of the existing Newdell train loading facility. These works will include an upgrade of the existing stockpile plus new train loading bin, conveyors and support infrastructure such as access roads, power and communication services; or an extension of the product coal stockpile footprint at the HVLP to increase the total stockpile capacity of the load point. The extension will require the relocation of Ausgrid transmission lines and communication infrastructure in this area and the closure of a portion of Liddell Station Road. – The construction of a haul road to enable ROM coal to be transported to the neighbouring Ravensworth Operations ROM pad via haul truck for processing, from where product coal is then transferred to RCT for transport to market.	• As proposed in original Project with the inclusion of the ability to temporarily transport product coal by truck from the Howick CPP to the Liddell stockpile for transport to market via the Liddell coal handling and train loading facilities during upgrades of the Newdell LP.

Aspect	Current approved	Previously proposed / original Project (EIS and HVO North Amendment Report)	Proposed amended Project (HVO North)
Water management	- Integrated water management with HVO South. - Water supply works including pumps, bores, diversions and dams. - Water discharges in accordance with Hunter River Salinity Trading Scheme (HRSTS). - Transfer of water between HVO South, LCO and Ravensworth Operations. - Existing and approved flood protection levees, including the Alluvial Lands, Carrington, Carrington West Wing and North Pit levees. - Construction of groundwater low permeability barrier walls (LPBW) as follows: - LPBW across the eastern arm of the Hunter River paleochannel within 2 years of mining in the Carrington Pit Southern Extension (<i>constructed</i>). - Carrington West Wing LPBW prior to undertaking mining within 100 m of the western arm of the Hunter River paleochannel, with an applicable permeability of 1×10^{-8} m/s (<i>not yet constructed</i>). - Diversion of the Unnamed Tributary to the west of Carrington West Wing.	- Continuation of the ability to transfer water to and from other mining operations where permitted. - Improved flood protection levee for North Pit (up to 1,000 year Annual Exceedance Probability (AEP)). - Improved flood protection for Carrington West Wing levee (up to 1,000 year AEP). - Additional mine/dirty water containment dams as required, as mining progresses. - Clean water diversion as required, as mining progresses, including an extension of the Mitchell clean water diversion. - Parnells Dam enlargement from approximately 1 gigalitre (GL) to approximately 4 GL, new spillway, and refurbishment of existing HRSTS discharge facility (no change to environment protection licence (EPL)/HRSTS approval). - Construction of the Carrington West Wing LPBW prior to mining within 100 m of the remnant connected western arm of the paleochannel, as per the existing development consent requirement.	- As proposed, with the additional establishment of the Mitchell East levee to provide flood protection for the final void in Mitchell Pit. - Water management system revised from that proposed in the original Project and revised conceptual final landform, as shown in Figure 1.5.
Rehabilitation	- Progressive rehabilitation, with the establishment of a mixture of pasture and native habitat areas. - Removal of levees and reinstatement of the Unnamed Tributary in the Carrington West Wing area to its original position.	- Progressive rehabilitation, with the post mining land use to comprise a mixture of grazing and native habitat areas. - The Alluvial Lands flood levee will be left in place in the final landform. - The Carrington and North Void TSF levees will be incorporated into the rehabilitated overburden dump/tailings capping, respectively, and so will not be retained as levees. The Carrington West Wing levee will be partially removed and incorporated into the final landform.	- As proposed in the original Project with revised final land use domains illustrated on Figure 1.5. - Removal of Carrington West Wing levee and incorporation of Mitchell East levee into final landform.

Aspect	Current approved	Previously proposed / original Project (EIS and HVO North Amendment Report)	Proposed amended Project (HVO North)
Final void	• Approved final void in Carrington Pit (evaporative sink). • Approved final void in West Pit. • Approved final void in Mitchell Pit. • Carrington West Wing void to be backfilled and returned to pasture.	• One final void at HVO North within the Carrington area, representing a reduction in the number of voids that will remain post mining compared to existing approved operations (i.e. from three to one).	• Two final voids being: – one final void associated with the Mitchell Pit – final void in Carrington Pit (evaporative sink) as currently approved.
Operational workforce	• Approximately 1,500 full-time equivalent (FTE) workers (HVO Complex).	• No change.	• No change.
Construction workforce	N/A	• Construction activities associated with: – Lemington Road realignment and associated works – transmission line and telecommunications decommissioning and realignment – upgrades to MIAs and relevant access roads – construction of the coal haulage route to Ravensworth Operations – upgrade of the existing Newdell LP train loading facility and construction of a new product coal stockpile or extension of the HVLP product stockpile – Parnells Dam capacity increase, and other water management system works such as levee construction – clean water diversion drains. • Approximately 600 temporary construction workers over an approximate five-year period. • Construction activities will generally be undertaken within standard construction hours (Monday to Friday 7.00 am to 6.00 pm, Saturday 8.00 am to 1.00 pm, and no work on Sundays or public holidays). However, some out of hours work may be required from time to time.	• As proposed in the original Project – no change.
Hours of operation	Continuous operations, 24 hours per day, seven days per week.	No change.	No change.

Other than as set out above, all activities that are currently approved under the existing HVO North approval are intended to continue. Key aspects of the approved development that will remain the same under the amended Project include:

- annual operational workforce numbers and associated traffic generation
- approved heights of overburden emplacement areas
- receipt of ROM coal from HVO South via internal haul roads for processing at all CPP facilities approved for HVO North
- continued avoidance of the Aboriginal heritage site known as CM-CD1
- the ridge between Jerrys Plains and HVO North will remain, continuing to provide an effective amenity barrier.



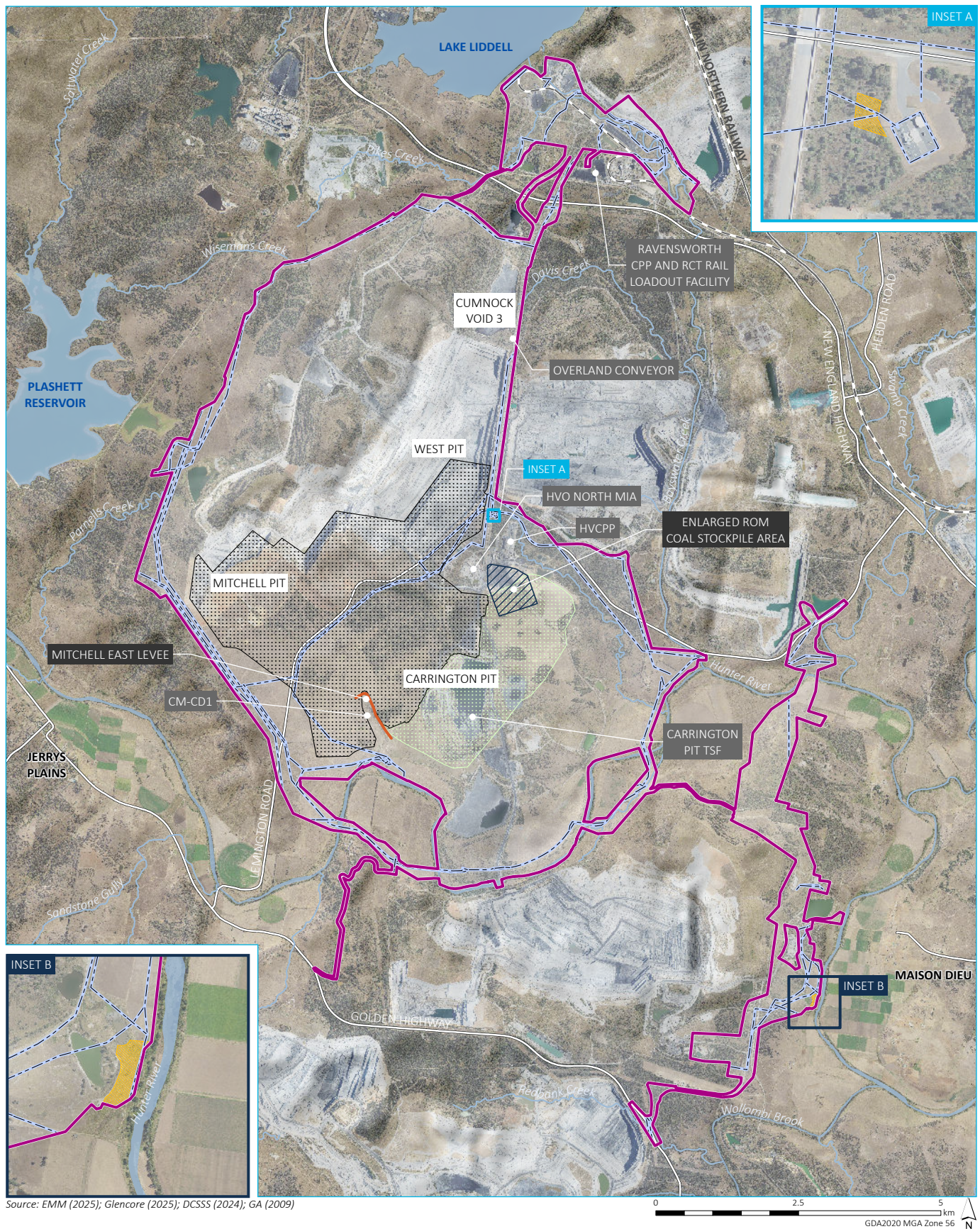
KEY

- Amended proposed HVO North development consent boundary
- Proposed HVO South development consent boundary
- Changes between current proposed and amended proposed HVO North development consent boundary

- Existing environment
- Rail line
- == Major road
- Named watercourse
- Named waterbody

HVO North and HVO South proposed development consent boundaries

HVO Continuation Project
Amendment Report
Figure 1.3



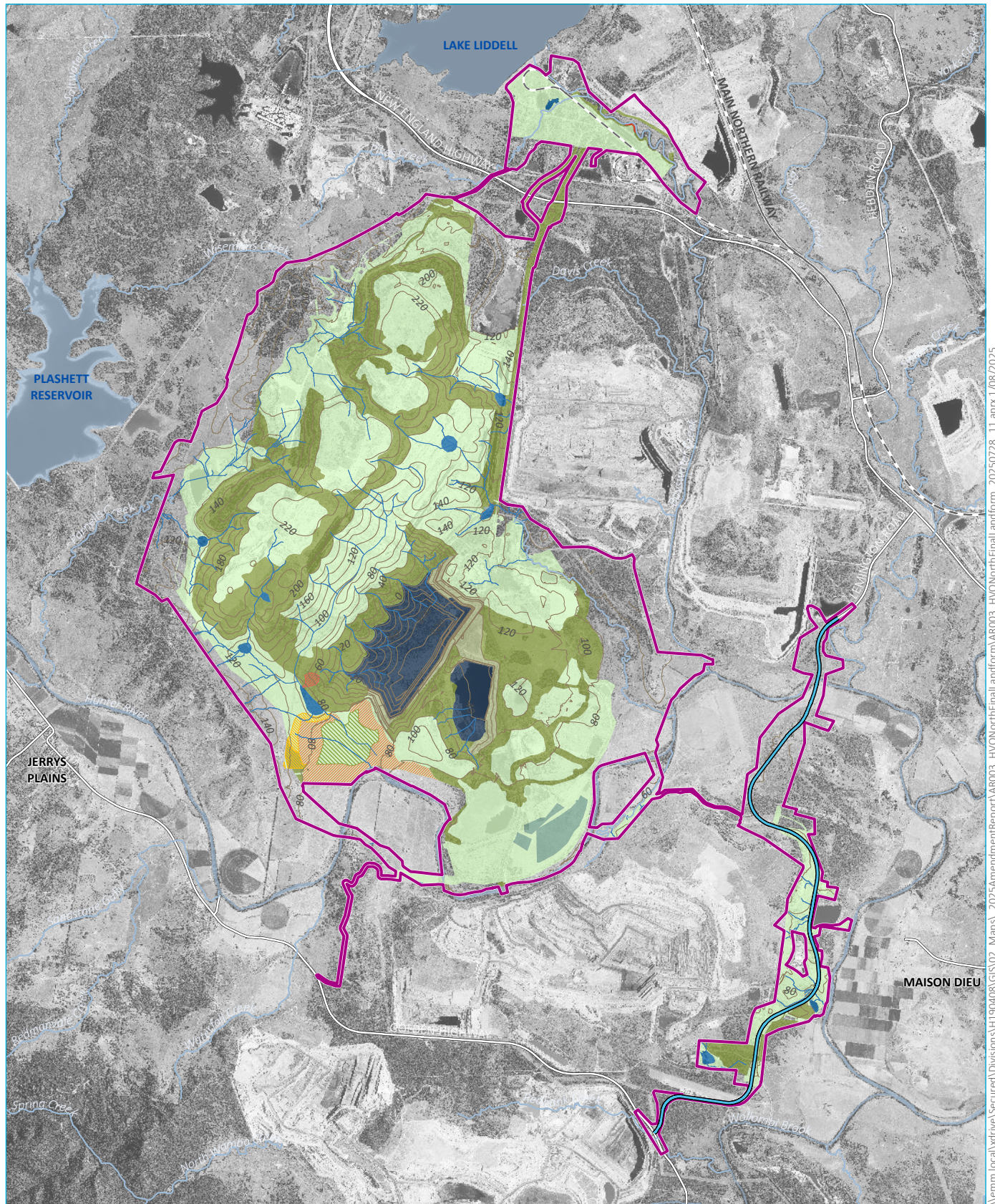
KEY

- Amended proposed HVO North development consent boundary
- Proposed additional disturbance area
- HVO North project amendment
- Levee
- Transmission line
- Amended mining area
- Previous mining area no longer proposed
- ROM coal stockpile area

- Existing environment
- Rail line
- Major road
- Named watercourse
- Named waterbody
- Label format**
- Existing item
- Project related item

HVO North proposed amendments

HVO Continuation Project
Amendment Report
Figure 1.4



Source: EMM (2025); Glencore (2025); DCSSS (2024); GA (2009)

- KEY**
- Amended proposed HVO North development consent boundary
 - Predicted drainage
 - Predicted 20 m contour
 - Lemington Road realignment
 - Existing environment
 - Rail line
 - Major road
 - Named watercourse
 - Named waterbody

- Final landform land use domain**
- Domain A | Native ecosystem
 - Domain A- Sub domain Ka | Other- Native ecosystem- partial vegetation on highwall benches
 - Domain B | Agriculture- grazing
 - Domain B- Sub domain Kb | Other- Agriculture- alluvial land
 - Domain G | Water storage
 - Domain J | Pit Lake

- Existing commitments maintained by the Project (indicative location)**
- Rural land capability**
- Class 2- DA 450-10-2003 MOD3
 - Class 3- DA 450-10-2003 MOD3
 - Class 4- DA 450-10-2003 MOD3
- Native ecosystem**
- Central Hunter Box-Ironbark Woodland - DA 450-10-2003 MOD3
 - Swamp Oak Floodplain Forest - DA 450-10-2003 MOD5

HVO North conceptual final landform

HVO Continuation Project
Amendment Report
Figure 1.5

Table 1.2 **Amendment overview – HVO South**

Aspect	Current approved	Previously proposed / original Project (EIS)	Proposed amended Project (HVO South)
Project area	Project approval boundary as shown in Figure 1.3.	Changes to the development consent boundary primarily on the northern side of the Hunter River to reflect removal of the approval to construct a conveyor from HVO South to the HVCPP. Other small changes are proposed to the consent boundary, primarily to align with cadastral boundaries inclusive of neighbouring Mount Thorley Warkworth (MTW) offset areas.	As proposed in original Project – no change.
Mining method	- Open cut mining operation, primarily using truck and shovel. - Highwall mining, including auger mining and dragline, is also approved. - Blasting – 7.00 am to 6.00 pm Monday to Saturday inclusive (except public holidays) to a maximum of three blasts per day and 15 blasts per week.	No change.	No change.
Mining area	- Extraction to base of the Bayswater Seam in Riverview and Cheshunt Pits. - Extraction to the base of the Bowfield Seam in South Lemington Pit 1. - Extraction to base of Vaux Seam in South Lemington Pit 2. - Extraction to base of Vaux Seam in Riverview South East Extension area.	- Continuation of coal extraction to base of the Bayswater Seam in Riverview and Cheshunt Pits. - Coal extraction in South Lemington Pit 1, South Lemington Pit 2 and the Riverview South East Extension area no longer proposed.	- Continuation of mining to the base of the Bayswater seam. - Revised mining area as illustrated in Figure 1.6.

Aspect	Current approved	Previously proposed / original Project (EIS)	Proposed amended Project (HVO South)
Disturbance area	Existing and approved disturbance of approximately 3,242 ha.	- Additional disturbance area of approximately 54.9 ha. - Relinquishment of approximately 173 ha of currently approved disturbance area.	- A total reduction in the current approved disturbance area by approximately 267 ha, as illustrated on Figure 1.6, comprising: - Relinquishment of 173 ha as per the original project - Removal of the disturbance area associated with the construction of the LCPP and associated rail facilities, resulting in a further 94 ha reduction in the current approved disturbance area, as compared to the original. - A total additional disturbance area of approximately 47 ha to that currently approved as illustrated on Figure 1.6 (reduced from the 54.9 ha proposed in the original Project).
Total resource recovery	16 Mtpa ROM coal approved in 2008 for 20 years – total of 320 Mt.	Approximately 210 Mt ROM coal over the Project life.	Extraction of approximately 122 Mt of ROM coal, from areas currently approved for extraction, over the Project life.
Annual production	Up to 20 Mtpa.	Reduction in the annual ROM coal extraction rate from 20 Mtpa to 18 Mtpa.	- Further reduction in the annual ROM coal extraction rate from up to 18 Mtpa, as proposed in the original Project, to 13 Mtpa. - Propose a HVO Complex limit of 26 Mtpa ROM whilst maintaining limits of: - up to 22 Mtpa from HVO North - up to 13 Mtpa from HVO South.
Mine Life	Mining operations approved until 24 March 2030.	Mining operations at HVO South up to 31 December 2045.	Reduction in the proposed life of mining operations from 31 December 2045, as proposed in the original Project, to 31 December 2042.

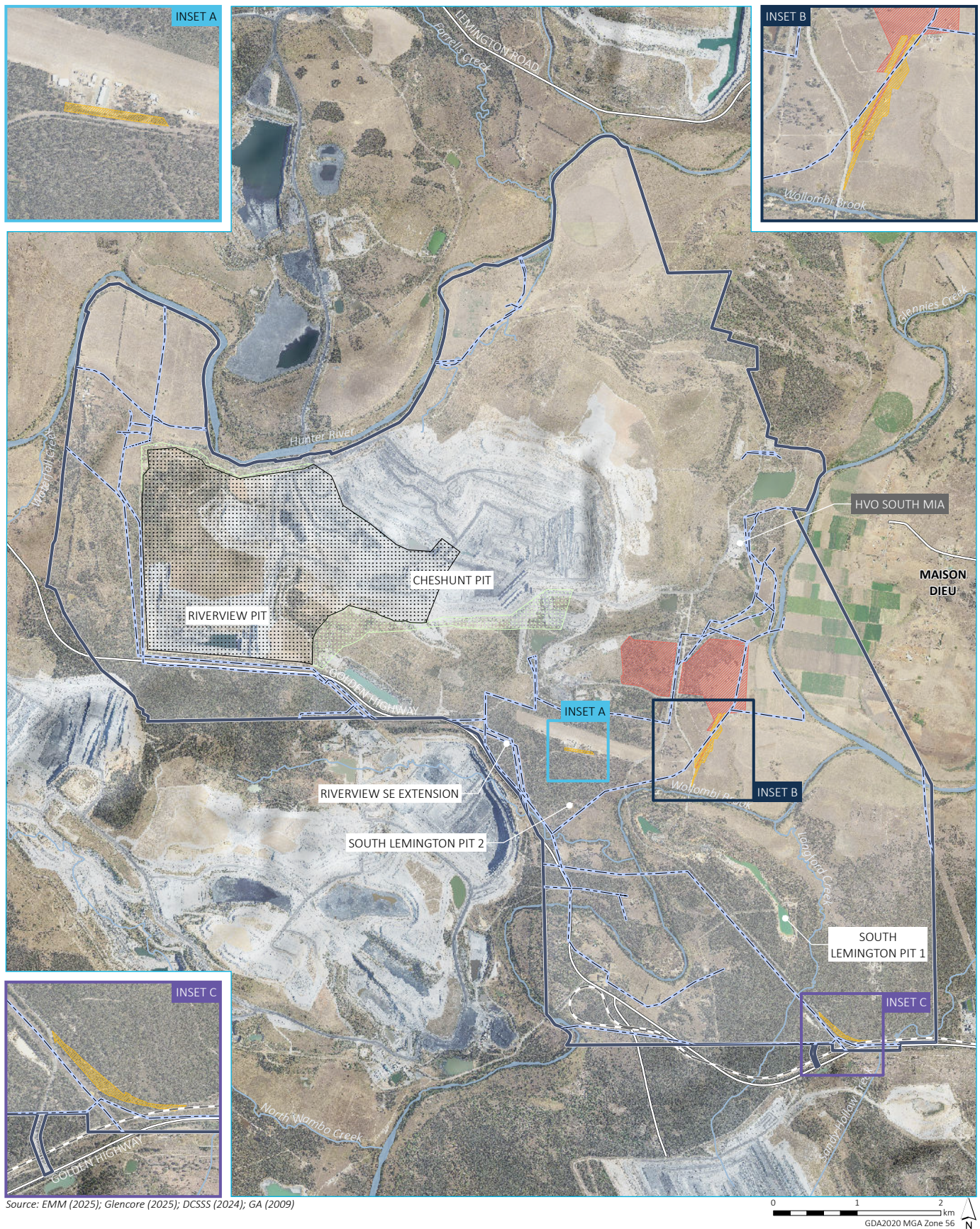
Aspect	Current approved	Previously proposed / original Project (EIS)	Proposed amended Project (HVO South)
General infrastructure	- HVO South MIA. - Construction and use of the LCPP (up to 16 Mtpa). - Maintenance and ancillary infrastructure required to facilitate operations. - Wollombi Brook bridge and low level crossing. - Operation of an Ammonium Nitrate Emulsion Plant (ANEP).	- As approved with: - relocation of some 11 kilovolt (kV) and 66 kV Ausgrid transmission lines - realignment of internal transmission lines to support mining activities - HVO South access road relocation to join the realigned Lemington Road - access roads to facilitate service provider access - use of demountable/temporary buildings and other ancillary temporary facilities including laydown areas to enable construction activities and mining operations as required.	As proposed in the original Project, except that construction of the LCPP and associated rail facilities is no longer proposed.
Beneficiation	- Construction and use of the LCPP (up to 16 Mtpa). - ROM/product coal may be transported from all HVO South pits via internal haul road to all CPPs within HVO (HVCPP, Howick CPP, Newdell CPP and LCPP) for processing (up to 20 Mtpa). - ROM coal from HVO South can also be transported via overland conveyor to HVCPP.	- No transport of ROM coal from HVO South via overland conveyor to HVCPP (i.e. approval for this conveyor will not be retained). - Ongoing use of temporary coal stockpiles assembled within the Project disturbance footprint prior to processing or transport. - No change to processing limits.	As proposed in the original Project, except that construction of the LCPP and associated rail facilities is no longer proposed.
Management of mining waste – overburden emplacement	- Ability to dispose of overburden within all pits and out-of-pit emplacement areas across HVO. - Maximum overburden emplacement area height of approximately 240 m AHD.	No change.	No change.
Management of mining waste – coarse reject	Ability to emplace coarse rejects within overburden emplacement areas across HVO.	No change.	No change.
Management of mining waste – tailings	Integrated tailings management with HVO North with emplacement of tailings within approved TSFs at HVO.	- As approved - LCPP tailings management will be integrated with HVO North when the LCPP is constructed. - Removal, relocation and/or reprocessing of tailings from historic TSFs as required.	As proposed in the original Project except that construction of the LCPP is no longer proposed and no tailings management from the LCPP will be required.

Aspect	Current approved	Previously proposed / original Project (EIS)	Proposed amended Project (HVO South)
Product transport	- Transport product coal by truck or overland conveyor from all CPPs to all loading points (HVLP, Newdell LP and Lemington LP and adjacent to the short rail loop south of South Lemington Pit 1). - Transfer of product coal to Wambo rail spur via either a rail spur and loop, overland conveyor, trucks or any combination. - Construction of a coal loader and new rail loop adjacent to the LCPP. The loop and associated rail line would connect to the Wambo rail spur. - Construction of a conveyor that would be utilised to transport coal via a new loop as described above. The conveyor would be constructed adjacent to the existing haul road described above.	Only the construction of the long rail loop and coal loader adjacent to the LCPP to be retained as an option for LCPP.	- Construction of the LCPP and associated rail facilities no longer proposed. - Transport product coal by truck or overland conveyor from all CPPs to loading points (HVLP, Newdell LP and Liddell LP).
Rehabilitation	Progressive rehabilitation, with the establishment of a mixture of pasture and native habitat areas.	Progressive rehabilitation, with the post mining land use to comprise a mixture of grazing and native habitat areas.	As proposed in the original Project with revised final land use domains illustrated on Figure 1.7.
Final void	- One final void in Riverview Pit. - South Lemington Pit 1 void, South Lemington Pit 2 void and the Ravensworth South East Extension to be filled in and rehabilitated.	- One void to remain in Riverview Pit. - South Lemington Pit 1 void and neighbouring strip 1 and strip 2 borrow pit to be filled with overburden material sourced from adjacent out of pit dump.	As proposed – no change from original Project.
Water management	- Water supply works including pumps and bores. - Integrated water management with HVO North. - Water discharges in accordance with HRSTS. - Transfer of water between HVO North, MTW and Wambo. - Existing and approved flood protection levees. - Construct additional bores (and associated infrastructure) at three transfer sites and adjacent to the existing LUG Bore to facilitate transfer of water into the former Lemington Underground Mine void and/or extraction of water from the void.	- Continuation of integrated water management with HVO North and water transfers with other mining operations (where permitted under the development consents that apply to those other mining operations). - Construction of Cheshunt and Riverview flood protection levees. - Lake James enlargement (from approximately 0.7 GL to 2.0 GL).	As proposed in the original Project.

Aspect	Current approved	Previously proposed / original Project (EIS)	Proposed amended Project (HVO South)
Operational workforce	Approximately 1,500 FTE workers (HVO Complex).	No change.	No change.
Construction workforce	N/A	- Construction activities associated with Lake James enlargement, and other water management system works such as levee construction - Approximately 600 temporary construction workers over an approximate five-year period. - Construction activities will generally be undertaken within standard construction hours (Monday to Friday 7.00 am to 6.00 pm, Saturday 8.00 am to 1.00 pm, and no work on Sundays or public holidays). However, some out of hours work may be required from time to time. - Construction workforce of around 600 required for the construction of the LCPP and rail loop (to be constructed around Year 13 to Year 15 of the Project should future operational requirements and/or market conditions deem it necessary).	As proposed in the original Project except that construction of the LCPP and associated rail facilities is no longer proposed, and therefore no construction workforce required for that activity.
Hours of operation	Continuous operations, 24 hours per day, seven days per week.	No change.	No change.

Other than as set out above, all activities that are currently approved under the existing HVO South approval are intended to continue. Key aspects of the approved development that will remain the same under the amended Project include:

- the coal seams to be extracted (i.e. no increase in the depth of mining)
- the extent of approved mining areas within the Riverview and Cheshunt pits
- approved heights of overburden emplacement areas
- transfer of coal from HVO South to HVO North for processing
- annual operational workforce numbers and associated traffic generation.



KEY

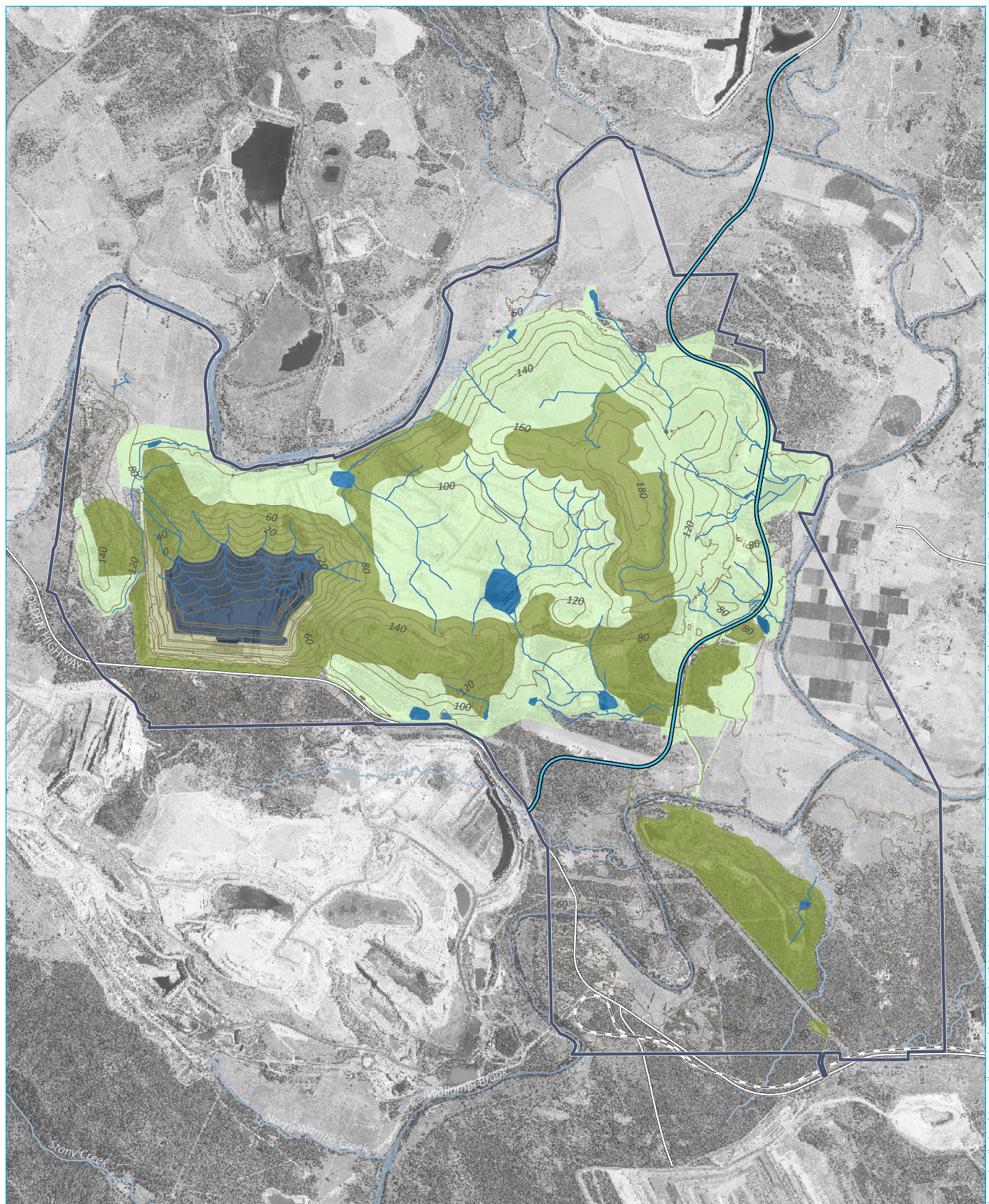
- Proposed HVO South development consent boundary
- Additional disturbance area no longer proposed
- Additional previously approved disturbance no longer retained

- HVO South project amendment
- Transmission line
- Amended mining area
- Previous mining area no longer proposed

- Existing environment
- Rail line
- Major road
- Named watercourse
- Named waterbody
- Label format
- Existing item

HVO South proposed amendments

HVO Continuation Project
Amendment Report
Figure 1.6



Source: EMM (2025); Glencore (2025); DCSSS (2024); GA (2009)

0 1 2 km
GDA2020 MGA Zone 56

KEY

- Proposed HVO South development consent boundary
- Predicted drainage
- Predicted 20 m contour
- Lemington Road realignment

- Final landform land use domain
- Domain A | Native ecosystem
 - Domain A- Sub domain Ka | Other- Native ecosystem- partial vegetation on highwall benches
 - Domain B | Agriculture- grazing
 - Domain G | Water storage
 - Domain J | Pit Lake

- Existing environment
- Rail line
 - Major road
 - Named watercourse
 - Named waterbody

HVO South conceptual final landform

HVO Continuation Project
Amendment Report
Figure 1.7

1.3 Terminology

Table 1.3 details the key terms used throughout this Amendment Report to describe existing operations and the amended Project.

Table 1.3 Project terminology

Term	Definition
HVO Complex	Comprises both HVO North and HVO South operations.
HVO North Project	Comprises the amended HVO North Project only as described in Appendix B of this Amendment Report.
HVO South Project	Comprises the amended HVO South Project only as described in Appendix B of this Amendment Report.
The original Project	The Project as originally described in the EIS.
The amended Project	The Project, as amended in the HVO North Amendment Report and this Amendment Report, in its entirety as described in Appendix B of this report which supersedes all previous versions.
Project area	The area that is the subject of the two SSD applications as proposed to be amended in this Amendment Report, i.e. the proposed development consent boundary for HVO North and the proposed development consent boundary for HVO South.
Existing and approved disturbance	Areas that are disturbed, previously disturbed and/or approved under the EP&A Act to be disturbed under the current development consents that apply to the HVO Complex as illustrated on Figure 1.2.
Approved mining area	The areas within the existing and approved disturbance area that have been previously assessed and approved under the EP&A Act for mining operations.
Additional disturbance area	The areas that will be disturbed by the amended Project that are outside of the existing and approved disturbance area for the HVO Complex and other neighbouring mines (Ravensworth Operations, United Wambo and LCO).
Previously approved areas not retained	Areas that are disturbed and/or approved to be disturbed under the current development consents that apply to the HVO Complex, that will no longer be disturbed by the amended Project, such as the LCPP, the Riverview South East Extension and South Lemington Pit 2 mining areas, and the approved temporary crossing across the Hunter River between HVO North and South.
Project disturbance area	This area is a combination of the existing and approved disturbance area, and the additional disturbance area associated with the amended Project, minus the areas not being retained by the amended Project. If the amended Project is approved, this will become the 'approved disturbance area' under the new SSD development consents.
Proposed mining area – HVO North	Areas where coal extraction will take place for the amended Project and includes: • areas already disturbed by mining at HVO North (e.g. West Pit, Wilton Pit, Mitchell Pit and Carrington Pit) • areas not previously approved for mining (e.g. the area between the Mitchell Pit and Carrington Pit) • areas approved but not yet disturbed (e.g. the Carrington West Wing area).
Proposed mining area – HVO South	Comprises the Riverview Pit and Cheshunt Pit, where coal extraction will continue under the amended Project, down to the Bayswater seam. The HVO South proposed mining area does not include the previously approved South Lemington Pit 1, South Lemington Pit 2, or the Riverview South East Extension, as coal extraction is not proposed in these areas as part of the amended Project.
Original proposed HVO North development consent boundary	The proposed HVO North development consent boundary for the original Project as presented in the HVO North Amendment Report and illustrated on Figure 1.3.
Amended proposed HVO North development consent boundary	The amended HVO North development consent boundary proposed for the amended Project as presented in Figure 1.3.

Term	Definition
Proposed HVO South development consent boundary	The proposed HVO South development consent boundary (being the same for the original Project and amended Project) and illustrated on Figure 1.3.
Transmission line corridors	Two categories of transmission line corridors have been defined for the purpose of quantifying the extent of disturbance for the amended Project: • realigned transmission lines (i.e. new transmission line easements) – the extent of disturbance will be limited to transmission line pole pads and an access road for maintenance along the alignment, as well as vegetation management to maintain safe transmission line clearance • existing transmission line easements to be decommissioned – disturbance will be confined to existing access tracks, existing easements and cleared areas required for removal of poles and associated infrastructure.
Realigned Lemington Road corridor	The corridor extends from the existing Comleroi Road intersection with the Golden Highway at the southern end of the new alignment, along the Comleroi Road alignment around the south-eastern side of HVO South and then extends in a northerly direction to join the existing Lemington Road approximately 2.3 km south of the existing New England Highway/Lemington Road intersection. The proposed realigned corridor forms part of the amended HVO North SSD application.
Mining operations	Includes the removal and placement of overburden, the extraction, processing, handling, storage and transportation of coal, and the emplacement of rejects and tailings.

1.4 Purpose of this document

This Amendment Report has been prepared by EMM Consulting Pty Ltd (EMM) on behalf of HVO to describe and assess the proposed amendments to the SSD applications for the Project being:

- SSD-11826681 for HVO North
- SSD-11826621 for HVO South.

This report should be read in conjunction with the EIS (EMM 2022a), Submissions Report (EMM 2023a) and HVO North Amendment Report (EMM 2023b) prepared for the Project.

This Amendment Report has been prepared in accordance with the *State significant development guidelines – preparing an amendment report* (DPIE 2022b).

1.5 The applicant

HVO is owned by subsidiary companies of Yancoal and Glencore, as participants in the unincorporated HVO JV. HV Operations Pty Ltd is the appointed manager of the JV in which:

- 51% interest is held by Coal Allied Operations Pty Ltd (a wholly owned subsidiary of Yancoal)
- 49% interest is held by Anotero Pty Ltd (a wholly owned subsidiary of Glencore).

HV Operations Pty Ltd is the proponent of the amended Project, as detailed in Table 1.4.

Table 1.4 **Proponent details**

Requirement	Detail
Proponent	HV Operations Pty Ltd
Postal address	PO Box 315, Singleton NSW 2330
ABN	76 606 478 399
Nominated contact	Jason Martin – Approvals Manager
Contact details	1800 888 733

2 Strategic context

2.1 Overview

The amended Project primarily involves the continuation of the life of HVO North and HVO South, from the current approved mining completion dates of 2026 and 2030, to 2045 and 2042 respectively. The continuation of mining across the HVO Complex will optimise resource recovery from the existing operation and largely within the extent of existing mining tenements.

The amended Project comprises the continuation of a brownfield mine which aligns with the strategic direction and policy objectives at a local, state and national level. Current national and NSW policy recognises the ongoing demand for coal, particularly in the Asian export market (which is the current key market for HVO) and its importance to the NSW and Australian economy (IPC 2022a and IPC 2022b). The current strategic direction relating to coal seeks to continue exploration, extraction and export (IPC 2022a and IPC 2022b). In NSW, the state government's *Strategic Statement on Coal Exploration and Mining in NSW* (NSW Government 2020, Strategic Statement) recognises that coal mining will continue to be an important part of the State economy into the future.

2.2 Coal demand and energy security

The *World Energy Outlook* (WEO) published by the International Energy Agency (IEA) in 2024 considers how the world will respond to the energy crisis using several scenarios. The 2024 WEO notes that continued investment in fossil fuels is essential in all the scenarios modelled. It will be needed to meet increases in demand over the period to 2030 in the Stated Policies Scenario (STEPS), which explores how the energy system will evolve if current policy settings are retained, and will also be needed to avoid a precipitous decline in supply that would far outstrip even the rapid declines in demand seen in the Net Zero Emissions (NZE) scenario.

While global coal demand is set to fall within the next few years, strong demand will remain for coal in the power sector out to 2050 under the STEPS. This is illustrated in Figure 2.1, which is reproduced from the 2024 WEO report and plots the demand of coal in exajoules over time (source: Figure 3.1, IEA 2024).

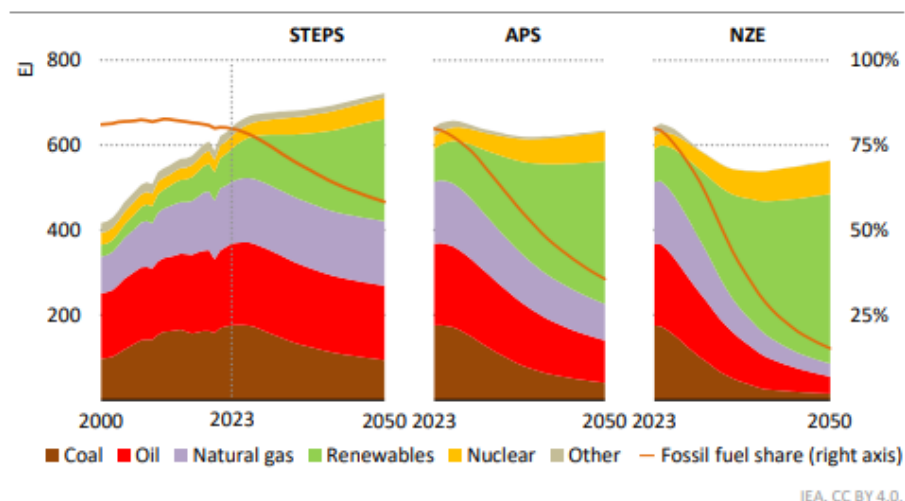


Figure 2.1 Global coal demand by sector in the STEPS, 2000-2050 (IEA 2024)

The *International Energy Outlook 2023*, published by the US Energy Information Administration (US EIA), also explores long-term energy trends across the world. It identifies that while renewable energy is growing the fastest as a share of the primary energy consumption across all cases it modelled, the demand for coal in 2050 is predicted to still be at a similar level to demand now, under all scenarios (Figure 2.2).

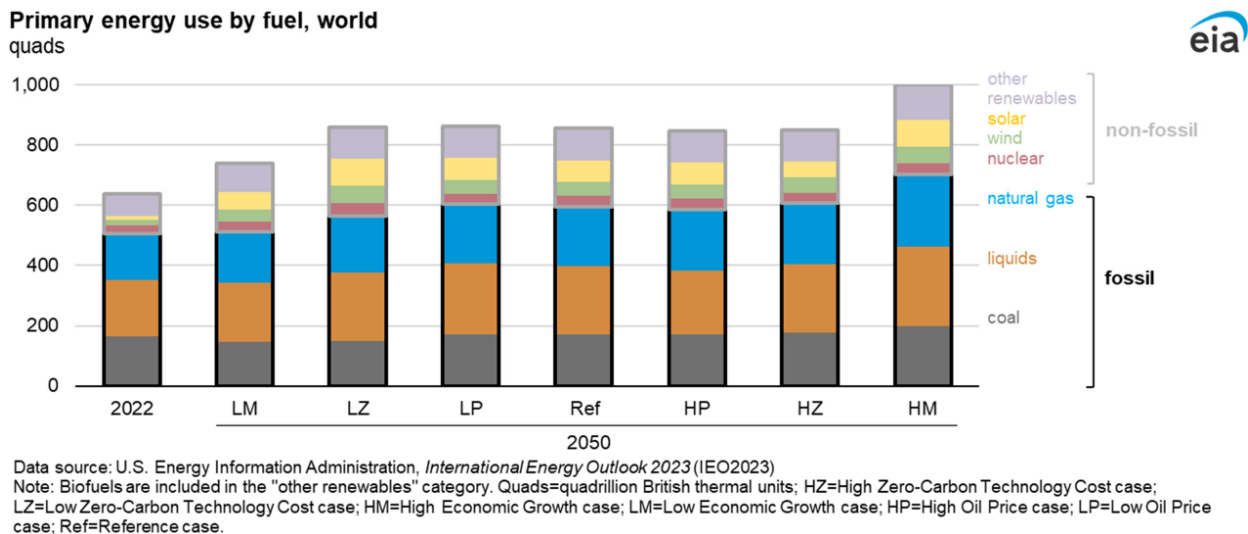


Figure 2.2 Primary energy use by fuel (US EIA 2023)

At a local level, the *Resources and Energy Quarterly* (REQ), published by the Commonwealth Office of the Chief Economist (OCE), provides forecasts of energy export prices and quantities. The December 2024 REQ notes the continued pace and scale of the rollout of renewables (particularly in China, the largest coal importer) and resulting reduction in thermal coal demand is expected to place downward pressure on prices over the coming years. However:

Despite record breaking renewables rollouts and increased use of nuclear and gas, unexpected spikes in demand and weather-related shocks to supply have become an ongoing feature of thermal coal markets. These shocks have sustained demand in 2024, and this pattern could continue. New demand from data centres and the accelerating use of artificial intelligence could double global demand for electricity towards 2026 (compared to 2022) according to the IEA. These uncertainties present upside risks to the forecasts.

The strategic context of the Project as described in the EIS therefore remains; that is, the need for coal from the amended Project is driven by global energy demand, largely from developing Asian countries, and the lack of investment in new sources of supply of coal. It is clear that there is a short-term challenge of resolving the energy crisis as well as the longer-term challenge of an orderly transition to a low emission future. This transition is not linear or uniform across geographies and time and coal continues to have a role in meeting global energy needs.

2.3 Hunter Regional Plan

The *Hunter Regional Plan 2041* (DPE 2022) (HRP 2041) is a 20-year land use plan prepared under the EP&A Act and applies to the local government areas (LGAs) of Cessnock, Dungog, Lake Macquarie, Maitland, Mid Coast, Muswellbrook, Newcastle, Port Stephens, Singleton and Upper Hunter. It sets the strategic land use framework for continued economic growth and diversification of the region.

The HRP 2041 notes that mining, energy and industrial sectors all make the Hunter an economic powerhouse and will remain important contributors to the regional economy into the future. It also references the Strategic Statement, noting that while the global transition to a low carbon future will result in regional variations in terms of coal production, with some areas seeing a gradual decline, the Hunter is likely to see continued demand over the short to medium term. Planning needs to recognise the potential for coal mines to grow, subject to rigorous assessment and extensive community consultation.

It also recognises that as the world transitions to other forms of energy, the NSW Government will work to support coal-dependent communities to diversify for the future with good employment opportunities. In this regard, the ongoing operations at HVO proposed by the amended Project, along with the direct and indirect employment and economic benefits resulting from it, will enable and support the transition to renewable energy forms over time, with reduced impacts to the local population and economy, and with reduced support required from the NSW Government compared to what would occur with a faster decline in the mining sector.

The HRP 2041 contains nine objectives for the Hunter. The first objective of diversifying the Hunter's mining, energy and industrial capacity relates closely to the amended Project, and notes that opportunities for the future alternate use of mine land and associated infrastructure such as power transmission lines, rail lines and water storages will play a key role in the transition of the local economy as existing mines cease operations. It encourages early consideration of alternative land uses during the design stage of new or expanded mines. In this regard, a discussion of how the Project could facilitate alternate land uses that may arise at the completion of the Project was provided in the *Mine Rehabilitation and Closure Strategy* for the Project (EMM 2022b) included as Appendix T of the EIS.

2.4 Singleton Local Environmental Plan 2013

The amended Project involves the continuation of an existing mine in an area that is an established coal mining and power generation precinct, providing employment and other socio-economic contributions to the local and regional community. The strategic planning framework for the area is well established, and mining projects are permissible with development consent on the land within the site.

A minor increase in the development consent boundary is proposed to accommodate additional disturbance areas associated with the construction of transmissions lines required for the amended Project. This additional area is zoned RU1 Primary Production in the *Singleton Local Environmental Plan 2013* (the Singleton LEP), consistent with the majority of the Project area. Development for the purpose of open cut mining is permissible with development consent within this land use zone.

2.5 Muswellbrook Local Environmental Plan 2009

As presented in the EIS (EMM 2022a), a small portion (~3%) of the Project area is contained within the Muswellbrook LGA, primarily on land zoned RU1 – Primary Production under the Muswellbrook LEP, and a small section zoned SP2 – Infrastructure. Minor works related to transmission lines are proposed within the SP2 zone as part of the amended Project. Works within the RU1 zone will be limited to upgrades of coal handling facilities and transmission line infrastructure (i.e. the upgrade of the Newdell LP train loading facility, or the extension of the HVLP product stockpile and the construction of a new 66 kV Ausgrid transmission line).

The amended Project is permissible with development consent in the RU1 zone within the Muswellbrook LGA.

The amended Project does not result in any changes to activities presented within the EIS to land within the Muswellbrook LEP.

3 Description of the amendments

3.1 Introduction

This chapter provides a description of the amendments to the Project documented and assessed in this Amendment Report. It includes a description of amendments to the Project area, mining area, disturbance area, ROM coal production rate, mine life, coal handling and processing and water management.

The amendments described in this Amendment Report are additional to those described in the HVO North Amendment Report (EMM 2023b). Combined, they amend the description of the Project contained in the EIS (EMM 2022a). Accordingly, a consolidated description of the Project as currently proposed, including amendments proposed in both amendment reports, is provided in Appendix B.

3.2 Project area

To provide additional flexibility in the location of transmission lines to be constructed as part of the amended HVO North Project, and as a result of potential conflicts with the proposed EnergyCo Hunter Transmission Project (SSI-70610456), small areas of additional disturbance have been identified as being required across the HVO North Project area. These additional disturbance areas have subsequently resulted in minor adjustments to the current proposed HVO North development consent boundary. The changes to the development consent boundary as proposed in the HVO North Amendment Report (EMM 2023b) and the now proposed amended HVO North development consent boundary, are illustrated on Figure 1.3.

No additional land parcels are impacted as a result of the proposed amendments to the HVO North development consent boundary than what was previously considered.

No changes to the current proposed HVO South development consent boundary, as detailed in the EIS (EMM 2022a) are required. The proposed HVO South development consent boundary is illustrated on Figure 1.3.

3.3 Mining area

To respond to matters raised through the assessment of the Project regarding GHG emissions from the Project, HVO proposes to amend the Project mine plan to avoid coal extraction within gas Domain 1 at HVO North as illustrated on Figure 3.2. In addition, some areas of higher strip ratio coal at HVO South have also been removed from the amended Project mine plan. The mining areas now proposed at HVO North and HVO South are illustrated on Figure 3.1. The amendments to the mine plan will reduce the volume of ROM coal extracted from HVO North and HVO South by approximately 220 Mt and result in a reduction in the annual average ROM coal extraction from the original HVO Project as detailed in Section 3.5, and reduce the mine life of both HVO North and HVO South as detailed in Section 3.6. When compared to the original Project as presented in the Submissions Report (EMM 2023a), this will result in a:

- ~31% reduction in diesel emissions
- ~55% reduction in fugitive emissions, including an approximate ~89% reduction in fugitive emissions from 2040 onwards
- ~43% reduction in total Scope 1 emissions
- ~20% reduction in mine life.

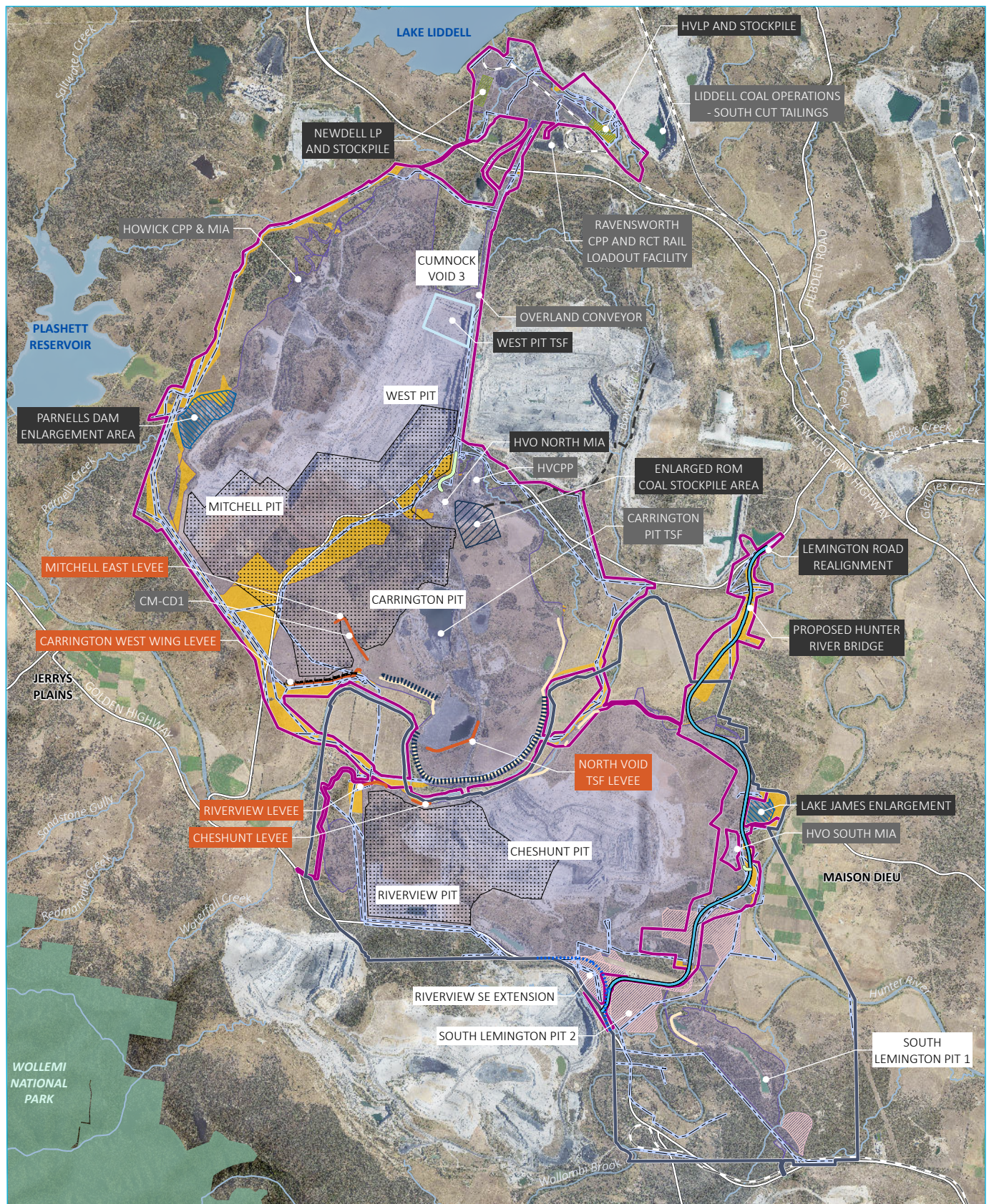
Detailed consideration of the changes to GHG emissions is presented in Section 6.1.

3.4 Disturbance area

Small areas of additional disturbance have been identified as being required across the HVO North Project area as a result of potential conflicts with the proposed EnergyCo Hunter Transmission Project. The total additional disturbance area for HVO North, beyond those previously approved, is now approximately 903 ha.

For HVO South, the removal of the approved Lemington CPP and associated rail facilities from the HVO South Project will result in a reduction in the current approved disturbance area, and complete avoidance of the 0.3 ha of impact to the Warkworth Sands Woodland Endangered Ecological Community (EEC) proposed by the HVO North Amendment Report (EMM 2023b). The amended Project will now have no impact to any Warkworth Sands Woodland EEC. The total additional disturbance area for HVO South, beyond those previously approved, is approximately 47 ha.

The now proposed additional disturbance areas for the HVO North and HVO South are illustrated on Figure 3.1.



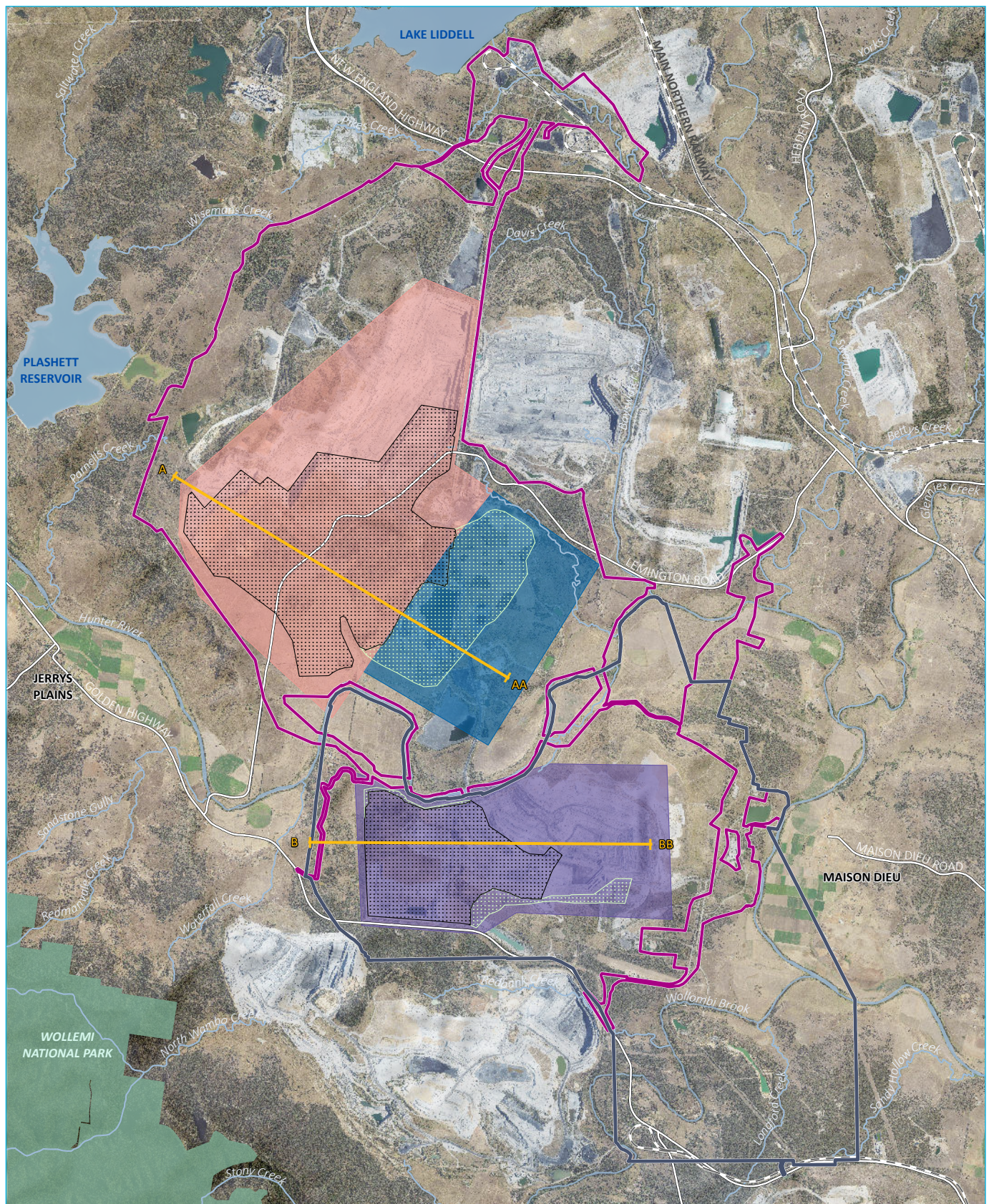
- KEY**
- Amended proposed HVO North development consent boundary
 - Proposed HVO South development consent boundary
 - Existing and approved disturbance area
 - Additional disturbance area
 - Previous approved area not retained
 - Existing low permeability barrier wall
 - Existing levee
 - Proposed HVO continuation project element
 - Approved barrier wall (not yet constructed)
 - Alternative Golden Highway alignment

- Lemington Road realignment
- Levee
- Mine access road
- Proposed haul route to Ravensworth Operations
- Transmission line
- Dam enlargement
- Mining area
- Product stockpile
- ROM coal stockpile area
- West Pit TSF

- Existing environment
- Rail line
- Major road
- Named watercourse
- Named waterbody
- NPWS reserve
- Label format
- Existing item
- Levee
- Project related item

HVO Complex conceptual layout

HVO Continuation Project
Amendment Report
Figure 3.1



Source: EMM (2025); Glencore (2025); DCSSS (2024); GA (2009)

0 2.5 5 km
GDA2020 MGA Zone 56

KEY

- | | |
|--|---|
| — Amended proposed HVO North development consent boundary | Domain (gas model) |
| — Proposed HVO South development consent boundary | ■ Domain 1 |
| — Cross section | ■ Domain 2 |
| ■ Previous mining area no longer proposed | ■ Domain 3 |
| ■ Proposed mining area | Existing environment |
| | — Rail line |
| | — Major road |
| | — Named watercourse |
| | ■ Named waterbody |
| | ■ NPWS reserve |

HVO greenhouse gas model domains

HVO Continuation Project
Amendment Report
Figure 3.2

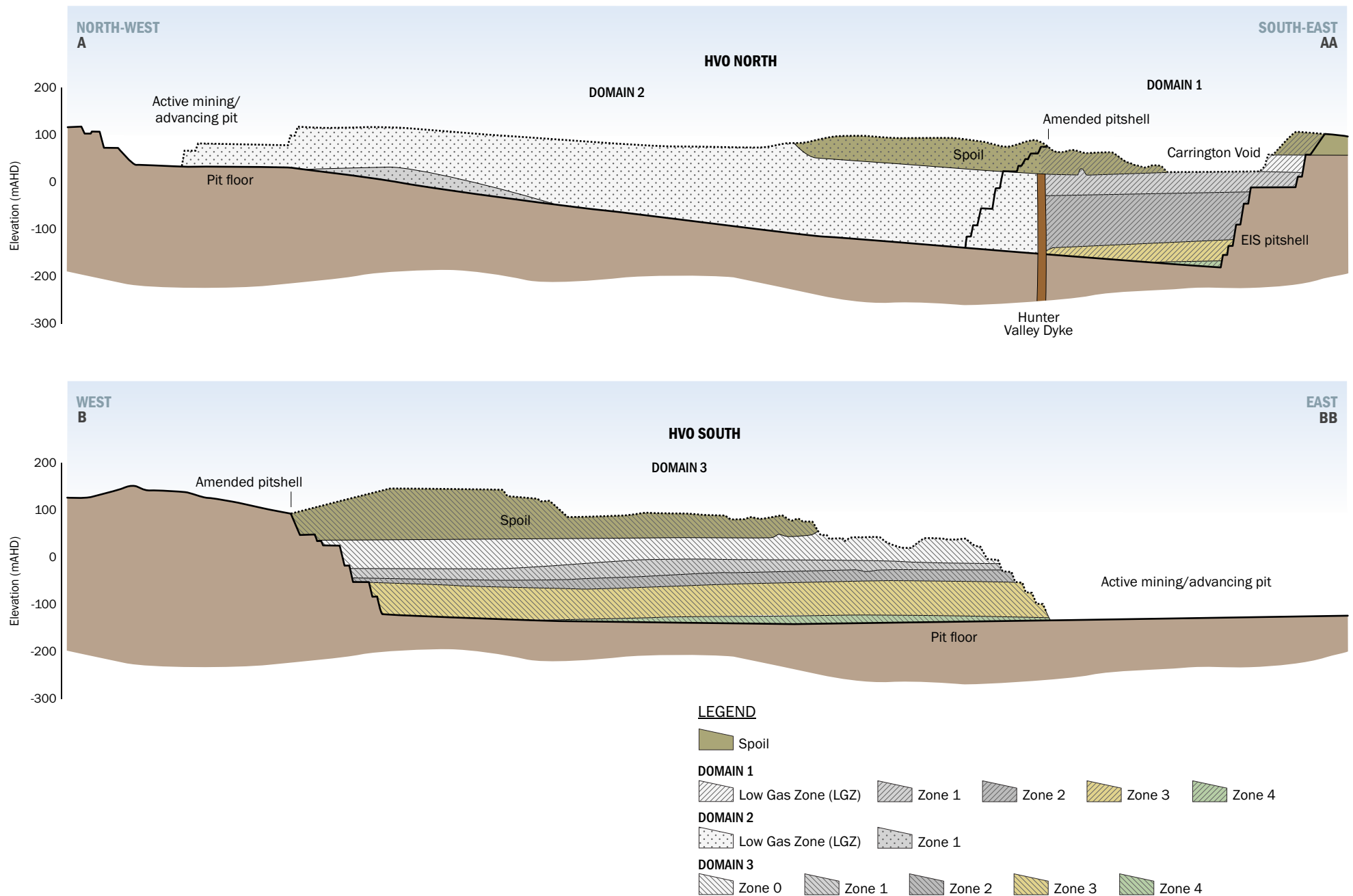


Figure 3.3 Conceptual gas domains and zones across the HVO Complex

3.5 ROM coal production rate

The amended Project will propose a maximum annual ROM coal production limit of 26 Mtpa across the HVO Complex compared to the currently approved 42 Mtpa. Within this limit, ROM coal production will be limited to:

- up to 22 Mtpa from HVO North
- up to 13 Mtpa from HVO South.

HVO South is currently approved to extract up to 20 Mtpa. The original Project as assessed in the EIS proposed a maximum ROM coal extraction rate from HVO South of 18 Mtpa. The amended Project now proposes a maximum annual ROM coal extraction rate of 13 Mtpa, a 7 Mtpa reduction in approved maximum ROM coal production in any one year.

No change to the maximum annual production rate at HVO North is proposed. This remains consistent with current approved ROM coal extraction rates and the 22 Mtpa assessed within the EIS (EMM 2022a).

Notwithstanding the above, HVO proposes a limit to the maximum annual ROM production rate for the HVO Complex of 26 Mtpa, reduced from the current approved maximum production of 42 Mtpa (or 35 Mtpa with the proposed reduced production limit for HVO South).

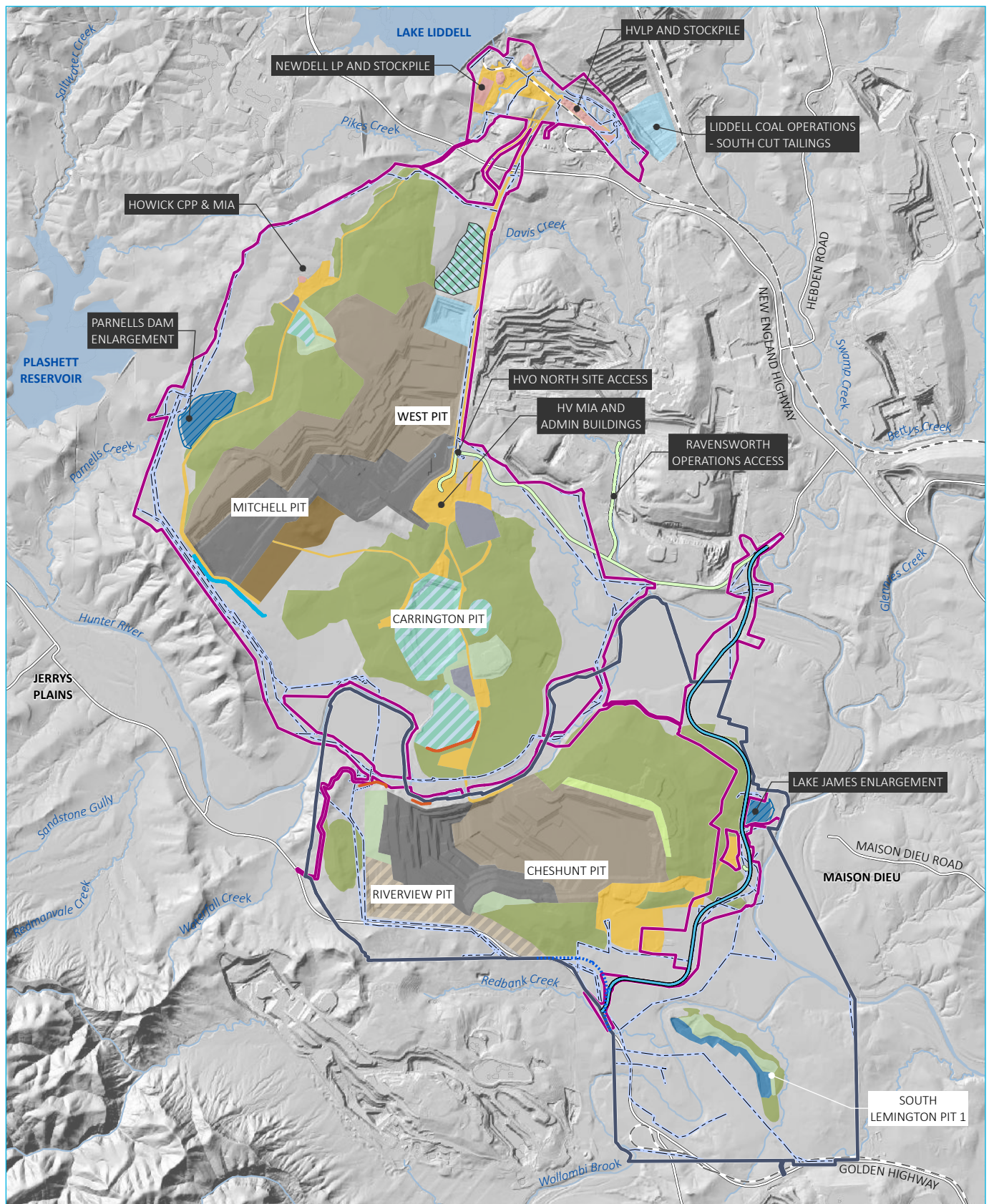
A total of approximately 430 Mt of ROM coal will be extracted over the amended Project life, which represents a reduction in total ROM coal extraction from the Project by approximately 220 Mt compared to the original Project mining schedule (2027-2050) as presented in the EIS (EMM 2022a).

3.6 Mine life

The amended Project will reduce the proposed life of mining operations at HVO North from 2050 (as proposed in the EIS) by five years to 2045 and for HVO South, from 2045 (as proposed in the EIS) by three years to 2042. Decommissioning and rehabilitation activities will continue to be carried out across the HVO Complex beyond these dates.

Revised conceptual staged mine plans for the life of the amended Project are provided for indicative years 3, 6, 8, 12 and 15 in Figure 3.4 to Figure 3.8. For the purposes of relevant technical assessments, Year 1 is assumed to be 2027, pending the timeframe for determination of the amended Project. The conceptual mine years presented in Figure 3.4 to Figure 3.8 were chosen as they are considered representative of key mining stages for the amended Project and to capture the most conservative scenarios (such as maximum material movement and closest proximity of activity) for assessment in terms of potential impacts to neighbouring properties with respect to air quality and noise.

The conceptual stage plans illustrate the different activities being undertaken during that indicative year, including coal extraction, overburden and tailings emplacement, infrastructure construction and rehabilitation. A revised conceptual final landform for HVO North and HVO South is also presented in Figure 1.5 and Figure 1.7 respectively. Consideration of the impacts of the amended final landform to what was presented in the EIS is discussed in detail in Section 6.9.

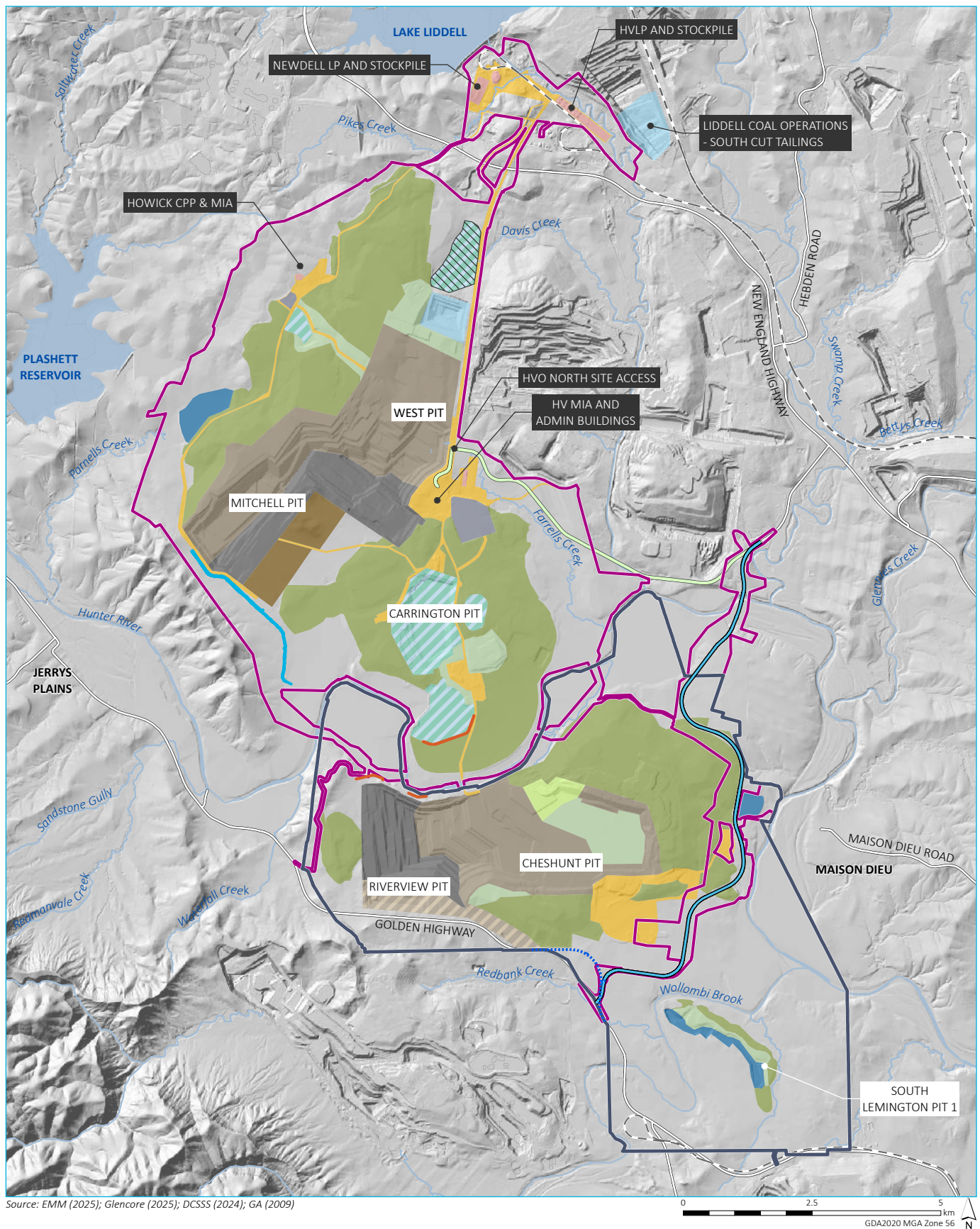


Source: EMM (2025); Glencore (2025); DCSSS (2024); GA (2009)



Conceptual staged mine plan - year 3

HVO Continuation Project
Amendment Report
Figure 3.4



KEY

- Amended proposed HVO North development consent boundary
- Proposed HVO South development consent boundary
- Alternative Golden Highway alignment
- Lemington Road realignment
- Mine access road
- Water infrastructure
- Clean water drain
- Levee
- Cumnock Void 3 (managed by Ravensworth Operations)

Year 6 indicative mine plan

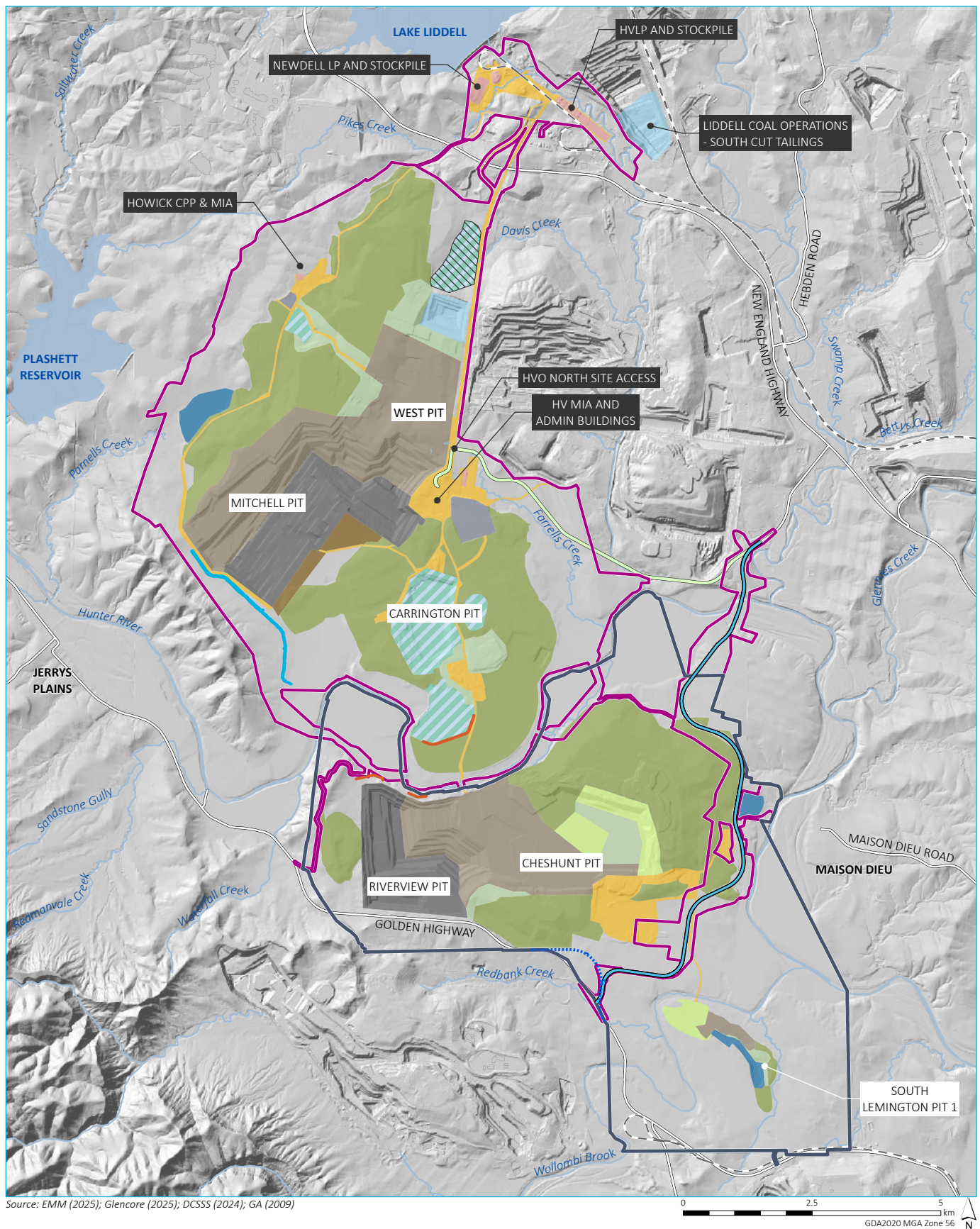
- Active emplacement area
- Inactive emplacement area
- Active mining area
- Active tailings emplacement area
- Inactive tailings emplacement/capping in progress
- Infrastructure/access
- Preparation area
- Product coal stockpile
- ROM coal stockpile
- Rehabilitation

Shaping for final landform

- Temporary stabilisation
- Water storage
- Existing environment
- Rail line
- Major road
- Named watercourse
- Named waterbody

Conceptual staged mine plan - year 6

HVO Continuation Project
Amendment Report
Figure 3.5

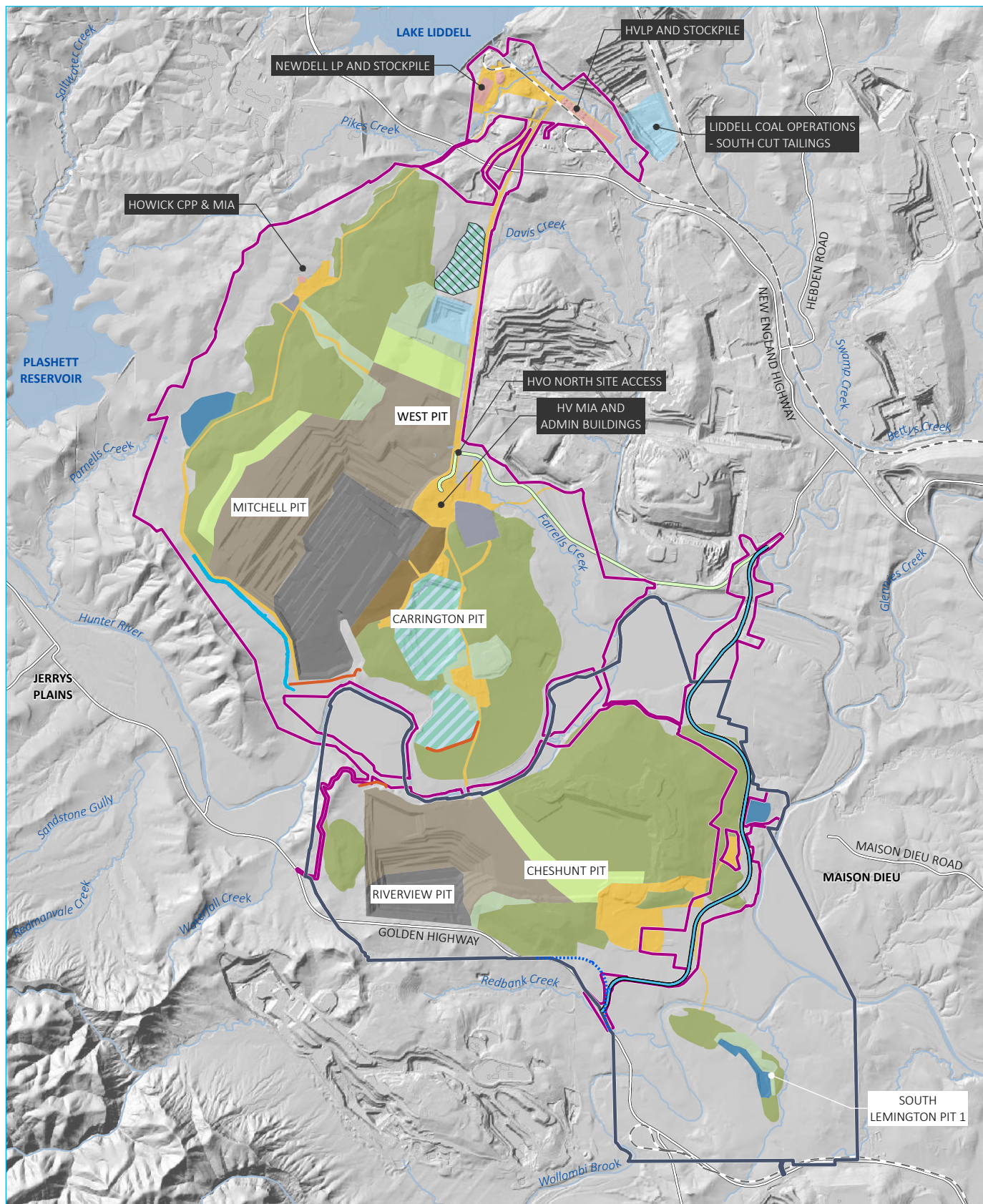


- KEY**
- Amended proposed HVO North development consent boundary
 - Proposed HVO South development consent boundary
 - Alternative Golden Highway alignment
 - Lemington Road realignment
 - Mine access road
 - Water infrastructure
 - Clean water drain
 - Levee
 - Cumnock Void 3 (managed by Ravensworth Operations)
- Year 8 indicative mine plan**
- Active emplacement area
 - Active mining area
 - Active tailings emplacement area
 - Inactive tailings emplacement/capping in progress
 - Infrastructure/access
 - Preparation area
 - Product coal stockpile
 - ROM coal stockpile
 - Rehabilitation
 - Shaping for final landform

- Temporary stabilisation
- Water storage
- Existing environment
- Rail line
- Major road
- Named watercourse
- Named waterbody

Conceptual staged mine plan - year 8

HVO Continuation Project
Amendment Report
Figure 3.6



KEY

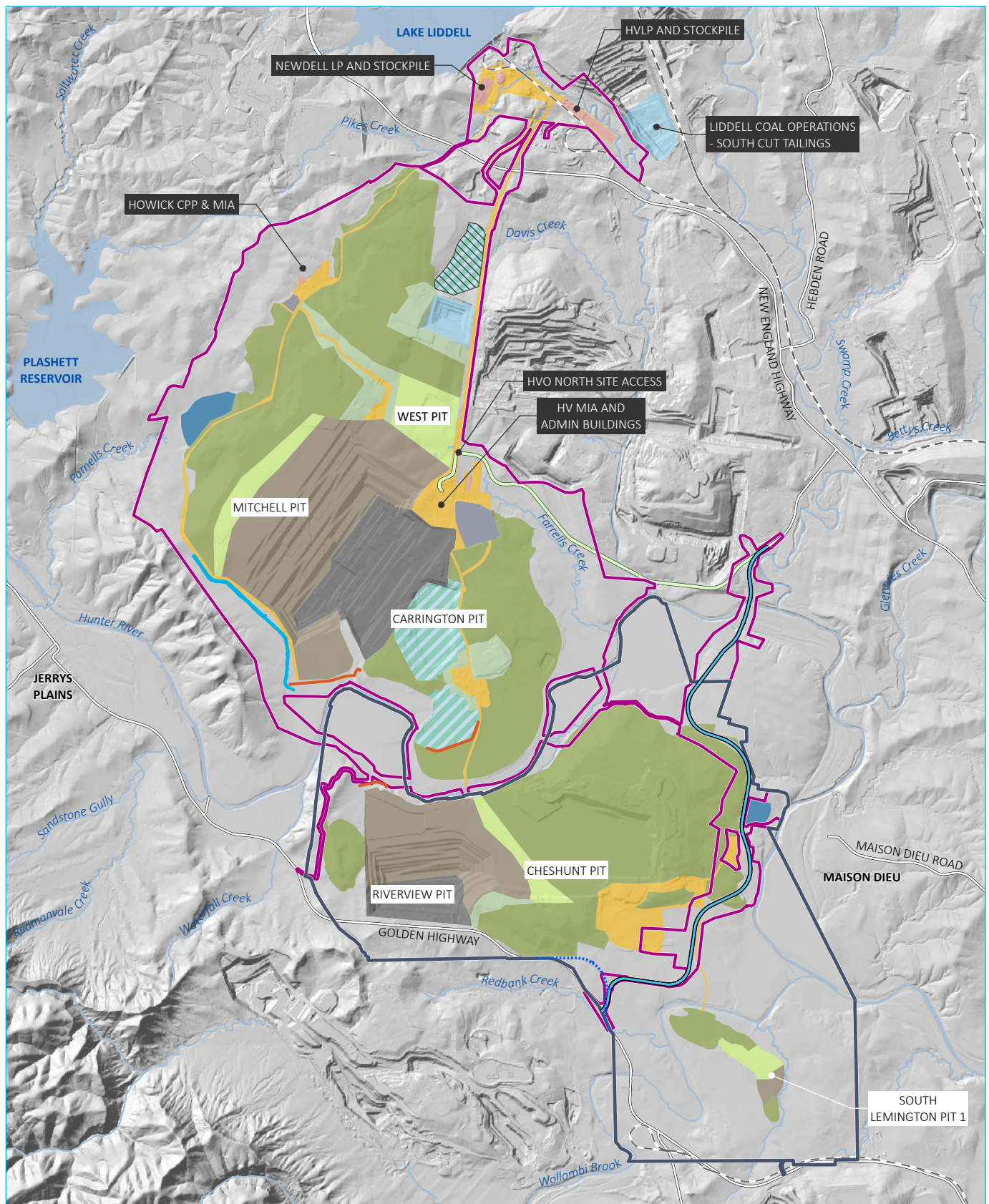
- Amended proposed HVO North development consent boundary
- Proposed HVO South development consent boundary
- Alternative Golden Highway alignment
- Lemington Road realignment
- Mine access road
- Water infrastructure
- Clean water drain
- Levee
- Cumnock Void 3 (managed by Ravensworth Operations)

- Year 12 indicative mine plan
- Active emplacement area
 - Active mining area
 - Active tailings emplacement area
 - Inactive tailings emplacement/capping in progress
 - Infrastructure/access
 - Preparation area
 - Product coal stockpile
 - ROM coal stockpile
 - Rehabilitation
 - Shaping for final landform

- Temporary stabilisation
- Water storage
- Existing environment
- Rail line
- Major road
- Named watercourse
- Named waterbody

Conceptual staged mine plan- year 12

HVO Continuation Project
Amendment Report
Figure 3.7



KEY

- Amended proposed HVO North development consent boundary
- Proposed HVO South development consent boundary
- Alternative Golden Highway alignment
- Lemington Road realignment
- Mine access road
- Water infrastructure
- Clean water drain
- Levee
- Cumnock Void 3 (managed by Ravensworth Operations)

- Year 15 indicative mine plan
- Active emplacement area
- Active mining area
- Active tailings emplacement area
- Inactive tailings emplacement/capping in progress
- Infrastructure/access
- Product coal stockpile
- ROM coal stockpile
- Rehabilitation
- Shaping for final landform
- Temporary stabilisation

- Water storage
- Existing environment
- Rail line
- Major road
- Named watercourse
- Named waterbody

Conceptual staged mine plan- year 15

HVO Continuation Project
Amendment Report
Figure 3.8

3.7 Coal handling and processing

Coal extracted from HVO North is approved to be transported via internal haul roads to one of two CPPs; the HVCPP or the Howick CPP, where it is crushed to size and either processed to remove impurities or bypassed where coal quality is appropriate.

Coal from all HVO South pits is approved to be transported via internal haul roads to the HVCPP or Howick CPP in addition to the Newdell CPP and the approved but not yet constructed LCPP.

The original Project as presented in the EIS (EMM 2022a) sought to retain the current ability to transport coal to these facilities for processing and transport off site by train.

As noted above, HVO South currently has approval to construct and operate the LCPP and to construct a rail loop off the Wambo rail spur; however, market conditions to date have not necessitated the construction of this infrastructure. The original Project sought to continue to provide the ability for the Project to construct and operate the LCPP and associated long rail loop. Following a review of the Project, HVO no longer requires the construction and use of the LCPP and associated rail facilities and therefore has removed this infrastructure from the amended Project (refer to Figure 3.1).

However, the amended Project now seeks the ability to temporarily transport product coal from the Howick CPP by truck to the Liddell stockpile and use the Liddell coal handling and train loading facilities while the Newdell LP is being upgraded. Product coal will be transported along the same route from Howick to Newdell but continue along a small section (~300 m) of private road between the Newdell LP and the Liddell coal handling and train loading facilities.

In addition to the above, an expansion of the ROM coal stockpile adjacent to the HVO North MIA is also proposed to improve management of coal volumes over the life of the amended Project.

3.8 Water management

An integrated water management system is in place across HVO North and South. The amended Project will continue the use of the existing integrated water management system, which includes water transfers to and from surrounding operations. The original Project as described in the EIS (EMM 2022a) included upgrades to the water management system which remain applicable to the amended Project.

To support the amended Project, a revised surface water management system has been designed, as is detailed in Section 6.5, to take into consideration staging of the amended Project and the revised final landform designs.

In addition to the changes to the surface water management system as proposed by the original Project and detailed in the EIS (EMM 2022a), the amended Project seeks approval for the construction of a new levee (Mitchell East levee) to provide flood protection to the Mitchell Pit void for the probable maximum flood (PMF) level after mine closure.

4 Statutory context

4.1 Introduction

This chapter describes the relevant Commonwealth and State legislation and regulatory framework under which the amended Project will be assessed and determined. Updated statutory compliance tables with relevant legislation are provided as Appendix D. It also provides consideration of the amended Project against the guiding principles set out in section 8 of the NZF Act.

4.2 Approval pathway

Sections 37 and 38 of the NSW Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) provide that a development application, including SSD applications, may be amended by the applicant at any time before the application is determined, with the approval of the consent authority. This report supports the applicant's request to amend the two SSD applications for the Project and has been prepared having regard to the *State significant development guidelines – preparing an amendment report* (DPIE 2022b).

The approval pathway of the amended Project remains the same to that discussed in the EIS; that is, the Project is SSD, and approval is sought under Part 4, Division 4.7 of the EP&A Act.

Under section 4.5 of the EP&A Act, the consent authority for SSD is the NSW Minister for Planning and Public Spaces if the NSW Independent Planning Commission (IPC) has not been declared to be the consent authority by an environmental planning instrument (EPI).

Section 2.7 of the *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP) states that the IPC is declared to be the consent authority under section 4.5 of the EP&A Act for SSD if:

- the council of the area in which the development is to be carried out has objected to the development, or
- at least 50 unique submissions (other than from a council) have been made by way of objection to the development, or
- a person has disclosed a reportable political donation in connection with the development application.

A total of 72 objections were received on the Project during the public exhibition period of the EIS. Of the 72 objecting submissions, 67 are considered unique submissions for the purposes of section 2.7 of Planning Systems SEPP. The IPC is therefore the consent authority for this Project, as amended, under section 4.5(a) of the EP&A Act.

It is noted that Singleton Council and Muswellbrook Shire Council did not object to the Project, nor has HV Operations Pty Ltd (as the applicant) made a reportable political donation.

4.3 Other approvals

As noted in Chapter 5 of the EIS, the Project requires approvals under other NSW legislation and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Table 4.1 identifies changes to these approval requirements as a result of the amended Project. The required approvals have been grouped into the following categories:

- Consistent approvals: which are approvals that cannot be refused and must be substantially consistent with the approval under section 4.42 of the EP&A Act.
- EPBC Act approvals: whether approval is required under the EPBC Act and whether the bilateral agreement applies.

- Other approvals: other approvals that are required and are not consistent approvals.
- Approvals not required: approvals that would be required if the amended Project was not SSD as per section 4.41 of the EP&A Act.

Table 4.1 Approvals and licences required

Approval	Requirement – Original Project	Amended Project
Consistent approvals		
Approval under section 22 of the NSW <i>Coal Mine Subsidence Compensation Act 2017</i> ¹	The Project is within the Patrick Plains mine subsidence district. Approval under section 22 will be sought for new and upgraded infrastructure proposed where applicable.	No change.
A mining lease under the NSW <i>Mining Act 1992</i> (Mining Act)	Additional conversion of existing exploration licences (ELs) to mining leases (MLs) will be required to enable the Project. At HVO North, the Project involves the extraction of coal from deeper seams (i.e. down to the Barrett seam) beneath areas that have been predominantly previously mined. Despite the upper seams of these areas being previously mined, the deeper seams are covered by ELs as existing MLs do not extend to the depth of the Barrett seam across the entire proposed mining area. Therefore, application for new MLs over these ELs will be required at depth in some areas. In addition, a small area that is within the proposed mining area (between the Mitchell Pit and the Carrington area) is within a surface EL and therefore a new ML to the required depth will be required to cover this area. At HVO South, the Project involves a small change to the approved footprint to straighten the highwall, and in doing so, steps outside the area covered by an existing ML into an area covered by an EL. A new ML will also be required at HVO South to cover this small area. A site verification certificate (SVC – 12575722) was issued on 14 May 2021 for these areas, as required by section 50A of the EP&A Regulation. Further to this, the Surface Water Impact Assessment prepared for the Project (which includes an updated water management system for the Project, refer to Appendix J of the EIS), identified the need for an additional clean water diversion and sediment dam adjacent to the Mitchell Pit at HVO North and the Riverview Pit at HVO South. A portion of these water management works will be outside of existing MLs and the area covered by SVC – 12575722. The clean water diversion is an ancillary mining activity for the purposes of section 6 of the Mining Act. Therefore, it must be authorised by a mining lease or via a condition included in an adjoining mining lease. HVO holds adjoining mining leases to where these	No change to the requirements under the Mining Act as documented for the original Project. A revised Water Assessment (EMM 2025d) has been prepared for the amended Project, to assess the changes to the proposed mining extent. The revised Water Assessment is provided as Appendix I with outcomes summarised in Section 6.5. There is no change to the ML requirements to facilitate the construction of the water management system beyond what was presented in the EIS.

¹ Section 4.42(1b) of the EP&A Act refers to approval under section 15 of the NSW *Mine Subsidence Compensation Act 1961*. However, this legislation was repealed in 2017 by the NSW *Coal Mine Subsidence Compensation Act 2017*.

Approval	Requirement – Original Project	Amended Project
	works will occur (ML 1428 and ML 1634); therefore, it is proposed that a condition be added to these MLs authorising the clean water diversion works on the land adjoining them or a new ML for ancillary mining activities be obtained. HVO will continue to consult with the Department of Regional NSW – Mining, Exploration & Geoscience on this matter associated with the submission of any mining lease applications required for the Project. In addition, the Project seeks to extend the existing product coal stockpile at the HVLP at HVO North beyond the currently approved extent. The area in which the extension is proposed is not covered by a surface mining lease, and therefore a second SVC was applied for and issued for this area (SVC – 41389276) on 30 June 2022.	
Environment protection licence under section 43 of the NSW <i>Protection of the Environment Operations Act 1997</i> (POEO Act)	The HVO Complex currently operates under one EPL (EPL 640). EPL 640 will be varied as required if the Project is approved.	No change.
Consent under section 138 of the NSW <i>Roads Act 1993</i> (Roads Act)	A consent is required under section 138 to work on or above a road or to connect a road to a classified road. Approval from Singleton Council as the appropriate roads authority will be required for the Lemington Road realignment and works on Liddell Station Road.	No change.
EPBC Act approval		
An approval under Part 3, Division 1 of the EPBC Act	Referrals under the EPBC Act were submitted in April 2022 to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) for the Project regarding potential impacts to listed threatened species and ecological communities, and water resources, to determine if it is a controlled action. The Project was determined a controlled action on 13 December 2023 with the Project requiring approval under Part 3, Division 1 of the EPBC Act. The assessment approach was to be by public environment reports (PERs). The EPBC Act referrals were withdrawn on 1 October 2024, in anticipation of the proposed amendments being made to the Project.	Revised referrals for the amended Project were submitted to DCCEEW on 16 April 2025, being: • HVO North Project (EPBC 2025/10177) • HVO South Project (EPBC 2025/10176). At the time of preparing this Amendment Report, a controlled action decision in relation to the referrals was still pending; however, it is anticipated that approval under Part 3, Division 1 of the EPBC Act will be required for the amended Project. It is also anticipated that the assessment approach will be via PERs.
Other approvals		
Approvals under Part 2 and Part 4 of the Roads Act	Approval will be required for realignment (closure and reopening) of Lemington Road and the closure of part of Liddell Station Road to enable the extension of the HVLP product coal stockpile.	No change.

Approval	Requirement – Original Project	Amended Project
Aquifer interference approval under section 91 of the NSW <i>Water Management Act 2000</i> (WM Act)	The requirement to obtain an aquifer interference approval under section 91(3) of the WM Act is triggered only when a proclamation has been made under section 88A that the particular type of approval is required. To date, no proclamation has been made specifying that an aquifer interference approval is required in any part of NSW. In the meantime, the <i>NSW Aquifer Interference Policy</i> (AIP) sets the policy with respect to aquifer interference.	No change.
Water access licences under the WM Act	HVO holds a number of water access licences under three water sharing plans (WSPs) regulated by the WM Act, including: • <i>Water Sharing Plan for the Hunter Regulated River Water Source 2016</i> (Hunter Regulated WSP). • <i>Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009</i> (Hunter Unregulated WSP). • <i>Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016</i> (North Coast Groundwater WSP). A water licensing strategy was presented as Appendix D of the Submissions Report (EMM 2023a) and identified that HVO holds sufficient entitlement for the Project predicted surface water take (from the Hunter Regulated WSP and Hunter Unregulated WSP) and holds more than sufficient entitlement to account for the predicted groundwater take over the Project life and beyond in most water sources. Due to long-term indirect take as a result of water table equilibration, a small predicted take in the Hunter Regulated River Alluvial Water Source – Glennies Creek management zone and the Jerrys Water Source of the North Coast Groundwater WSP would require additional water licences to be secured prior to the take occurring, with purchase entitlement available via the open market.	A revised Water Assessment has been prepared to support the amended Project. The revised Water Assessment is provided as Appendix I. HVO holds considerable water entitlement in the relevant surface water and groundwater sources in the Project area, which is sufficient to account for the predicted takes in most water sources. During operations, the small predicted peak indirect groundwater (alluvial) take from the Jerrys Water Source (4 ML/yr) of the North Coast Groundwater WSP exceeds HVO's entitlement. Prior to the take occurring, HVO will either apply to convert sufficient existing unregulated river entitlements to aquifer entitlements or purchase entitlement via the open market to account for the small predicted indirect groundwater take in the Jerrys Water Source. During the closure period, take associated with runoff captured from storages on non-minor streams within the Jerry Water Source (Jerrys management zone) during the transition period that exceeds HVO's existing entitlement will be sourced from the open market (including trade, in accordance with the WSP rules). There is adequate share entitlement within the Jerrys Water Source for the predicted take. At closure, the predicted peak indirect groundwater (alluvial) take from the Jerrys Water Source (26 ML/yr) exceeds HVO's entitlement. Prior to the take occurring, HVO will either apply to convert sufficient existing unregulated river entitlements to aquifer entitlements or purchase entitlement via the open market. A revised water licensing strategy has been prepared which considers the water licensing requirements of the amended Project. The revised water licensing strategy is presented in the Water Assessment provided as Appendix I with outcomes summarised in Section 6.5 of this Amendment Report.
Commonwealth <i>Native Title Act 1993</i> (NT Act)	There are no native title claims or determinations currently over the Project area.	No change.

Approval	Requirement – Original Project	Amended Project
Approvals under Part 4 and Part 5 of the NSW <i>Crown Land Management Act 2016</i> (CLM Act)	There are a number of Crown land parcels and roads within the Project footprint as shown in Figure 5.2 of the EIS. An appropriate authorisation will be obtained under the CLM Act to enable the occupation and use of the identified Crown land and roads.	No change. There are no additional Crown land parcels or roads within the amended proposed HVO North development consent boundary or the proposed HVO South development consent boundary.
Approvals not required		
A permit under sections 201, 205 or 219 of the NSW <i>Fisheries Management Act 1994</i> (FM Act)	The Project's impacts on threatened species, populations or communities listed under the FM Act are discussed in Chapter 14 of the EIS. An Aquatic Ecology and GDE Assessment (ELA 2022) was prepared and provided as Appendix M to the EIS (EMM 2022a). The Project is not predicted to impact any threatened species, populations or communities listed under the FM Act.	No change. The amended Project is not predicted to impact any threatened species, populations or communities listed under the FM Act. An Aquatic Ecology and GDE Assessment has been prepared by ELA (2025) which considers the impacts of the amended Project on threatened species, populations or communities under the FM Act. An Aquatic Ecology and GDE Assessment is provided as Appendix J and outcomes summarised in Section 6.5 of this Amendment Report.
Approval under Part 4 or section 139 of the NSW <i>Heritage Act 1977</i> (Heritage Act)	The Project's impacts on historic heritage items are discussed in Chapter 16 and Appendix O of the EIS.	No change. A review of impacts to historic heritage items as a result of the amended Project is presented in Section 6.10.
An Aboriginal heritage impact permit under section 90 of the NSW <i>National Parks and Wildlife Act 1974</i> (NPW Act)	The Project's impacts on Aboriginal cultural heritage are described in Chapter 15 and Appendix N of the EIS. A revised Aboriginal Cultural Heritage Assessment was presented in Appendix C of the Submissions Report (EMM 2023a). The Project will have an impact on two sites assessed as having high significance, 10 sites assessed as having moderate significance and 193 sites assessed as having low/low-moderate significance.	A review of impacts to Aboriginal cultural heritage as a result of the amended Project is presented in Appendix K with outcomes summarised in Section 6.6. The amended Project will not change impacts to sites of high or moderate significance. The amended Project will avoid impacts to six sites of low significance that were proposed to be impacted by the original Project.
A water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the WM Act	The Project's impacts on water resources are discussed in Chapter 12 of the EIS.	A revised Water Assessment (EMM 2025d) has been prepared to assess the impacts of the amended Project on water resources. The revised Water Assessment is provided as Appendix I and outcomes summarised in Section 6.5 of this Amendment Report.

4.4 Pre-conditions to approvals

Pre-conditions for the consent authority in exercising the power to grant approval for the amended Project are provided in Table 5.2 of the EIS. There is no change to these pre-conditions for the amended Project, as addressed in the EIS.

4.5 Mandatory matters for consideration

The mandatory conditions that must be satisfied before the consent authority may grant approval to the amended Project are listed in Table 4.2.

Table 4.2 **Mandatory considerations for the amended Project**

Statutory document	Section reference	Mandatory consideration	Where addressed
Considerations under the EP&A Act and Regulation			
EP&A Act	Section 1.3	Relevant objects of the Act.	Chapter 7 (Justification). EIS Chapter 28 (Justification and conclusion).
	Section 4.15(1)	The provisions of any relevant EPIs:	This table.
		• Planning Systems SEPP • <i>State Environmental Planning Policy (Resources and Energy) 2021</i> (the Resources and Energy SEPP) • <i>State Environmental Planning Policy (Transport and Infrastructure) 2021</i> (the Transport and Infrastructure SEPP) • <i>State Environmental Planning Policy (Resilience and Hazards) 2021</i> (the Resilience and Hazards SEPP) • Singleton LEP • Muswellbrook Local Environmental Plan 2009 (the Muswellbrook LEP).	
		The provisions of any planning agreement that has been entered into or any draft planning agreement that a developer has offered to enter into.	
		The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality.	
		The suitability of the site for the development.	
		The public interest.	Chapter 7 (Justification). EIS Chapter 28 (Justification and conclusion).

Statutory document	Section reference	Mandatory consideration	Where addressed
Mandatory relevant considerations under EPIs			
Resources and Energy SEPP	Section 2.16	Non-discretionary development standards for mining: - Identifies development standards on particular matters relating to mining that, if complied with, prevents the consent authority from requiring more onerous standards for those matters: - Cumulative noise level – The development does not result in a cumulative amenity noise level greater than the recommended amenity noise levels, as determined in accordance with Table 2.2 of the <i>Noise Policy for Industry</i> (EPA 2017), for residences that are private dwellings. - Cumulative air quality level – The development does not result in a cumulative annual average level greater than 25 micrograms per cubic metre ($\mu\text{g}/\text{m}^3$) of particulate matter with a diameter of 10 micrometres (μm) or smaller (PM_{10}) or 8 $\mu\text{g}/\text{m}^3$ of particulate matter with a diameter of 2.5 μm or smaller ($\text{PM}_{2.5}$) for private dwellings. - Airblast overpressure – Airblast overpressure caused by the development does not exceed: 120 decibels (dB) (Lin Peak) at any time 115 dB (Lin Peak) for more than 5% of the total number of blasts over any period of 12 months, measured at any private dwelling or sensitive receiver. - Ground vibration – Ground vibration caused by the development does not exceed: 10 millimetres per second (mm/sec) (peak particle velocity) at any time 5 mm/sec (peak particle velocity) for more than 5% of the total number of blasts over any period of 12 months. - Measured at any private dwelling or sensitive receiver. - Aquifer interference – Any interference with an aquifer caused by the development does not exceed the respective water table, water pressure and water quality requirements specified for item 1 in columns 2, 3 and 4 of Table 1 of the AIP for each relevant water source listed in column 1 of that Table.	Section 6.1 (GHG) and Appendix E. Section 6.2 (Air quality) and Appendix F. Section 6.3 (Noise) and Appendix G. Section 6.5 (Water resources) and Appendix I. Section 6.10 (Other matters – blasting).

Statutory document	Section reference	Mandatory consideration	Where addressed
	Section 2.17	Compatibility of proposed mine, petroleum production or extractive industry with other land uses: - Consider whether or not the development is likely to have a significant impact on, or be incompatible with, the existing, approved or future uses of land in the vicinity of the development. - Evaluate and compare the respective public benefits of the development and the land uses referred above, and any measures proposed by the applicant to avoid or minimise any incompatibility.	There is no change to the compatibility of the amended Project to other land uses to that described in the EIS. The matters are addressed in EIS Chapter 28 (Justification and conclusion) and in Chapter 7 (Justification) of this report.
	Section 2.18	Consideration of voluntary land acquisition and mitigation policy: Consider any applicable provisions of the voluntary land acquisition and mitigation policy.	Section 6.2 (Air quality) and Appendix F. Section 6.3 (Noise) and Appendix G.
	Section 2.19	Compatibility of proposed development with mining, petroleum production or extractive industry: - Consider whether or not the development is likely to have a significant impact on, or be incompatible with, current or future extraction or recovery of minerals, petroleum or extractive materials (including by limiting access to, or impeding assessment of, those resources). - Evaluate and compare the respective public benefits of the development and the uses, extraction and recovery referred to above, and evaluate any measures proposed by the applicant to avoid or minimise any incompatibility.	There is no change to the compatibility of the amended Project to other land uses to that described in the EIS. The matters are addressed in EIS Chapter 28 (Project Justification) and in Chapter 7 (Justification) of this report.

Statutory document	Section reference	Mandatory consideration	Where addressed
	Section 2.20	Natural resource and environmental management: - Consider whether or not the consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner. - Consider an assessment of the greenhouse gas emissions of the development. - Consider any certification by the Chief Executive of the Office of Environment and Heritage or the Director-General of the Department of Primary Industries that measures to mitigate or offset the biodiversity impact of the proposed development will be adequate.	Section 6.1 (GHG) and Appendix E. Section 6.4 (biodiversity) and Appendix G. EIS Chapter 28 (Justification and conclusion) It is noted in Section 6.1 that the countries that have historically imported product coal from the HVO Complex for power generation have submitted Nationally Determined Contributions (NDCs) under the Paris Agreement or have followed international standards recognised by the United Nations Framework Convention on Climate Change (UNFCCC) and published NDCs in line with the Agreement. Under the Paris Agreement, each party is required to prepare, communicate, and maintain successive NDCs, submitting updates every five years. These NDCs are recorded in the UNFCCC's public registry. These regular update cycles and the built in "ratchet" mechanism are designed to progressively increase emission reductions over time, ensuring that Parties strengthen their emission reduction commitments in alignment with the long term goals of the Paris Agreement. While this context is relevant within the global context, it does not establish a basis for the consent authority (i.e. the IPC) to impose conditions (if consent were granted) to reduce scope 3 emissions from the amended Project. It is therefore unnecessary and inappropriate for downstream scope 3 emissions that occur outside NSW and Australia to be subject to conditions of consent under the EP&A Act.

Statutory document	Section reference	Mandatory consideration	Where addressed
	Section 2.21	Resource recovery: - Consider the efficiency or otherwise of the development in terms of resource recovery. - Consider whether or not the consent should be issued subject to conditions aimed at optimising the efficiency of resource recovery and the reuse or recycling of material.	Chapter 3 (Description of the amendments). As described, the amended Project will not extract approximately 220 Mt of ROM coal that was proposed to be extracted by the original Project; however, this is primarily to address concerns relating to Scope 1 GHG emissions. Notwithstanding, as demonstrated by the economic assessment, the Project will still generate a significant net economic benefit to NSW and the local region, and in doing so, it strikes an appropriate balance between resource recovery and managing environmental constraints.
	Section 2.22	Transport: Consider whether or not the consent should be issued subject to conditions related to the transport of materials by road.	Section 6.10 (Other matters – traffic and transport).
	Section 2.23	Rehabilitation: Consider whether or not the consent should be issued subject to conditions aimed at ensuring the rehabilitation of land that will be affected by the development.	Section 6.9 (Rehabilitation and closure). EIS Chapter 21 (Rehabilitation and closure).
Transport and Infrastructure SEPP	Section 2.48(2)	Development likely to affect an electricity transmission or distribution network: Consider any response received from the electricity supply authority for the area in which the development is to be carried out.	Ausgrid provided a submission on the EIS, and a response to this submission was provided in Section 5.3 of the Submissions Report (EMM 2023a). No changes are proposed as part of the amendment to relevant transmission infrastructure to what was proposed in the original Project, and no further consultation is required with electricity supply authorities.
	Section 2.97(2)	Development adjacent to rail corridors: Consider any response received from the rail authority for the rail corridor and any guidelines that are issued by the Secretary for the purposes of this clause and published in the Gazette.	No submission was received from ARTC in respect of the original Project. The amendment does not propose any changes with respect to development adjacent to rail corridors.

Statutory document	Section reference	Mandatory consideration	Where addressed
	Section 2.98(2)	Excavation in, above, below or adjacent to rail corridors: Consider any response received from the rail authority for the rail corridor and any guidelines that are issued by the Secretary for the purposes of this clause and published in the Gazette.	No submission was received from ARTC in respect of the original Project. The amendment does not propose any changes with respect to development adjacent to rail corridors.
	Section 2.121(2)	Traffic generating development: - Consider any response received from Transport for NSW (TfNSW). - Consider the accessibility of the site. - Consider any potential traffic safety, road congestion or parking implications of the development.	TfNSW provided a submission on the EIS, and a detailed response to this submission was provided in Section 4.13 and Appendix H of the Submissions Report (EMM 2023a). No changes are proposed as part of the amendment in relation to traffic and transport to what was proposed and assessed as part of the original Project and the HVO North Amendment Report. No further consultation is required with TfNSW.
Resilience and Hazards SEPP	Section 3.12	Consider departmental guidelines: <i>Applying SEPP 33.</i> <i>HIPAP No.3 – Risk Assessment.</i> <i>HIPAP No.12 – Hazards related Conditions of Consent.</i>	Section 6.10 (Other matters – hazards, public safety and health). EIS Chapter 22 (Hazards, public safety and health).
	Section 4.6	A consent authority must not consent to the carrying out of any development on land unless it has considered whether the land is contaminated.	Section 6.10 (Other matters – hazards, public safety and health). EIS Chapter 22 (Hazards, public safety and health).
Singleton LEP	Zone objectives	RU1 Primary Production zone	Section 2.4 (Singleton LEP). EIS Chapter 2 (Strategic context).
	Section 5.10	Heritage conservation	Section 6.6 (Aboriginal cultural heritage). EIS Chapter 15 (Aboriginal cultural heritage). Section 6.10 (Other matters – historic heritage). EIS Chapter 16 (Historic heritage).
	Section 7.1	Earthworks	Chapter 3 (Description of amendments).

Statutory document	Section reference	Mandatory consideration	Where addressed
	Section 7.6	Riparian land and watercourses	Section 6.5 (Water resources). EIS Chapter 12 (Water resources).
Muswellbrook LEP	Zone objectives	RU1 Primary Production zone SP2 Infrastructure	Section 2.5 (Muswellbrook LEP). EIS Chapter 2 (Strategic context).
	Section 7.6	Earthworks	EIS Chapter 4 (Project description). Chapter 3 (Description of amendments).
Considerations under other legislation			
NSW <i>Biodiversity Conservation Act 2016</i> (BC Act)	Section 7.14	The likely impact of the proposed development on biodiversity values as assessed in the biodiversity development assessment report. The Minister for Planning and Public Spaces may (but is not required to) further consider under that EP&A Act the likely impact of the proposed development on biodiversity values.	Section 6.4 (Biodiversity) and Appendix H.

4.6 Climate Change (Net Zero Future) Act 2023

In assessing the impact of the amended Project, consideration has been given to the guiding principles in the NZF Act. A summary of how the amended Project has considered, and is consistent with, these guiding principles is outlined in Table 4.3.

Table 4.3 Consideration of the Guiding Principles in the Climate Change (Net Zero Future) Act 2023

Guideline principle	Consideration
(1) For this Act, the guiding principles are the principles set out in this section.	Noted.
(2) There is a critical need to act to address climate change, which is a serious threat to the social, economic and environmental wellbeing of New South Wales.	In recognition of the need to act on climate change, both Yancoal and Glencore have developed robust climate change strategies for their global operations. Yancoal's strategy includes commitments to monitoring relevant policy, market, and technological developments and financial signals to inform how Yancoal's investment and development priorities should adapt to transitions in the global energy mix, and to support innovation and investment in carbon capture, utilisation and storage (CCUS) through various industry and policy initiatives. Glencore has also carefully considered its position regarding the future of its coal mining operations and how it intends to support the global transition to a low-carbon future. In 2020, Glencore announced it would adopt a responsibly managed decline of its global coal portfolio. By managing the depletion of its coal portfolio and responsibly realising the remaining value in these assets it can make a meaningful contribution to global climate change goals. Glencore has factored the continued development of its coal project pipeline, including the Project, as amended, into its plan.
(3) Action to address climate change should be taken as early as possible to minimise the cost and adverse impacts of climate change.	GHG emission mitigation was a key consideration in the development of the mine plan for the Project as presented in the EIS. The changes to the mine plan presented in this Amendment Report are designed to further reduce GHG emissions. Emissions from the amended Project, if approved, will decline in accordance with the timeframes and quantitative performance expectations of the Safeguard Mechanism and the NZF Act. As described in the GHG Assessment for the amended Project (attached as Appendix E), HVO proposes emissions reduction measures for the Project that align with both the NSW targets in the NZF Act, as well as being consistent with its obligations under the Safeguard Mechanism. HVO proposes that the Project emissions be managed in a way that is consistent with its obligations under the Safeguard Mechanism while at the same time implementing measures that go beyond its Safeguard Mechanism obligations to make an additional, voluntary contribution towards the NSW emissions reduction targets. In percentage terms, net emissions for the amended Project (including the Safeguard Mechanism and additional NSW decline rate) are projected to reduce at a greater rate (5.1% per year on average) than those for the state (4.4% per year on average). The amended Project will monitor and review the implementation of the mitigation hierarchy and determine which strategy is appropriate to apply to first avoid then reduce emissions as much as possible and then offset any residual emissions. A number of measures to further reduce GHG emissions from the amended Project over its life have also been committed to. Measures to minimise GHG emissions are generally focused on the efficient use of diesel, by: • optimising the design of haul roads to minimise the distance travelled • using a fleet management system where required to optimise the efficient use of machinery • minimising the re-handling of material (i.e. coal, overburden and topsoil) • maintaining the mobile fleet in good operating order. Furthermore, over the life of the amended Project, available technologies will be regularly reviewed in consideration of reasonable and feasible abatement measures to

Guideline principle	Consideration
	minimise Scope 1 and Scope 2 GHG emissions, including but not limited to options for fuel switching (e.g. biofuels, renewable fuels, hydrogen and electric powered). HVO will also conduct a trial of gas pre-drainage in areas identified with higher potential, to investigate the feasibility and effectiveness of gas pre-drainage. The design of the trial will be developed in consultation with relevant stakeholders and be provided to DPHI within two years of commencement of the amended Project. The amended Project would be a relatively small contributor to GHG emissions in NSW. For example, for the combined Safeguard Mechanism and NSW decline trajectory, it would represent between 0.25% and 0.81% (depending on the reference year) of state-wide emissions in the NSW current policy case. Consequently, the amended Project would be consistent with the NSW emissions reduction trajectory to achieve interim target reductions and net zero by 2050 and the amended Project supports the NSW efforts to decarbonise.
(4) Action to address climate change should be taken in a way that— a) is fiscally responsible, and b) promotes sustainable economic growth, and c) considers the economic risks of delaying action to address climate change, and d) considers the impact on rural, regional, and remote communities in New South Wales.	HVO is a significant contributor to the economy. In 2024, HVO made a total direct economic contribution of \$1.55 billion, including payment of \$224 million in wages and salaries, and \$276 million in taxes and royalties. HVO has been an economic anchor of the Hunter Valley regional community, and the amended Project will provide the community with an economic and social anchor as NSW moves to a lower carbon future. The potential net economic benefits from the amended Project are approximately \$5.7 billion (EY 2025) in NPV terms and would provide continuing employment for a workforce of around 1,500 to 2045. The amended Project is a brownfield mine life extension which proposes extracting coal mostly from areas which have been previously disturbed. As discussed in the EIS (EMM 2022a) and HVO North Amendment Report (EMM 2023b), the Project aligns with both NSW State and Federal policies on climate change, energy and resources. The guideline principles within the NZF Act recognise the need to address action on climate change and meet energy needs in a fiscally responsible manner that promotes sustainable economic growth. Current national and NSW policy recognises the ongoing demand for coal, particularly in the Asian export market (which is the current key market for HVO) and its importance to the NSW and Australian economy (IPC 2022a and IPC 2022b). The current strategic direction relating to coal seeks to continue exploration, extraction and export (IPC 2022a and IPC 2022b). Further, HVO is a designated large facility under the Commonwealth <i>National Greenhouse and Energy Reporting Act 2007</i> (NGER Act) and is therefore subject to carbon regulation in the form of the Safeguard Mechanism. A robust environmental, social and economic impact assessment has been prepared for the Project, as documented in the EIS (EMM 2022a), the HVO North Amendment Report (EMM 2023b), the Submissions Report (EMM 2023a) and this Amendment Report. The EIS and subsequent documents consider the impact of the Project on the local and regional communities surrounding the Project. The impact of the Project on these communities were a consideration in developing the project design. Detailed design studies considering both mining options and infrastructure arrangements were carried out, and each of these studies evaluated potential environmental and social impacts to inform the Project design as results from studies became available. The Project has therefore been developed to avoid and minimise impacts where reasonable and feasible to do so. The environmental and social impact assessments identified residual impacts of the Project and appropriate mitigation measures to address these impacts. Notably, the Project's design and proposed management measures are based on a comprehensive understanding of the environmental conditions in and around Project area, gained over a very long history of mining at HVO.

Guideline principle	Consideration
(5) Action to address climate change should be consistent with the right to a clean, healthy and sustainable environment.	The potential environmental impacts of the Project have been comprehensively assessed in the EIS (EMM 2022a), the HVO North Amendment Report (EMM 2023b), the Submissions Report (EMM 2023a) and this Amendment Report, and considered in the design of the Project. GHG emission mitigation was a key consideration in the development of the mine plan for the original Project as presented in the EIS. The changes to the mine plan presented in this Amendment Report are designed to further reduce GHG emissions through avoidance.
(6) Action to address climate change should be consistent with the principles of ecologically sustainable development described in the <i>Protection of the Environment Administration Act 1991</i> , section 6(2).	The amended Project would remain consistent with the principles of ecologically sustainable development (ESD) (refer to Section 7.7.1i).
(7) Action to address climate change should involve appropriate consultation with affected persons, communities and stakeholders.	A comprehensive consultation program for the Project has been carried out with relevant stakeholders. As described in Chapter 6 of the EIS (EMM 2022a), HVO has been part of the local community since operations commenced in 1949. A range of engagement mechanisms have been used over time to consult with neighbouring property owners, the local community, Federal, State and local government, regulators, service providers, local community groups, Aboriginal groups and HVO Community Consultative Committee (CCC) members. This long history of engagement means that the targeted consultation undertaken for the Project has been based on a comprehensive understanding of the community in which HVO operates. Community views were taken into account in the Project design. How these views were addressed by the Project is comprehensively described in Section 6.5.3 of the EIS. Following the public exhibition of the EIS, amendments were made to the HVO North Project to respond to submissions received on the Project and documented in the HVO North Amendment Report. Furthermore, this Amendment Report has been prepared to respond to further feedback on the Project received throughout the Project's assessment process.
(8) Action to address climate change should take into account the following— (a) the knowledge and perspectives of Aboriginal communities,	Comprehensive consultation with Aboriginal communities was undertaken to inform the Aboriginal Cultural Heritage Assessment (ACHA, EMM 2022c) prepared for the Project in accordance with the requirements of the NSW government; that is, the methods outlined in the <i>Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010</i> (DECCW 2010). The consultation process resulted in the registration of 33 Aboriginal organisations/individuals wishing to be consulted throughout the Project. This consultation has continued since submission of the EIS and is further documented in the Submissions Report (EMM 2023a) and Chapter 5 of this Amendment Report. Specific feedback on climate changes was not raised by the registered Aboriginal parties (RAPs) on the Project.

Guideline principle	Consideration
(b) the best available science,	HVO's proposed actions to mitigate GHG emissions are based on best available science, and emissions estimates are supported by regulatory method. A GHG Assessment has been prepared to support the amended Project. The GHG Assessment is provided as Appendix E with key outcomes summarised in Section 6.1. The estimation of GHG emissions for the amended Project were undertaken in accordance with the <i>Australian National Greenhouse Accounts Factors</i> workbook (DCCEW 2024). Emissions were considered in the context of the NSW emissions reduction trajectory developed by the NSW Government's Net Zero Emissions Modelling Program. Net emissions from the amended Project, if approved, will decline at a rate and within a timeframe quicker than that required under the Safeguard Mechanism, plus the additional voluntary contribution proposed by HVO to reflect consideration of the NZF Act. In percentage terms, emissions for the amended Project (in accordance with the adopted additional NSW decline rate) are projected to reduce at a greater rate (5.1% per year on average) than those for the state (4.4% per year on average). HVO has committed to conducting 3 yearly reviews of emerging technologies for mining fleet decarbonisation to assess what may be feasible to deploy in the future. HVO will also conduct a trial of gas pre-drainage in areas identified with higher potential, to investigate the feasibility and effectiveness of gas pre-drainage. Any carbon offsets and Safeguard Mechanism Credits surrendered will be fully compliant with the requirements of the Safeguard Mechanism.
(c) the knowledge of rural, regional and remote communities in New South Wales,	HVO has been operating for over 75 years, and in that time has developed a thorough understanding of the community and the environment in which it operates and effective measures to manage the impacts of its operation. A robust environmental, social and economic impact assessment has been prepared for the Project which considers the impact of the Project on the local and regional communities. This has been documented in the EIS (EMM 2022a), the HVO North Amendment Report (EMM 2023b), the Submissions Report (EMM 2023a) and this Amendment Report.
(d) the need to support local communities, including Aboriginal communities, who may be affected by the action, including by— (i) considering the impact on local employment and industries, and (ii) diversifying local economies, and (iii) encouraging local procurement, and (iv) optimising job creation and employment transition opportunities, and (v) considering the impact on the amenity of local communities,	A comprehensive consultation process has been undertaken for the Project. Discussions between HVO and RAPs, facilitated as part of the Aboriginal consultation process and the Social Impact Assessment (SIA) of the Project, identified a number of initiatives across key Closing the Gap themes including health, education, business, finance, employment, culture, and community. These initiatives, which HVO have committed to implementing, were described in the EIS (EMM 2022a) and are as follows: • HVO will continue to administer the community grants program currently in place, which invests in programs, events and services that promote community cohesion, connectedness and support. • As part of the development of the social impact management plan (SIMP) for the Project, HVO will develop a funding framework to enable funding of programs and projects that align with Closing the Gap initiatives, including job readiness programs, assistance relating to tendering for work at HVO by Aboriginal suppliers, and a commitment of \$1,000,000 over the first 10 years of the Project. These initiatives will be developed as part of the preparation of the SIMP, which will also outline the proposed implementation plan. If approved, the amended Project will provide continuing employment for a workforce of around 1,500 to 2045 and will deliver significant economic benefits to the state and local region.

Guideline principle	Consideration
(e) the need for education and skills diversification	Over time, there will be progressive closure of coal mines in the Hunter region, as identified in the NSW Government's own <i>Future Jobs and Investment Authorities Issues Paper</i> (May 2024) (Issues Paper). The Issues Paper states that, "These [coal-producing] regions contribute billions of dollars to the NSW economy and tens of thousands of jobs. The local economies of these regions are highly dependent on the coal sector. As global demand and production of coal declines over time, coal-reliant regions will go through significant structural economic changes. The NSW Government is committed to supporting these communities through this change to ensure they have access to new economic opportunities to secure their long-term economic future." Graphs contained within the Issues Paper forecast that from 2024 there is major reduction of direct and indirect jobs in coal mining and electricity generation across the four coal-producing regions of NSW, as follows, from total jobs of ~80, 000 in 2024 to: • ~55,000 jobs in 2030, representing ~30% reduction • ~40,000 jobs in 2035, representing ~50% reduction • ~10,000 jobs in 2040, representing ~90% reduction • ~2,000 jobs in 2045, representing almost 100% reduction. These employment reductions would decimate the regional communities they support, unless replacement employment opportunities of comparable economic value become available. There are currently no clear or quantified transition plans for the communities in coal producing regions, such as the Hunter. The Project provides a valid opportunity to support the community whilst enabling the transition to newer and emerging economies to develop. If approved, the amended Project will provide continuing employment for a workforce of around 1,500 to 2045 and will deliver significant economic benefits to the state and local region.
(f) the need to ensure essential utilities and infrastructure are provided, including energy, water, telecommunications and transport,	HVO provides high quality thermal and semi-soft coking coal to export markets which demand these commodities for energy generation and steel manufacturing. As detailed in Section 2.2, the 2024 WEO notes that continued investment in fossil fuels is essential in all of the scenarios modelled. It will be needed to meet increases in demand over the period to 2030 in the STEPS, which explores how the energy system will evolve if current policy settings are retained and will also be needed to avoid a precipitous decline in supply that would far outstrip even the rapid declines in demand seen in the NZF Act scenario. While global coal demand is set to fall within the next few years, strong demand will remain for coal in the power sector out to 2050 under the STEPS. The amended Project will have negligible impact to public infrastructure. The realigned Lemington Road will improve road safety conditions and accessibility, resulting in a positive impact on transport infrastructure to the local community. If approved, all other public infrastructure and utilities would remain safe and serviceable at all times as a result of the amended Project.
(g) the impact of the action on consumer costs in New South Wales, including energy costs,	As detailed in Section 2.2, the need for coal from the amended Project is driven by global energy demand, largely from developing Asian countries, and the lack of investment in new sources of supply of coal. The global demand for coal in 2050 is predicted to still be at a similar level in terms of tonnes of coal, to demand now (IEO 2023). The amended Project supports an orderly transition to a low emission future by providing a reliable, coal supply to meet global coal demand in the short to medium term. The amended Project, if approved, is unlikely to have an impact on energy costs to Australian consumers.

Guideline principle	Consideration
(h) the need to reduce the risk climate change poses to human health,	Net emissions from the amended Project, if approved, will decline at a faster rate and within faster timeframes than required under the Safeguard Mechanism. In percentage terms, net emissions for the amended Project (in accordance with the adopted additional NSW decline rate) are projected to reduce at a greater rate (5.1% per year on average) than those for the state (4.4% per year on average). The amended Project will be consistent with the NSW emissions reduction trajectory to achieve interim target reductions and net zero by 2050 and the amended Project supports the NSW efforts to decarbonise.
(i) equity and social justice impacts on socially disadvantaged groups and economically vulnerable regions,	An SIA was prepared to support the EIS (EMM 2022a). A revised SIA has been prepared to support this Amendment Report and is provided as Appendix L. The SIA considers the potential impact of the amended Project on the local and regional community. No mitigated social impacts rated as a high risk have been identified for the amended Project, with all potential impacts ranked as medium or low. The key social impacts identified relate to the continued generation of dust and noise associated with ongoing operations, traffic congestion during construction activities, divergent opinions on the Project and the possible impact on community cohesion, and issues relating to pest and land management. Mitigation measures have been identified to appropriately manage these risks. A number of social benefits have also been identified with a very high or high benefit rating, including the realignment of Lemington Road and the improved, safer road conditions and accessibility this will deliver to the community, ongoing employment and stability of the local population, continued royalty payments to the State government, ongoing provision of community grants, improved rehabilitation outcomes, continuation of procurement opportunities for local businesses, and the benefit of allowing more time for transition planning in the Hunter Valley through the ongoing provision of jobs and flow on benefits.
(j) the need to reduce the risk climate change poses to the survival of all species	A comprehensive Biodiversity Development Assessment Report (BDAR) has been prepared for the amended Project (Umwelt 2025) and provided as Appendix H. The BDAR considers the potential impacts of the amended Project on biodiversity, including listed species. A biodiversity offset strategy will be developed for the amended Project (refer to Section 6.4) so that there will be a net beneficial outcome for biodiversity values.
(9) Action to address climate change should take into account the impact on animals.	See above.
(10) The Government of New South Wales is responsible for— (a) urgently developing and implementing strategies, policies and programs to address climate change, and (b) ensuring the Government of New South Wales pursues best practice in addressing climate change	This is a matter for the NSW Government. Notwithstanding this, a GHG Assessment has been prepared which addresses the government's latest policy on large GHG emitters – the <i>NSW Guide for Large Emitters</i> (EPA 2025). This assessment is summarised in Section 6.1 (GHG) and provided in full in Appendix E. As described in the GHG Assessment, the amended Project would contribute a small amount to NSW's total GHG emissions — between 0.25% and 0.81%, depending on the reference year. This means the Project is consistent with the NSW governments plan to reduce emissions and reach net zero by 2050, supporting the state's efforts to decarbonise.

5 Engagement

Comprehensive stakeholder engagement for the Project was undertaken throughout Project scoping and preparation of the EIS, as detailed in Chapter 6 of the EIS (EMM 2022a). HVO has undertaken further engagement with stakeholders including council, government agencies, the local community, and neighbouring landholders following submission of the EIS. An overview of the engagement activities carried out following the public exhibition of the EIS is provided in Section 5 of the Submission Report (EMM 2023a). Additional consultation was completed as part of the HVO North Amendment Report (EMM 2023b).

Consultation undertaken since the submission of the Submissions Report (EMM 2023a) and HVO North Amendment Report (EMM 2023b), including updates relating to the amendments the subject of this Amendment Report, is detailed in the following sections.

5.1 Community

HVO regularly distributes newsletters via letter box drop to the local community. These newsletters are also published on the HVO website. Since the public exhibition of the EIS, HVO has provided regular updates on the Project to the community through these newsletters. Newsletters since the submission of the Submissions Report (EMM 2023a) and HVO North Amendment Report (EMM 2023b) were distributed to the local community in Jerrys Plains, Maison Dieu, Long Point, Camberwell and Gouldsville as follows:

- HVO News (Issue 11) in April 2023
- HVO News (Issue 12) in September 2023
- HVO News (Issue 13) in April 2024
- HVO News (Issue 14) in October 2024
- HVO News (Issue 15) in April 2025.

Regular updates on the Project have also been presented at the HVO CCC meetings held in:

- November 2023
- February 2024
- May 2024
- August 2024
- November 2024
- February 2025
- May 2025.

Material provided to the HVO CCC as part of the quarterly meetings is also publicly available on the HVO website where appropriate.

Community information sessions were held in October 2024 (Jerrys Plains and Maison Dieu), February 2025 (Jerrys Plains) and April 2025 (Maison Dieu). The HVO Family Day was also held in May 2024 and May 2025, where updates were provided on the Project to interested community members and the HVO workforce.

5.2 Registered Aboriginal Parties

Aboriginal consultation for the Project began in 2020. Section 2 in both the EIS Aboriginal Cultural Heritage Assessment (ACHA) (EMM 2022c) and the ACHA Addendum (EMM 2023c) outline Aboriginal participants for the Project and consultation activities that occurred throughout the assessment phase.

Since the completion of the HVO North Amendment Report, the RAPs have been kept updated as follows:

- provision of the HVO newsletters (refer to Section 5.1).
- notification of determination of the HVO North Mod 8 was provided to the RAPs on 28 April 2025.
- provision of the Aboriginal heritage advice report (EMM 2025a) to the RAPs, providing information on the change in impacts to the cultural assemblage as a result of the proposed amendments.

5.3 Government agencies

Engagement with key regulatory stakeholders continued post lodgement of the Submissions Report (EMM 2023a) and the HVO North Amendment Report (EMM 2023b), including engagement in relation to the proposed amendments, as summarised in Table 5.1.

Table 5.1 Summary of government agency engagement

Agency	Date	Summary of engagement
DPHI	3 December 2024	Meeting to provide an update on the Project and overview of proposed amendments to the HVO North mine plan to avoid coal extraction in gas domain 1.
	26 March 2025	Letter outlining proposed amendments and approach to this Amendment Report.
	22 July 2025	Amendment Report overview.
EPA	3 December 2024	Meeting to provide an update on the Project and overview of proposed amendments to the HVO North mine plan to avoid coal extraction in gas domain 1.
	16 July 2025	Meeting to provide an overview of proposed amendments and present key outcomes of revised GHG emission calculations.
MEG	31 July 2025	Meeting to provide an overview of proposed amendments, changes to the mine plan, changes in resource recovery and present key outcomes of economic assessment.
Singleton Council	3 July 2025	Meeting to provide an update on the amended Project.
Muswellbrook Shire Council	1 August 2025	Meeting to provide an update on the amended Project.
Commonwealth DCCEEW	10 September 2024	Briefing on the amended Project and project updates.
	13 March 2025	Pre referral lodgement meeting

6 Assessment of impacts

6.1 Greenhouse gas emissions

6.1.1 Introduction

A GHG assessment (EMM 2025b) has been prepared which assesses the impacts of the amended Project and is provided in Appendix E of this report. The GHG assessment has been prepared in accordance with the *NSW Guide for Large Emitters* (EPA 2025).

The primary objectives of the GHG assessment are to:

- outline key legislative and policy assessment requirements for GHGs
- provide an assessment of the GHG emissions of the amended Project
- provide a conclusion of the assessment.

In accordance with the *NSW Guide for Large Emitters* the GHG assessment has been independently peer reviewed by Zephyr Environmental.

6.1.2 Assessment methods

i Assessment guidelines and requirements

The *NSW Guide for Large Emitters* was released by the EPA in January 2025. The guide requires proponents of proposals with large projected GHG emissions to assess their development's emissions and mitigation opportunities. This firstly involves categorising the project, identifying whether it would be a large emitter, and then following the required assessment steps.

The amended Project is classified as a large emitter based on the process identified in the *NSW Guide for Large Emitters*.

ii Summary of assessment methods

To assess GHG emissions, sources of scope 1, 2 and 3 emissions were identified. Scope 1 emissions address the direct emissions that occur within the boundary of a project. Scope 2 and scope 3 emissions are indirect. Scope 2 emissions relate to emissions generated from purchased electricity, steam, heat or cooling, whilst Scope 3 emissions include all other upstream and downstream activities.

The emission sources that were included in the GHG assessment for the amended Project are set out below.

For scope 1 emissions, the sources included were:

- on-site liquid fuel (diesel) combustion associated with:
 - construction of the amended Project
 - operation of the amended Project, which would feature conventional open-cut mining techniques, which are largely dependent of the use of diesel-powered equipment. Fossil fuel consumption associated with progressive mine rehabilitation was also included
- fugitive emissions associated with coal extraction. These also included on-site fugitive emissions for 'post-mining' activities such as the handling, stockpiling and processing of coal

- blasting using explosives
- on-site land use changes. The amended Project is not likely to result in significant land use change. The emissions associated with loss of the carbon sink due to the clearing of vegetation relating to construction activities (2027 only) were determined.

For scope 2 emissions, the relevant source was the purchase of grid electricity for on-site use in the CPP, electric mining equipment and other electrical applications (lighting, office air conditioning, etc).

For upstream scope 3 emissions, the sources included were:

- the extraction, production and transport of the liquid fuel (diesel) consumed on-site
- the purchase of grid electricity for on-site use. Here, scope 3 emissions are indirect emissions from the extraction, production and transport of the fuel burned during electricity generation, and the indirect emissions attributable to the electricity lost in delivery in the transmission and distribution network
- embodied emissions associated with construction materials, and the use of diesel in the transport of materials to the HVO Complex site. These emissions were allocated to 2027 only.

For downstream scope 3 emissions, the sources included were:

- the transport of product coal from the HVO Complex to the Port of Newcastle by rail
- the transport of product coal from the Port of Newcastle to overseas markets by sea. For the purpose of the GHG calculation, these markets were assumed to be in Japan and China, with the distance to the largest end user (Japan; 8,000 km) being used in the calculations
- thermal coal combustion (for power generation)
- coking coal combustion (for steel production, either domestically or overseas).

The scope 1, 2 and 3 emission sources are shown in Figure 6.1. These emissions sources represent all of the significant sources associated with the amended Project.

Several potential GHG sources were excluded from the assessment. Where a particular source was excluded from the assessment, this was either because it was not relevant, activity data for it were not readily available, or its emissions were unlikely to be material (i.e. they would have been too low over the life of the amended Project to materially change the outcomes of the assessment or influence decision-making). The excluded sources can be found in Appendix E.

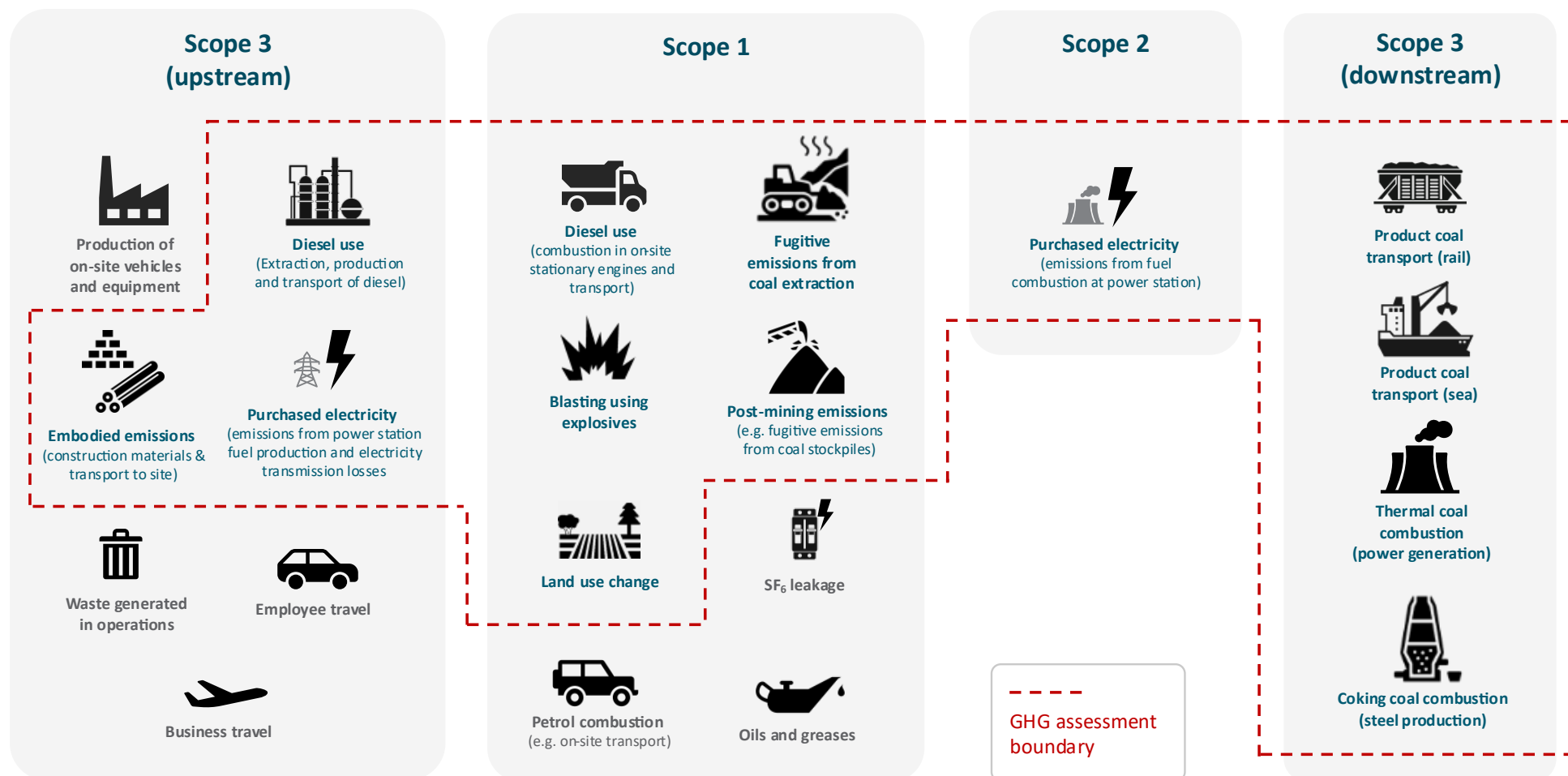


Figure 6.1 GHG assessment boundary and emission sources

Due to the amended Project involving a modification to an existing operation, scope 1, scope 2 and scope 3 emissions were calculated for the scenarios in Table 6.1.

Table 6.1 Emission scenarios

EPA terminology		Terminology in GHG Assessment	
		Scenario no.	Scenario description
Business-as-usual (BAU)	Represents the emissions that are expected to occur without the proposed project.	1	Represents the approved HVO Complex. The HVO North approval expires at the end of 2026. Due to its reliance on the infrastructure of HVO North, HVO south is also unable to operate beyond 2026. GHG emissions in this scenario would therefore be zero for the life of the amended Project.
Modified business	Represents the emissions associated with existing operations and including the proposed project as designed.	2a	Represents emissions from the HVO Complex with the original HVO Continuation Project, as described in the Submissions Report (EMM 2023a).
		2b	Represents emissions from the HVO Complex with the amended Project. It reflects a reduction in emissions compared with Scenario 2a, primarily due to the avoidance of coal extraction in gas Domain 1.
Project only	Represents emissions for the project only, in the context of total facility emissions. NB: This scenario determines whether or not a project is a large emitter.	3	Represents emissions from the amended Project only. Determined as emissions in Scenario 2b minus emissions in Scenario 1.

The *NSW Guide for Large Emitters* requires that scope 1 and scope 2 emissions are estimated based on maximum capacity and planned operational throughput. However, for the amended Project, the assessment is based on planned operational throughput, which fluctuates over time due to various factors, including coal resource characteristics, mining methods and equipment specifications. Because of the complex and inter-dependent nature of resource extraction, it is not practical to develop a separate scenario based solely on hypothetical maximum extraction rates. A hypothetical maximum extraction scenario would be highly artificial and would not be deliverable given the mining deposit parameters and equipment constraints. The results therefore reflect a single (planned) operational condition.

6.1.3 Amended Project emissions

i Emission estimates

Gross GHG emissions for the amended Project were calculated as designed, and then emission sources for mitigation were prioritised. Details of the GHG emission calculation methodology for the amended Project are provided in Appendix E. Emissions in Scenario 3 were calculated as the difference between those in Scenario 2b and those in Scenario 1 (noting that emissions from Scenario 1 would be zero beyond 2026). The supporting activity data (e.g. fuel consumption, electricity consumption) for the two scenarios are also provided in Appendix E.

a Scope 1 and scope 2 emissions

The scope 1 and scope 2 emissions in kilotonnes of carbon dioxide equivalent per year (kt CO₂-e/year) in Scenario 3, in each calendar year of the amended Project life, are shown in Table 6.2.

Table 6.2 Annual scope 1 and scope 2 emissions (Scenario 3)

Calendar year	GHG emissions – amended Project (kt CO ₂ -e/year)		
	Scope 1	Scope 2	Scope 1 + scope 2
2027	1,082.4	42.2	1,124.6
2028	1,129.7	35.3	1,165.0
2029	1,103.8	23.2	1,127.0
2030	953.9	16.2	970.1
2031	814.6	15.8	830.4
2032	919.8	13.4	933.2
2033	883.6	9.4	893.0
2034	837.7	9.3	847.1
2035	932.2	7.4	939.7
2036	960.8	6.4	967.2
2037	833.2	6.3	839.5
2038	803.6	6.5	810.1
2039	705.0	7.1	712.1
2040	766.1	3.5	769.6
2041	796.2	3.2	799.4
2042	743.5	3.4	747.0
2043	383.5	2.7	386.1
2044	271.6	2.1	273.7
2045	183.0	1.3	184.4
Average (kt CO₂-e/year)	795.0	11.3	806.3
Total (kt CO₂-e)	15,104.2	214.9	15,319.1

As current mining operations are approved to the end of 2026, the scope 1 and 2 emissions from the amended Project represent incremental emissions relative to the approval. However, the incremental scope 1 and scope 2 emissions would reduce with time, being around 1,125 kt CO₂-e/year in 2027, and 184 kt CO₂-e/year by 2045.

Over the life of the amended Project, the aggregated scope 1 and scope 2 emissions would be 15,104 kt CO₂-e and 215 kt CO₂-e, respectively.

b Scope 3 emissions

The scope 3 emissions in Scenario 3, in each calendar year of the amended Project, are shown in Table 6.3.

Table 6.3 Annual scope 3 emissions (Scenario 3)

Calendar year	Scope 3 GHG emissions – amended Project (kt CO ₂ -e/year)
2027	41,171
2028	40,611
2029	42,059
2030	40,197
2031	42,677
2032	42,729
2033	45,294
2034	44,048
2035	46,052
2036	46,142
2037	45,878
2038	46,727
2039	49,153
2040	47,761
2041	42,085
2042	47,143
2043	36,869
2044	28,784
2045	18,379
Average (kt CO₂-e/year)	41,777
Total (kt CO₂-e)	793,763

Scope 3 emissions would be much larger than scope 1 and scope 2 emissions. The aggregated scope 3 emission over the life of the amended Project would be around 800 Mt CO₂-e.

c Total emissions

The amended Project is estimated to result in a total of about 809 Mt CO₂-e of GHG emissions (between 2027 and 2045) including scope 1, 2 and 3 emissions. It will produce a maximum of about 50 Mt CO₂-e of annual emissions in 2039 and an annual average of about 43 Mt CO₂-e. The average scope 1 emission intensity over the life of the amended Project would be 0.0352 tonnes of CO₂-e per tonne of ROM coal.

ii Prioritisation of emissions

a Scope 1 and scope 2 emissions

The sources of scope 1 and scope 2 emissions in Scenario 3 are ranked according to their contribution to emissions over the life of the amended Project and are shown in Table 6.4.

Table 6.4 Ranking of scope 1 and scope 2 sources based on project life emissions (Scenario 3)

Ranking	Source	Scope	Life of mine emissions – amended Project (kt CO ₂ -e)	Contribution (%)
1	Diesel consumption	Scope 1	8,860.2	57.8%
2	Fugitive emissions from coal extraction	Scope 1	6,019.5	39.3%
3	Electricity consumption	Scope 2	214.9	1.4%
4	Blasting	Scope 1	200.7	1.3%
5	Vegetation clearing (loss of carbon sink)	Scope 1	23.8	0.2%

Diesel consumption would be responsible for 58% of the total emissions, and fugitive emissions from coal extraction would be responsible for 39% of the total.

b Scope 3 emissions

The ranking of sources for scope 3 emissions in Scenario 3, based emissions over the life of the amended Project are shown in Table 6.5.

Table 6.5 Ranking of scope 3 sources based on project life emissions (Scenario 3)

Ranking	Source	Scope	Life of mine emissions – amended Project (kt CO ₂ -e)	Contribution (%)
1	Product coal combustion (power generation)	Scope 3	690,050	86.9%
2	Product coal combustion (steel production)	Scope 3	91,245	11.5%
3	Product coal transport by sea (Port of Newcastle to Japan)	Scope 3	8,931	1.1%
4	Extraction, production and transport of liquid fuels: diesel	Scope 3	2,184	0.3%
5	Product coal transport by rail (HVO to Port of Newcastle)	Scope 3	1,318	0.2%
6	Embodied emissions	Scope 3	20.7	<0.1%
7	Electricity consumption	Scope 3	13.8	<0.1%

Product coal combustion for power generation would be responsible for around 87% of emissions, with coal combustion for steel production accounting for most of the remainder (12%).

The locality of the amended Project, the Hunter region, is susceptible to certain climate change impacts, particularly those associated with heat, water scarcity, and bushfire risk.

These risks are not unique to the Hunter region but are influenced by its environmental and economic profile.

The amended Project will contribute to global GHG emissions. However, this contribution will be very small as a proportion of global GHG emissions and is not sufficient to materially affect the extent or timing of climate change impacts in the locality, which are driven by global cumulative emissions. It is also not possible to conclude that the amended Project's GHG emissions will lead to a net increase in global emissions, and therefore contribute to an increase in global temperatures, as this outcome is dependent on multiple factors external to the amended Project.

6.1.4 Mitigation measures

Mitigation measures for emissions generated by the amended Project, considering the EPA's mitigation hierarchy were developed. The amended Project primarily targets the avoidance and reduction of diesel and fugitive emissions, both in total and on an annual basis. This would mainly be achieved by:

- avoiding coal extraction within gas Domain 1 at HVO North
- reducing mining at HVO South compared to what was proposed for the original Project, due primarily to the removal of some higher strip ratio coal from the mine plan
- reducing the annual production rates across the complex from an approved maximum value of 42 Mtpa ROM coal to 26 Mtpa ROM coal
- reducing the period over which mining would occur by approximately five years compared to the original Project
- reducing diesel consumption through optimisation of haulage.

i Planned mitigation measures

The emission estimates for the amended Project reflect the current operational practices at HVO in relation to maximising energy efficiency and minimising diesel consumption. They also reflect the avoidance of fugitive emissions, primarily from gas Domain 1, due to the changes in the mine design from the original Project. These mitigation measures are summarised in Table 6.6.

Table 6.6 Planned mitigation measures

Mitigation measure	Comments
Scope 1 – fossil fuel	
Optimisation of haul routes	Lengths of haul routes are optimised to minimise fuel use (and hence GHG emissions), as well as dust and noise emissions.
Optimisation of ramp gradients	Ramp gradients are optimised based on pit geometry.
Payload management and loading equipment productivity	Payload and equipment productivities are monitored and actively managed to maintain efficient haulage.

Mitigation measure	Comments
Fuel/energy-efficient haul trucks and other mobile plant	Fuel or energy efficiency is an important selection criterion when procuring mine vehicles and equipment. HVO will continue to consider efficiency during equipment procurement. This will include the optimisation of equipment/engine size according to operational needs.
Scheduling activities so that equipment use and vehicle operation are optimised	Scheduling the location and use of equipment and mobile plant is a routine part of mining operations. HVO prepares short-term, medium-term and long-term production plans to optimise production and fuel consumption.
Minimising idling	Equipment shut down when not in use.
Scope 1 – fugitive sources	
Changes in mine design and planning, including the avoidance of Domain 1	Reduced rate and extent of mining, and the period over which mining would occur, compared with the original Project.
Scope 2	
Optimisation of CPP operation and electrical mining equipment	The operation of the CPP and electrical mining equipment is optimised for energy efficiency.
Decarbonisation of the NSW electricity grid	Emissions from the purchase of grid electricity will decrease as the NSW grid decarbonises.

HVO operates a large diesel-powered mining fleet and anticipates ongoing equipment replacement over the life of the amended Project to 2045. While replacement decisions are driven primarily by economic considerations, newer models offer potential emissions benefits through improved efficiency. A schedule of indicative replacements has been developed, though it will evolve as technology and market conditions change.

Each replacement presents an opportunity to adopt lower-emissions technology, subject to maturity, commercial readiness, and cost considerations (including carbon pricing). HVO is actively monitoring emerging technologies, though no commercially available low-emission alternatives are currently deployable at scale.

HVO will review new technologies and abatement measures every three years, assessing their feasibility for implementation. These reviews will include options such as biofuels, hydrogen, electrification, and retrofit opportunities for existing equipment.

For scope 3, HV Operations Pty Ltd anticipates that future export destinations for HVO Complex coal will continue to follow similar patterns as historic sales. The primary countries that HVO Complex coal has been exported to all have NDCs under the Paris Agreement (or have followed international standards recognised by UNFCCC and published their own NDCs document in support of the Paris Agreement).

Under the Paris Agreement, each party is required to prepare, communicate, and maintain successive NDCs, submitting updates every five years. These NDCs are recorded in the UNFCCC's public registry. The next round, commonly referred to as NDC 3.0, is due in early 2025, in the lead-up to COP 30 in November 2025.

ii [Amendment emissions with mitigation measures](#)

The benefits of mitigation measures relating to the changes between the original Project as presented in the Submissions Report (EMM 2023a), and the amended Project are able to be quantified, and consist of the avoidance of scope 1, scope 2 and scope 3 emissions as shown in Figure 6.2 and Table 6.7.

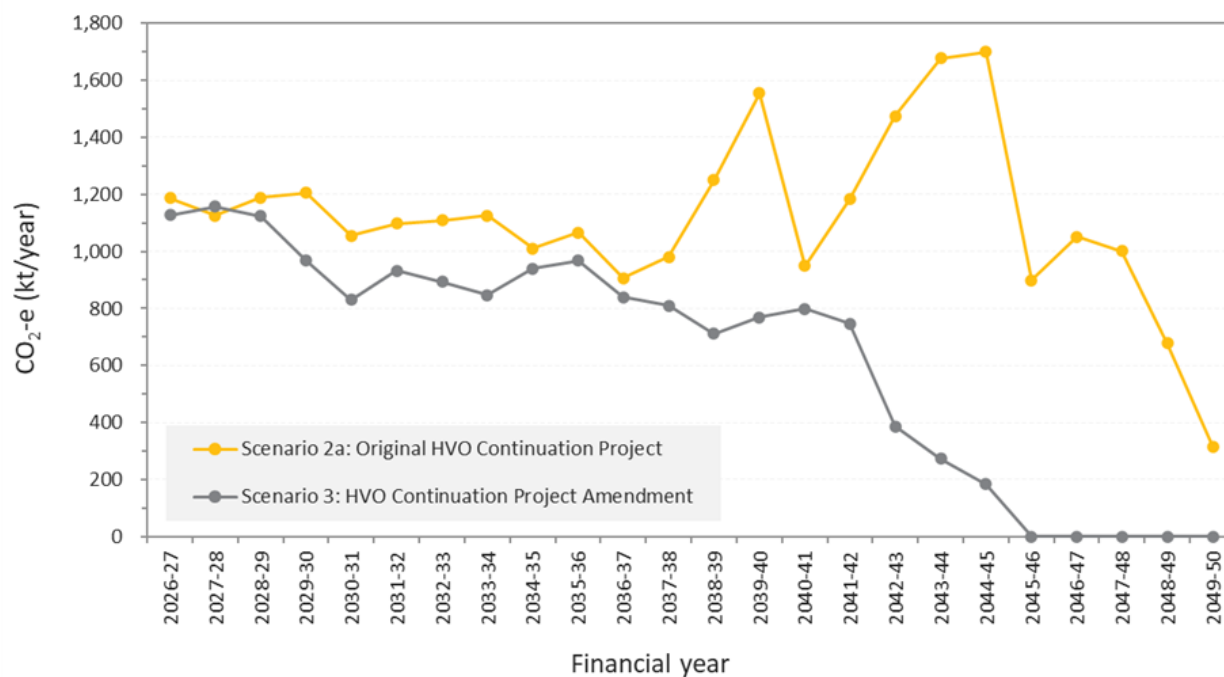


Figure 6.2 Reductions in scope 1 and 2 emissions from the HVO Complex with the amendment

Table 6.7 **Reductions in emissions from original Project**

Calendar year	Scope 1 emissions (kt CO ₂ -e/year)			Scope 2 emissions (kt CO ₂ -e/year)			Scope 3 emissions (kt CO ₂ -e/year)		
	Original Project	Amended Project	Change with Amendment	Original Project	Amended Project	Change with Amendment	Original Project	Amended Project	Change with Amendment
2027	1,153.0	1,082.4	-70.6	34.0	42.2	+8.2	36,564	41,171	4,607
2028	1,102.0	1,129.7	+27.7	24.0	35.3	+11.3	46,831	40,611	-6,220
2029	1,168.0	1,103.8	-64.2	20.0	23.2	+3.2	48,328	42,059	-6,269
2030	1,194.0	953.9	-240.1	12.0	16.2	+4.2	48,914	40,198	-8,716
2031	1,043.0	814.6	-228.4	11.0	15.8	+4.8	45,318	42,677	-2,641
2032	1,086.0	919.8	-166.2	11.0	13.4	+2.4	47,138	42,729	-4,409
2033	1,096.0	883.6	-212.4	12.0	9.4	-2.6	49,922	45,294	-4,628
2034	1,124.0	837.7	-286.3	2.0	9.3	+7.3	51,130	44,048	-7,082
2035	1,009.0	932.2	-76.8	2.0	7.4	+5.4	50,462	46,052	-4,410
2036	1,064.0	960.8	-103.2	2.0	6.4	+4.4	52,660	46,142	-6,518
2037	905.0	833.2	-71.8	2.0	6.3	+4.3	53,236	45,878	-7,358
2038	979.0	803.6	-175.4	2.0	6.5	+4.5	49,463	46,727	-2,736
2039	1,248.0	705.0	-543.0	2.0	7.1	+5.1	54,320	49,153	-5,167
2040	1,552.0	766.1	-785.9	2.0	3.5	+1.5	61,964	47,761	-14,203
2041	948.0	796.2	-151.8	2.0	3.2	+1.2	46,899	42,085	-4,814
2042	1,181.0	743.5	-437.5	2.0	3.4	+1.4	48,487	47,143	-1,344
2043	1,474.0	383.5	-1,090.5	2.0	2.7	+0.7	46,171	36,869	-9,302
2044	1,676.0	271.6	-1,404.4	2.0	2.1	+0.1	44,875	28,784	-16,091
2045	1,698.0	183.0	-1,515.0	2.0	1.3	-0.7	43,774	18,379	-25,395
2046	897.0	-	-897.0	1.0	-	-1.0	31,442	-	-31,442
2047	1,051.0	-	-1,051.0	1.0	-	-1.0	29,517	-	-29,517
2048	1,000.0	-	-1,000.0	1.0	-	-1.0	26,253	-	-26,253
2049	678.0	-	-678.0	1.0	-	-1.0	14,989	-	-14,989
2050	315.0	-	-315.0	0.0	-	0.0	6,145	-	-6,145
Average^(a) (kt CO₂-e/year)	1,110.0	795.0	-480.7	6.3	11.3	+2.6	43,117	41,777	-10,043
Total^(a) (kt CO₂-e)	26,641.0	15,104.2	-11,536.8	152.0	214.9	+69.9	1,034,802	793,763	-241,039

Note

(a) For the period 2027 to 2050.

Significant reductions in emissions are expected with the amended Project, as compared to the original Project, particularly in the years from approximately 2039 onwards. Compared with the original Project, total scope 1 and 2 emissions would decrease by 11,487 kt CO₂-e over the life of the amended Project. The major driver of these reductions would be the avoidance of fugitive emissions in gas Domain 1.

The HVO complex with the amended Project would continue to emit above the Safeguard Mechanism threshold of 100,000 t of CO₂-e per year throughout its life. As a Safeguard facility, the amended Project would be subject to the declining emissions trajectory required by the Safeguard Mechanism.

HVO proposes that the emissions from the amended Project would be managed in a way that is consistent with HVO's obligations under the Safeguard Mechanism. The decline rate for emissions under the Safeguard Mechanism (i.e. the baseline) is calculated as:

- a reduction of 4.9% per year from 1 July 2023 to 1 July 2029
- a reduction of 3.285% per year thereafter.

The calculation of the baseline takes into account annual coal production.

HVO also proposes to implement measures that go beyond its Safeguard Mechanism obligations. HVO has committed to make additional, voluntary contribution towards the NSW emission-reduction targets to reflect consideration of the NZF Act. With this in mind, HVO proposes that the emissions of the amended Project are aligned, so far as practicable, with the NZF Act emission-reduction targets, including by using offsets to reduce the amended Project's net GHG emissions where it is not feasible to avoid, reduce or substitute emissions. In effect, HVO would implement a net emissions decline rate for the amended Project that is more ambitious than the Safeguard Mechanism requirements, involving:

- a reduction of 5.9% per year from 1 July 2023 to 1 July 2029
- a reduction of 4.0% per year from 1 July 2030 to 1 July 2034
- a reduction of 2.58% per year thereafter.

Figure 6.3 illustrates the resulting net baseline for the Safeguard Mechanism (dashed purple line), and the net baseline with the additional NSW voluntary contributions (dashed green line), compared with the gross scope 1 emissions profile for the amended Project.

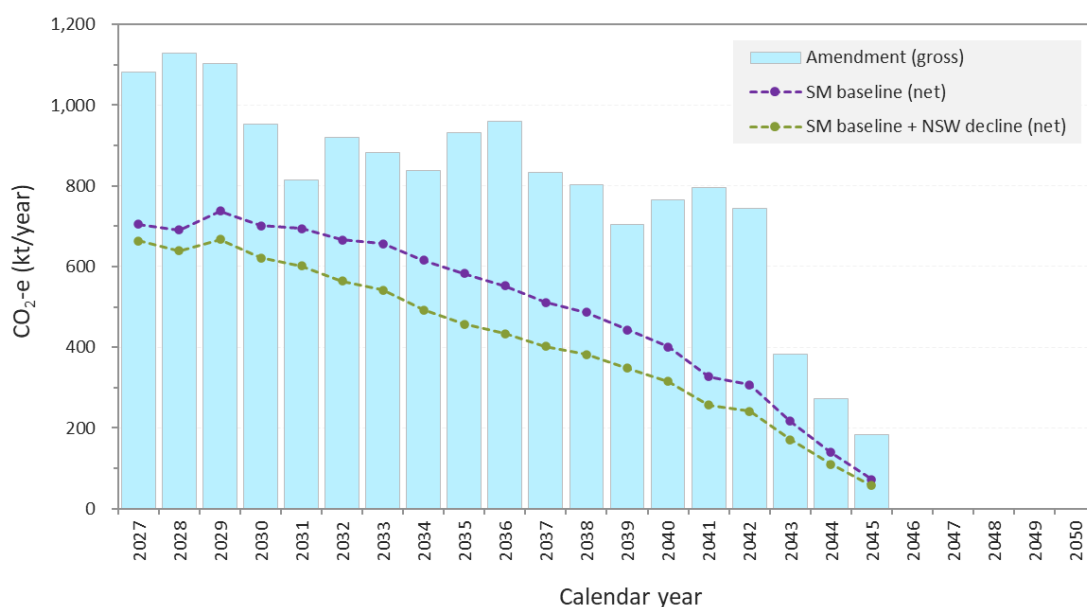


Figure 6.3 Scope 1 emissions for the amended Project and baseline profiles

Over the life of the amended Project, compliance with the Safeguard Mechanism baseline would reduce scope 1 GHG emissions by 5,595 kt CO₂-e, and compliance with the combined Safeguard Mechanism baseline and NSW decline rate would reduce GHG emissions by 7,139 kt CO₂-e.

iii Emission goals

Under the *NSW Guide for Large Emitters*, proponents are required to set long-term scope 1 emission goals, as well as interim goals, for a project's residual emissions. For the amended Project, the emission-reduction goals are effectively stated in the combined Safeguard Mechanism baseline and additional voluntary emission reductions to help NSW to achieve its emission-reduction targets. HVO is committed to achieving the combined decline rate on a net basis and adjusted for ROM coal production.

iv Summary

Specific mitigation measures to reduce the level of future GHG emissions from the amended Project are summarised in Table 6.8.

Table 6.8 GHG mitigation and management measures

ID	Mitigation and management measures
GHG1	HVO will conduct a trial of gas pre-drainage in areas identified with higher potential, to investigate the feasibility and effectiveness of gas pre-drainage. The design of the trial will be developed in consultation with relevant stakeholders to the satisfaction of the Planning Secretary and be provided within two years of commencement of the Project.
GHG2	HVO will continue to undertake regular reviews of technologies and abatement measures to reduce GHG emissions from the Project, including whether these measures are reasonable and feasible to implement at HVO. These reviews will be undertaken every three years and will include consideration of the use of alternate fuels including biofuels and hydrogen, and the transition to an electric powered fleet, as these technologies advance and more information becomes available.
GHG3	A greenhouse gas management plan will be developed to reflect the amended Project and will include an action plan (updated every 3 years) for investigating and implementing all reasonable and feasible abatement measures to minimise GHG emissions.
GHG4	To meet the requirements of the Safeguard Mechanism, HVO will implement abatement activities identified by mitigation measure, or purchase carbon offsets such as Australian carbon credit units (ACCUs) or Safeguard Mechanism credit units (SMCs), whichever is cost effective and practical at the time.
GHG5	HVO will make additional voluntary contribution towards the NSW emission-reduction targets to reflect consideration of the NZF Act. With this in mind, HVO proposes that the emissions of the Amended Project are aligned, so far as practicable, with the NZF Act emission-reduction targets, including by using offsets to reduce the amended Project's net GHG emissions where it is not feasible to avoid, reduce or substitute emissions.

6.1.5 Offsets strategy

HVO will thoroughly consider and assess the feasibility of a range of mitigation measures to avoid or reduce emissions wherever reasonable and feasible.

Based on the assessments conducted to date, HVO anticipates that, in the short term, the primary approach to achieving the net emission-reduction targets set out above will involve the use of carbon offsets and Safeguard Mechanism Credits (SMCs). Any carbon offsets and SMCs surrendered will be fully compliant with the requirements of the Safeguard Mechanism and the *NSW Guide for Large Emitters*. Eligible carbon offsets must meet the integrity standards set out in the *Commonwealth Carbon Credits (Carbon Farming Initiative) Act 2011*.

This approach aligns with both the EPA's expectations and the Safeguard Mechanism framework, demonstrating HVO's commitment to prioritising direct emission reductions where feasible, before relying on offsets.

6.1.6 Conclusion

The GHG assessment for the amended Project has been prepared in accordance with the *NSW Guide for Large Emitters* and the calculation methods identified therein.

The amended Project would be a relatively small contributor to GHG emissions in NSW. For example, for net emissions under the combined Safeguard Mechanism and NSW decline trajectory, it would represent between 0.25% and 0.81% (depending on the year) of state-wide emissions in the NSW current policy case.

In percentage terms, net emissions for the amended Project (including the Safeguard Mechanism and additional NSW decline rate) are projected to reduce at a greater rate (5.1% per year on average) than those for the state (4.4% per year on average).

6.2 Air quality

6.2.1 Introduction

An Air Quality Impact Assessment (AQIA) (Airen 2025) has been prepared to support the amended Project and is provided as Appendix F. The purpose of the Amendment AQIA is to quantify emissions to air and present modelling outcomes to determine the potential impact of the amended Project on local air quality. Furthermore, the Amendment AQIA supplements the EIS AQIA (Jacobs 2022) with more recent and up-to date information on the existing environment.

The Amendment AQIA was prepared in accordance with the procedures outlined in the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (EPA 2022) (Approved Methods).

6.2.2 Air quality criteria

The EPA has developed assessment criteria for a range of air quality indicators including particulate matter and nitrogen dioxide (NO₂). These criteria are outlined in the Approved Methods and summarised in Table 6.9.

Table 6.9 EPA air quality assessment criteria

Air quality indicator	Averaging time	Criterion	Application
Particulate matter (PM ₁₀)	24-hour	50 µg/m ³	Cumulative, at sensitive receptors
	Annual	25 µg/m ³	Cumulative, at sensitive receptors
Particulate matter (PM _{2.5})	24-hour	25 µg/m ³	Cumulative, at sensitive receptors
	Annual	8 µg/m ³	Cumulative, at sensitive receptors
Particulate matter (TSP)	Annual	90 µg/m ³	Cumulative, at sensitive receptors
Deposited dust	Annual (maximum increase)	2 g/m ² /month	Incremental, at sensitive receptors
	Annual (maximum total)	4 g/m ² /month	Cumulative, at sensitive receptors
Nitrogen dioxide (NO ₂)	1-hour	164 µg/m ³	Cumulative, at sensitive receptors
	Annual	31 µg/m ³	Cumulative, at sensitive receptors

The *NSW Voluntary Land Acquisition and Mitigation Policy* (VLAMP) (NSW Government 2018) includes the NSW Government's policy for voluntary mitigation and land acquisition to address dust (particulate matter) impacts from State significant mining, petroleum and extractive industry developments.

From the VLAMP, voluntary mitigation rights may apply where the development contributes to exceedances of the criteria outlined in Table 6.10 at any residence on privately owned land or workplace on privately owned land where the consequences of those exceedances in the opinion of the consent authority are unreasonably deleterious to worker health or the carrying out of business at that workplace, including consideration of the relevant factors identified on this subject in the VLAMP.

Table 6.10 VLAMP mitigation criteria for particulate matter

Air quality indicator	Averaging time	Criterion	Impact type
Particulate matter (PM ₁₀)	24-hour	50 µg/m ³ **	Human health
	Annual	25 µg/m ³ *	Human health
Particulate matter (PM _{2.5})	24-hour	25 µg/m ³ **	Human health
	Annual	8 µg/m ³ *	Human health
Particulate matter (TSP)	Annual	90 µg/m ³ *	Amenity
Deposited dust	Annual (maximum increase)	2 g/m ² /month **	Amenity
	Annual (maximum total)	4 g/m ² /month **	Amenity

Notes

* Cumulative impact (i.e. increase in concentrations due to the development plus background concentrations due to all other sources).

** Incremental impact (i.e. increase in concentrations due to the development alone), with **zero allowable exceedances** of the criteria over the life of the development.

Voluntary acquisition rights may apply where, even with best practice management, the development contributes to exceedances of the criteria in Table 6.11 at any residence on privately owned land or workplace on privately owned land where the consequences of those exceedances in the opinion of the consent authority are unreasonably deleterious to worker health or the carrying out of business at that workplace (including consideration of the relevant factors identified on this subject in the VLAMP), or on more than 25% of any privately owned land where there is an existing dwelling or where a dwelling could be built under existing planning controls.

Table 6.11 VLAMP acquisition criteria for particulate matter

Air quality indicator	Averaging time	Criterion	Impact type
Particulate matter (PM ₁₀)	24-hour	50 µg/m ³ **	Human health
	Annual	25 µg/m ³ *	Human health
Particulate matter (PM _{2.5})	24-hour	25 µg/m ³ **	Human health
	Annual	8 µg/m ³ *	Human health
Particulate matter (TSP)	Annual	90 µg/m ³ *	Amenity
Deposited dust	Annual (maximum increase)	2 g/m ² /month **	Amenity
	Annual (maximum total)	4 g/m ² /month **	Amenity

Notes

* Cumulative impact (i.e. increase in concentrations due to the development plus background concentrations due to all other sources).

** Incremental impact (i.e. increase in concentrations due to the development alone), with **five allowable exceedances** of the criteria over the life of the development.

6.2.3 Methodology

i Modelling scenarios

The HVO production schedule and equipment usage forecasts were used to identify a range of future operational years to be assessed.

Three future operational scenarios have been selected – Year 3 (2029), Year 8 (2034) and Year 15 (2041). These three scenarios address the periods of anticipated maximum material handling quantities, maximum haul distances, and varying proximities to local communities.

A scenario for a historical, representative year (2024) was also developed to determine existing contributions to air quality and for establishing background levels in the absence of modelled sources.

The modelling has considered contributions from the amended Project as well as from existing, surrounding mining operations, and in the case of future operating scenarios, approved mining operations.

ii Mining dust

Dust from mining activities has been quantified using the CALPUFF model. Dust concentrations and deposition levels have been simulated for every hour of the representative year and results at local communities and sensitive receptors have then been compared to the relevant air quality assessment criteria.

iii Post blast fume

Blasting activities have the potential to result in fume and particulate matter emissions. Particulate matter emissions from blasting are included in the mining dust modelling

Model results for post-blast fume have been compared to the applicable EPA air quality criterion for NO₂; that is 164 µg/m³ as a 1-hour average and taking background levels into account.

iv Diesel exhaust

Emissions from diesel exhausts, specifically NO₂, and PM₁₀ (including PM_{2.5}) have been assessed. NO_x emissions were explicitly modelled to provide an indication of the off-site NO₂ concentrations due to diesel exhaust emissions.

6.2.4 Impact assessment

i Mining dust

Detailed modelled outcomes for each parameter and assessment scenario are presented in the Amendment AQIA provided as Appendix F with the results summarised in the below sections.

a Particulate Matter (as PM₁₀)

The EPA does not prescribe a project only criteria for 24-hour average PM₁₀, but the VLAMP refers to 50 µg/m³ for the purposes of determining land acquisition and mitigation rights. Modelled maximum 24-hour average PM₁₀ concentrations due to the amended Project indicate that the 50 µg/m³ will not be exceeded at any private sensitive receptor. In addition, the maximum 24-hour average PM₁₀ concentrations due to the amended Project are expected to be lower at sensitive receptors than the concentrations due to the original Project.

Modelled maximum 24-hour average PM₁₀ concentrations due to the amended Project and other sources of PM₁₀ indicate that, in a representative year, many locations across the model domain are expected to experience maximum PM₁₀ concentrations above 50 µg/m³. Due to drought and bushfires, most locations in the Hunter Valley and NSW, have historically recorded one or more days each year when the 24-hour average PM₁₀ concentration exceeded 50 µg/m³.

Consequently, further investigation of the potential for the amended Project to cause an exceedance has been carried out with a focus of 24-hour average PM₁₀ concentrations at private receptors 161, 308 and 321. These three private receptors were selected as they represent the closest communities of Maison Dieu and Jerrys Plains to HVO.

Modelled results are presented in Figure 6.4 to Figure 6.6 and show that concentrations at these three receptors would be well below 50 µg/m³ for most days of the year (>99% of the time). There is, however, a potential risk that HVO influences an exceedance in the following circumstances:

- In 2029 at receptor 308 (Jerrys Plains) on one day in the year, when background levels are in the order of 40 µg/m³ or more.
- In 2034 at receptor 161 (Maison Dieu) on one day in the year, when background levels are in the order of 35 µg/m³ or more.
- In 2034 at receptor 308 (Jerrys Plains) on one day in the year, when background levels are in the order of 40 µg/m³ or more.

The contributions of HVO to the selected locations on these days are less than 11 µg/m³ and well below the air quality compliance criteria from the existing approvals for HVO North and HVO South (that is, 50 µg/m³ due to the development on its own). However, in these circumstances, it will be necessary for HVO to respond to any potential increases in offsite air quality risks and minimise its contribution to air quality.

These results are consistent with those reported for the original Project.

HVO is committed to proactively modifying or shutting down any activities that may be increasing the risk of air quality impacts. The HVO Air Quality and Greenhouse Gas Management Plan (AQGGMP) outlines the proactive and reactive management measures that are implemented (and will continue to be implemented) at HVO. These measures are consistent with best practice. Modelling undertaken by Airen has shown that the implementation of modifying operations in response to the trigger levels defined in the AQGGMP can reduce HVO's contributions to air quality such that HVO would not be the cause of an exceedance.

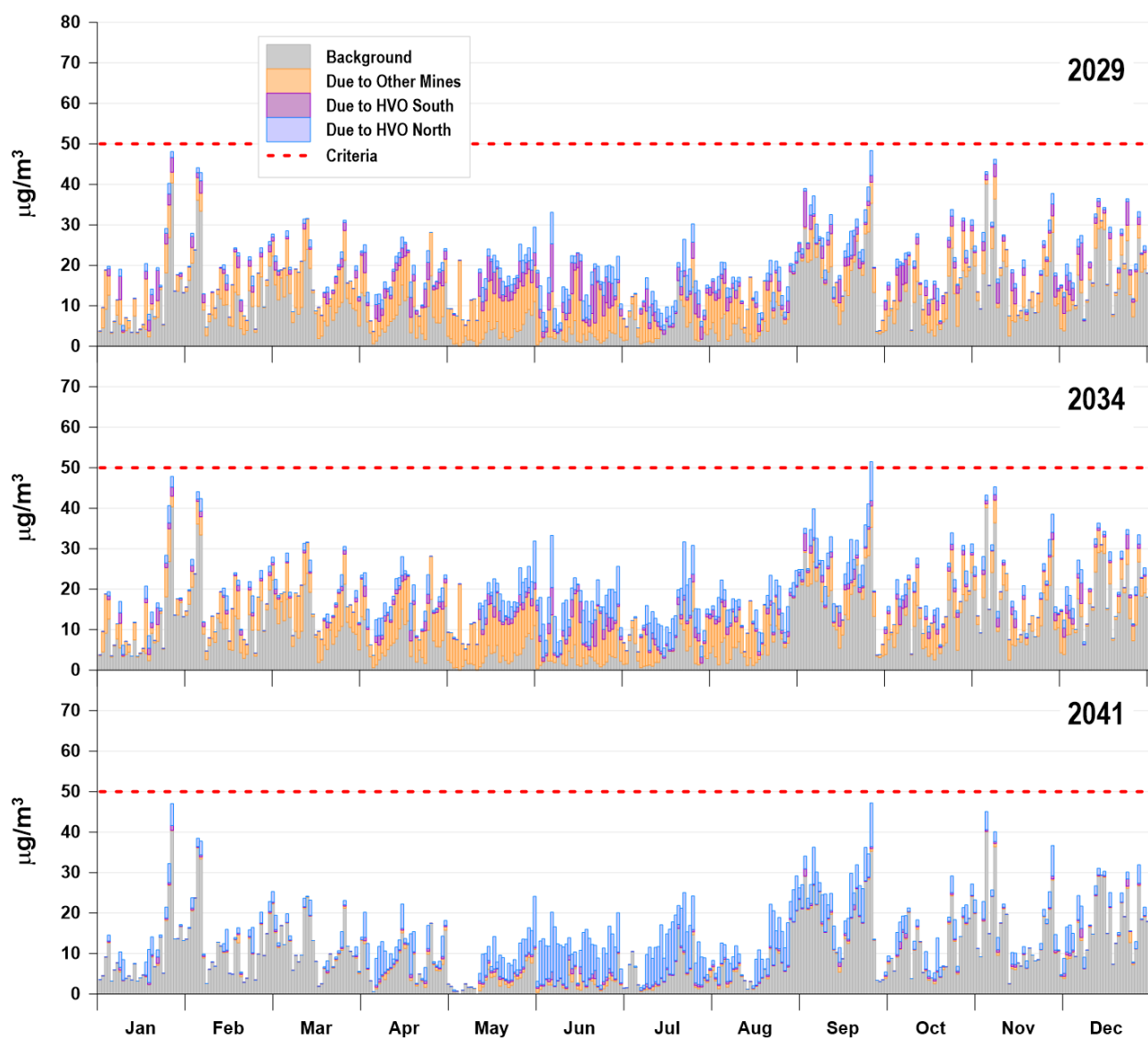


Figure 6.4 Time series of modelled 24-hour average PM10 concentrations at receptor 161 (Maison Dieu)

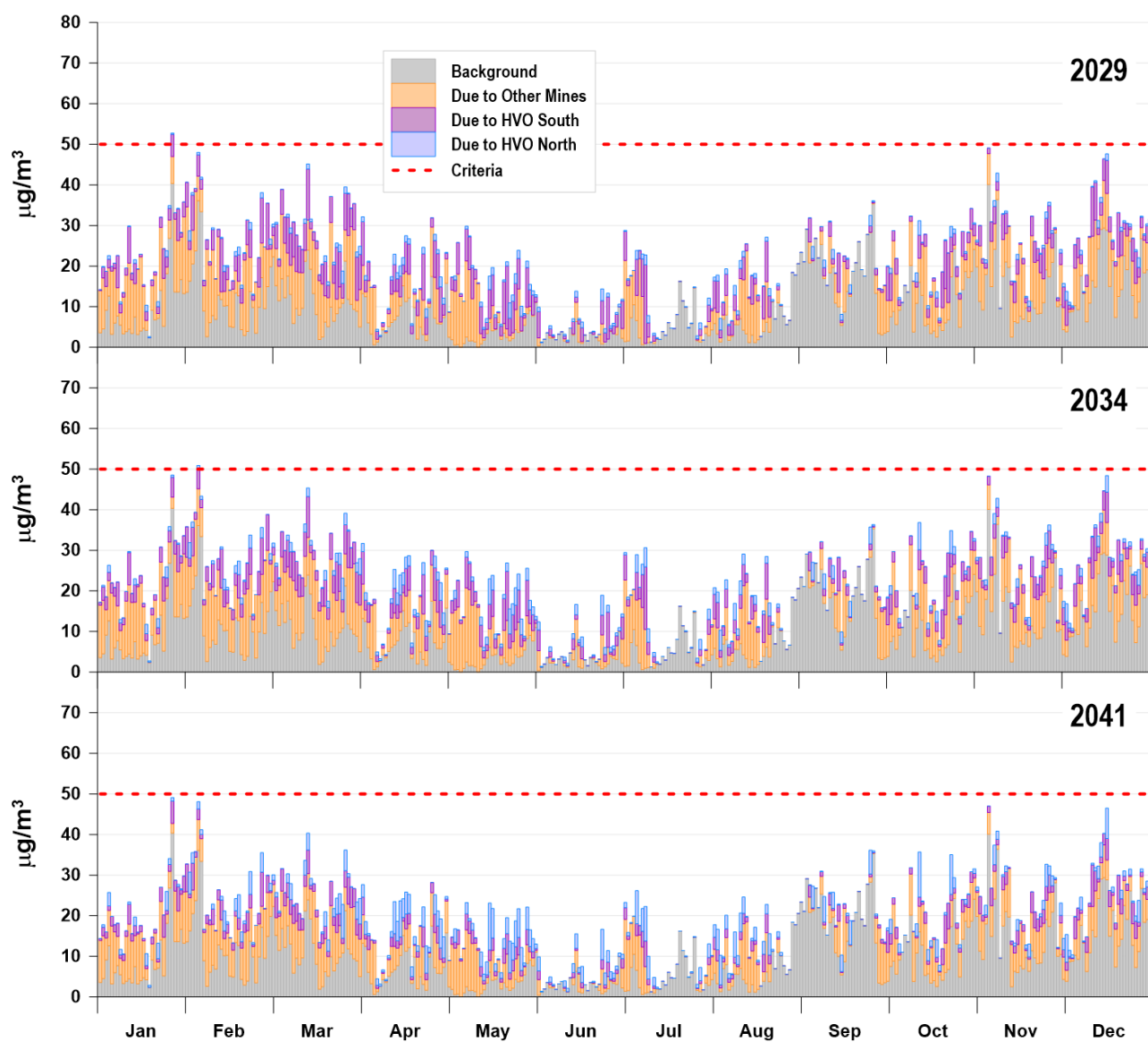


Figure 6.5 Time series of modelled 24-hour average PM10 concentrations at receptor 308 (Jerrys Plains)

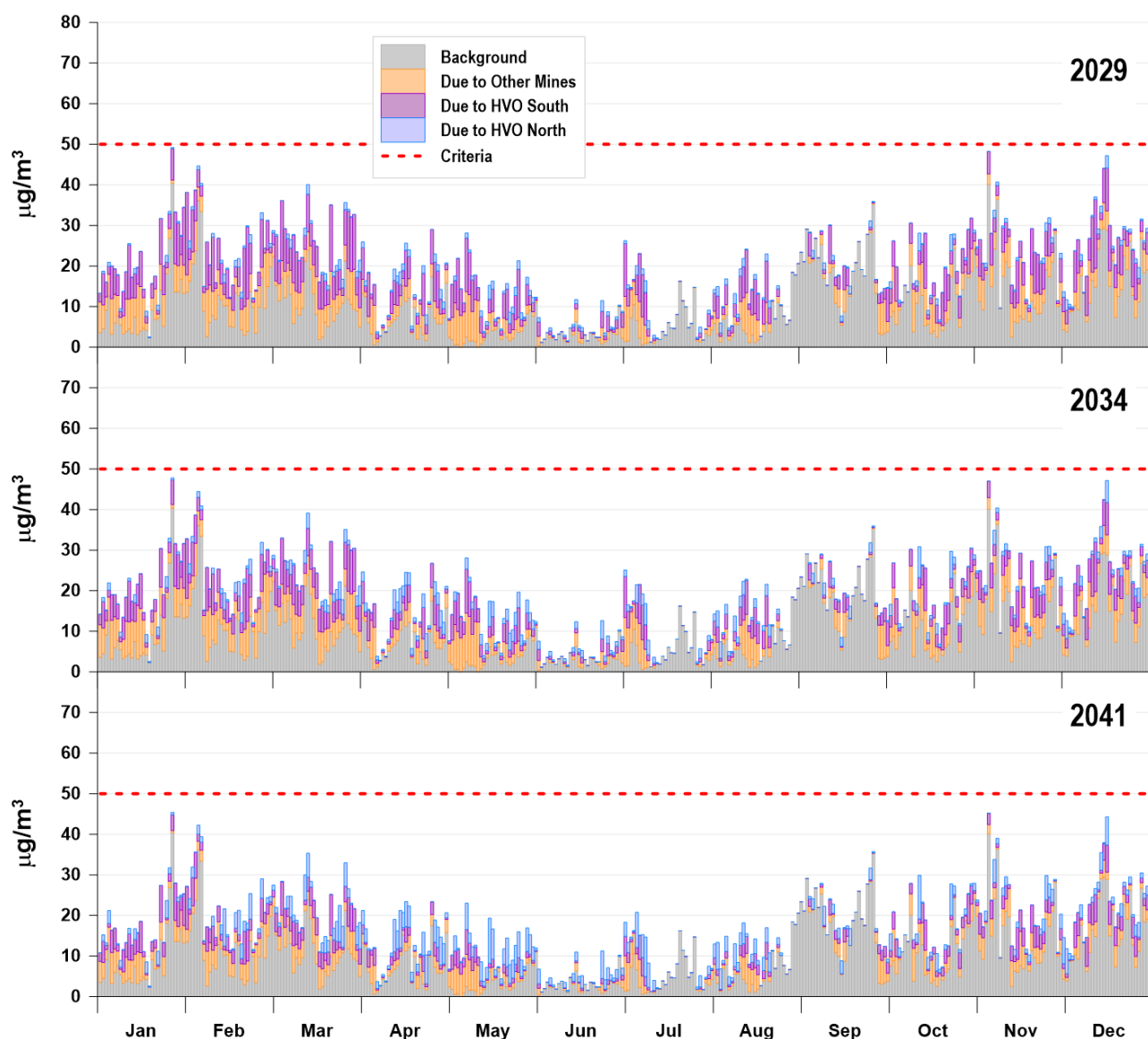


Figure 6.6 Time series of modelled 24-hour average PM₁₀ concentrations at receptor 321 (Jerrys Plains)

The EPA does not prescribe a project only criteria for annual average PM₁₀. Modelled cumulative annual average PM₁₀ concentrations due to the amended Project and other sources of PM₁₀ indicate compliance with the EPA's assessment criterion for annual average PM₁₀ (25 µg/m³) at all private sensitive receptors. These concentrations are expected to be lower than those from the original Project.

b Particulate Matter (as PM_{2.5})

The EPA does not prescribe a project only criteria for 24-hour average PM_{2.5}, but the VLAMP refers to 25 µg/m³ for the purposes of determining land acquisition and mitigation. The modelling shows that the 25 µg/m³ criterion would not be exceeded at any private sensitive receptor as a result of the amended Project only. These concentrations are expected to be lower than those from the original Project.

Modelled maximum 24-hour average PM_{2.5} concentrations due to the amended Project and other sources of PM_{2.5} indicate that the EPA's assessment criterion for maximum 24-hour average PM_{2.5} (25 µg/m³) will not be exceeded at any private sensitive receptor.

Modelled annual average PM_{2.5} concentrations due to the amended Project and other sources of PM_{2.5} indicate that the EPA's assessment criterion for annual average PM_{2.5} (8 µg/m³) will not be exceeded at private sensitive receptors. These concentrations are expected to be lower than those from the original Project.

c Particulate Matter (as TSP)

Modelled annual average TSP concentrations due to the amended Project and other sources of TSP indicate that the EPA's assessment criterion for annual average TSP ($90 \mu\text{g}/\text{m}^3$) will not be exceeded at private sensitive receptors. These concentrations are expected to be lower than those from the original Project.

d Deposited Dust

Modelled annual average deposited dust levels due to the amended Project indicate compliance with the EPA's assessment criteria of $2 \text{ g}/\text{m}^2/\text{month}$ (incremental) at all private sensitive receptors. These concentrations are expected to be lower than those from the original Project.

Modelled annual average deposited dust levels due to the amended Project and other sources also indicate compliance with the EPA's criteria of $4 \text{ g}/\text{m}^2/\text{month}$ (cumulative) at all private sensitive receptors. Again, these concentrations are expected to be lower than those from the original Project.

e VLAMP assessment

Table 6.12 provides a summary of the assessed model outcomes for the original and amended Project against the VLAMP acquisition criteria.

Table 6.12 Assessment against VLAMP acquisition criteria for particulate matter

Air quality indicator	Averaging time	Criterion	Assessment outcome from modelling	
			Original Project	Amended Project
Particulate matter (PM_{10})	24-hour	$50 \mu\text{g}/\text{m}^3$ **	Compliance	Compliance
	Annual	$25 \mu\text{g}/\text{m}^3$ *	Project may contribute to an exceedance of the criteria on more than 25% of privately owned land where there is an existing dwelling for the following landholdings: 3//700476 (Property 308) 5/251617, 9//3005, 8//3005 (Property 121)	Project may contribute to an exceedance of the criteria on more than 25% of privately owned land where there is an existing dwelling for the following landholdings: 8//3005 (receptor 121)
Particulate matter ($\text{PM}_{2.5}$)	24-hour	$25 \mu\text{g}/\text{m}^3$ **	Compliance	Compliance
	Annual	$8 \mu\text{g}/\text{m}^3$ *	Project may contribute to an exceedance of the criteria on more than 25% of privately owned land where there is an existing dwelling for the following landholdings: 3//700476 (Property 308) 5/251617, 9//3005, 8//3005 (Property 121)	Project may contribute to an exceedance of the criteria on more than 25% of privately owned land where there is an existing dwelling for the following landholdings: 8//3005 (receptor 121)
Particulate matter (TSP)	Annual	$90 \mu\text{g}/\text{m}^3$ *	Compliance	Compliance
Deposited dust	Annual (maximum increase)	$2 \text{ g}/\text{m}^2/\text{month}$ **	Compliance	Compliance

Air quality indicator	Averaging time	Criterion	Assessment outcome from modelling	
			Original Project	Amended Project
	Annual (maximum total)	4 g/m ² /month *	Compliance	Project may contribute to an exceedance of the criteria on more than 25% of privately owned land where there is an existing dwelling for the following landholdings: 8//3005 (receptor 121)

Notes

* Cumulative impact (i.e. increase in concentrations due to the development plus background concentrations due to all other sources).

** Incremental impact (i.e. increase in concentrations due to the development alone), with **five allowable exceedances** of the criteria over the life of the development.

ii Post blast fume

Modelled maximum 1-hour average NO₂ concentrations due to post-blast fume at HVO indicate that, under worst-case meteorological conditions with a rated 2 fume, blasting every day between 9:00 am and 5:00 pm and concurrent background concentrations, the maximum 1-hour average NO₂ concentrations will not exceed the EPA's criterion at any off-site sensitive receptor.

The amended Project will not change the proposed blasting activities, so potential impacts are expected to be similar to those of the original Project.

iii Diesel exhaust

Modelled maximum 1-hour average NO₂ concentrations due to diesel exhaust emissions as a result of the amended Project, indicate compliance with the EPA's 164 µg/m³ criterion at all private sensitive receptors.

Modelled annual average NO₂ concentrations due to diesel exhaust emissions as a result of the amended Project indicate compliance with the EPA's 31 µg/m³ criterion at all private sensitive receptors.

Both maximum 1-hour average and annual average NO₂ concentrations due to diesel exhaust emissions are expected to be lower than the concentrations due to the original Project.

6.2.5 Mitigation, management and monitoring

A range of best practice dust mitigation measures will be implemented for the amended Project as summarised in Table 6.13.

Table 6.13 Best practice dust mitigation measures to be implemented for the amended Project

Activity	Mitigation measures
Topsoil stripping	Watering of haul routes
	Restricting vehicle speeds
	Modifying or ceasing operations when visible dust is generated
	Minimise advance clearing to reduce exposed area for wind erosion
Drilling	Use of water suppression during drilling
	Dust curtains
	Modifying or ceasing operations when excessive visible dust is sustained.

Activity	Mitigation measures
Blasting	Pre-blast checks including review of meteorological conditions
Hauling overburden/coal	Watering of haul routes
	Regular maintenance of haul routes
	Restricting vehicle speeds
	Clearly marked haul routes
	Fleet optimisation to reduce vehicle kilometres travelled
Loading and unloading of overburden	Minimisation of material drop height during loading
	Having less wind exposed dump locations to use during high wind conditions
	Modifying or ceasing operations during adverse dust conditions
Unloading coal to ROM hoppers	Water sprays
Handling coal at CHPP	Water sprays
Dozers on coal stockpiles	Modify or cease operations during dusty conditions
	Reduced travel speed during dusty conditions
Conveyors	Covered/enclosure (where practical)
	Belt cleaning
	Water sprays
Wind erosion	Primary rehabilitation and temporary seeding/stabilisation of long term inactive overburden dumps.
Wind erosion from product stockpiles	Water sprays used in adverse wind conditions

In addition to the above, the air quality mitigation and management measures outlined in Table 6.14 will be implemented for the amended Project, consistent with those presented in the previous HVO North Amendment Report (EMM 2023b).

Table 6.14 Air quality mitigation and management measures

ID	Mitigation and management measures
AQ1	Air quality will continue to be managed and monitored as per the HVO AQMP, which will be updated to reflect the Project. The AQMP will detail the monitoring and management controls to be implemented to manage air quality impacts associated with the Project including ongoing implementation of the proactive and reactive management protocols and include control measures for managing other air quality aspects such as blast fume and spontaneous combustion.
AQ2	Reactive air quality management will continue to assess the need to modify the activities in response to the following triggers: • visual conditions, such as excessive visible dust, identified through the use of cameras as well as visual observations • meteorological conditions, such as dry, strong wind conditions • ambient air quality conditions (that is, elevated short-term PM₁₀ concentrations, observed through air quality monitoring results) • a Trigger Action Response Plan (TARP) process will be implemented, and dust levels investigated when the TARP process is enacted to identify likely sources of dust.
AQ3	Proactive air quality management measures will include daily forecasts, alerting operations of the potential requirement to modify mining activities, as appropriate, to minimise or avoid the potential dust impacts.

ID	Mitigation and management measures
AQ4	It is anticipated that receptor 121 will be afforded voluntary air quality acquisition rights as a result of the Project in accordance with the VLAMP.
AQ5	A review of the existing air quality monitoring locations will be undertaken within 12 months of the commencement of the Project, so that the monitoring network provides adequate coverage of the Project area.
AQ6	The program for all private residences within 4 km of the proposed mining area whereby these residences will be eligible for tank inspections, and cleaning and installation of first flush filter systems for residential water tanks and domestic taps will continue to be implemented.
AQ7	A site-specific blast management plan will be implemented during operations, including key fume management actions, such as defining the potential risk zone based upon weather patterns and obtaining permissions to fire based on an assessment of real-time weather conditions.
AQ8	Mitigation measures to manage diesel combustion emissions include: - servicing all machinery in accordance with original equipment manufacturer recommendations for maintenance - targeting the maintenance to ensure, as far as reasonably practical, equipment remains fit for purpose over its whole life cycle.

6.2.6 Conclusion

The air quality assessment considered the potential impacts relating to construction dust, operational dust, operational post-blast fume and operational diesel exhaust, associated with the amended Project.

Construction activities, largely through the realignment of Lemington Road, have the potential to increase the overall dust emissions in the early phase of the amended Project (that is, the first two to three years) but these increases are not predicted to be of a magnitude that will change the air quality outcomes for privately owned sensitive receptors. Nevertheless, appropriate management and monitoring will need to continue during the construction activities.

Table 6.15 summarises the predicted cumulative operational impacts.

Table 6.15 Predicted air quality impacts summary

Air quality impact	Parameters	Predicted impact
Particulate matter (PM ₁₀)	Maximum 24-hour average	The maximum 24-hour average PM₁₀ VLAMP criterion of 50 µg/m³ will not be exceeded at any privately owned residential sensitive receptor due to emissions from the Project alone. Compared to the original Project, concentrations at sensitive receptors are predicted to be lower. While 24-hour PM₁₀ concentrations may continue to exceed the EPA's cumulative air quality criteria of 50 µg/m³, these events are predicted to be within the range of historically measured days above the criterion, excluding extraordinary events. Results show that concentrations at the representative receptors would be well below 50 µg/m³ for most days of the year (>99% of the time). However, there is a potential risk that HVO will influence an exceedance in the following circumstances: - In 2029 at receptor 308 (Jerrys Plains) on one day in the year, when background levels are in the order of 40 µg/m³ or more. - In 2034 at receptor 161 (Maison Dieu) on one day in the year, when background levels are in the order of 35 µg/m³ or more. - In 2034 at receptor 308 (Jerrys Plains) on one day in the year, when background levels are in the order of 40 µg/m³ or more. The contributions of HVO to the selected locations on these days are less than 11 µg/m³ and well below the air quality compliance criteria in the existing approvals for HVO North and HVO South. These predictions are consistent with those for the original Project.

Air quality impact	Parameters	Predicted impact
	Annual average	Cumulative annual average PM₁₀ concentrations (due to the amended Project and other sources of PM₁₀), indicate compliance with the EPA's assessment criterion for annual average PM₁₀ (25 µg/m³) at all private sensitive receptors. Compared to the original Project, concentrations at sensitive receptors are predicted to be lower. Annual average PM₁₀ concentrations will comply with air quality criteria at all privately owned sensitive receptors not subject to existing air quality acquisition rights except for receptor 121 in Maison Dieu. The modelling result is influenced by the combined contributions from the amended Project, other mining operations and other sources of PM₁₀ and is considered unlikely to eventuate based on the conservative approach to the modelling and historical monitoring in this area that show PM₁₀ concentrations 25% lower than the criteria. Under the VLAMP, receptor 121 will trigger voluntary acquisition rights as the amended Project may contribute to an exceedance of the criteria on more than 25% of privately owned land where there is an existing dwelling. Notwithstanding the above, the number of lots with risk of a VLAMP exceedance is reduced with the amended Project, relative to the original Project. For the original Project, two receptors were predicted to be impacted, including receptor 121. Receptor 308 is no longer predicted to be impacted by the amended Project.
Particulate matter (PM _{2.5})	Maximum 24-hour average	Cumulative maximum 24-hour average PM_{2.5} concentrations (due to the amended Project and other sources of PM_{2.5}) indicate that the EPA's cumulative assessment criterion for maximum 24-hour average PM_{2.5} (25 µg/m³) will not be exceeded at any private sensitive receptor. Compared to the original Project, concentrations at sensitive receptors are predicted to be lower.
	Annual average	Cumulative annual average PM_{2.5} concentrations (due to the amended Project and other sources of PM_{2.5}) and other sources of PM_{2.5} indicate that the EPA's assessment criterion for annual average PM_{2.5} (8 µg/m³) will not be exceeded at private sensitive receptors. Compared to the original Project, concentrations at sensitive receptors are predicted to be lower. Under the VLAMP, receptor 121 trigger voluntary acquisition rights as the amended Project may contribute to an exceedance of the criteria on more than 25% of privately owned land where there is an existing dwelling. Notwithstanding the above, the number of lots with risk of a VLAMP exceedance is expected to reduce with the amended Project, relative to the original Project. For the original Project, two receptors were predicted to be impacted, including receptor 121. Receptor 308 is no longer predicted to be impacted by the amended Project.
Particulate matter (TSP)	Annual average	Annual average TSP concentrations will comply with air quality criteria at all privately owned sensitive receptors not subject to existing air quality acquisition rights. The amended Project will not be the cause of any exceedance. Compared to the original Project, concentrations at sensitive receptors are predicted to be lower.
Deposited dust	Annual average	Annual average deposited dust levels will comply with air quality criteria at all private sensitive receptors not subject to existing air quality acquisition rights. The amended Project will not be the cause of any exceedance. Compared to the original Project, concentrations at sensitive receptors are predicted to be lower. Under the VLAMP, receptor 121 trigger voluntary acquisition rights as the amended Project may contribute to an exceedance of the criteria on more than 25% of privately owned land where there is an existing dwelling. No properties were predicted to trigger VLAMP for the original Project.
Operational post blast fume emissions	-	No expected adverse air quality impacts.
Operational diesel exhaust emissions	-	Operational diesel exhaust emissions associated with off-road vehicles and equipment are not expected to result in any adverse air quality impacts.

Based on the assessment, the amended Project is unlikely to affect air quality beyond the range of historically measured fluctuations of key air quality indicators around the region. In addition, the amended Project is expected to result in a lower air quality risk than the original Project as presented in the EIS (EMM 2022a). This is largely because the amended Project proposes significantly (approximately 23%) lower quantities of material moved in each year. As such, particulate matter emissions and impacts are expected to be lower than originally estimated and presented in the EIS.

6.3 Noise

6.3.1 Introduction

A Noise Impact Assessment (NIA) (EMM 2025c) (Amendment NIA) has been prepared to support the amendment application and is provided in Appendix G. The primary objectives of the Amendment NIA are to:

- assess potential noise impacts associated with the amended Project, including operational noise, construction noise, modifying factor adjustments and sleep disturbance
- confirm suitable criteria for each element of potential noise impact in accordance with relevant NSW guidelines and policies. This was completed in the EIS NIA and all determined criteria is unchanged for this amendment NIA
- identify and assess all reasonable and feasible noise mitigation controls and management strategies
- propose any necessary noise monitoring and management strategies.

The Amendment NIA was prepared in accordance with the requirements of the SEARs and with consideration to the following guidelines, policies and industry requirements:

- Noise Policy for Industry (NPfI) (EPA 2017).
- Interim Construction Noise Guideline (ICNG) (DECCW 2009).
- VLAMP (NSW Government 2018).

Not included in the Amendment NIA is:

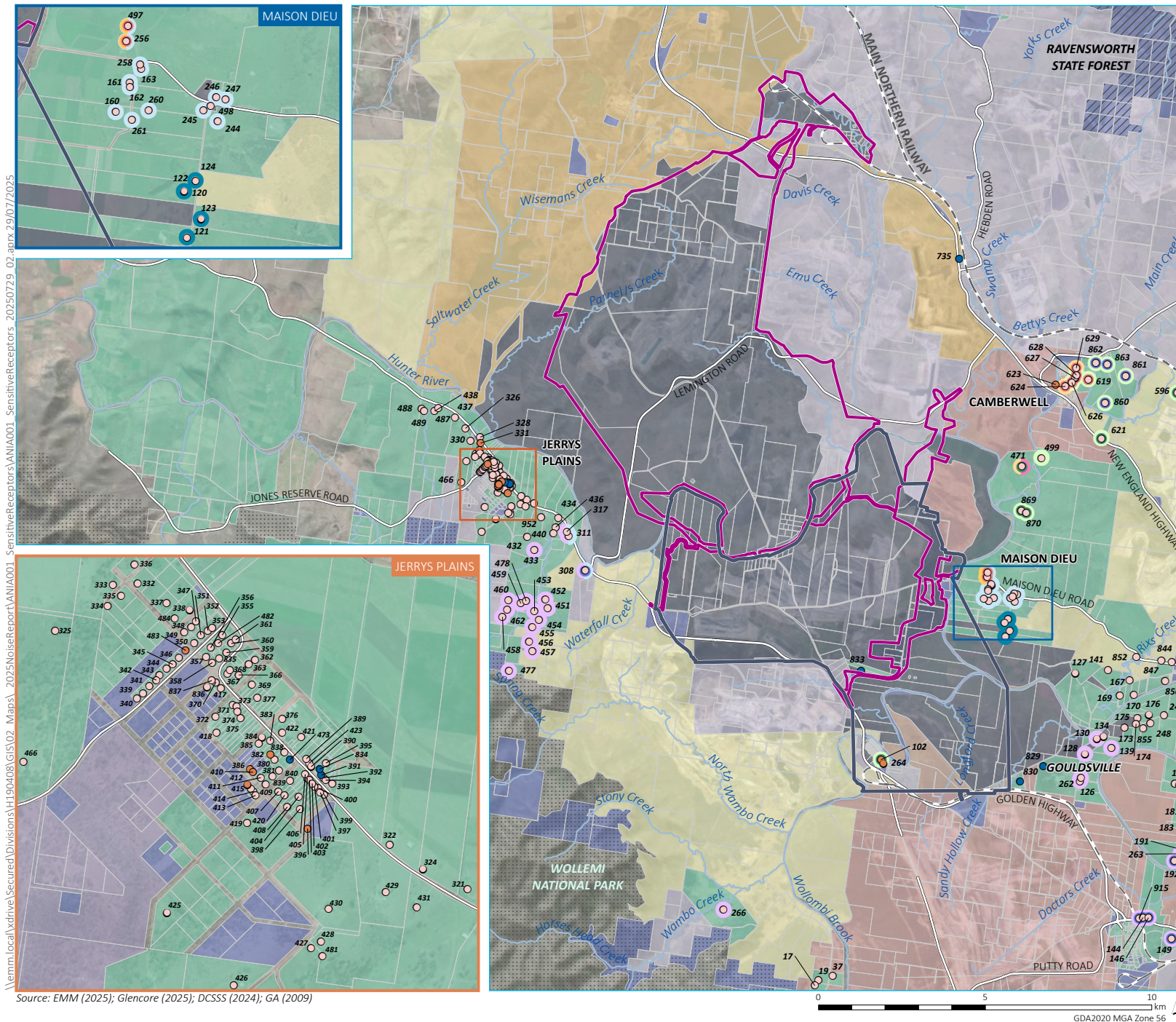
- An assessment of road traffic noise. There are no changes proposed to the annual workforce numbers or associated traffic generation as part of the amendment to that described and assessed in the EIS. As such, there is no change from the road traffic noise assessment completed for the EIS NIA and the findings of that assessment still apply to the amended Project. The EIS NIA found that given no changes are proposed to workforce numbers or operational traffic to that currently approved, no change to road traffic noise on the main road network is expected to occur. The predicted noise from traffic along the realigned Lemington Road is predicted to comply with the relevant noise limits as per the *Road Noise Policy* (DECCW 2011) at all of the closest receptors in Maison Dieu.
- An assessment of rail noise. The amended Project proposes to continue to transport coal from the site via rail to the Port of Newcastle, to deliver export coal to customers. The amended Project does not propose any changes to the demand on the rail network or the Port of Newcastle beyond the original Project as presented in the EIS (EMM 2022a). Coal will be transported in accordance with existing agreements with rail providers and the Port.

6.3.2 Receptors and noise criteria

i Receptors

There are limited private residences in close proximity to the amended Project, with the closest residences at Maison Dieu to the east, Long Point/Gouldsville to the south-east, Camberwell to the north-east and Jerrys Plains to the west.

The nearest private sensitive receptors are shown in Figure 6.7.



- KEY**
- Amended proposed HVO North development consent boundary
 - Proposed HVO South development consent boundary
- Receptor location**
- Private - residential
 - Private - non residential
 - Community Infrastructure
 - Subject to existing acquisition rights - Other mine - AQ
 - Subject to existing acquisition rights - Other mine - Noise
 - Subject to existing acquisition rights - Other mine - AQ & Noise
 - Subject to existing mitigation rights - HVO - AQ
 - Subject to existing mitigation rights - HVO - Noise & AQ
 - Subject to existing mitigation rights - HVO - Noise
 - Subject to existing mitigation rights - Other mine - Noise & AQ
 - Subject to existing mitigation rights - Other Mine - AQ
 - Subject to existing mitigation rights - Other mine - Noise
- Land ownership**
- HVO JV land
 - Other mine owned - Glencore land
 - Other mine owned - Yancoal
 - Other mine owned
 - AGL Macquarie
 - Private
 - Public/Crown
- Existing environment**
- Cadastral boundary
 - Rail line
 - Major road
 - Named watercourse
 - NPWS reserve
 - State forest

Sensitive receptors

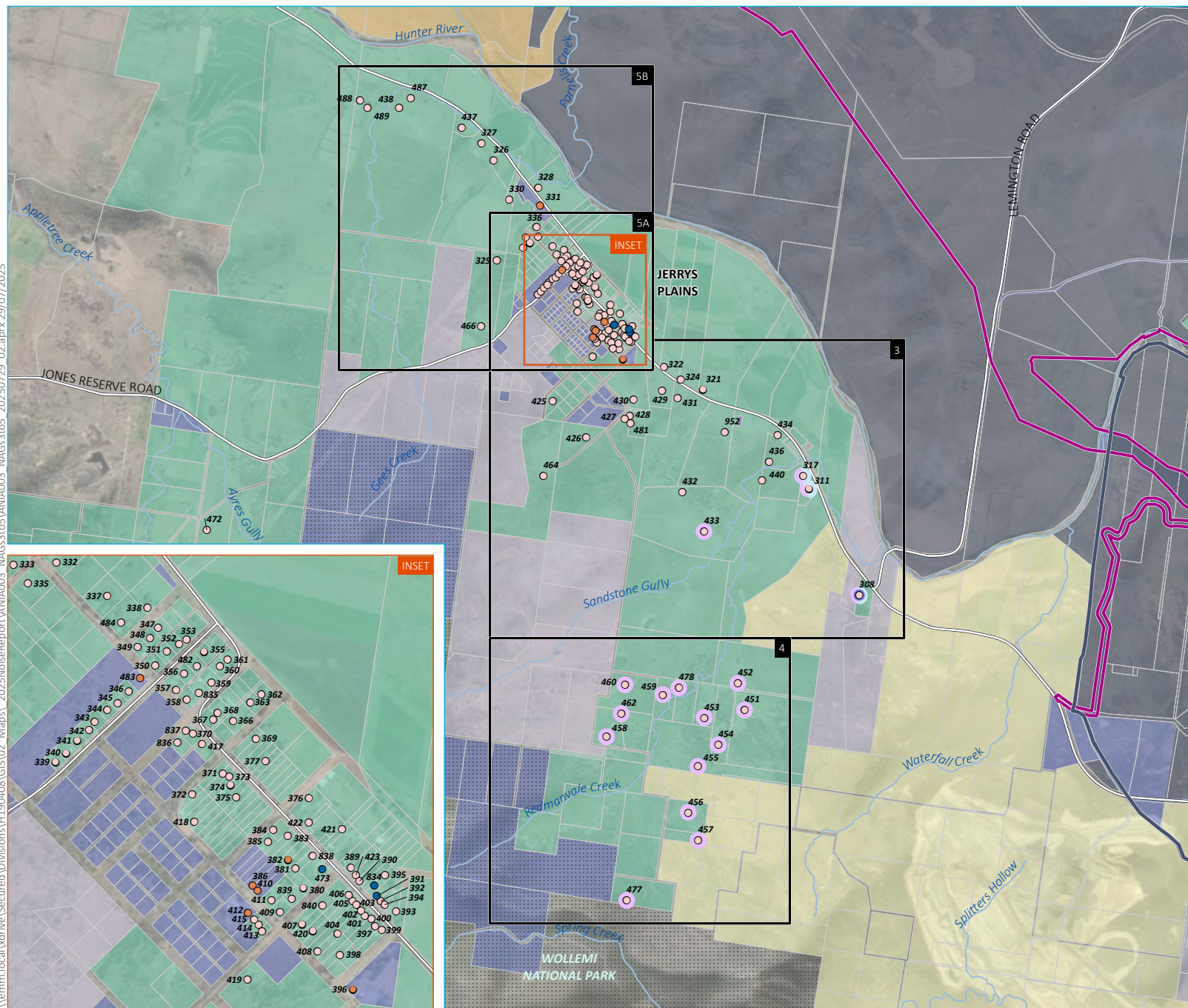
HVO Continuation Project
Amendment Report
Figure 6.7

Eight noise assessment groups (NAGs) were established for the original Project in the EIS NIA (EMM 2022a). The primary objective of a NAG is to classify receptors into groups, where each group can be represented by a single background noise level and, hence, assessed against a singular criterion. NAG identifiers and their localities are detailed in Table 6.16 and shown in Figure 6.8 and Figure 6.9. The eight NAGs identified for the EIS NIA are considered appropriate and have therefore also been adopted for assessment in the Amendment NIA (Appendix G).

Table 6.16 **Noise assessment groups**

NAG	Locality
1A	Shearers Lane and northern receptors in Maison Dieu area
1B	Knodlers Lane and southern receptors in Maison Dieu area
1C	North-western receptors in Maison Dieu area
2	Long Point
3	Jerrys Plains South / Moses Crossing
4	Redmanvale Road
5A	Jerrys Plains Village
5B	Jerrys Plains West

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ii Current approved operational noise criteria

Table 6.17 provides a summary of the noise limits under the current HVO development consent/project approval and EPL for the key receptor areas around the HVO Complex.

Table 6.17 Current consent and EPL operational noise criteria – $L_{Aeq,15\text{minute}}$ dB

NAG	Locality	Lowest Criterion			Highest Criterion		
		Day	Evening	Night	Day	Evening	Night
1A	Shearers Lane and Northern receptors in Maison Dieu area	41	41	41	41	41	41
1B	Knodlers Lane and Southern receptors in Maison Dieu area	40	40	40	40	40	40
1C	North western receptors in Maison Dieu area	39	39	39	39	39	39
2	Long Point	35	35	35	37	37	37
3	Jerrys Plains South / Moses Crossing	35	35	35	40	40	40
4	Redmanvale Road	35	35	35	35	35	35
5A	Jerrys Plains Village	40	40	40	40	40	40
5B	Jerrys Plains West	35	35	35	40	40	40

iii Background noise levels

As part of the EIS NIA, background noise surveys were conducted around the HVO Complex to determine rating background levels (RBL) in the areas where sensitive receptors have been identified.

Table 6.18 presents the established RBLs used to derive relevant noise goals for the original Project in accordance with the NPfI and the ICNG, as presented in the EIS NIA. The RBLs remain unchanged for the amended Project.

Table 6.18 Background noise monitoring results summary

NAG	Locality	RBL L_{A90} dB		
		Day	Evening	Night
1A	Maison Dieu – Shearers Lane and northern receptors	31	32	33
1B	Maison Dieu – Knodlers Lane and southern receptors			
1C	Maison Dieu – North-western receptors			
2	Long Point	34	30	31
3	Jerrys Plains South	36	37	33
4	Redmanvale Road*	35	30	30
5A	Jerrys Plains Village	36	33	32
5B	Jerrys Plains West	33	28	27

Note

*A background noise survey was not conducted at Redmanvale Road (NAG 4) as background levels are likely to be less than the NPfI default minimum RBLs. The NPfI default minimum RBLs have been adopted for this NAG.

iv Project noise trigger levels

For the EIS NIA, project noise trigger levels (PNTL) were determined from the RBL in accordance with the NPfI, and they are unchanged in the Amendment NIA. Table 6.19 provides calculated PNTL for each NAG private residential receptor. Where private residential receptors fall outside of the identified NAGs, the NPfI default minimum RBLs were adopted.

The use of PNTLs in the Amendment NIA were used as a benchmark level above which noise management measures are required to be considered (in accordance with the NPfI) and to evaluate the significance of residual noise impacts.

Table 6.19 Project noise trigger levels

NAG	PNTL (L _{Aeq,15minute})		
	Day	Evening	Night
1A	40	36	36
1B	40	36	36
1C	40	36	36
2	40	35	35
3	41	41	38
4	40	35	35
5A	41	38	37
5B	40	35	35

v Recommended amenity noise levels

Table 2.2 of the NPfI provides recommended amenity noise levels for various land uses. Where the existing noise level from industrial sources approaches the recommended amenity noise level, noise from new sources must be limited to protect the amenity of the area. Recommended amenity noise levels are intended to protect community against noise impacts such as speech interference, annoyance, and some sleep disturbance.

Recommended amenity noise levels for relevant receptor categories in the Amendment NIA are listed in Table 6.20 and remain consistent with those presented in the EIS NIA.

Table 6.20 Recommended amenity noise levels – L_{Aeq,period} dB

Receptor category	Day	Evening	Night
Private residential (external)	50	45	40
School classroom (internal, when in use)	35	NA	NA
School classroom (external, when in use) ¹	45	NA	NA
Passive recreation area (external)	50	50	50
Active recreation area (external)	55	55	55
Commercial premises (when in use)	65	65	65
Industrial premises (when in use)	70	70	70

Receptor category	Day	Evening	Night
Place of worship (internal)	40	40	40
Place of worship (external) ¹	50	50	50

Notes: 1. 10 dB adjustment applied to obtain equivalent external amenity noise level.

vi Construction noise criteria

Construction noise management levels presented in Table 6.21 apply to private residential receptors for the amended Project during standard construction hours. Out of hours construction activities would need to comply with approved operational noise limits.

Table 6.21 Standard construction hours noise management levels, private residential receptors – $L_{Aeq,15\text{minute}}$ dB

NAG	Area	Noise Affected	Highly Noise Affected
1A	Shearers Lane and northern receptors in Maison Dieu area	45	75
1B	Knodlers Lane and southern receptors in Maison Dieu area	45	75
1C	North western receptors in Maison Dieu area	45	75
2	Long Point	45	75
3	Jerrys Plains South/Moses Crossing	46	75
4	Redmanvale Road	45	75
5A	Jerrys Plains Village	46	75
5B	Jerrys Plains West	45	75

6.3.3 Methodology

i Operational noise

The operational noise assessment presented in the Amendment NIA was undertaken generally in accordance with the guidelines outlined in the NPfI, and consistent with the methodology applied in the EIS NIA.

Five indicative operational scenarios were modelled representing stages in progression of mining operations over the proposed life of mine, with emphasis on targeting the highest noise impact, including periods when operations will be closest to identified private residential receptors and maximum extraction periods.

Each stage modelled is a representative typical worst case operating configuration for that period of operations. The stages nominally relate to Year 3 (2029), Year 6 (2032), Year 8 (2034), Year 12 (2038) and Year 15 (2041) of the amended Project which represent periods when operations will be closest to identified private residential receptors and during maximum extraction periods. Year 3 is anticipated to be approximately 2029, subject to date of approval. Operational intrusive, cumulative, and potential sleep disturbance impact associated with each of these stages has been assessed.

ii Construction noise

Table 6.22 lists primary construction tasks proposed for the amended Project and the mine they are associated with (i.e. HVO North or HVO South).

Table 6.22 **Proposed construction activities**

HVO North	HVO South
Lemington Road realignment	Lake James enlargement
Transmission line relocations	Cheshunt flood protection levee
Parnells Dam enlargement	Riverview flood protection levee
West Pit TSF	Additional mine water/sediment dams
HVO North site access	Pumping infrastructure
Haul road to Ravensworth Operations	
Diversion drains	
Tailings pipelines and pumps	
Additional mine water/sediment dams	
HV MIA, admin building etc	
Newdell LP upgrade	
HVLP product stockpile extension	
Pumping infrastructure	
Carrington West Wing levee	

Note: Blue highlight indicates construction activities quantitatively assessed.

The tasks highlighted blue have the greatest potential to cause construction noise impact and have, therefore, been quantitatively assessed. The remaining tasks occur well within the Project boundaries, have relatively low noise emissions and/or are at sufficient distance from private residential receptors that noise emissions would be relatively inconsequential and lower than predicted for the modelled activities.

A worst-case construction scenario has been assessed with concurrent construction associated with the activities highlighted in blue (Table 6.22).

Standard construction hours for the amended Project are:

- Monday to Friday, 7.00 am to 6.00 pm
- Saturday, 8:00 am to 1:00 pm
- no construction work on Sunday and public holidays.

HVO proposes to undertake primary noise generating activities during standard construction hours. Outside of these times, HVO is committed to managing noise such that the cumulative impact from the mining operations and construction activities do not exceed the operational noise limits. This will allow construction tasks to be undertaken as required but will restrict cumulative operational and construction noise to approved operational noise limits.

iii Sleep disturbance

Potential sleep disturbance impact was assessed by predicting noise levels from plant items known to generate noise levels that at times stand out above the general mining continuum.

The following sources were modelled to assess sleep disturbance:

- noise generated by excavator buckets impacting truck bodies or hard ground material, or rocks impacting the bottom of empty haul truck trays was modelled at each dig location
- dozer track slap at each exposed dozer operating location, typically overburden emplacement areas
- haul truck exhaust surges were modelled by assessing a maximum sound power event at each overburden emplacement area, and, at exposed sections along haul routes.

Assessment of sleep disturbance for each model stage involved modelling each of these sources, and then combining the highest source prediction with results for the remainder of operational plant to obtain an estimate of possible short-term maximum noise emission.

iv Cumulative noise assessment

Other industrial noise sources around HVO with potential to cause cumulative noise impact to receptors within the assessment area include:

- United Wambo Joint Venture (UWJV)
- Wambo Underground (WU)
- Rixs Creek South (RCS)
- Mount Thorley Warkworth (MTW)
- Ravensworth Operations (RO)
- Ashton Coal Project (ACP).

These sources were assessed in combinations with the amended Project at HVO North and HVO South dependant on geographical location and directionally where there is potential to cause cumulative noise impact with HVO North and/or HVO South.

The assessed combinations are detailed in Table 6.23.

Table 6.23 Cumulative noise assessment combinations

Locality	Combination 1	Combination 2	Combination 3
Camberwell	HVO North, RO, ACP	-	-
NAG 1A, 1B and 1C	HVO South, HVO North	HVO South, UWJV, WU	HVO North, RO
NAG 2	HVO South, UWJV, WU, RCS	HVO South, UWJV, WU, MTW	
NAG 3	HVO South, HVO North	HVO South, UWJV, WU	
NAG 4	HVO South, HVO North	HVO South, UWJV, WU	
NAG 5	HVO North, HVO South	HVO South, UWJV, WU	

6.3.4 Impact assessment

i Operational noise assessment

Noise modelling presented in the Amendment NIA considered all reasonable and feasible mitigation options to be implemented by HVO including:

- various levels (height options) will be provided for overburden emplacement to allow shielded emplacement to occur deeper in the mining area during adverse meteorological conditions
- haul route alignments within the mining area will maximise the available topographical shielding provided by the mine design where practical
- progressively attenuate the remaining fleet of large mining equipment and implement BATEA sound power where reasonable and feasible for significant noise generating mobile equipment
- dozers will be restricted if deemed to be a primary source of noise during periods of meteorological enhancement
- continue to implement Best Management Practice (BMP) measures including:
 - real-time noise monitoring locations used for noise management
 - proactive operational planning based on predicted meteorological conditions
 - a tiered alarming system that incorporates real-time monitoring and meteorological data is used to notify site personnel when elevated noise levels occur off site. The NMP includes a detailed procedure outlining management protocols in response to noise trigger levels
 - monthly attended noise monitoring is used to assess compliance against impact assessment criteria. Monitoring is conducted at eight locations representing potentially affected privately owned residences and the Hunter Valley Gliders Club
 - sound power testing is completed on one third of the attenuated fleet annually to ensure equipment noise levels are consistent with modelled levels
 - noise management awareness is provided to all personnel as part of the induction process
 - a detailed management procedure is in place to ensure any community complaints are recorded, investigated and communicated appropriately.
- restricting operation of exposed drills if required during periods of meteorological enhancement
- an 8 m high roadside bund is to be constructed on the exposed side of the haul road from the Mitchell Pit towards the Howick CPP for approximately 900 m.

Once all reasonable and feasible noise mitigation options were incorporated into the noise model, results were still higher than the PNTL for many receptors, indicating additional mitigation measures (i.e. equipment shutdowns during noise enhancing meteorological conditions) would need to be considered for the amended Project to further reduce noise. This is also consistent with the approach taken for the original Project.

The Amendment NIA predicted that to meet the PNTLs, HVO North and HVO South would need to shut down for up to 71% and 52% of the time respectively. These operational shutdown requirements to meet the PNTLs were determined as not reasonable for the amended Project to remain viable. Periods of shutdown were then considered.

Therefore, in accordance with the NPfI, once all reasonable and feasible mitigation options had been considered, which was extended to include periods of plant shutdown, reasonable acceptable noise level (ANL) were determined for the amended Project and are detailed in Table 6.24. These ANL are consistent with the EIS NIA, except for adjustments to the day period ANL for NAG 1C, 2 and 4 based on the EPA's advice on the original Project as assessed in the EIS, where:

- for NAG 1C the daytime ANL is 1 dB lower
- for NAG 2, the daytime ANL is 3 dB lower
- for NAG 4, the daytime ANL is 3 dB lower.

The ANL are levels that HVO is proposing it could meet 100% of the time, as that level of compliance with approved noise criteria is required by regulators in NSW.

Table 6.24 Achievable noise levels for the amended Project

NAG	Residential receptor ID	Day	Evening	Night	
		L _{Aeq,15minute} dB	L _{Aeq,15minute} dB	L _{Aeq,15minute} dB	L _{Amax}
1A	160, 161, 162, 163, 256, 258, 260, 261, 497	41	41	41	46
1B	120, 121, 122, 123	40	40	40	46
1C	244, 245, 246, 247, 498	39	39	39	46
2	126, 127, 128, 130, 134, 139, 141, 156, 157, 167, 169, 170, 173, 174, 175, 176, 178, 179, 248, 249, 250, 251, 262, 843, 846, 847, 852, 855, 856	37	35	35	46
3	308, 311, 317, 321, 322, 324, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 436, 440, 464, 952, 481	41	41	40	46
4	451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 462, 477, 478	37	37	37	46
5A	332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 355, 356, 357, 358, 359, 360, 361, 362, 363, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 380, 381, 383, 384, 385, 389, 390, 392, 393, 394, 395, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 411, 413, 414, 415, 417, 418, 419, 420, 421, 422, 423, 482, 484, 835, 836, 837, 838, 839, 840	40	40	40	46
5B	326, 328, 330, 437, 438, 466, 487, 488, 489	40	40	40	46
-	All other privately owned land	40	35	35	45

Table 6.25 and Table 6.26 present the operational noise predictions against the ANL. To comply with the ANL, the frequency of plant shutdowns required would be up to 38% and 30% for HVO North and South, respectively. HVO has advised that the frequency of plant shutdowns required to meet the proposed ANL can be accommodated by the amended Project schedule.

Table 6.25 HVO North – night period ANL and worst-case result for all stages

NAG	ANL	Base scenario ¹		Mitigation scenario result before shutdowns ²	
		L _{Aeq,15 minute} dB	% of time above ANL	L _{Aeq,15 minute} dB	% of time above ANL
1A	41	30	0%	30	0%
1B	40	29	0%	29	0%
1C	39	30	0%	30	0%
2	35	26	0%	26	0%
3	40	44	45%	43	38%
4	37	38	29%	37	8%
5A	40	44	53%	42	34%
5B	40	43	55%	41	30%
Other	35	34	0%	33	0%

Notes: 1. This operational scenario includes plant sound power mitigation, but does not include operational modifications, e.g. utilising alternative haulage routes and operating in more shielded locations.
2. This operational scenario includes plant sound power mitigation and operational modifications.

Table 6.26 HVO South – night period ANL and worst-case result for all stages

NAG	ANL	Base scenario ¹		Mitigation scenario result before shutdowns ²	
		L _{Aeq,15 minute} dB	% of time above ANL	L _{Aeq,15 minute} dB	% of time above ANL
1A	41	41	10%	38	0%
1B	40	41	15%	39	1%
1C	39	38	3%	36	0%
2	35	37	41%	35	25%
3	40	43	51%	41	30%
4	37	36	1%	34	0%
5A	40	37	0%	36	0%
5B	40	34	0%	33	0%
Other	35	36	19%	33	0%

Notes: 1. This operational scenario includes plant sound power mitigation, but does not include operational modifications, e.g. utilising alternative haulage routes and operating in more shielded locations.
2. This operational scenario includes plant sound power mitigation and operational modifications.

a Residual noise impact assessment

After all reasonable and feasible mitigation controls are applied to the amended Project, any predicted exceedances of the PNTLs can be considered residual noise impact. Residual noise impacts were evaluated for the amended Project with the outcomes as follows:

- No receptors are predicted to experience a significant residual impact, meaning that voluntary acquisition rights are not triggered at any receptor as a result of the amended Project. This is consistent with the original Project as assessed in the EIS.
- The residual impact at all receptors is predicted to be either negligible or marginal, again consistent with the original Project as assessed in the EIS.
- Thirty receptors (equivalent to 24 landholders) are predicted to experience a marginal impact due to the amended Project, as follows:
 - Twenty-two receptors (equivalent to 19 landholders) are in new areas of marginal impact, being NAGs 5A and 5B in the area of Jerry Plains. Of these, five are 'isolated' (326, 328, 330, 437, 487) and therefore qualify for voluntary noise mitigation rights. The remaining 17 (being receptors 348, 362, 389, 390, 392, 393, 394, 395, 397, 399, 400, 402, 403, 405, 406, 421, and 423) are within the Jerrys Plains village and therefore do not qualify for mitigation as per Section 4.2 of the NPfI, which states that *"receiver treatment, including the extreme case of voluntary acquisition, is normally only applicable for isolated residences in rural areas."* There is no one noise source responsible for the marginal impacts in the Jerrys Plains area. Identification of the highest contributing sources was part of the feasible and reasonable noise mitigation assessment of the amended Project, which was undertaken prior to determining the residual noise impacts. The feasible and reasonable mitigation measures applied to the Project are described in Section 4.2.4 of the Amendment NIA (Appendix G).
 - Eight receptors (121, 160, 161, 162, 256, 258, 261, 497) (equivalent to 5 landholders) are in areas of existing marginal impact (NAGs 1A and 1B in Maison Dieu), and therefore currently have noise mitigation rights which will continue.

It is noted that there are an additional 12 receptors that hold existing noise mitigation rights under the HVO South project approval, and will be offered to maintain their rights, despite not being required to by the amended Project (receptors 120, 122, 123, 163, 244, 245, 246, 247, 260, 308, 311, 317).

A summary of receptors allocated to each residual noise significance category (determined in accordance with Table 4-1 of the NPfI) is provided in Table 6.27.

Table 6.27 Residual noise significance summary

Significance category	HVO North receptors	HVO South receptors
Significant	-	-
Moderate	-	-
Marginal	328, 326, 330, 437, 348 ² , 362 ² , 389 ² , 390 ² , 392 ² , 393 ² , 394 ² , 395 ² , 397 ² , 399 ² , 400 ² , 402 ² , 403 ² , 405 ² , 406 ² , 421 ² , 423 ² , 487.	121 ³ , 160 ³ , 161 ³ , 162 ³ , 256 ³ , 258 ³ , 261 ³ , 497 ³ .

Significance category	HVO North receptors	HVO South receptors
Negligible	321, 322, 324, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 349, 350, 351, 352, 353, 355, 356, 357, 358, 359, 360, 361, 363, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 380, 381, 383, 384, 385, 398, 401, 404, 407, 408, 409, 411, 413, 414, 415, 417, 418, 420, 422, 429, 434, 436, 440, 466, 482, 484, 488, 489, 835, 836, 837, 838, 839, 840, 952, 311, 317, 419, 427, 428, 430, 431, 481	120 ¹ , 123 ¹ , 163 ¹ , 260 ¹ , 308 ¹ , 122 ¹ , 244 ¹ , 245 ¹ , 246 ¹ , 247 ¹ , 311 ¹ , 317 ¹ , 434, 436, 498

Notes

1. Receptor currently has voluntary noise mitigation rights under HVO approvals. Mitigation rights are to be retained, despite not being required for the amended Project.
2. Does not qualify for mitigation as per Section 4.2 of the NPfI.
3. Current mitigation rights to continue (and required by the amended Project).

b EIS NIA comparison

A comparison with the residual noise impact outcomes from the EIS NIA is provided in Table 6.28.

Table 6.28 Residual noise impact comparison

Impact	EIS NIA receptor total	Amendment NIA receptor total
Receptors with significant residual impact	Nil	Nil
Receptors with marginal residual impact ¹	28 (equivalent to 19 landholders)	30 (equivalent to 24 landholders)
Receptors in new areas of marginal residual impact ¹	15 (equivalent to 11 landholders)	22 (equivalent to 19 landholders)
Receptors in existing areas of marginal impact	13 (equivalent to 8 landholders)	8 (equivalent to 5 landholders)
Receptors to maintain rights, despite not being required by the Project	7	12

Note

1. The EIS NIA noted 28 receptors with marginal residual impact and 15 receptors in new areas of marginal impact, however, one of those receptors (327) has since been demolished. Table 6.28 reflects this change and receptor 327 has not been included in this amendment NIA.

The proposed and limiting night period ANLs are consistent between the EIS and the Amendment NIAs; however, despite this, there are variations in the predicted residual noise impacts between the two assessments. These differences primarily stem from changes to the mine planning between the original Project and the amended Project. The amendment incorporates new mine plans that reflect reduced annual ROM coal production rates, a shortened Project life for both HVO North and HVO South, and avoidance of coal extraction in gas domain 1 at HVO North. Factors contributing to the changes in predicted noise impacts include revised fleet sizes and equipment types, altered pit progression and scheduling due to lower annual ROM production rates, the removal of the LCPP and associated rail facilities and shifts in the location and timing of active dig and dump operations. These amendments have led to increased predicted marginal residual impacts in Jerrys Plains Village (NAG 5A), while reducing predicted impacts in Maison Dieu (NAG 1A, 1B, 1C). The increase in marginal residual impact in Jerrys Plains Village is a result of the revised operations now distributing noise across a different part of the village, where residences are more densely located. Despite this, the predicted noise levels remain within 2 dB range across the entire NAG, which is below the threshold for perceptibility and indicates that the change, while reflected in the modelling, is not expected to be noticeable in practice.

c NAG 5A marginal impact discussion

HVO has exhausted all feasible and reasonable control options to reduce noise towards the PNTLs. The resulting achievable noise levels, particularly for Jerrys Plains, are consistent with current HVO development consent/Project Approval and EPL limits and should not adversely impact the Jerrys Plains community. Noise levels there should not change as HVO would continue to operate within existing approved limits.

All HVO North predictions in NAG 5A are within a 2 dB range, which is widely accepted as an imperceptible difference in noise level.

At present there is no requirement for receiver treatment at any residence in the village. Affording mitigation rights for some residences in the village and not others may:

- indicate some (i.e. those offered mitigation rights) will be subjected to perceptibly different noise levels than others, which is not the case
- indicate to the community that noise levels will be increasing above current levels associated with the existing operation (no mitigation rights have previously been applicable), which is not the case
- cause unnecessary social impacts and community frustration because some residents are afforded residential receiver treatments while immediately neighbouring residents are not.

It is therefore proposed that mitigation rights are not applicable to 17 receptors (348, 362, 389, 390, 392, 393, 394, 395, 397, 399, 400, 402, 403, 405, 406, 421, and 423) in the village where predicted levels are 3 dB higher than PNTLs in accordance with the VLAMP exclusions where:

- the predicted level has been approved and experienced for many years
- the modification to operations has negligible noise impact.

Regarding these exclusions, the VLAMP references “modifications of existing developments”. While a new SSD consent is sought for the Project for both HVO North and HVO South, the amended Project relates to the continuation of an operation that has existed in some capacity since 1949. Mining noise in the village is expected to continue as before and is not new.

HVO is proposing to continue operating within current noise limits at Jerrys Plains. Proposed limits are the same as existing and the community should therefore not experience noise levels above what is currently approved.

ii Construction noise assessment

Construction of the LCCP and associated infrastructure is no longer proposed as part of the amended Project, and therefore the construction noise impacts associated with those construction activities (described as Phase 2 construction in the EIS) will now be avoided.

Construction noise impact assessment predictions for private residential receptors associated with the amended Project are presented in Table 6.29. These results are consistent with the results presented in the EIS for the following construction activities for which approval is sought (described as Phase 1 construction in the EIS):

- Lake James enlargement (HVO South)
- Lemington Road realignment (HVO North)
- Parnells Dam enlargement (HVO North)
- Transmission and telecommunication line relocations (HVO North).

There are no changes to the outcomes of the construction noise assessment for the above construction activities as a result of the proposed amendments, which are summarised below.

Results presented are 90th percentile construction noise predictions for the worst-case season during standard construction hours. Results are provided for any receptor with a 90th percentile construction noise prediction exceeding $L_{Aeq,15\text{minute}}$ 45 dB, which is the ICNG ‘noise affected management level’. All other receptors have construction noise predictions less than or equal to $L_{Aeq,15\text{minute}}$ 45 dB. Of note, construction noise predictions remain below the ‘noise affected level’ for all receptors in NAGs 2, 3, 4, 5A and 5B. Predictions for all non-residential receptors are well below relevant management levels presented in Table 6.29.

Table 6.29 Construction noise predictions – $L_{Aeq,15\text{minute}}$ dB

Receptor ID	NAG	Management levels		Construction task combination		
		Noise affected	Highly noise affected	HVON ¹	HVOS	Combined
120	1B	45	75	47	45	47
121	1B	45	75	46	45	49
122	1B	45	75	46	46	48
123	1B	45	75	45	46	48
124	1B	45	75	46	47	49
160	1A	45	75	52	53	54
161	1A	45	75	50	53	55
162	1A	45	75	50	53	54
163	1A	45	75	50	53	54
244	1C	45	75	46	48	49
245	1C	45	75	46	49	50
246	1C	45	75	46	47	49
247	1C	45	75	45	47	49
256	1A	45	75	50	55	56
258	1A	45	75	50	53	54
260	1A	45	75	49	51	53
261	1A	45	75	51	52	54
497	1A	45	75	50	55	56
498	1C	45	75	46	48	49
947	1A	45	75	50	53	55

1. Highest result for all modelled construction activities

Results presented in Table 6.29 indicate all private residential receptors in NAGs 1A, 1B and 1C have construction noise predictions higher than the 'noise affected' management level, but significantly less than the 'highly noise affected' management level. These are worst case construction noise predictions that may occur during noise enhancing weather conditions during the peak of the construction period, that is, an expected infrequent occurrence. Consequently, received levels should typically be less than those presented in Table 6.29.

All receptors with predicted construction noise levels higher than the 'noise affected' management level are in Maison Dieu (NAG 1A, 1B and 1C). The amended Project at both HVO North and HVO South have potential to generate levels in the $L_{Aeq,15\text{minute}}$ 47 to 56 dB range at the nearest receptors. The construction tasks primarily responsible for predicted levels are the Lemington Road realignment and Lake James enlargement. Approval for these tasks is being sought under the HVO North and HVO South consents, respectively.

At receptors with the highest predictions, the cumulative impact due to both HVO North and HVO South construction tasks as part of the amended Project being conducted concurrently only causes an increase of 1 to 2 dB relative to just HVO South works being conducted in isolation. Given that listeners in Maison Dieu would not be able to distinguish which site is generating received noise levels, and an increase of up 2 dB would not be perceptible to the human ear, it is recommended that all construction tasks be allowed to occur concurrently. This has potential to significantly reduce the duration of construction noise, with only a minor and likely imperceptible increase in received noise levels.

iii Private land area assessment

An assessment of operational noise impact over privately-owned land where there is an existing dwelling or where a dwelling could be built under existing planning controls was undertaken in accordance with the requirements of the VLAMP. Additional single point predictions were generated over private lot areas for each of the five modelled stages to determine the maximum extent of noise impact over the life of the Project. Predictions for all privately owned land areas were below the acceptable amenity noise level plus 5 dB (as per Table 2.2 of the NPfI).

iv Sleep disturbance

Sleep disturbance model predictions are less than the L_{Amax} trigger level of 52 dB for all receptors. As such, there is no requirement for a detailed assessment of maximum noise events as per NPfI methodology.

Consistent with the EIS, there is only one receptor where a result greater than the current HVO South sleep disturbance criterion of L_{Amax} 45 dB has been predicted. This is receptor 121, which already has voluntary mitigation rights with HVO, where L_{Amax} 46 dB has been calculated for year 8 (approximately 2034). All other receptor results are less than the recommended criterion.

All results also meet the current HVO North and EPL sleep disturbance criterion of $L_{A1,1\text{minute}}$ 46 dB. It is proposed this criterion is retained for the amended Project as is detailed in Table 6.24.

v Cumulative noise

All modelled cumulative noise results met or were below the recommended amenity noise levels listed in Table 2.2 of the NPfI, with the exception of receptor 308 in NAG 3. This receptor has current noise mitigation rights for HVO South and is subject to voluntary noise acquisition by UWJV.

6.3.5 Mitigation, management and monitoring

The noise mitigation and management measures outlined in Table 6.30 will be implemented for the amended Project. The mitigation and management measures remain generally consistent with those presented in the previous HVO North Amendment Report (EMM 2023b).

Table 6.30 Noise mitigation and management measures

ID	Mitigation and management measures
NOS1	Noise will continue to be managed and monitored as per the HVO Noise Management Plan, which will be updated to reflect the Project. The management plan will describe aspects such as: • Best practice noise management measures to be implemented across the site. • Noise monitoring. • Triggers for the modification of equipment operation during periods of elevated noise. A review of both real-time and attended compliance monitoring locations will be undertaken within 12 months of the commencement of the Project, to ensure the monitoring network provides adequate coverage of the Project area, and the existing Noise Management Plan will be updated accordingly.
NOS2	A review of both real-time and attended compliance monitoring locations will be undertaken within 12 months of the commencement of the Project, to ensure the monitoring network provides adequate coverage of the Project area, and the existing Noise Management Plan will be updated accordingly.
NOS3	HVO will develop and implement a Construction Environmental Management Plan (CEMP), or equivalent, which will be prepared prior to the commencement of any construction activities. The CEMP will include the identification of feasible and reasonable noise mitigation measures relevant to the construction aspects for implementation during construction activities.
NOS4	HVO should apply all feasible and reasonable work practices to meet the 'noise affected' level and should schedule construction works within standard construction hours where practical.
NOS5	Various levels (height options) will be provided for overburden emplacement to allow shielded emplacement to occur deeper in the mining area during adverse meteorological conditions.
NOS6	Haul route alignments within the mining area will maximise the available topographical shielding provided by the mine design, where practical.
NOS7	The remaining fleet of large mining equipment will be progressively attenuated and BATEA sound power levels will be implemented, where reasonable and feasible, for significant noise generating mobile equipment.
NOS8	Dozers will be restricted if deemed to be a primary source of noise during periods of meteorological enhancement.
NOS9	Restricting operation of exposed drills during periods of meteorological enhancement, if required.
NOS10	An 8 m high roadside bund will be constructed on the exposed side of the haul road from the HVO Mitchell Pit towards the Howick CPP for approximately 900 m.
NOS11	The following receptors are anticipated to be afforded voluntary noise mitigation rights in accordance with the VLAMP as a result of the amended Project: • HVO North: 326, 328, 330, 437, 487 • HVO South: 121, 160, 161, 162, 256, 258, 261, 497. The following 12 receptors hold existing noise mitigation rights under the current HVO South project approval, and will be offered to maintain their rights, despite not being required to by the Project: • 120, 122, 123, 163, 244, 245, 246, 247, 260, 308, 311, 317.

Table 6.31 recommends compliance noise monitoring locations for the amended Project.

Table 6.31 Recommended compliance noise monitoring locations, dB

NAG	Coordinates (GDA94)	
	Easting	Northing
1A	317994	6399021
1B	318616	6398438
1C	318570	6399332

NAG	Coordinates (GDA94)	
	Easting	Northing
2	321128	6396863
3	306014	6399906
3	305485	6401177
4	304666	6399100
5A	303718	6402475
5B	303120	6403452

6.3.6 Conclusion

The Amendment NIA has considered potential noise impacts associated with the amended Project, including operational noise, construction noise, cumulative noise, modifying factor adjustments and sleep disturbance.

This assessment found that 13 receptors will be entitled to voluntary mitigation rights based on predicted marginal residual noise impacts associated with the amended Project, eight of which already have existing rights under existing HVO approvals. In addition, there are 17 receptors in the village of Jerrys Plains where marginal noise impacts are predicted; however, they do not qualify for mitigation as per Section 4.2 of the NPfI. Further, 12 receptors that already have mitigation rights in accordance with the HVO South project approval are not predicted to experience noise levels such that they would be entitled to voluntary mitigation rights for the amended Project; however, HVO proposes to retain mitigation rights for these receptors.

While there are some variations in predicted residual noise impacts associated with the amended Project when compared to the noise impacts presented in the EIS NIA, these are a result of revised mine plans, including changes to pit progression, fleet composition, and project duration. These operational changes have altered the distribution of noise but not the overall approach to its management or overall conclusions of the NIA regarding the acceptability of the noise impacts of the Project as presented in the EIS.

6.4 Biodiversity

6.4.1 Introduction

A revised Biodiversity Development Assessment Report (BDAR) (Umwelt 2025) has been prepared for the amended Project and is provided as Appendix H. The purpose of the revised BDAR is to assess the impact of the amended Project on biodiversity values and identify offsetting requirements following the implementation of all reasonable avoidance and minimisation measures. While the amended Project does not result in significant changes to the additional disturbance areas from those presented in the November 2023 BDAR (Umwelt 2023), prepared in support of the HVO North Amendment Report, the extension of the Project's assessment beyond 2024 has resulted in the requirement to address biodiversity data currency as per the requirements of Section 3.4 of the *Biodiversity Assessment Method (BAM) Operational Manual – Stage 1* (DPIE 2020). The revised BDAR presents the additional surveys completed over the Project's additional disturbance areas required for the amended Project (being largely the same as for the original Project) (referred to as Additional Disturbance Areas) since the completion of the November 2023 BDAR (Umwelt 2023).

6.4.2 Existing environment

The central Hunter Valley has been largely cleared of intact native vegetation, primarily for agriculture but also other land uses, such as mining and urban development. Similar land use patterns occur in the vicinity of the HVO North and HVO South Additional Disturbance Areas, which are predominantly surrounded by coal mining operations and agricultural land, with small and scattered patches of native vegetation.

The most significant intact vegetation occurring in the wider locality is within Wollemi National Park, which is located approximately 4 km to the south-west at the nearest point to the HVO South additional disturbance area and represents a significant refuge area between remnant patches of vegetation in the central Hunter Valley. Ravensworth State Forest is also located in the wider locality, 7 km to the north-east at the nearest point to the HVO North additional disturbance area. The vegetation in Wollemi National Park and Ravensworth State Forest is important for its functionality as a fauna refuge in an otherwise widely cleared landscape. The Hunter River, which broadly divides the HVO North and HVO South Project areas, provides a narrow corridor across the landscape for fauna which utilise riparian vegetation as movement habitat.

The HVO North and HVO South additional disturbance areas occur entirely in the Sydney Basin Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion and the Hunter subregion. The Hunter Valley is considered to be of great ecological significance given that it represents the only major break in the Great Dividing Range (linking coastal and inland areas of NSW) and includes an overlap between tropical and temperate climate zones.

The Hunter Valley is also characterised by extensive areas of agriculture and coal mining operations. The landscape within and surrounding the HVO North and HVO South additional disturbance areas have been shaped by historical clearing for agricultural, mining and rural development. As such, much of the land associated with the Project conforms to Category 1 – Exempt Land under the *Local Land Services Act 2013* (LLS Act), being lawfully cleared areas and/or low conservation vegetation.

6.4.3 Methodology

i Native vegetation and threatened ecological communities

Vegetation mapping across the additional disturbance areas was undertaken using best-practice techniques. For the purposes of the amended BDAR, plant community type (PCT) allocation across the additional disturbance areas adopted the east coast PCT classification released in April 2023 and following the expiration of the transitional arrangements on 14 April 2025.

Vegetation communities identified in the Project's additional disturbance areas were compared to threatened ecological communities (TECs) listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and an assessment of similarity with the NSW Scientific Committee Final Determinations was undertaken.

ii Threatened species

The identification of threatened species that are likely to occur on or use the additional disturbance areas was undertaken primarily using the Threatened Biodiversity Data Collection (TBDC) and the BAM calculator (BAM-C).

Targeted field surveys and opportunistic searches over multiple years were undertaken for those species-credit species considered to have the potential to occur within the Project's additional disturbance areas. Furthermore, Dr David Sharpe (approved expert in the squirrel glider under the BAM) was engaged to provide advice on the likely suitable habitat within the amended Project's additional disturbance areas for the squirrel glider and eastern pygmy possum, and (in the absence of formal guidance in BAM documents or the TBDC) proposed suitable survey methods for these two species.

6.4.4 Results

i Vegetation and threatened species

Surveys of the HVO North and HVO South additional disturbance areas identified five PCTs across 17 condition zones as outlined in Table 6.32.

Table 6.32 Plant community types and vegetation zones

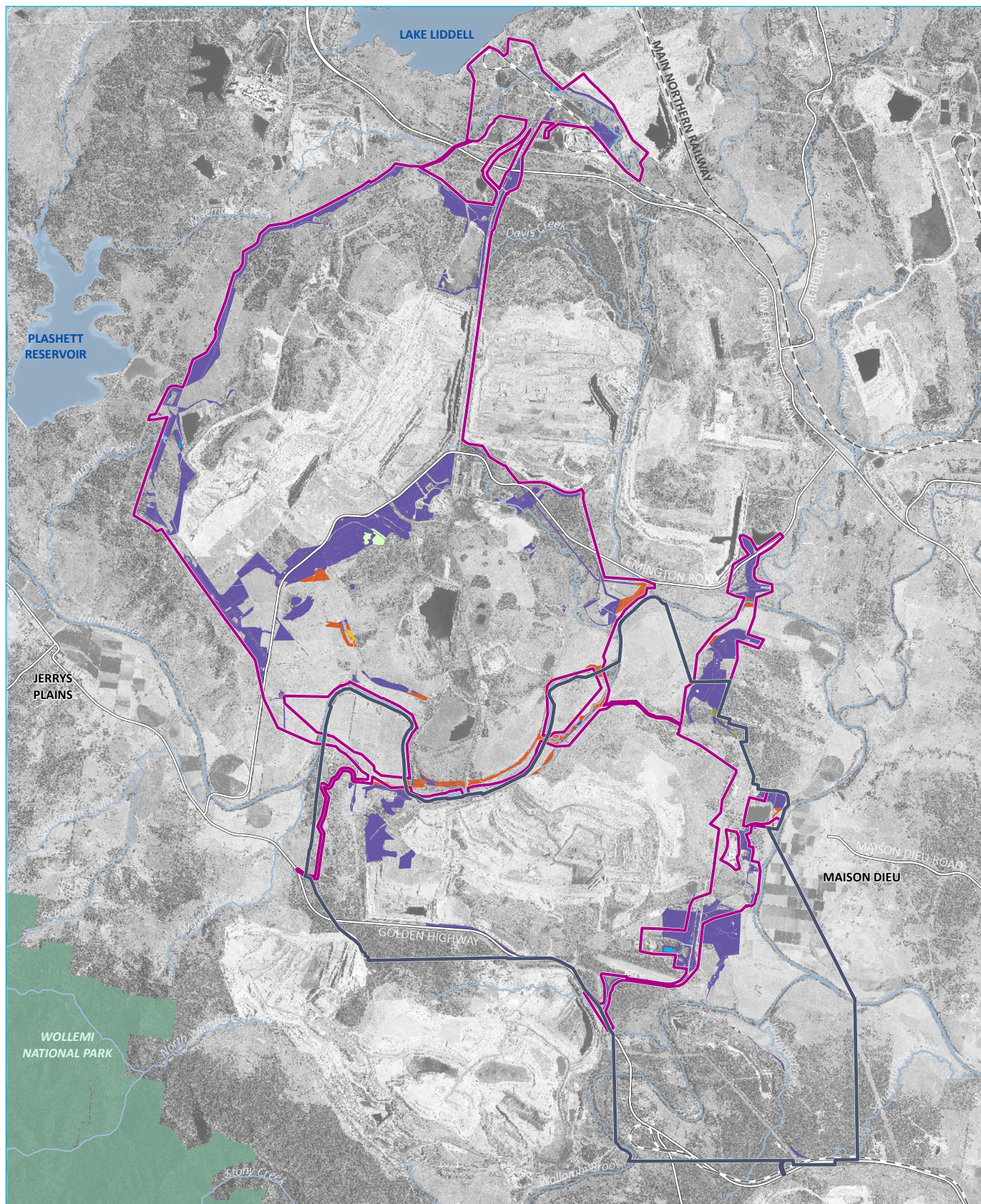
Plant community type	Vegetation zone and condition	Area (ha)		
		HVO North	HVO South	Total
3431 - Central Hunter Ironbark Grassy Woodland	1. <i>Moderate</i>	64.5	0.5	65.0
	2. <i>Thinned Woodland</i>	11.3	1.9	13.2
	3. <i>Woodland with Exotic Understorey</i>	1.9	0.0	1.9
	4. <i>Plantation</i>	8.2	0.0	8.2
	5. <i>Scattered Regeneration</i>	48.7	0.0	48.7
	6. <i>Cooba Woodland</i>	12.8	0.2	13.0
	7. <i>Poor Condition Derived Native Grassland</i>	284.3	7.1	291.4
	8. <i>Exotic Grassland</i>	58.0	7.4	65.4
	9. <i>Bullock Variant</i>	35.2	0.0	35.2
	TOTAL for PCT 3431	524.9	17.1	542.0
3485 - Hunter Valley Footslopes Slaty Gum Forest	10. <i>Moderate</i>	7.1	0.0	7.1
	TOTAL for PCT 3485	7.1	0.0	7.1
4015 - Central Hunter Swamp Oak Riparian Forest	11. <i>Moderate</i>	3.0	0.0	3.0
	TOTAL for PCT 4015	3.0	0.0	3.0
4081 - Northwest River Oak-River Red Gum Forest	12. <i>Moderate</i>	4.0	0.0	4.0
	TOTAL for PCT 4081	4.0	0.0	4.0
4089 - Namoi-Upper Hunter River Red Gum Forest	13. <i>Moderate</i>	1.0	0.0	1.0
	14. <i>Low to Moderate</i>	0.7	0.0	0.8
	15. <i>Cooba Woodland</i>	0.2	0.6	0.8
	16. <i>Derived Native Grassland</i>	5.0	0.0	5.0
	17. <i>Exotic Grassland</i>	24.6	4.7	29.3
	TOTAL for PCT 4089	31.5	5.3	36.8
Total Vegetation		570.5	22.4	592.9

Thirteen of the vegetation zones described above and mapped within the Project disturbance area conform to TECs under the BC Act. These TECs occur within the HVO North Project disturbance area, with three BC Act-listed TECs occurring in the HVO South Project disturbance area.

A summary of the TECs recorded in the Project disturbance area is provided in Table 6.33.

Table 6.33 Summary of TECs listed under the NSW BC Act

Threatened ecological community listed under the NSW BC Act	Vegetation zone	Area (ha) in Project disturbance area	
		HVO North	HVO South
Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions EEC	1. PCT 3431 – Moderate	64.5	0.5
	2. PCT 3431 – Thinned Woodland	11.3	1.9
	3. PCT 3431 – Woodland with Exotic Understorey	1.9	0.0
	4. PCT 3431 – Plantation	4.7	0.0
	TOTAL EEC	82.4	2.4
Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion VEC	10. PCT 3485 – Moderate	7.1	0.0
	Total VEC	7.1	0.0
Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions EEC	13. PCT 4089 – Moderate	1.0	0.0
	14. PCT 4089 – Low to Moderate	0.7	0.0
	Total EEC	1.7	0.0
Hunter Valley Weeping Woodland in the Sydney Basin Bioregion CEEC	7. PCT3431 – Poor Condition DNG	0.05	0.0
	Total CEEC	0.05	0.0



Source: EMM (2025); Glencore (2025); Umwelt (2025); DCSGS (2024); GA (2009)

0 2.5 5 km
GDA2020 MGA Zone 56

KEY

- Amended proposed HVO North development consent boundary
- Proposed HVO South development consent boundary

Existing environment

- Rail line
- Major road
- Named watercourse
- Named waterbody
- NPWS reserve

Plant community type (PCT) (Umwelt, 2025)

- PCT 3395 | Northwest Elevated White Box Woodland
- PCT 3431 | Central Hunter Ironbark Grassy Woodland
- PCT 3485 | Hunter Valley Footslopes Slaty Gum Forest
- PCT 3636 | Warkworth Sands Woodland
- PCT 4015 | Central Hunter Riparian Forest
- PCT 4081 | Northwest River Oak-River Red Gum Forest
- PCT 4089 | Namoi-Upper Hunter River Red Gum Forest

Mapped plant community types

HVO Continuation Project
Amendment Report
Figure 6.10

ii Threatened species

Four species-credit species that will generate credits as part of the amended Project were recorded in the Project disturbance area, and three species have been assumed present for this assessment based on the prevalence of records in the local area and region.

Assumed Present:

- southern myotis (*Myotis macropus*)
- squirrel glider (*Petaurus norfolcensis*)
- eastern pygmy possum (*Cercartetus nanus*).

Recorded:

- *Eucalyptus camaldulensis* – River Red Gum endangered population in the Hunter catchment
- *Acacia pendula* – population in the Hunter catchment
- Hunter Valley delma (*Delma vescolineata*) (formerly known as *Delma impar*)
- brush-tailed phascogale (*Phascogale tapoatafa*).

6.4.5 Avoidance and minimisation

HVO has taken all reasonable measure to avoid and minimise potential impacts on biodiversity values through Project design. This included targeted avoidance and minimisation of disturbance of key high conservation value vegetation communities and fauna habitats through designing the Project to maximise use of existing mining facilities and existing and approved disturbance areas, reducing the mining footprint and relocating infrastructure where possible, and implementing a range of biodiversity mitigation measures. The continuation of mining across the HVO Complex is proposed to be predominantly undertaken through previously mined and disturbed areas, and areas previously approved to be disturbed.

Table 6.34 outlines the approximate proportion of the impacts for areas across the proposed development consent boundaries.

Table 6.34 Disturbance areas across the amended Project area

Site context	Area (ha)		
	HVO North	HVO South	Total
Approved disturbance area (existing consents)			
Existing and approved disturbance area	4,963	3,242	8,205
Other approved disturbances^	263.5	0.0	263.5
River red gum additional disturbance area	44	0	44
Areas to be relinquished*	6.7	267 [#]	273.7
Additional disturbance areas			
Category 1 – Exempt Land, cleared land, non-vegetated land and exotic vegetation	415.3	36.8	452.1
Remnant forest/woodland and derived native grasslands (native cover)	487.8	10.4	498.2

Site context	Area (ha)		
	HVO North	HVO South	Total
Total Area (ha)	903.1	47.2	950.3

Notes

^ Includes areas within other site consents (i.e. Liddell Coal Operations and Ravensworth Operations).

* Lemington Short Rail Loop, Riverview SE Extension, South Lemington Pit 2, LCPP and rail.

46 ha of this occurs within the United Wambo JV approved disturbance area.

Table 6.35 provides a summary of the key avoidance measures undertaken for the amended Project and associated outcomes on biodiversity.

Table 6.35 Key biodiversity features avoided through Project design and refinement

Biodiversity feature	Avoided by Lemington Road realignment (original Project) ⁺	Project component area avoided (ha)					Total area avoided since EIS submission and this Amendment Report (ha)
		Lemington Road realignment (HVO North Amendment)	Transmission line alignment	River Red Gum (RRG) additional disturbance area	Removal of previously approved disturbance areas ^{^^}	This Amendment	
Native forest and woodland habitat	19.5	25.4	23.6	5.8	90.2	9.8	154.8
Native and exotic grasslands	6.3	18.8	161.2	N/A	33.7	5.8	219.5
Hunter Valley delma (<i>Delma vescolineata</i>) habitat [^]	4.7	4.8	145.4	N/A	0.0	5.7	155.9
BC Act-listed features							
Warkworth Sands Woodland EEC	7.2	9.8 [#]	0.0	0.0	0.0	0.3	10.1
Central Hunter Grey Box – Ironbark Woodland EEC	9.1	12.7	4.6	0.0	87.4	49.5	154.2
Hunter Floodplain Red Gum Woodland EEC	0.0	0.0	0.4	5.8	1.3	0.6	8.1
Hunter Valley Footslopes Slaty Gum Woodland VEC	2.6	1.1	0.0	0.0	1.5	0.0	2.6
River Red Gum (<i>Eucalyptus camaldulensis</i>)	0	0	5 individuals	255 individuals	0	0	260 individuals

Notes

[^] PCT3431 DNG, Thinned Woodland, Scattered Regeneration and PCT4089 DNG.

⁺ Not included in total (ha).

[#] Not inclusive of approximately 2.3 ha of possible WSW EEC included in original impact calculations.

^{^^} Previously approved disturbance areas which will not be maintained by the amended Project include Riverview SEE, SLP2, LCPP and associated rail facilities

6.4.6 Impact assessment

i Impacts not requiring assessment

Impacts not requiring further assessment under the BAM include areas of land without native vegetation. As summarised in Table 6.36. The amended Project disturbance area contain approximately 229.3 ha of cleared land (containing disturbed land and dams) and Category 1 – Exempt Land under the NSW *Local Land Services Act 2013* (LLS Act) that will be impacted as a result of the amended Project. This impact does not require further assessment under the BAM (other than for prescribed impacts).

Table 6.36 Impacts not requiring assessment

Areas not requiring assessment	Area (ha)	
	HVO North	HVO South
Category 1 – Exempt Land under the LLS Act	202.8	24.7
Cleared land (non-vegetated, roads, infrastructure)	1.0	0.0
Waterbodies/dams	0.7	0.0

ii Direct impacts

Following the application of avoidance and minimisation measures (as outlined in Section 6.4.5), the amended Project will result in residual direct impacts on biodiversity values within the additional disturbance areas as summarised in Table 6.37 for ecosystem credits and Table 6.38 for species credits. Impacts associated with the Additional River Red Gum Disturbance Area are detailed in Table 6.39.

Table 6.40 outlines the specific impacts on BC Act listed TECs (note: these impacts are not additional to those outlined in Table 6.37).

Table 6.37 Direct impacts of the amended Project on PCTs

PCT	BC Act status	Area (ha)	
		HVO North	HVO South
3431 - Central Hunter Ironbark Grassy Woodland	Some condition zones conform to Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions EEC	162.7	2.6
3485 - Hunter Valley Footslopes Slaty Gum Forest	Conforms to Hunter Valley Footslopes Slaty Gum Woodland Vulnerable Ecological Community (VEC)	7.1	0.0
4015 - Central Hunter Swamp Oak Riparian Forest	-	2.2	0.0
4081 - Northwest River Oak-River Red Gum Forest	-	1.7	0.0
4089 - Namoi-Upper Hunter River Red Gum Forest	Some condition zones conform to Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions EEC	2.15	0.6
Total vegetation		175.85	3.2

Table 6.38 Direct impacts of the amended Project on species-credit species

Species name	BC Act status	Area (ha)	
		HVO North	HVO South
southern myotis (<i>Myotis macropus</i>)	Vulnerable	76.85	2.2
squirrel glider (<i>Petaurus norfolcensis</i>)^	Vulnerable	85.2	2.4
eastern pygmy possum (<i>Cercartetus nanus</i>)^	Vulnerable	92.8	2.4
<i>Eucalyptus camaldulensis</i> population in the Hunter Catchment	Endangered	0.45	0.6
Hunter Valley delma (<i>Delma vescolineata</i>)	Endangered	174.8	8.6
brush-tailed phascogale (<i>Phascogale tapoatafa</i>)	Vulnerable	122.05	2.4

Note

^Assumed present until surveys are undertaken to determine presence or absence.

Table 6.39 Impacts associated with the Additional River Red Gum Disturbance Area

Species	Area (ha)
Hunter Floodplain Red Gum Woodland EEC	0.15
<i>Eucalyptus camaldulensis</i> –population in the Hunter catchment	0.8

Table 6.40 Direct Impacts of the amended Project on TECs

Threatened ecological community	Listing status	SAll entity	Area (ha)	
			HVO North	HVO South
Central Hunter Grey Box-Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions	EEC	No	76.2	2.3
Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions	EEC	Yes	1.2*	0.0
Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion	VEC	No	7.1	0.0
Total TEC impacts	-	-	84.25	2.3

Note

*Includes impacts within the RRG additional disturbance area.

iii Indirect impacts

Some indirect impacts associated with the amended Project that have the potential to impact on biodiversity features in the locality include:

- drawdown impacts on surrounding groundwater dependent ecosystems (GDEs), in particular the River Red Gum (*Eucalyptus camaldulensis*) endangered population in the Hunter
- rubbish dumping along the re-aligned Lemington Road
- edge effects (weeds and other disturbances) reducing the viability of surrounding habitats
- cumulative impacts of the amended Project for biodiversity in the wider locality

- fugitive light emissions, noise and dust impacts into surrounding habitats.

An assessment of the indirect impacts of the amended Project are presented in Table 6.41 and are consistent with those presented in the November 2023 BDAR (Umwelt 2023).

Table 6.41 **Assessment of indirect impacts**

Potential indirect impact	Project applicability		Impacted biodiversity features	Consequences
	HVO North	HVO South		
Drawdown impacts on surrounding groundwater dependent ecosystems	✓	✓	• River red gum endangered population • Hunter Floodplain Red Gum Woodland EEC • Other GDEs (PCT4015 – Swamp Oak and PCT4089 River Oak)	Potential decline in health of river red gum stands and Hunter Floodplain Red Gum Woodland EEC along the Hunter River and decline in health of other GDEs in the locality. However, a significant impact is not considered likely (EMM 2025d, Eco Logical 2025). Drawdown impacts are not predicted for areas of Warkworth Sands Woodland EEC.
Rubbish dumping along the re-aligned Lemington Road	✓		• All threatened fauna species in the locality. • Warkworth Sands Woodland EEC • Central Hunter Grey Box – Ironbark Woodland EEC	Injury or death of threatened species through entanglement or ingestion of litter. Reduction in threatened species and TEC resilience in the locality due to damage to vegetation and habitat condition.
Edge effects (weeds and other disturbances) reducing the viability of surrounding habitats	✓	✓	• All adjacent plant communities and locally-occurring threatened species	Reduction in threatened species and TEC resilience in the locality due to damage to vegetation and habitat condition.
Cumulative impacts of the Project for biodiversity in the wider locality	✓	✓	• All locally-occurring plant communities and threatened species	Further fragmentation of already small patches of intact vegetation and habitats.
Fugitive light emissions, noise and dust impacts into surrounding habitats	✓	✓	• All locally-occurring plant communities and threatened species	Reduction in threatened species and plant community resilience in the locality. Disruption of faunal behaviours and health.

An assessment of the applicable prescribed impacts of the amended Project is presented in Table 6.42.

Table 6.42 **Assessment of prescribed impacts**

Prescribed Impact (BC Regulation)	Applicable to Project?		Likely impacted threatened entities	Consequences
	HVO North	HVO South		
Impacts on the habitat of threatened species or ecological communities associated with: • non-native vegetation associated with suitable grassland habitat	✓	✓	• Hunter Valley delma (<i>Delma vescolineata</i>)	The loss of additional areas of potentially suitable habitat for the Hunter Valley delma. Due to the nature of the disturbance, it is expected that a large proportion of the Category 1 – Exempt Land is characterised by exotic grasslands which represents less suitable habitat for the species, as evidenced by the targeted survey results. Nonetheless the species may utilise this habitat for movement between areas of higher quality native grassland.
Impacts on the habitat of threatened species or ecological communities associated with the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	✓	✓	• All threatened fauna species, but particularly ground-dwelling or arboreal species known to occur such as spotted-tailed quoll and brush-tailed phascogale. • Threatened ecological communities including: – Warkworth Sands Woodland EEC – Hunter Floodplain Red Gum Woodland EEC – Central Hunter Grey Box—Ironbark Woodland EEC – Hunter Valley Foothills Slaty Gum Woodland VEC	The loss of connectivity and movement corridors for native flora and fauna.
Impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (impacts on dams and waterbodies suitable for southern myotis)	✓	✓	• southern myotis	The reduction of potentially suitable foraging habitat for the southern myotis in the locality.
Impacts of vehicle strikes on threatened species or on animals that are part of a TEC.	✓		• All threatened fauna species, but particularly ground-dwelling species known to occur such as spotted-tailed quoll and brush-tailed phascogale	Injury and death of threatened species in the locality resulting in reduced populations and resilience.
Fugitive light emissions, noise and dust impacts into surrounding habitats	✓	✓	• All locally-occurring plant communities and threatened species.	Reduction in threatened species and plant community resilience in the locality. Disruption of faunal behaviours and health.

v Serious and irreversible impacts

Under the BC Act, a determination of whether an impact is serious and irreversible must be made in accordance with four principles prescribed in the NSW *Biodiversity Conservation Regulation 2017* (the BC Regulation) being:

1. The impact will cause a further decline of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline.
2. The impact will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size.
3. The impact is made on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution.
4. The impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.

Following avoidance measures, one TEC identified in the Project disturbance area was identified as a candidate for Serious and Irreversible Impacts (SAIL) as a result of the amended Project, being Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions EEC.

vi Uncertain impacts

Consistent with the November 2023 BDAR (Umwelt 2023), there are no uncertain impacts predicted to occur as a result of the amended Project. It is considered that the potential impacts associated with the amended Project are well known, as outlined in the sections above, and particularly noting the history of mining and similar operations in the Hunter Valley.

6.4.7 Biodiversity offsets

i Biodiversity credit summary

Table 6.43 provides the updated summary of the ecosystem credits required to offset the amended Project. The credits are divided into offset areas that must include hollow-bearing trees (HBTs) and areas that do not require inclusion of HBTs.

Species credits required to offset the amended Project are presented in Table 6.44.

Table 6.43 Ecosystem credits required to offset the amended Project

Name	HVO North		HVO South		TOTAL
	With HBTs	Without HBTs	With HBTs	Without HBTs	
3431 - Central Hunter Ironbark Grassy Woodland					
Conforming to <i>Central Hunter Grey Box—Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions EEC</i>	2,131	9	65	0	2,205
Non-TEC	683	1233	0	5	1,921
3485 - Hunter Valley Footslopes Slaty Gum Forest					
Conforming to <i>Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion VEC</i>	313	0	0	0	313

Name	HVO North		HVO South		TOTAL
	With HBTs	Without HBTs	With HBTs	Without HBTs	
4015 - Central Hunter Swamp Oak Riparian Forest					
Non-TEC	0	77	0	0	77
4081 - Northwest River Oak-River Red Gum Forest					
Non-TEC	0	37	0	0	37
4089 - Namoi-Upper Hunter River Red Gum Forest					
Conforming to <i>Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions EEC</i>	33 (plus 3 credits associated with the Additional River Red Gum Disturbance Area)	1	0	0	37
Non-TEC	3	9	20	0	32

Table 6.44 Species credits required to offset the Project

Name	HVO North	HVO South	TOTAL
<i>Eucalyptus camaldulensis</i> – endangered population in the Hunter catchment	5 (plus 15 credits associated with the Additional River Red Gum Disturbance Area)	7	27
Hunter Valley delma (<i>Delma vescolineata</i>)	1,977	103	2,080
southern myotis (<i>Myotis Macropus</i>)	1,972	59	2,031
brush-tailed phascogale (<i>Phascogale tapoatafa</i>)	3,315	65	3,380
squirrel glider (<i>Petaurus norfolcensis</i>)^	2,349	65	2,414
eastern pygmy possum (<i>Cercartetus nanus</i>)^	2,679	65	2,744

Note

^Assumed present until surveys are undertaken to determine presence or absence

ii Biodiversity offset staging

HVO proposes to stage the retirement of credits as clearing of the additional disturbance areas occur for the amended Project. Broadly, the staging of offsets is proposed to occur as follows:

- **Stage 1** – areas to be disturbed associated with the additional disturbance areas (i.e. additional mining area, Lemington Road realignment and infrastructure construction). Stage 1 activities will generally be undertaken in the first few years post approval (HVO North and HVO South).
- **Stage 2** – disturbance required associated with the HVL product stockpile extension (if constructed) (HVO North only).

A summary of the credits required in the stages in which they are proposed to be met is provided in Table 6.45 and Table 6.46 for HVO North and HVO South, respectively.

Table 6.45 HVO North – staged credit requirements

Biodiversity feature	Stage 1		Stage 2	
	Area (ha)	Credits	Area (ha)	Credits
TEC ecosystem credits				
<i>Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions EEC</i>	1.2*	37	0.0	0
<i>Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion VEC</i>	7.1	313	0.0	0
<i>Central Hunter Grey Box—Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions EEC</i>	74.9	2,103	1.3	37
Non-TEC ecosystem credits				
3431 - Central Hunter Ironbark Grassy Woodland	86.5	1,913	0.1	3
4015 - Central Hunter Riparian Forest	1.6	58	0.6	19
4081 - Northwest River Oak-River Red Gum Forest	1.7	37	0.0	0
4089 - Namoi-Upper Hunter River Red Gum Forest	1.1	12	0.0	0
Species credits				
<i>Eucalyptus camaldulensis</i> – endangered population in the Hunter catchment	1.85*	20	0.0	0
squirrel glider <i>Petaurus norfolcensis</i> [^]	83.9	2,313	1.3	36
eastern pygmy possum <i>Cercartetus nanus</i> [^]	91.0	2,627	1.8	52
Hunter Valley delma <i>Delma vescolineata</i>	174.5	1,973	0.3	4
southern myotis <i>Myotis macropus</i>	75.75	1,944	1.1	28
brush-tailed phascogale <i>Phascogale tapoatafa</i>	120.3	3,266	1.8	49

Note

*Includes impacts in the River Red Gum additional disturbance area.

[^]Assumed present until surveys are undertaken to determine presence or absence.

Table 6.46 HVO South – staged credit requirements

Biodiversity feature	Stage 1	
	Area (ha)	Credits
TEC ecosystem credits		
Central Hunter Grey Box—Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions EEC	2.3	65
Non-TEC ecosystem credits		
3431 - Central Hunter Ironbark Grassy Woodland	0.2	5
4089 - Namoi-Upper Hunter River Red Gum Forest	0.6	20
Species credits		
Eucalyptus camaldulensis – endangered population in the Hunter catchment	0.6	7
squirrel glider <i>Petaurus norfolcensis</i> [^]	2.4	65
eastern pygmy possum <i>Cercartetus nanus</i> [^]	2.4	65
Hunter Valley delma <i>Delma vescolineata</i>	8.6	103
southern myotis <i>Myotis macropus</i>	2.2	59
brush-tailed phascogale <i>Phascogale tapoatafa</i>	2.4	65

Note

[^]Assumed present until surveys are undertaken to determine presence or absence.

iii Biodiversity offset strategy

The biodiversity offset strategy will be based on the credits required to be retired to offset the impacts of the amended Project as specified in Table 6.45 and Table 6.46, and the offset options available under the BC Act and BC Regulation including the following options:

- land based offsets (HVO will retire the required number and class of credits determined in accordance with the BDAR and the offset rules in the BC Regulation through the establishment of new stewardship sites (and the subsequent retirement of credits) or by retiring credits from existing stewardship sites)
- purchasing credits from the market, and or
- paying into the Biodiversity Conservation Fund.

The final biodiversity offset strategy will likely comprise a combination of one or more of the above listed options. It is HVO's intention that the offset strategy for the amended Project will focus on purchasing credits from the market and establishing suitable land-based offset options both in a local and regionally strategic approach. As such, this may include new stewardship sites established and managed by HVO and sourcing credits from existing stewardship sites which will assist in the management and improvement of stewardship sites in the region.

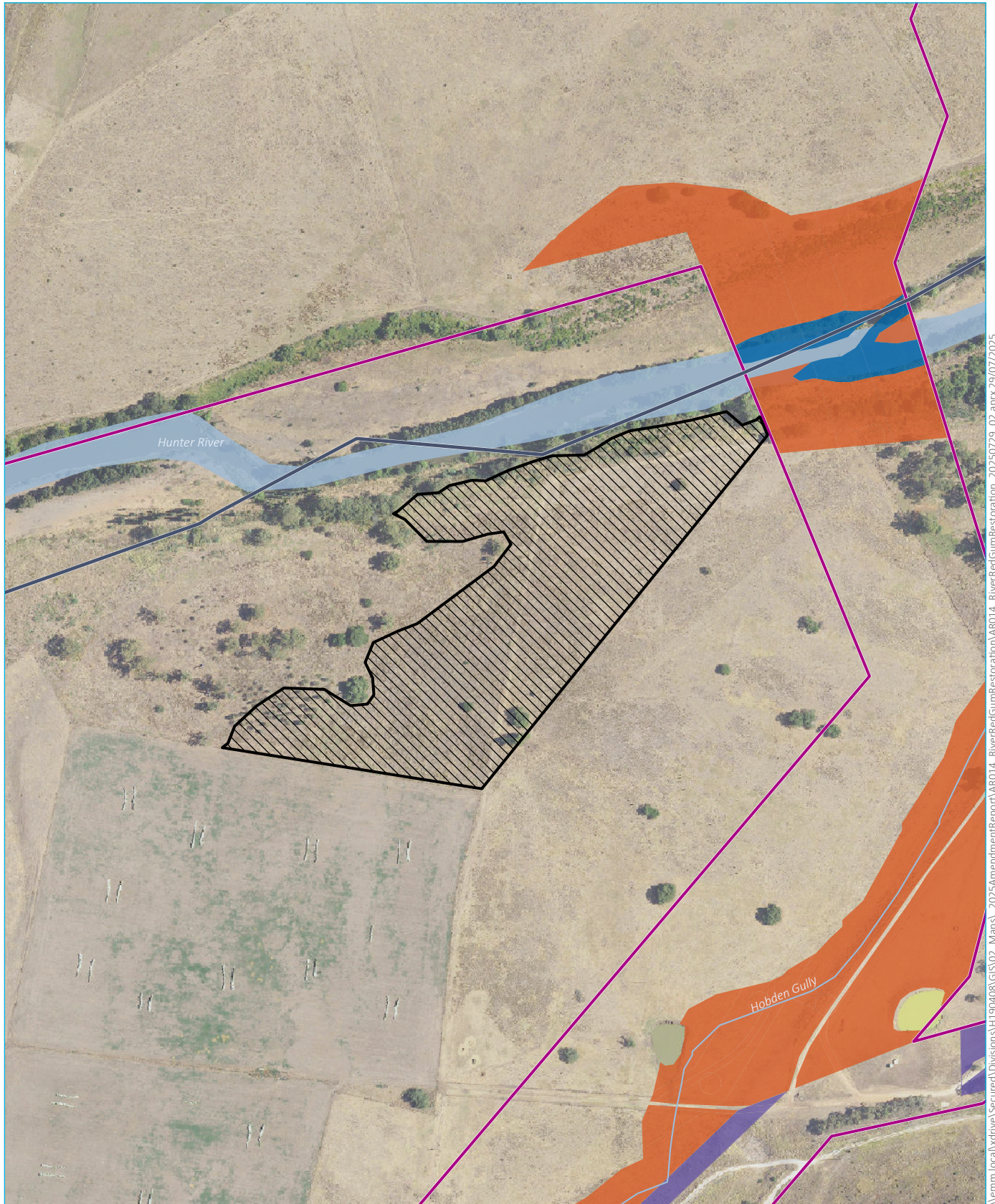
The amended Project is proposing to impact 1.15 ha of the *Hunter Floodplain Red Gum Woodland EEC* (1 ha in HVO North and 0.15 ha in the River Red Gum additional disturbance area). The EEC is also listed as a potentially SAll entity under the Biodiversity Offsets Scheme (BOS). Following substantial efforts to avoid and mitigate impacts through Project design and site location selection (refer to Section 6.4.5), this impact is acknowledged as a key impact on a restricted TEC. HVO has been proactive in seeking a suitable local offset or additional measures to mitigate impacts to the EEC that adds to the conservation of an existing patch of *Hunter Floodplain Red Gum Woodland EEC* as well as the management and improvement of surrounding land to restore this community in the locality.

Accordingly, HVO has identified an area approximately 6.6 ha in size adjacent to a remnant patch of river red gum that will be subject to restoration (refer to Figure 6.11). This site provides a reasonable baseline to commence restoration works and with a detailed management plan and schedule to improve and maintain the site it would result in the successful re-establishment of the EEC adjacent to the existing remnants.

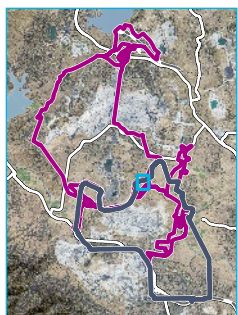
The aim of the proposed restoration site would be to not only increase the extent of the EEC but through additional and appropriate measures:

- increased land management focus on the existing HVO priority site (remnant and existing revegetation) above and beyond existing commitments
- protection and management of the additional area to the east (including revegetation)
- higher level of protection of a significant patch of mature river red gums and improvement of its resilience through revegetation and site management of the adjoining area to the east.

HVO propose to review and update the existing HVO River Red Gum and Restoration Strategy (RRGRS) to include the additional proposed restoration site illustrated on Figure 6.11.



Source: EMM (2025); Glencore (2025); Umwelt (2025); DCSSS (2024); GA (2009)



KEY

- Amended proposed HVO North development consent boundary
- Proposed HVO South development consent boundary
- River Red Gum – proposed restoration area
- Plant community type (PCT) (Umwelt, 2025)
 - PCT 3431 | Central Hunter Ironbark Grassy Woodland
 - PCT 4081 | Northwest River Oak-River Red Gum Forest
 - PCT 4089 | Namoi-Upper Hunter River Red Gum Forest

- Existing environment
 - Rail line
 - Major road
 - Named watercourse
 - Named waterbody

HVO River Red Gum restoration area

HVO Continuation Project
Amendment Report
Figure 6.11

6.4.8 Mitigation, management and monitoring

The mitigation and management measures outlined in Table 6.47 will be implemented for the amended Project. The mitigation and management measures remain consistent with those presented in the previous HVO North Amendment Report (EMM 2023b).

Table 6.47 Biodiversity mitigation and management measures

ID	Mitigation and management measures
BIO1	Biodiversity will continue to be managed as per the Biodiversity Management Plan, which will be updated to reflect the Project. The management plan will describe aspects such as: • Pre-clearance and clearance protocols for vegetation and fauna. • Pest, weed and pathogen control measures. • Bushfire management actions. • Monitoring and adaptive management strategies.
BIO2	Wildlife warning signs such as 'Injured Native Wildlife' signs will be installed in likely high impact locations along the realigned Lemington Road.
BIO3	Measures will be implemented to protect the river red gum populations located within the River Red Gum Additional Disturbance Area during construction of the realigned transmission lines in this area.
BIO4	River red gum health monitoring will continue, in accordance with the River Red Gum Rehabilitation and Restoration Strategy, which will be updated for the Project. This will include a change in classification for the River Red Gum Additional Disturbance Area from a 'low priority' to a 'priority site'.
BIO5	A biodiversity offset strategy will be developed for the Project based on the credits required to be retired to offset the impacts of the Project and the options available under the BC Act and BC Regulation including: • Land based offsets (HVO will retire the required number and class of credits determined in accordance with the BDAR and the offset rules in the BC Regulation through the establishment of new stewardship sites (and the subsequent retirement of credits) or by retiring credits from existing stewardship sites). • Purchasing credits from the market. • Paying into the Biodiversity Conservation Fund.
BIO6	An Ecological Restoration Plan (ERP) will be developed for the Hunter Floodplain Red Gum Woodland EEC. The plan will provide a framework for the management of the vegetation community during and post-development of the Project, within the Project disturbance area. The ERP will be developed prior to the disturbance of the noted EEC and be included within the existing Integrated Biodiversity Management Plan. The ERP will include management actions to inform specific weed control, re-establishment of vegetation, security/protection measures and a trigger response plan for the continued improvement of the EEC.

6.4.9 Conclusion

The landscape within and surrounding the amended Project is characterised by extensive historical clearing for agricultural, mining and rural development. As such, much of the land associated with the amended Project conforms to Category 1 – Exempt Land and only approximately 21.2% of the combined additional disturbance areas are covered by native (woody) vegetation.

Previous avoidance and minimisation strategies that have been implemented include refinement of the Lemington Road realignment to avoid the Warkworth Sands Woodland EEC, careful consideration of proposed transmission easement alignment and habitat retention following decommissioning of existing transmission lines.

In addition, the amended Project no longer seeks to maintain approval for the construction and operation of the LCPP and associated rail facilities, which is currently approved, but not constructed, under the HVO South Project Approval. This means that the amended Project avoids all direct impacts to the Warkworth Sands Woodland EEC, reducing the total direct impact of the Project on this community from 0.3 ha presented in the HVO North Amendment Report, to 0 ha (noting the original Project proposed to directly impact 5.2 ha of Warkworth Sands Woodland EEC).

After accounting for the implementation of avoidance and minimisation measures, the amended Project will directly impact 179.2 ha of native vegetation that meets the offsetting threshold under the BOS. Of this, 86.8 ha conforms to TECs under the BC Act (84.5 ha in HVO North and 2.3 ha in HVO South).

A biodiversity offset strategy that appropriately compensates for the unavoidable loss of ecological values as a result of the amended Project will be developed in consultation with DPHI and CPHR and will be implemented prior to clearing occurring and in accordance with the process outlined in the BC Act.

6.5 Water resources

This chapter provides a summary of the Water Assessment (EMM 2025d) prepared for the amended Project, with the full technical report included as Appendix I.

The water assessment is an overarching report documenting and summarising the findings of a number of water related technical studies, including:

- Groundwater Modelling (EMM 2025d) – Annexure A of the Water Assessment
- Surface Water Impact Assessment (SWIA) (Engeny 2025) – Annexure B of the Water Assessment
- Aquatic Ecology and Groundwater Dependent Ecosystems Assessment (ELA 2025) – Appendix J.

6.5.1 Overview

Consistent with the original Project presented in the EIS (EMM 2022a), this amended Project involves continued operations within portions of catchments that are currently or have been historically subject to approved mining and its associated impacts. The existing operation has a well-established water management system (WMS) in place to manage water within the objectives of the approved water management plan (minimising impacts on surface water) and requirements of existing WALs (for surface water and groundwater take) and EPL 640, as well as the HRSTS to manage excess water.

The proposed key changes between the amended Projects and the original Project as described in the EIS (of relevance on water resources) are summarised in Table 6.48.

Table 6.48 Amended Project activities that have the potential to impact water resources

Water-related activities for amended Project	Description of change from original Project
HVO North	
Continuation of mining operations at HVO North until 31 December 2045.	Change – proposed mine life was to the end of 2050 in the original Project.
Production of up to 22 Mtpa with no separation of extraction limits between West Pit and Carrington Pit.	No change.
Continuing to mine down to the base of the Barrett Seam in the West and Mitchell Pit areas, and down to the base of the Bayswater Seam in the approved Carrington West Wing area.	Change – mining to the base of the Barrett seam in the Carrington West wing area was proposed in the original Project. Amendment mine plan limits extent of coal extraction north of the Hunter Valley dyke.

Water-related activities for amended Project	Description of change from original Project
Realignment of Lemington Road and construction of a new Hunter River bridge crossing, which will significantly improve the flood immunity of this road adjacent to the Hunter River, reducing road closures in flooding events.	No change.
Improved flood protection levee for North Pit TSF (up to 0.1% Annual Exceedance Probability (AEP)) as per Glencore's operating standard.	No change.
Improved flood protection for the Carrington West Wing levee (up to 0.1% AEP).	No change.
Establishment of a new levee (Mitchell East Levee) to provide flood protection for the HVO North main final void.	Change. Levee not proposed as part of the original Project.
An increase in the capacity of Parnells Dam (Dam 9W) from approximately 0.7 gigalitre (GL) to approximately 4 GL.	No change.
Installation of the approved Carrington West Wing barrier wall across the western arm of the paleochannel, and prior to undertaking mining within 100 m of the western arm of the paleochannel.	No change.
Reducing the number of approved final voids that will remain post closure from three to two final voids at HVO North - North Void and the approved Carrington Void.	Change – one void was proposed in the original Project. The amended mine plan will not mine through the approved Carrington Void.
HVO South	
Continuation of mining operations at HVO South until 31 December 2042.	Change - proposed mine life was to the end of 2045 in the original Project.
A reduction in the approved maximum extraction rate from 20 Mtpa to 13 Mtpa.	Change – a maximum extraction rate of 18 Mtpa was proposed in the original Project.
Removal of coal extraction from the mine plan for the Riverview South East Extension and South Lemington Pits 1 and 2 mining areas.	No change.
Remove approval for the construction and operation of the LCPP and associated rail facilities, which is currently approved, but not constructed, under the HVO South Project Approval.	Change – the original Project proposed to maintain approval to construct the LCPP and associated rail facilities.
Construction of the Cheshunt and Riverview Pit flood protection levees (up to 0.1% AEP).	No change.
An increase in the capacity of Lake James (Dam 15S) from approximately 0.7 GL to approximately 2 GL.	No change.
One final void will remain largely the same as that currently approved at HVO South.	No change.

6.5.2 Existing water environment

Surface water resources in the vicinity of the HVO Complex include the Hunter River, Wollombi Brook and other minor watercourses such as Farrells Creek and Parnells Creek. The Hunter River, and highly connected alluvial groundwater within 40 m of the river bank, is managed under the NSW *Water Sharing Plan (WSP) for the Hunter Regulated River Water Source 2016*. The tributaries to the Hunter River are managed under the *WSP for the Hunter Unregulated and Alluvial Water Sources 2022*.

The *WSP for the North Coast Fractured and Porous Rock Groundwater Sources 2016* applies to the Permian groundwater resources within the amended Project area.

Consistent with the original Project, the main groundwater resources in the amended Project area include:

- alluvial aquifers (including the paleochannel) form unconfined aquifers, and quality is fresh to brackish. The alluvium is generally more permeable than other lithologies, with recorded hydraulic conductivities ranging from 10^{-2} m/day to 10^2 m/day (AGE 2022)
- the regolith does not form aquifers due to limited saturated thickness
- Permian interburden layers form aquitards
- Permian coal seams generally form low to moderately permeable confined aquifers, with poor groundwater quality. Hydraulic conductivity generally decreases with depth due to increased rock mass strength (AGE 2022).

The amended Project will intercept groundwater and result in changes to the existing groundwater and surface water environment. However, the HVO Complex already comprises active and approved open cut pits and the potential for the amended Project to result in a significant incremental impact on water resources is low.

Consistent with the original Project, water receptors include:

- downstream water users accessing surface water via water access licences and basic landholder rights
- third-party landholder bores located upstream and downstream of the HVO Complex, typically installed in the alluvium
- ecosystems that potentially rely on surface water and/or groundwater:
 - river red gum vegetation stands (including in the Carrington Billabong area) that opportunistically access shallow groundwater recharged by leakage from the Hunter River and Wollombi Brook, and rely on flooding for germination
 - Central Hunter Ironbark Grassy Woodland (formerly Bull Oak Grassy Woodland of the Central Hunter Valley) vegetation and Central Hunter Swamp Oak Riparian Forest (formerly Swamp Oak – Weeping Grass grassy riparian forest of the Hunter Valley)
 - stygofauna occurring principally in alluvial sediments along the Hunter River and its tributaries
 - aquatic ecosystems
 - Warkworth Sand Woodland communities which rely principally on rainfall infiltration and a seasonal perched watertable observed to occur after large rainfall events.

6.5.3 Water assessment findings

The assessment approaches and methods for the different technical studies (surface water (including modelling), groundwater modelling, aquatic ecology and GDEs) are described in the supporting appendices to the Water Assessment prepared for the original Project and presented in the EIS (EMM 2022a). The assessment methods have been peer reviewed and found fit for the intended purpose. As such, the assessment methods remain unchanged from the original Project.

The modelling and assessments show the amended Project can operate within and meet the requirements of the water regulatory framework. Key results are summarised in Table 6.49.

Table 6.49 **Summary of assessment findings**

Study	Impact aspect	Original Project findings	Amended Project findings
Surface water	Water management system performance	The existing WMS with the proposed additional components (dams, pumps and pipelines) will enable water at HVO to be managed in accordance with the water management plan objectives, current EPL and WALs.	
	Streamflow impacts – during operation	• Negligible impact on the regulated Hunter River, with any changes to leakage or baseflow managed via existing WALs. • Reduced operational impacts on Wollombi Brook when compared to approved operations. • Minor changes predicted to streamflow along three watercourses during operations when compared to approved operations (Parnells Creek, Unnamed Tributary 1 and Farrells Creek).	• Positive impact on Hunter River streamflow when compared to approved operations due to an increase in surface water catchment to Hunter River. • Reduced operational impacts on Wollombi Brook when compared to approved operations and the original Project. • No change to the number and duration of dry periods for Wollombi Brook in comparison to the original Project. • Minor changes predicted to streamflow along three watercourses during operations when compared to approved operations (Parnells Creek, Unnamed Tributary 1 and Farrells Creek) – but less impact when compared to the original Project.
	Surface water quality	Discharge under the HRSTS is not expected to have an adverse effect on surface water quality or change the beneficial use.	
	Flooding impacts	As the mine plan proposed for the amended Project does not encroach onto the floodplain further than the original Project or further reduce floodplain storage, flood modelling and associated impact assessment has not been re-simulated for the amended Project. The flooding assessment conducted for the original Project is described in the EIS SWIA (Engeny 2022).	
Groundwater	Groundwater drawdown – during mining (Hunter River alluvium: Carrington Billabong)	Minimal incremental drawdown (0.2-0.5 m) is predicted in the Hunter River alluvium around the Carrington Billabong area, and up to 0.2 m at mapped river red gum stands. The predicted drawdown will be buffered by leakage through the riverbed. Predicted cumulative drawdown during operations is between 0.2 m to 1 m in the Hunter River alluvium and is due to depressurisation of the Permian hydrostratigraphy and an associated downward vertical gradient between the alluvial watertable and the Permian potentiometric surface. The depressurisation is related to mining at HVO North and HVO South and dewatering of the alluvium is not predicted to occur.	Minimal incremental drawdown of up to approximately 0.5 m in the Hunter River alluvium in a small area north of the Carrington Billabong, and up to 0.2 m at mapped river red gum stands. The area of predicted incremental drawdown (defined by the 0.2 m contour) is smaller than that predicted for the original Project, due to the amended mine plan not progressing as close the Hunter River or as deep. Predicted cumulative drawdown in the Hunter River alluvium near Carrington Billabong is similar to the incremental drawdown, covering a slightly larger area. This is a positive impact (i.e. less cumulative drawdown) in comparison to the original Project predictions.
	Groundwater drawdown – during mining (Hunter River alluvium: Carrington West Wing)	No incremental drawdown was predicted in the Carrington West Wing area, south of the LPBW.	Consistent with the original Project, no incremental drawdown is predicted in the Carrington West Wing area, south of the LPBW.

Study	Impact aspect	Original Project findings	Amended Project findings
	Groundwater drawdown – during mining (Wollombi Brook alluvium)	No incremental drawdown predicted in the Wollombi Brook alluvium, given mining is no longer proposed at Riverview South East Extension and South Lemington Pits 1 and 2. Up to 2 m cumulative drawdown in the Wollombi Brook alluvium above the historical Lemington underground mine. Drawdown is predicted due to the simulated continued use of groundwater from the Lemington underground for operational water use, continuing the downward vertical gradient between the Permian groundwater systems and the Wollombi Brook alluvium.	No incremental drawdown predicted in the Wollombi Brook alluvium, given mining is no longer proposed at Riverview South East Extension and South Lemington Pits 1 and 2. This is consistent with the original Project. Cumulative drawdown around Wollombi Brook alluvium is up to 2 m. This is consistent with the original Project.
	Groundwater drawdown – post closure (Hunter River alluvium)	Incremental maximum drawdown of 0.5 m drawdown was predicted in the Hunter River alluvium around the Carrington West Wing area. Maximum cumulative drawdown of up to 2 m was predicted to remain in the same areas as during operations but will spread slightly. This is due to the influence of the continuing evaporative pumping effect from the final voids post mining whilst the groundwater regime reaches a new equilibrium.	There is no incremental drawdown predicted in the Hunter River alluvium due to the amended Project. This is a positive impact in comparison to the original Project. Maximum cumulative drawdown of up to 2 m is predicted in the Carrington Billabong area and up to 0.5 m in the Carrington West Wing area.
	Groundwater drawdown – post closure (Wollombi Brook alluvium)	No incremental drawdown predicted in the Wollombi Brook alluvium. Cumulative drawdown in Wollombi Brook alluvium of up to 5 m in the vicinity of the Lemington underground mine..	No incremental drawdown predicted in the Wollombi Brook alluvium. Maximum cumulative drawdown in Wollombi Brook alluvium is predicted up to 2 m, upstream of the confluence with Hunter River in the vicinity of the Lemington underground mine. This is consistent with the original Project.
	Groundwater quality	Consistent with the original Project, no changes to the environmental, community or cultural values of groundwater are predicted (negligible impact on groundwater quality).	
	Groundwater inflow to pits	Groundwater inflows to HVO mining areas peak at approximately 2,100 ML/year in Year 18 (approximately 2040).	Groundwater inflows to HVO mining areas peak at 2,488 ML/yr in Year 13 (approximately 2039). The results are broadly consistent with the original Project with some variability owing to the updated numerical representation of mine progression and changes to the annual pit progression including size and timing of open areas and proximity to the Hunter River alluvium (noting hydraulic properties are the same as those adopted for the original groundwater modelling (AGE 2022)).
Geochemistry	Geochemical assessment	No change from the original Project, as no new material will be intercepted. This has therefore not been reassessed for the amended Project. The majority of rejects generated by the amended Project are likely to be non-acid forming (NAF). Although 15% of the rejects samples tested were potentially acid forming (PAF), the thorough intermingling of rejects and overburden, and the excess acid neutralising capacity in the overburden, suggests that these bulk fill zones are unlikely to result in any significant acid rock drainage issues or effects on rehabilitation. Existing waste management practices will continue to isolate PAF and manage any leachate or water quality risks.	

Study	Impact aspect	Original Project findings	Amended Project findings
Water receptors	Third party bores	No impact is predicted at privately-owned groundwater bores.	
	Surface water users	Potential impacts on surface water downstream users will be negligible as no changes in streamflow regimes are predicted in the Hunter River, given it is a regulated system and HVO holds sufficient entitlement for the predicted reduction in streamflow due to the amended Project.	
	Terrestrial GDES	Consistent with the original Project and as presented in Appendix J, no significant impact on terrestrial GDES associated is predicted. As the predicted drawdown extent and magnitude in the alluvium is less when compared with the original Project, there is a slight positive impact as slightly less drawdown is predicted in the Hunter River alluvium for the amended Project.	
	Subterranean GDES (Stygofauna)	The risk to the stygofauna community associated with the amended Project is low because there will be no additional excavation in the alluvium beyond what has already been approved. The cumulative impact to the stygofauna community from already-approved mining in the paleochannel is high (refer to Appendix J).	
Final voids	Residual void landform catchment area	The amended Project is consistent with the original Project final void assessment; both have an overall reduction in catchment area reporting to the final voids in comparison to the approved operations. This will result in increased catchment and surface runoff to the surrounding waterways, which is a positive impact in comparison to the approved operations.	
		Catchment areas reporting to voids: • HVO South void: 714 ha • HVO North void: 720 ha • Total: 1,434 ha	Catchment areas reporting to voids: • HVO South void: 570 ha • HVO North (main) void: 706 ha • Approved Carrington void: 324 ha • Total: 1,600 ha
	Long-term pit lake levels	Final void levels for the amended Project are generally consistent with that predicted for the original Project, with equilibrium predicted to occur several hundred years after cessation of mining and evaporation causing all final voids to act as groundwater sinks.	
		Median long-term pit lakes: • HVO South void: -83.9 mAHD (159 m freeboard) • HVO North void: -80.4 mAHD (155 m freeboard)	Median long-term pit lake levels: • HVO South void: -29.7 mAHD (110 m freeboard) • HVO North void: -17.8 mAHD (100 m freeboard) • Carrington void: 41.8 mAHD (14 m freeboard)
	Long-term pit salinity levels	All three pit lakes are shown to have an ongoing trend towards higher salinity over time with the forecast median total dissolved solids (TDS) values of 7,100 mg/L, 21,550 mg/L and 8,400 mg/L for North Void, Carrington Void, and South Void respectively when equilibrium water levels are reached. This is consistent with original Project predictions that also show increasing salinity over time.	

6.5.4 Licensing strategy

HVO holds considerable water entitlement in the relevant surface water and groundwater sources in the Project area, which is sufficient to account for the predicted takes in most water sources.

During operations:

- The predicted take from the Sydney Basin North Coast Fractured Rock groundwater source is below HVO's existing entitlement.

- The predicted indirect groundwater take from the Hunter regulated river alluvial water sources (and management zones) is below HVO's existing entitlement.
- The small predicted peak indirect groundwater (alluvial) take from the Jerrys water source (4 ML/yr) exceeds HVO's entitlement. Prior to the take occurring, HVO will either apply to convert sufficient existing unregulated river entitlements to aquifer entitlements or purchase entitlement via the open market to account for the small predicted indirect groundwater take in the Jerrys Water Source.
- The predicted indirect surface water take (associated with watertable drawdown) from the Hunter Regulated River Water Source and the unregulated river water sources can be met by HVO's existing entitlement.
- Consistent with the EIS, HVO is seeking an amendment of the hydroline spatial data (as defined in the NSW NSW Water Management (General) Regulation 2018 (the WM Regulation) hydroline to reflect the approved WMS, including approved stream diversions, and to have any residual licensing liability for captured rainfall runoff based on this amended drainage configuration. Once updated, the WMS only includes dams either off stream or located on minor hydrolines and therefore are exempt from requiring WALs as the dams meet the definition of excluded works in the WM Regulation (to prevent the contamination of a water source).
- The predicted peak water take from the Hunter Regulated River Water Source required to meet operational requirements is within HVO's existing high security entitlement.

Post-mining:

- During the closure period:
 - The water management structures identified within the conceptual final landform will act as sediment dams to control runoff water quality by retaining sediment until adequate vegetation cover is established. Post-mining, when the vegetation cover criteria have been met, the dams will be decommissioned or converted to dry retention basins, retained as harvestable rights dams (if on minor streams) or retained with the required water supply work approvals and licences acquired (if on non-minor streams).
 - Take associated with runoff captured from storages on non-minor streams within the Jerry water source (Jerrys management zone) during the transition period that exceeds HVO's existing entitlement will be sourced from the open market (including trade, in accordance with the water sharing plan rules). There is adequate share entitlement within the Jerrys Water Source for the predicted take. In addition, the Hunter Unregulated and Alluvial water sharing plan allows for trade (permanently and temporarily) into the Jerrys Water Source from several (17) other upstream water sources. This demonstrates there is sufficient entitlement within the water source and upstream water sources for HVO to obtain additional entitlement via the open market.
 - HVO will apply to convert sufficient aquifer entitlements to unregulated river entitlements for the predicted peak take associated with dams on non-minor streams in the Lower Wollombi Brook Water Source during closure.
- At closure (i.e. in the long-term), residual take will be limited to direct take associated with evaporative losses from the final voids and associated indirect surface water and groundwater take:
 - The predicted long-term take from the Sydney Basin North Coast Fractured Rock groundwater source is below HVO's existing entitlement.

- The predicted indirect groundwater take from the Hunter regulated river alluvial water sources (and management zones) is below HVO's existing entitlement.
- The predicted peak indirect groundwater (alluvial) take from the Jerrys water source (26 ML/yr) exceeds HVO's entitlement. Prior to the take occurring, HVO will either apply to convert sufficient existing unregulated river entitlements to aquifer entitlements or purchase entitlement via the open market.
- The predicted indirect surface water take (associated with watertable drawdown) from the Hunter Regulated River Water Source and the unregulated river water sources can be met by HVO's existing entitlement.

The final detail of any post mining dam configuration, design of the drainage systems and associated licensing will be further investigated and resolved during preparation of the relevant stages of the Rehabilitation Management Plan and in the detailed closure planning process.

6.5.5 Mitigation, management and monitoring

The proposed management and mitigation measures listed in the water related assessments and summarised in Table 6.50 are generally consistent with the existing mitigation measures currently in place at HVO and documented in the EIS (EMM 2022a).

Table 6.50 Water resources mitigation and management measures

ID	Mitigation and management measures
WAT1	The HVO WMP will be updated to include the Project, and will describe aspects such as: • erosion and sediment control measures • water sharing arrangements with neighbouring mines • methods for measuring and estimating water take (where practical), which will be reviewed for compliance with the <i>NSW Non-Urban Water Metering Policy</i> • tailings management • groundwater model review and validation • groundwater and surface water monitoring, including review and adaptive management procedures • trigger action response plans, including trigger action response plans for unexpected changes in surface and groundwater results.
WAT2	The Carrington West Wing Levee will be monitored during operational life of the Project, particularly following large flood events (5% AEP or larger) to identify signs of instability and potential corrective action.
WAT3	The frequency of comprehensive surface water quality analysis will be increased from an annual basis to six monthly.
WAT4	Improved flood protection levees will be implemented as follows: HVO North: • North Pit levee - up to 0.1% AEP • Carrington West Wing levee - up to 0.1% AEP. HVO South: • Cheshunt levee - up to 0.1% AEP • Riverview levee - up to the Extreme Flood Event (defined as four times the 1% AEP).
WAT5	Consistent with the methodology used for the Carrington Pit LPBW, the Carrington West Wing LPBW will be constructed prior to mining within 100 m of the connected remnant western arm of the paleochannel. The Carrington West Wing LPBW will be designed to achieve a permeability of 1×10^{-8} m/sec.

ID	Mitigation and management measures
WAT6	Additional monitoring bores will be installed within the zone of predicted short-term incremental drawdown, approximately one year prior to mining recommencing in the remnant paleochannel. A network of eight nested monitoring bores are proposed and will be included in the updated water management plan.
WAT7	Piezometers will be installed within the Carrington West Wing LPBW, consistent with the approach used for the Carrington Pit LPBW. The purpose of the piezometers will be to monitor for changes in salinity and pressure.
WAT8	A LPBW monitoring and management plan will be prepared in consultation with DCCEEW Water Group (which will include assigned trigger levels and a response plan for trigger level exceedance and deviations from predictions).
WAT9	The Carrington West Wing levee will be decommissioned at closure to reinstate floodplain storage in this area.
WAT10	HVO will secure additional water entitlement that may be needed during operations and during closure in accordance with the amended Project water licensing strategy.

6.5.6 Conclusion

The assessments show the amended Project can operate within and meet the requirements of the water regulatory framework. The following is a summary of the outcomes of the assessed impacts of the amended Project on water resources:

- The WMS is predicted to maintain an overall balance without excess accumulation or shortfall of mine water demands, minimising business disruption and potential impacts on surface water resources.
- Potential impacts on streamflow and downstream users will be minor to negligible.
- No impacts are predicted on the aquatic ecology of the Hunter River, particularly as flow will be mitigated through regulated releases from Glenbawn Dam, and only minor impacts to the aquatic ecology in the tributaries to the Hunter River are predicted.
- No changes to the flood impacts are anticipated from the original Project (i.e. no changes to flooding at third-party properties or impact on land use; improved flood immunity of the realigned Lemington Road; and no changes to flood hazard categories).
- No impact is predicted at third-party bores.
- There is no incremental drawdown predicted for the amended Project in the Wollombi Brook alluvium; this is consistent with the original Project. In addition, in comparison to the approved HVO South operations, the amended Project will result in less drawdown in the Wollombi Brook alluvium. Cumulative drawdown is consistent between the original and amended Projects.
- Minimal incremental drawdown (less than 0.5 m) is predicted in the Hunter River alluvium around Carrington Billabong near mapped river red gum vegetation stands and widespread dewatering will not occur. This predicted drawdown will be buffered by leakage through the riverbed. Therefore, no significant impact in ecological receptors is predicted. In addition, river red gum communities will continue to rely on flooding for germination. Cumulative drawdown is consistent between the original and amended Projects with a slight positive impact (ie less drawdown) seen in the Carrington Billabong area during mining.
- The final voids will act as regional groundwater sinks and the long-term lake level will be considerably deeper than the base of the alluvium and the base of weathering. Therefore, the risk of seepage from the void lakes or backfilled mine areas is minor.
- The risk of spill from the void lakes is negligible.

- The amended Project will not result in adverse changes to the environmental, cultural and community values of groundwater or surface water.
- HVO holds considerable water entitlement in the relevant surface water and groundwater sources in the Project area, which is sufficient to account for the predicted direct and indirect takes in most water sources. HVO has identified a water licensing strategy, demonstrating a suitable pathway for securing additional entitlement that may be needed during operations and during closure.

6.6 Aboriginal cultural heritage

6.6.1 Introduction

An Aboriginal heritage advice report was prepared by EMM (2025a) and is provided as Appendix K. The report outlines the outcomes of the Aboriginal cultural heritage assessments completed as part of the Project to-date, and changes as a result of the proposed amendments.

6.6.2 The archaeological resource

As part of development of the EIS ACHA (EMM 2022c), and the ACHA addendum (EMM 2023c) prepared in support of the Submissions Report (EMM 2023a), some 279 Aboriginal sites and places were documented within the Aboriginal cultural heritage assessment area. This included 200 previously documented sites and 79 newly identified sites from field surveys.

Of these 279 sites, only 27 were considered to meet the criteria outlined in the ACHA as reflecting moderate or high significant sites and places. Eleven of these sites were considered of high significance, including five culturally modified trees, three sites containing stratified and potential or demonstrated Pleistocene cultural deposits, and three high-density artefact scatters with some potential for stratified cultural deposits. Sixteen sites were assigned a moderate significance and typically characterised as moderate to high density stone artefact scatters constrained to shallow texture contrast soil profiles.

The remaining 252 sites were assessed as having low to low-moderate significance. The ACHA addendum (2023c) regarded these low and low-moderate significant sites as being part of a broader background scatter of cultural material that is widespread across the Hunter Valley – reflective of over 50,000 years of Aboriginal occupation.

6.6.3 Impact assessment

Spatially, the amended Project (refer to Section 1.2) results in a reduction to the Project's disturbance area that was assessed by the EIS ACHA (EMM 2022c) and the ACHA addendum (EMM 2023c). Specifically:

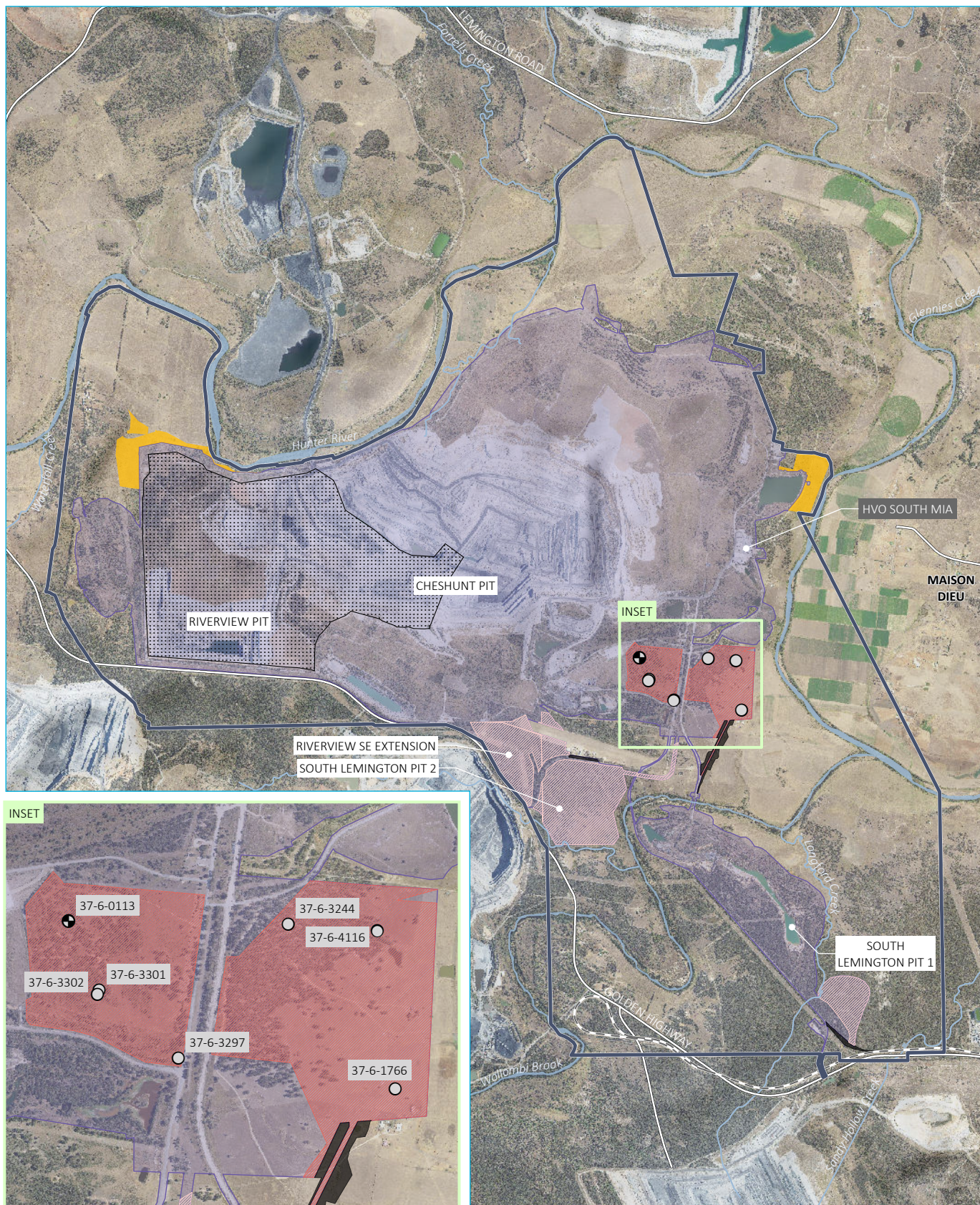
- discrete areas of the additional disturbance area proposed in Amendment ACHA have been removed, primarily along the proposed Lemington Road re-alignment, as well as a small portion adjacent the Golden Highway in the southernmost part of the Project
- previously approved disturbance areas associated with the LCPP, and associated rail facilities, are no longer proposed. While parts of these activities were previously excluded in the EIS, they have now been expanded and additional areas along the proposed Lemington Road re-alignment assessed by EMM (2022c and 2023c) are now excised.

In addition, the proposed amendments include additional discrete areas of disturbance associated with the construction of transmission lines across the Project area required to provide flexibility with transmission lines associated with the EnergyCo Hunter Transmission Line Project.

As a result of the amended Project:

- no additional heritage sites are located within the proposed additional disturbance areas associated with the construction of transmission lines
- six valid low significant Aboriginal sites and objects, located within the excised disturbance areas, would now no longer be impacted (refer to Figure 6.12). These include:
 - HVO-45 (37-6-3244) – isolated find

- HVO-101 (37-6-3297) – isolated find
- HVO-105 (37-6-3301) – isolated find
- HVO-106 (37-6-3302) – isolated find
- HVOCP TR296-IF1 (37-6-4116) – isolated find
- HVO-135 (37-6-1766) – open artefact scatter.



Source: EMM (2025); Glencore (2025); DCSSS (2024); OEH (2023); GA (2009)

KEY

- Proposed HVO South development consent boundary
- Existing and approved disturbance area
- Additional disturbance area
- Additional disturbance area no longer proposed
- Additional previously approved disturbance no longer retained
- Previous approved area not retained

- Documented Aboriginal object and/or site, typically reflecting isolated or low densities of stone artefacts

- Site status
- Destroyed
- Proposed HVO Continuation Project elements
- Mining area

- Existing environment
- Rail line
- Major road
- Named watercourse
- Named waterbody
- Label format
- Existing item

Aboriginal sites and places excised from the Project area

HVO Continuation Project
Amendment Report
Figure 6.12

6.6.4 Mitigation, management and monitoring

The EIS ACHA (EMM 2022c) recommended that an Aboriginal Cultural Heritage Management Plan (ACHMP) be developed to provide a framework for management of cultural materials following approval. It also outlined a range of general mitigation measures for each of the Aboriginal sites and places identified by that report, including avoidance, surface collection of stone artefacts, salvage excavation of buried cultural deposits, and relocation of culturally modified trees (or significant components of them).

Following Heritage NSW comments of the EIS, the ACHA addendum (EMM 2023c) further expanded on the mitigation measures. The ACHA addendum focussed mitigation measures towards the 27 key sites and places of high and/or moderate significance where they would be adversely affected, and outlined a program of archaeological excavation and recovery. These were focussed on cultural deposits where the Warkworth sand system and/or other deep soil profiles were predicted to occur, and included Test Excavation Areas 9 (HVOCP TR104-AS1 [37-2-6507] and HVOCP TR105-AS1 [37-2-6519]), 11 (LID 6 [#37-3-0449], HVOCP TR189-AS2 [37-3-1634], and HVOCP TR195-AS3 [37-3-1649]) and 12 (HVOCP TR213-AS1 [37-3-1626]), as well as a small portion of CM 1 (37-2-1504).

Archaeological methods were outlined including a range of different mechanical and manual excavations to account for the different aims and requirements of each of the cultural deposits. In addition, the ACHA addendum included direction on the management and removal of culturally modified trees was also presented, although none were proposed for impact as a result of Project re-design.

Management and mitigation measures also included the cultural collection of surface stone artefacts and/or the passive/active avoidance of sites not proposed to be adversely affected.

Table 6.51 details the proposed revised management approach to the six Aboriginal sites no longer directly impacted by the amended Project, with revised management and mitigation measures for all identified Aboriginal heritage sites within the assessment area presented in Annexure A of the Aboriginal heritage advice report provided as Appendix K.

Table 6.51 **Significance, impact assessment and proposed management of sites now excised by the amended Project**

Site status	AHIMS	Site name	Site features	Overall significance	Management
Valid	37-6-3244	HVO-45	Isolated Find	L	Avoidance – where activities proposed within 20 m, establish fencing and signage. Where >20 m, include in site inductions and present on development site plans as ‘no-go’ zones or equivalent
Valid	37-6-3297	HVO-101	Isolated Find	L	Avoidance – where activities proposed within 20 m, establish fencing and signage. Where >20 m, include in site inductions and present on development site plans as ‘no-go’ zones or equivalent
Valid	37-6-3301	HVO-105	Isolated Find	L	Avoidance – where activities proposed within 20 m, establish fencing and signage. Where >20 m, include in site inductions and present on development site plans as ‘no-go’ zones or equivalent

Site status	AHIMS	Site name	Site features	Overall significance	Management
Valid	37-6-3302	HVO-106	Isolated Find	L	Avoidance – where activities proposed within 20 m, establish fencing and signage. Where >20 m, include in site inductions and present on development site plans as ‘no-go’ zones or equivalent
Valid	37-6-4116	HVOCP TR296-IF1	Isolated Find	L	Avoidance – where activities proposed within 20 m, establish fencing and signage. Where >20 m, include in site inductions and present on development site plans as ‘no-go’ zones or equivalent
Valid	37-6-1766	HVO-135	Open artefact scatter	L	Avoidance – where activities proposed within 20 m, establish fencing and signage. Where >20 m, include in site inductions and present on development site plans as ‘no-go’ zones or equivalent

Generally consistent with the mitigation and management measures presented in the HVO North Amendment Report (EMM 2023b), the mitigation and management measures outlined in Table 6.52 will continue to be implemented for the amended Project.

Table 6.52 Aboriginal heritage mitigation and management measures

ID	Mitigation and management measures
ACH1	Direct impacts to Aboriginal cultural heritage site CM-CD1 (AHIMS Site 37-2-1877) will continue to be avoided.
ACH2	Direct impacts will be avoided to two scarred trees of Aboriginal cultural heritage origin (AHIMS #37-3-1635 and AHIMS #37-3-1629), identified as being of high archaeological significance.
ACH3	A consolidated Aboriginal Cultural Heritage Management Plan (ACHMP) (including HVO North and HVO South) will be developed for the Project in consultation with RAPs and Heritage NSW. This will include: • Mitigation and management measures for identified Aboriginal heritage sites (refer to Annexure A of Appendix K in this Amendment Report). • Unexpected finds protocols. • Consultation.
ACH4	HVO will provide assistance to RAPs to connect with family and Country to facilitate the transfer of knowledge and culture to younger generations. The form of this assistance will be developed in consultation with these groups and documented with the revised ACHMP.

6.6.5 Conclusion

The amended Project would result in limited changes to the archaeological resource or the potential impacts previously outlined in the EIS ACHA (EMM 2022c) and ACHA addendum (EMM 2023c). Overall, the changes would result in the removal of six Aboriginal objects and sites from the proposed disturbance activities which would be avoided by the amended Project. These are all sites of low significance and considered part of the broader background scatter across the assessment area.

The amended Project, as it relates to Aboriginal cultural heritage, is summarised below:

- 279 extant Aboriginal sites and places have been documented within the Project’s assessment area. Of these:
 - 11 sites have been assessed as having high significance

- 16 sites have been assessed as having moderate significant sites
- the remaining 252 sites are considered to be of low/low-moderate significance.
- Following an iterative design process for the original Project, the HVO North Amendment and the amended Project as presented in this Amendment Report, the Project has avoided through re-design impacts to:
 - nine sites assessed as having high significance
 - seven sites assessed as having moderate significance
 - 66 sites assessed as having low significance.
- Consequently, the amended Project will have an adverse impact on:
 - two sites assessed as having high significance – being HVOCP TR195-AS2 (37-3-1619), HVOCP TR213-AS1 (37-3-1626), both artefact scatters with archaeological deposits within the amended Lemington Road alignment and proposed to be impacted by the alignment as presented in the EIS. It is noted the scarred trees of Aboriginal cultural heritage origin proposed to be impacted by the EIS alignment are now avoided
 - 10 sites assessed as having moderate significance
 - 187 sites assessed as having low/low-moderate significance.

The proposed impacts, avoidance and mitigation measures of the 27 high and moderate significant sites within the Project's assessment area, outlined in ACHA addendum (EMM 2023c), would remain unchanged as a result of the amended Project.

Management and mitigation measures will include the cultural collection of surface stone artefacts and/or the passive/active avoidance of sites not proposed to be adversely affected.

Archaeological investigative and salvage excavations will be undertaken focussing on nine identified sites with high artefact densities and/or containing stratified cultural deposits, and where these sites are proposed for impact.

6.7 Social

6.7.1 Introduction

A SIA was prepared by EMM (2025e) to assess the amended Project in accordance with the EP&A Act, the *Social Impact Assessment Guideline 2023* (DPE 2023a) and the *Social Impact Assessment Technical Supplement* (DPE 2023b). This SIA evaluates the potential social impacts and benefits of the amended Project, focusing on local and regional communities.

The assessment builds on the findings of the SIA prepared to support the EIS (EMM 2022a) and HVO North Amendment Report (EMM 2023b) and incorporates updated social baseline data, including insights from the third release of the 2021 Census of Population and Housing (2021 Census) (ABS 2021).

6.7.2 SIA study area

The SIA study area for the amended Project includes the following local and regional areas, as defined in Table 6.53 and updated to reflect the latest 2021 Census data.

Table 6.53 SIA study area

Study area	Geographic area	ABS data category	Referred to in report as:
Local area	Jerrys Plains	SAL 12030	Local area
	Maison Dieu	SAL 12457	
	Camberwell	SAL 10761	
	Long Point	SAL 12391	
	Singleton – township	SA2 106011112	
	Muswellbrook – township	SA2 106041126	
Regional area	Singleton	LGA 17000	Regional area
	Muswellbrook	LGA 15650	
Area of reference	Hunter Valley region	Hunter Valley excluding Newcastle SA4 106	Area of reference
	Newcastle	SED 10058	
State of New South Wales	New South Wales	New South Wales State and Territory (STE)	NSW

The SIA study area was defined with reference to stakeholders who could be directly or indirectly affected by the amended Project, including landholders, nearby neighbours, community members, businesses, service providers, and Indigenous groups. The geographic boundaries are consistent with the original SIA and updated to reflect current ABS classifications – Suburbs and Localities (SALs) and Statistical Areas Level 2 (SA2s).

The study area is further contextualised within the broader Hunter Valley region, which includes key economic and social hubs such as Newcastle and the surrounding agricultural and industrial zones.

6.7.3 Engagement

i Community

Given the scope of the proposed amendments and overall reduction in impacts, no SIA-specific engagement was conducted for the amended Project. Instead, the SIA drew on existing data from:

- previous independent social engagement conducted during preparation of the SIA to support the EIS (EMM 2022a)
- EIS engagement program and engagement undertaken since the EIS was submitted
- feedback provided through EIS submissions phase
- complaints received during ongoing operations between January 2023 and May 2025.

Actions undertaken since the submission of the Submissions Report (EMM 2023a) included:

- regular newsletters (e.g. *HVO News* Issues 11–15)
- Community Consultative Committee (CCC) meetings (e.g. November 2023, February 2024, May 2024, August 2024, November 2024, February 2025, May 2025)
- community information sessions (e.g. 22 February 2025 and 12 April 2025)
- HVO Family Day (e.g. 10 May 2025).

ii Registered Aboriginal Parties

Since the completion of the HVO North Amendment Report, RAPs have been kept updated as follows:

- provision of HVO newsletters
- notification of determination of HVO North Mod 8 provided to the RAPs on 28 April 2025
- provision of the Aboriginal heritage advice report (EMM 2025a) to provide the RAPs information on the change in impacts to the cultural assemblage as a result of the amendments to the Project.

6.7.4 Existing environment

The SIA study areas remain unchanged from the original SIA. The local study area includes the communities which directly surround HVO, being Jerrys Plains, Maison Dieu, Long Point and Camberwell, along with the two key nearby townships of Singleton and Muswellbrook.

The original SIA baseline primarily relied upon data collected in 2016. A revised social baseline study was completed for the amended Project derived from the 2021 Census (ABS 2021). The revised social baseline for the SIA can be found in Chapter 5 of the Social Impact Assessment (Appendix L).

The revised social baseline provides a foundation for assessing the potential social impacts of the amended Project.

6.7.5 Impact assessment

The amended Project has been assessed for potential social impacts and benefits, informed by updated social baseline data, community engagement outcomes, and changes to project activities. Key social impacts identified for the amended Project compared to the SIA for the original Project are summarised in Table 6.54 and described further below.

Table 6.54 Summary of social impacts

Impact category	Original Project	Amended Project	
	Impact	Mitigated significance	Changes to impact and significance
Way of life	Impact of continued traffic congestion and road delays – construction	Medium	Low
	Impact of continued traffic congestion and road delays – operations	Low	No change
	Impacts due to continued generation of dust and diminished air quality	Medium	No change
Community	Impact on community cohesion due to divergent opinions on the Project	Medium	No change
Accessibility	Impact on an increased housing demand impacting rental affordability and availability	Medium	No change
Health and wellbeing	Impacts from noise and vibration	Medium	No change
	Impact of continued anxiety about potential effects on water quality	Medium	No change
	Impacts of continued exposure to dust and decreased air quality	Medium	No change
Surroundings	Impact on changes to visual amenity	Low	No change
	Impacts of lighting on nearby neighbours	Low	No change
Livelihood	Impact on perceived decreased water quality impacting agriculture-based livelihoods	Low	No change

No new impacts or benefits were identified because of the amendment. It was assessed that the amendment will not result in any change to most of the impacts and benefits assessed in the SIA for the original Project and therefore do not require further investigation. Of the 18 impacts and 10 benefits identified in the SIA for the original Project, seven impacts and 10 benefits were assessed as not requiring further investigation as they remain largely unchanged from what was assessed and considered as part of the original Project and presented in the EIS.

There were 11 impacts identified for further investigation. These impacts relate to amenity including traffic, generation of dust, noise and vibration, and visual landscape, impacts relating to community cohesion, housing and accommodation, and perceived water quality impacts. As shown in Table 6.54, all aspects remained unchanged except for traffic, which went from a medium risk to low. This is due to the removal of the construction of the LCPP and associated rail facilities as part of the amended Project, and therefore the avoidance of all construction related traffic associated with its construction.

6.7.6 Management, mitigation and monitoring

A summary of the social mitigation measures is provided in Table 6.55.

Table 6.55 Social mitigation and management measures

ID	Mitigation and management measures
SOC1	A SIMP will be developed for the Project which will include a monitoring and management framework.
SOC2	HVO will continue to administer the community grants program which invests in programs, events and services that promote community cohesion, connectedness and support.
SOC3	As part of the development of the SIMP, HVO will develop a funding framework to enable funding of programs and projects that align with Closing the Gap initiatives, including job readiness programs, assistance relating to tendering for work at HVO by Aboriginal suppliers, and a commitment of \$1,000,000 over the first 10 years of the Project. These initiatives will be developed as part of the preparation of the SIMP, which will also outline the proposed implementation plan.

6.7.7 Cumulative impacts

There are currently 15 active coal mines across the Hunter Valley. Several mines have closed since the SIA for the original Project was prepared, such as Muswellbrook Coal Mine, Liddell Coal Operations, Integra Underground Mine and Bulga Underground. Others have recently had their life extended with the approval of continuation projects, such as the Ravensworth Underground mine at the Ashton Mine Complex and Mt Arthur Coal Mine.

The construction and operation of non-resource sector projects such as energy transmission, solar and wind projects, and road infrastructure in the Singleton and Muswellbrook LGAs, which intersect with the construction and operation of the amended Project, are also relevant to the assessment of cumulative impacts. At least 15 non-resource projects are planned in the local and regional area, supporting the transition to renewable energy. A quantitative assessment of changes to construction and operation workforce was conducted including employment and population change while a qualitative assessment was conducted for competition for labour, housing and accommodation, traffic, social infrastructure and amenity.

Although the Project's contribution to cumulative impacts related to the initial construction workforce remains unchanged for the amended Project (with the exception of the LCPP construction workforce towards the latter part of the Project life), there has been a significant increase in the construction workforce associated with planned non-resource projects since the EIS was submitted. It is unlikely that labour demand will affect the amendment due to differing skill requirements across industries. This is based on the assumption that non-resource projects such as renewable energy technologies and transmission infrastructure will require a large number of specialised workers such as electrical and mechanical engineers. Therefore, it is unlikely that demand for skilled workers will overlap significantly between the resource and non-resource construction industries.

Further, in relation to accommodation for the cumulative construction workforce, it is considered unlikely that cumulative construction demand will significantly impact local housing as the majority of non-resource projects will house their construction workforce in accommodation camps. Additionally, projects with large construction workforce numbers (such as the Hunter Transmission Project, New England REZ Transmission Project, and Hunter Gas Pipeline) are likely to have a geographically dispersed workforce across a number of local government areas, therefore impacts are unlikely to disproportionately impact Muswellbrook and Singleton.

Mitigation measures identified within the SIA for the original Project remain relevant for the amended Project and will assist with managing potential cumulative impacts associated with the construction workforce.

6.7.8 Conclusion

No new impacts or benefits were identified by the SIA of the amended Project when compared to the original Project. All impacts and benefits remain unchanged for the amended Project, except for traffic, which went from a medium risk to low. This is due to the removal of the construction of the LCPP and associated rail facilities as part of the amended Project, and therefore the avoidance of all traffic associated with its construction.

While the Project's initial contribution to cumulative impacts relating to construction workforce remains the same (with the exception of the LCPP construction workforce which is no longer required in the latter part of the amended Project life), there has been a substantial increase in construction workforces of planned non-resource projects since EIS submission. It is unlikely that labour demand will affect the amendment due to differing skill requirements across industries. Further, in relation to accommodation for the cumulative construction workforce, it is considered unlikely that cumulative construction demand will significantly impact local housing as the majority of non-resource projects will house their construction workforce in accommodation camps and are likely to have a geographically dispersed workforce across a number of local government areas, therefore impacts are unlikely to disproportionately impact Muswellbrook and Singleton.

6.8 Economics

6.8.1 Introduction

An Economic Impact Assessment (EIA) (EY 2025) was prepared to support this Amendment Report and is provided as Appendix M. The EIA provides an assessment of economic impacts and benefits of the amended Project.

The EIA is based on the economic assessment framework set out in the *Guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals* (DPIE 2015) (the Guidelines) and the methods outlined in the *Technical Notes supporting the Guidelines for the Economic Assessment of Mining and Coal Seam Gas Proposals* (DPIE 2018).

Consistent with the Guidelines, the EIA includes a cost benefit analysis (CBA) and a local effects analysis (LEA). The CBA provides an estimate of the net benefits of the amended Project to NSW, and the LEA estimate of the net benefits of the Project to the Lower Hunter region (as defined by the ABS SA3 10601 region).

Results are reported for a 'central case' which is the primary scenario used to evaluate the costs and benefits of the amended Project. This scenario is constructed based on the most probable assumptions and serves as the baseline against which alternative scenarios are compared in a sensitivity analysis.

This section provides a summary of the updated EIA (EY 2025) and compares it to the results of the previous EIA (EY 2024) prepared to support the Project.

6.8.2 Background

EY prepared an EIA (EY 2022) which accompanied the EIS (EMM 2022a) for the Project. The CBA for this EIA showed that the net benefits of the original Project to NSW would be \$4,848.5 million in net present value (NPV) terms. It also showed that the net benefits of the original Project on the Lower Hunter region would be \$1,739.0 million in NPV terms.

In March 2024, HVO received correspondence from DPHI requesting additional information to inform their assessment of the Project primarily in relation to consideration of the Commonwealth Safeguard Mechanism and the NZF Act. In its correspondence, DPHI requested 'any relevant updates to the economic assessment associated with the above'.

In accordance with DPHI's request, a revised EIA (EY 2024) was prepared and submitted to DPHI which incorporated changes to the economic assessment landscape arising since the completion of the EY (2022). The CBA for this EIA showed that the net benefits of the Project to NSW increased significantly to \$7,836.2 million in NPV terms, an increase of \$2,987.7 million. The LEA showed that the net benefits of the Project on the Lower Hunter region also increased significantly to \$2,181.8 million in NPV terms, an increase of \$442.8 million. The increase in the benefits of the Project to the State and to the Lower Hunter were largely due to increases in the NSW Government coal royalty rate and increases in the contemporary and forecast coal prices.

The EIA prepared to support the amended Project (EY 2025) incorporates additional changes to the economic assessment landscape arising since the completion of the EY (2024) including:

- updated forecasts for production, GHG emissions, operating expenses, capital expenses, and employment resulting from the changes to the Project
- contemporary coal price and currency forecasts for Quarter 1 2025.

6.8.3 Cost benefit analysis

Consistent with the Guidelines, the CBA is based on determining the net direct and indirect benefits and subtracting the indirect costs of the amended Project and comparing this against the scenario where the Project does not occur (i.e. the baseline scenario).

To define the baseline scenario, it is noted that the existing approval for mining operations at HVO North ceases in December 2026 while HVO South's Project Approval allows mining until March 2030. However, HVO South is currently dependant on HVO North for coal processing and transport. Therefore, the baseline for the EIA considers that both mines cease operations at the end of the currently approved HVO North mine life in 2026. As such, the economic benefits and costs associated with extraction of coal up to December 2026 across the complex have been included in the baseline, and therefore excluded for the purposes of assessing the incremental net benefits of the amended Project.

The direct benefits of the amended Project are a function of its profitability which, in turn, depends on the prevailing coal price. The indirect benefits of the amended Project are related to the linkages that it has to the NSW economy through both the labour market and suppliers. The indirect costs of the amended Project are related to the costs borne by the NSW community through its generation of externalities.

As shown in Table 6.56, the amended Project is estimated to provide a net benefit to NSW. As a complex, HVO is estimated to produce a net benefit of \$5,692.4 million to NSW in NPV terms via the amended Project. This compares to \$7,836.2 million in NPV terms presented in EY (2024) which is a decrease of \$2,143.8 million.

The decrease in the net benefit is predominantly due to the reduction in ROM coal mined and market coal sold, largely as a result of avoiding coal extraction within gas Domain 1 at HVO North and reducing the mine life of both HVO North and HVO South. Notwithstanding this, a net benefit of \$5,692.4 million in NPV terms remains significant.

If the individual mine sites are considered separately, the net benefit to NSW from HVO North and HVO South via the amended Project is \$3,719.5 million and \$2,023.5 million NPV, respectively, which compares to \$5,458.0 million and \$2,318.1 million, respectively reported in EY (2024).

The results of the CBA in EY (2024) and EY (2025) are summarised in Table 6.56.

Table 6.56 Cost benefit analysis – amended Project (for central case)

	HVO Complex (\$million)		HVO North (\$million)		HVO South (\$million)	
	2024*	2025#	2024*	2025#	2024*	2025#
Direct benefits	4,367.4	2,768.1	2,901.4	1,706.7	1,351.5	935.6
Indirect benefits	3,488.1	2,941.9	2,569.6	2,024.0	972.0	1,094.4
Incremental indirect costs	19.3	17.6	12.7	11.2	5.4	6.5
Net benefits	7,836.2	5,692.4	5,458.0	3,719.5	2,318.1	2,023.5

Note

* NPV in 2024 Australian dollars based on a 7% real discount rate.

NPV in 2025 Australian dollars based on a 7% real discount rate.

As shown in Table 6.56, the net benefit of the amended Project in NPV terms is comprised of:

- \$2,768.1 million in direct benefits
- \$2,941.9 million indirect benefits
- \$17.6 million in incremental indirect costs.

Estimated incremental direct costs were considered individually as capital expenditure and operational expenditure to determine the net producer surplus for potential direct benefits.

The breakdown of these benefits and costs is presented in Table 6.57.

Table 6.57 **Estimated net benefits of the amended Project (for central case)**

Benefits	NPV (\$million)	Costs	NPV (\$million)
Direct benefits		Direct costs	
Net producer surplus attributed to NSW	-	Safeguard Mechanism and Voluntary additional ACCU purchases	347.5
Royalties, payroll tax and Council rates	2,395.2		
Company income tax apportioned to NSW	372.9		
Total direct benefits	2,768.1	Total direct costs	347.5
Indirect benefits		Indirect costs	
Net economic benefit to landholders	-	Air quality impact	-
Net economic benefit to NSW workers	1,158.4	Greenhouse gas emissions^	3.8
Net economic benefit to NSW suppliers	1,783.5	Noise impact^	-
		Traffic and transport impact	0.7
		Net public infrastructure cost	-
		Surface water impact^	
		Groundwater impact^	-
		Biodiversity impact^	59.2
		Loss of surplus to other industries	13.1
		Visual amenity impact^	-
		Aboriginal cultural heritage impact^	
		Historical heritage impact^	-
Total indirect benefits	2,941.9	Other	-
Total economic benefit of amended Project	5,710.0	Indirect cost	91.4
NPV of amended Project	5,692.4	Total incremental cost of the amended Project	17.6

Notes

NPV in 2025 Australian dollars based on a 7 per cent real discount rate.

^ Management and mitigation costs are included in the operating and capital costs.

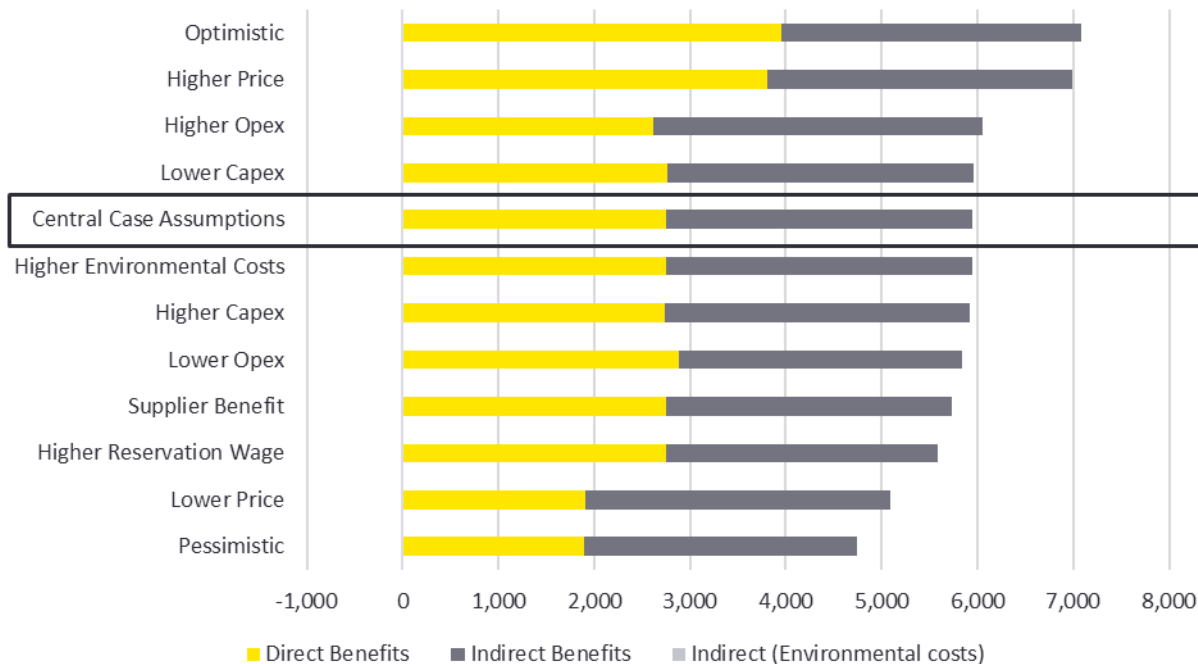
6.8.4 **Sensitivity analysis**

In accordance with the Guidelines, a comprehensive sensitivity analysis was conducted to assess the net economic benefits of the amended Project. The findings indicate that the projected net benefits remain robust, demonstrating positive outcomes across a range of tested assumptions.

Among the variables examined, coal price assumptions exert the most significant influence on the net benefit estimates. For instance, if coal prices are assumed to be 25% lower than the central case scenario, the NPV of benefits to NSW is estimated at \$5,077.5 million, representing a 14.3% decrease from the central estimate, as shown in Figure 6.14.

The analysis also considered extreme scenarios to establish lower and upper bounds of potential outcomes. Under the most conservative assumptions, including lower coal prices, higher capital and operational expenditures, and reduced benefits to workers and suppliers, the NPV of net benefits is estimated at \$4,727.0 million. Conversely, under the most optimistic assumptions, the NPV could reach \$7,065.9 million.

Additionally, the choice of discount rate significantly affects the NPV due to the project's extended timeframe. Applying real discount rates of 10% and 4% results in NPVs ranging from \$4,696.0 million to \$7,678.5 million, respectively.



NPV in 2025 Australian dollars based on a 7 per cent real discount rate.
Indirect costs of NPV \$15.9 million have been included in the figure.

Figure 6.14 Sensitivity analysis of CBA to key assumptions (NPV, \$ million)

6.8.5 Local effects analysis

Consistent with the Guidelines, the LEA uses a similar framework to the CBA but is focussed on the net economic impacts to the local community. The Guidelines refer to the local area as being consistent with the relevant SA3 as defined by the ABS. For the amended Project the Lower Hunter SA3 area is used in the LEA.

Most of the amended Project area is in the north-west Lower Hunter on the border between the Lower Hunter and Upper Hunter SA3. HVO South is situated completely in Lower Hunter, whereas a small portion of HVO North is situated in Upper Hunter. As a result, it is conservatively assumed that the majority of local effects of the amended Project are attributed to the Lower Hunter SA3 region.

However, given the amended Project's central location between Muswellbrook and Singleton, it is not unreasonable to assume that many of the benefits that accrue to the Lower Hunter region, could also accrue to the neighbouring Upper Hunter region nearby, noting that the majority of the workforce comes from Singleton compared to Muswellbrook.

Given the nature of mining operations, it is also acknowledged that many of the inputs may be supplied from the broader NSW region. It is expected though, based on current operations, that only a proportion of the inputs will be supplied from the Lower Hunter region and some of the workforce are sourced from the wider region. As a result, the amended Project would generate economic benefits to a broader region; for example, due to supplies that are sourced from the wider Upper Hunter region, Newcastle and some of the surrounding regional communities situated near the Project.

The analysis shows the amended Project has an estimated net benefit of \$1,778.1 million in the Lower Hunter region in NPV terms. This compares to an estimated net benefit of \$2,181.8 million in EY (2024) which is a decrease of \$403 million. Table 6.58 summarises the net local benefit of the amended Project estimated in EY (2024) and EY (2025) for the HVO Complex as well as HVO North and HVO South.

Table 6.58 Local effects analysis – amended Project (for central case)

Benefits	HVO Complex (\$million)		HVO North (\$million)		HVO South (\$million)	
	2024*	2025#	2024*	2025#	2024*	2025#
Direct benefits						
Net producer surplus attributed to Low Hunter	-	-	-	-	-	-
Royalties, payroll tax and Council rates	36.6	72.1	18.3	54.5	17.1	16.3
Company income tax apportioned to NSW	-	-	-	-	-	-
Total direct benefits	36.6	72.1	18.3	54.5	17.1	16.3
Indirect benefits						
Net economic benefit to landholders	-	-	-	-	-	-
Net economic benefit to NSW workers	1,174.0	990.9	869.3	617.8	420.5	378.6
Net economic benefit to NSW suppliers	985.2	790.3	722.5	597.1	232.0	302.4
Total indirect benefits	2,159.2	1,781.2	1,591.6	1,215.0	652.5	680.9
Total Project economic benefit	2,195.7	1,853.3	1,609.9	1,269.5	669.6	697.3
Indirect costs	14.0	75.2	9.4	61.8	4.0	14.0
NPV of Project	2,181.8	1,778.1	1,600.5	1,207.7	665.6	683.3

Notes

* NPV in 2024 Australian dollars based on a 7% real discount rate.

NPV in 2025 Australian dollars based on a 7% real discount rate.

The net benefit of the amended Project is driven by:

- Benefits to local workers of \$990.9 million in NPV terms for the HVO Complex, and \$617.8 million and \$378.6 million for HVO North and HVO South respectively. It is assumed that the proportion of workers sourced from the Lower Hunter region would remain consistent at the complex level, and between HVO North and HVO South. It is estimated that around 75% of the workforce expected for the amended Project is sourced from the Lower Hunter region.

- Benefits to local suppliers of \$900.6 million in NPV terms for the HVO Complex, and \$675.3 million and \$346.3 million for HVO North and HVO South respectively. These estimates are based on the assumption that 37% of the inputs to production are from the region. It is also assumed that the proportion of inputs that are sourced from the local region would remain constant at the complex level and between HVO North and HVO South.
- Payment of local council rates of \$31.5 million in NPV terms over the life of the amended Project, which is comprised of the estimated land tax and payments to the Singleton Council. For HVO North and HVO South, the total payments to council are estimated to be respectively \$15.8 million and \$14.5 million in NPV terms.

A sensitivity analysis was also conducted for the LEA, which demonstrated that the estimated local effects are robust, with a lower bound estimate of net benefits to the Lower Hunter region of \$1,709.2 million and upper bound estimate of \$1,881.6 million in NPV terms for the amended Project.

6.8.6 Summary and conclusion

The results of the EIA (EY 2025) indicate that overall, the amended Project is expected to generate significant net benefits and is also expected to generate increased economic activity and employment within NSW and the local region.

The estimated net benefit of the amended Project is \$5,692.4 million in NPV terms, which is a reduction of \$2,143.8 million from the net benefit of the original Project of \$7,836.2 million reported in EY (2024). This is predominantly due to the reduction in ROM coal mined and market coal sold, largely because of avoiding coal extraction within gas Domain 1 at HVO North and reducing the mine life of both HVO North and HVO South. Notwithstanding this, a net benefit of \$5,692.4 million remains significant.

The net benefit is most sensitive to the coal price assumption used in the CBA; however, the sensitivity analysis demonstrated that even with the most pessimistic assumptions around coal prices, capital expenditure, operational expenditure, worker and supplier benefits as well as indirect costs, the net benefits to NSW will remain significant in NPV terms.

The LEA considered the costs and benefits of the amended Project on residents of the Lower Hunter region and found that it is expected to deliver a net benefit to the Lower Hunter Region of \$1,778.1 million in NPV terms. This is a reduction of \$403 million compared to an estimated net benefit of \$2,181.8 million in EY (2024). This assessment demonstrates that the estimated local effects are robust under the sensitivity analysis conducted with a lower bound estimate of net benefits to the Lower Hunter Region of \$1,636.3 million and upper bound estimate of \$1,810.0 million in NPV terms for the HVO Complex.

Given the significant net benefits of the amended Project as demonstrated by the outcomes of the EIA, the amended Project is desirable and justified from an economic efficiency perspective.

6.9 Rehabilitation and closure

6.9.1 Introduction

A final landform design and refinement process has been undertaken for the amended Project so that the final landforms are appropriate for the site overburden and soils and can be rehabilitated to be stable to support the nominated post mining land uses.

The final landform design approach for the amended Project is documented in the Landform Design Report (WSP 2025) and provided as Appendix N.

6.9.2 Rehabilitation principles and objectives

The amended Project does not propose to change the overarching rehabilitation and closure objectives currently approved for HVO, and presented in the EIS, which is to restore the land to a combination of grazing and native ecosystem woodland final land uses. These land uses include stable landforms and self-sustaining vegetation developed in consideration of several factors including opportunities (such as proximity to remnant native vegetation areas) and constraints (such as slope and soil quality), ecological and rural land use values and existing strategic land use objectives.

The rehabilitation objectives for the amended Project are set out in Table 6.59.

Table 6.59 Closure and rehabilitation objectives

Aspect	Objective
Mine site (as a whole)	• Safe, stable and non-polluting. • Landforms designed to incorporate micro-relief and integrate with existing rehabilitated landforms and surrounding natural landforms. • Constructed landforms that maximise surface water drainage to the natural environment (excluding final void catchments). • Minimise visual impact of final landforms as far as is reasonable and feasible.
Voids	• Minimise water inflows to prevent risk of discharge to surface waters. • Minimise to the greatest extent practicable the safety risk to humans, stock and fauna.
Native woodland habitat	• Establish self-sustaining native woodland ecosystems characteristic of vegetation communities found in the Project area. • Establish native woodland corridors to link remnant native vegetation and biodiversity offset areas.
Grazing	• Reinstate target and mandated land and soil capability classes. • Rehabilitate grassland areas so that they can support sustainable grazing activities.
Clean water diversion channel(s)	• Engineered to be hydraulically and geomorphologically stable. • Incorporate erosion control measures based on natural channel design principles. • Revegetate with suitable native species and establish areas of self-sustaining riparian habitat.
Surface infrastructure	• To be decommissioned and removed, unless agreed otherwise as part of the detailed closure planning process.
Community	• Ensure public safety. • Minimise direct adverse socio-economic effects of mine closure via community and workforce consultation and updates throughout the life of Project and leading up to closure to allow adequate time for transition planning

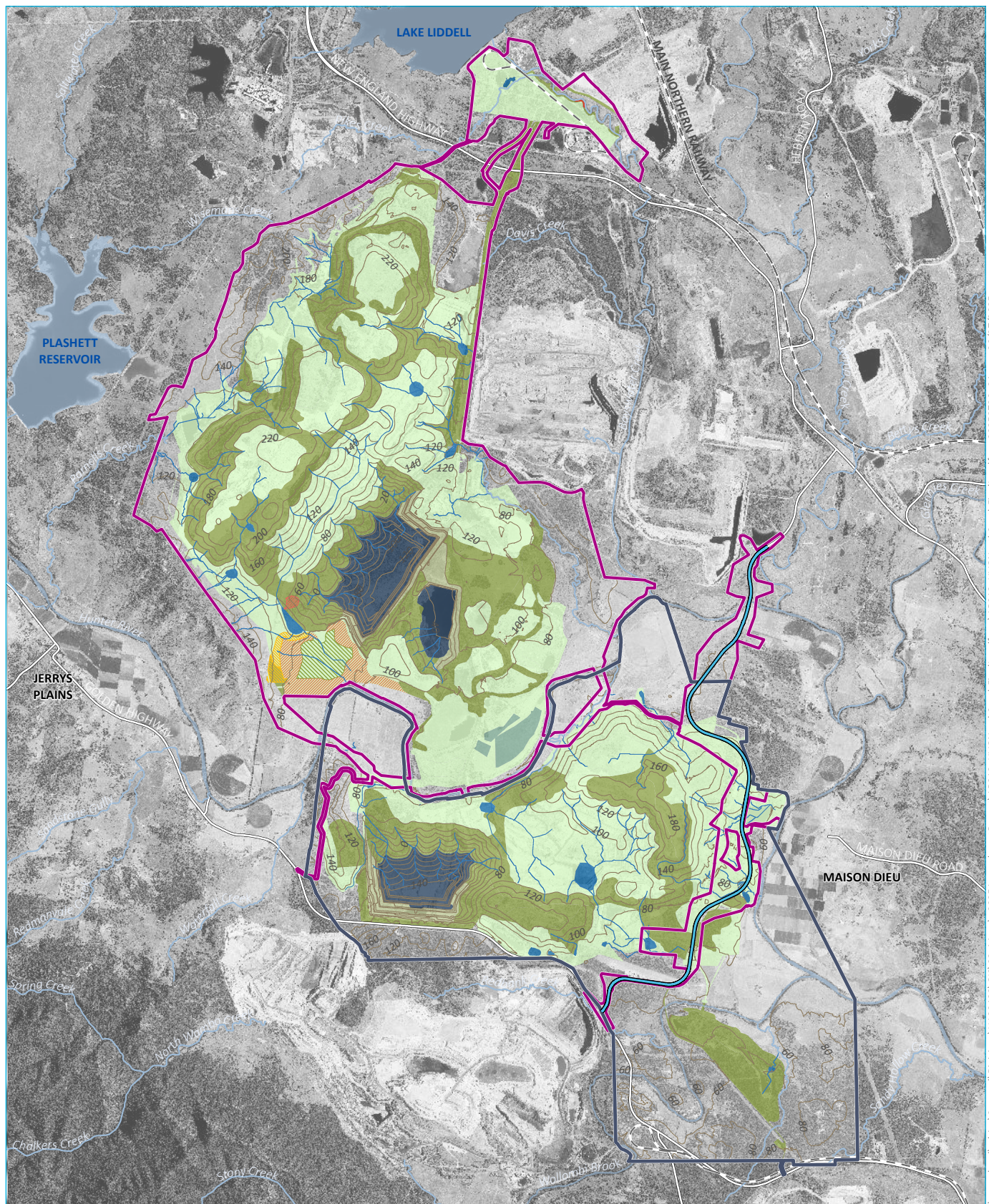
6.9.3 Final land use

Table 6.60 and Figure 6.15 detail the proposed final land use domains for the amended Project.

Table 6.60 Final land use domains

Domain code	Final land use domain	Domain information
A	Native ecosystem – woodland and riparian vegetation communities depending on position in the landscape	Areas of native ecosystem will be established to provide woodland habitat and to provide wildlife corridor linkages to other areas of habitat rehabilitation in adjoining mines, or areas of remnant habitat in adjoining non mined land. It is anticipated that native ecosystem habitat rehabilitation will be fenced to exclude grazing particularly on the steeper slopes such as the void highwalls and low walls, although some stock corridors and farm machinery access will be required through these areas for stock and land management. Carefully managed short ‘crash’ grazing will be able to be permitted in some native woodland habitat rehabilitation areas to manage fire risk fuel loads. The percent of native vegetation to be established for the amended Project across the HVO Complex is approximately 40%. At HVO North, approximately 37% of land is proposed to be rehabilitated to native vegetation, whereas at HVO South the area of land proposed to be rehabilitated to native vegetation is approximately 45%.
B	Agriculture – grazing	The remaining areas of land will be rehabilitated with native and introduced pasture species to facilitate cattle grazing consistent with historical and surrounding agricultural practices. Suitable stocking rate for these areas would be determined to ensure these areas are appropriately managed. Pastures will be a combination of native and introduced species consistent with pasture rehabilitation undertaken on site with land suitability classes ranging from 4–6 depending on soil depth, stoniness, slope and chemical limitations. The amended Project will establish grazing land across approximately 60% of rehabilitated areas across the HVO Complex, comprising approximately 63% of rehabilitated land at HVO North and approximately 55% at HVO South.
G	Water storages	This domain includes water storages to be established to supply water to the final land use. Figure 6.15 shows conceptual locations of water storages established on drainage lines established in the final landform which will initially be used to control runoff water quality by retaining sediment until adequate vegetation cover is established. When the vegetation cover criteria have been met the dams will be inspected, and sediment removed (if required) and dam sizes adjusted, or if necessary removed, to suit the final land use, with regard to catchment harvesting water licence requirements at the time of closure. This domain includes any dams that will be converted to water dams for future grazing or habitat purposes. Major water storages Lake James and Parnells Dam will be decommissioned and mine related infrastructure removed. Stock water and habitat dams may be constructed as replacement water supplies to support final land use purposes.
J	Pit lake	Three pit lakes, commonly referred to as final voids, will remain post mining, two at HVO North and one at HVO South. The pit lakes will be permanent water bodies functioning as groundwater sinks (EMM 2025). Final void levels achieving equilibrium are predicted to occur several hundred years after cessation of mining and evaporation causing all final voids to act as groundwater sinks. Median long-term pit lake levels for the voids are as follows: • HVO South void: -29.7 mAHD (110 m freeboard) • HVO North void: -17.8 mAHD (100 m freeboard) • Carrington void: 41.8 mAHD (14 m freeboard) Pit lakes in the final void occupy approximately 325 ha at HVO North and 162 ha at HVO South.

Domain code	Final land use domain	Domain information
Sub domain Ka	Other – native ecosystem – partial vegetation on highwall benches	Approximately 112 ha at HVO North and 73 ha at HVO South of final highwall will be revegetated to achieve partial revegetation on highwall benches with appropriate native habitat species. This revegetation will provide some habitat values and will assist to soften the geometric visual form of the highwalls. This is defined as a separate domain due to the revegetation methods and completion criteria being different to other native vegetation establishment areas in Domain A. Total areas reported for native vegetation calculations include Domain Ka, as it is native vegetation.
Sub domain Kb	Other – agriculture – grazing alluvial land	HVO has previously successfully rehabilitated strategic agricultural land. In May 1993, consent was granted to mine 170 ha of Hunter River alluvial flood plain (Alluvial Lands Project). The approval required verification that mining and subsequent rehabilitation would not result in the loss of prime agricultural land and that a sustainable post mining land use could be achieved once mining had been completed. Following mining, HVO successfully rehabilitated 63 ha of Class I and Class II agricultural land, in accordance with the former rural land classification scheme (Cunningham et al, 1988). This was able to achieve a lucerne hay productivity yield of 'at least equivalent to the average crop productivity yields for the Upper Hunter Region for three consecutive years. The remaining 102 ha was rehabilitated to Class IV grazing land in accordance with the consent requirements.



Source: EMM (2025); Glencore (2025); DCSSS (2024); GA (2009)

KEY

- Amended proposed HVO North development consent boundary
- Proposed HVO South development consent boundary
- Predicted drainage
- Predicted 20 m contour
- Lemington Road realignment
- Existing environment
- Rail line
- Major road
- Named watercourse
- Named waterbody

- Final landform land use domain
- Domain A | Native ecosystem
- Domain A- Sub domain Ka | Other- Native ecosystem- partial vegetation on highwall benches
- Domain B | Agriculture- grazing
- Domain B- Sub domain Kb | Other- Agriculture- alluvial land
- Domain G | Water storage
- Domain J | Pit Lake

- Existing commitments maintained by the Project (indicative location)
- Rural land capability
 - Class 2- DA 450-10-2003 MOD3
 - Class 3- DA 450-10-2003 MOD3
 - Class 4- DA 450-10-2003 MOD3
- Native ecosystem
 - Central Hunter Box-Ironbark Woodland - DA 450-10-2003 MOD3
 - Swamp Oak Floodplain Forest - DA 450-10-2003 MOD5

HVO Complex final land use domains

HVO Continuation Project
Amendment Report
Figure 6.15

6.9.4 Rehabilitation planning and implementation

A Mine Closure and Rehabilitation Strategy (EMM 2022b) was prepared to support the EIS (Appendix T to the EIS) which detailed the rehabilitation methods to be adopted for the amended Project.

The rehabilitation methods documented in the Mine Closure and Rehabilitation Strategy remain valid for the amended Project and will be captured within the HVO Rehabilitation Management Plan should the amended Project be approved.

Final rehabilitation and Project closure requirements will ultimately be developed as part of a detailed closure plan, which will be produced within five years of closure in consideration of input from key government agencies and relevant stakeholders at the time.

6.9.5 Management, mitigation and monitoring

The mitigation measures detailed in Table 6.61 will be implemented for the amended Project.

Table 6.61 Rehabilitation and closure mitigation measures

ID	Mitigation measures
RC1	The Rehabilitation Management Plan will be updated for the Project.
RC2	The final landform in areas disturbed by the Project will incorporate natural design elements generally in accordance with the conceptual design presented in this EIS.
RC3	The final land use across rehabilitated areas of the site will include a combination of grazing and native woodland ecosystem land uses, or as determined as part of detailed closure planning processes.
RC4	A detailed closure plan will be developed within five years of cessation of mining.
RC5	Rehabilitation monitoring will be undertaken using analogue sites and landscape function analysis to assess rehabilitation progress and success, as detailed in the Rehabilitation Management Plan.

6.9.6 Conclusion

The final landform and final land use domains proposed to be achieved by the amended Project are presented in Figure 6.15

Project closure requirements will be formulated in consultation with key government agencies and other relevant stakeholders to be undertaken during the detailed closure planning phase.

The amended Project, including the proposed continuation of mining and associated infrastructure, do not change the existing approved mine closure, rehabilitation or post mining land use objectives. The final land use objectives for the amended Project have been maintained largely consistent with currently approved land use objectives, with agricultural grazing and native ecosystem woodland areas achievable across the complex. The proposed ratio of agricultural grazing and native ecosystem woodland for the amended Project is approximately 60% and 40% respectively, which is generally consistent with what is currently approved.

The remainder of the final landform will comprise pit lakes or water storages in support of final land uses. Rehabilitation progress will be regularly monitored in accordance with the completion criteria detailed within the Rehabilitation Management Plan, with the results of the monitoring to be reported in the Annual Review for the HVO Complex.

Final rehabilitation and Project closure requirements will ultimately be developed as part of a detailed closure plan, which will be produced within five years of closure in consideration of input from key government agencies and relevant stakeholders at the time.

6.10 Other matters

Table 6.62 outlines considerations of other environmental aspects in relation to the amended Project.

Table 6.62 Other matters

Aspect	Considerations
Traffic and transport	The amendments detailed in Chapter 3 of this Amendment Report do not alter the proposed workforce of 1,500 across the HVO Complex as presented in the EIS. Consequently, the proposed amendments are not anticipated to have any greater impact on the local road network beyond what was presented in the EIS, Submissions Report, and HVO North Amendment Report. In fact, due to the reduced project life and the omission of the LCPP and associated rail facilities, impacts are likely to be less. The Traffic and Transport Impact Assessment (TTIA) prepared for the EIS (Appendix R of the EIS) (EMM 2022a) assessed the potential impacts of the Project on the local road network during construction and continued operations. Key considerations included: • construction and operational traffic movements • realignment of Lemington Road • upgrade to the intersection of Comleroi Road/Golden Highway • access to operations, including via the realigned Lemington Road. The TTIA was underpinned by extensive baseline surveys, including traffic counts on local roads and intersections. The construction program, anticipated to span five years, involves upgrades to existing facilities at the HVO Complex and the realignment of Lemington Road. Notably, intersections such as Lemington Road/New England Highway and Old New England Highway/New England Highway were identified to operate at capacity. To mitigate potential adverse traffic queuing, it was recommended to minimise outbound heavy vehicle movements accessing Lemington Road during peak hours. The TTIA concluded that the impact on the local road network during this phase would be acceptable, requiring minimal mitigation measures manageable through a Transport Management Plan (TMP). During continued operations, the TTIA found that the Project's impact on the local road network was expected to be minor. No changes to the existing approved workforce were proposed, and thus, operational traffic movements remain unchanged. Beyond 2035, some intersections were expected to reach Level of Service (LoS) F, indicating longer delays; however, these impacts are generally confined to side streets and auxiliary lanes. The TTIA found that the realignment of Lemington Road is projected to enhance travel reliability, safety, and average speed. A new bridge replacing the existing single-lane low-level Moses Crossing over the Hunter River will substantially improve flood resilience, providing more reliable access between the New England Highway and Golden Highway. Travel time changes due to the realignment were assessed as follows: • trips to/from the west of the Lemington Road/Golden Highway intersection may increase by 1.4 to 2.3 minutes, affecting approximately 5% of current trips on Lemington Road • trips to/from the east of the intersection may decrease by approximately 9–10 minutes, indicating an improvement in travel time. In response to feedback from Transport for NSW (TfNSW) and Muswellbrook Shire Council (MSC) during the EIS exhibition, additional assessments were conducted. These included updated baseline traffic data and evaluations of potential impacts on the Comleroi Road/Golden Highway intersection and the access driveway to the Hunter Valley Gliding Club (HVGC). The findings reaffirmed the TTIA's conclusions that, with proposed mitigation measures, the Project would have minimal impact on the local road network during construction and operation. Further investigations into vegetation communities along the Lemington Road alignment led to a proposed amendment in the HVO North Amendment Report (EMM 2023b). This change added 580 m to the alignment to avoid Warkworth Sands Woodland and two scarred trees of Aboriginal cultural heritage significance. A supporting traffic technical memorandum indicated this amendment would result in an estimated 25-second increase in travel time, considered a minor impact. Measures to mitigate and management traffic and transport impacts from the Project include: • A TMP will be developed for the Project and will include:

Aspect	Considerations
	– measures to be implemented to minimise interruption to the local road network during construction activities, and ensure the safe ingress and egress of construction vehicles – liaison with relevant road authorities and local school and bus providers to manage intersection performance affected by increased demand by construction traffic. • To manage intersection performance affected by increased demand by construction traffic: – minimise outbound construction truck movements during the AM peak period (6.00 am–7.00 am) at Lemington Road/New England Highway – primary access via the Liddell Station Road access, so that the Old New England Highway is used as a secondary access only at Old New England Highway/New England Highway. • To maintain connection between the Golden Highway and the New England Highway the new portion of Lemington Road will be constructed and complete prior to the closure of the existing alignment. Other than managed traffic control during the tie-in work, the construction of the new alignment will not restrict access or use of the existing Lemington Road.
Soil, land resources and agriculture	The Soil and Land Impact Assessment prepared for the EIS (Appendix K of the EIS) (EMM 2022a) consisted of a site verification for undisturbed areas of LSC in accordance with the LSC Guideline (OEH 2012). The proposed post-mining LSC was based on the application of available soil materials on a rehabilitated landform according to final land use domains. These calculations have been amended to account for the revised final land use domain. These domains would be rehabilitated to a suitable LSC to facilitate the final land uses. The post-mining LSC is as follows: • Domain A and Ka – Native ecosystem: LSC Class 5/6/7 – covering approximately 3,186 ha. • Domain B – Agricultural: – Grazing: LSC Class 4/5/6 – covering approximately 4,756 ha. – Domain Kb – Grazing alluvial areas: LSC Class 2 and 3 – covering 62 ha. • Domains G – Water storages and Domain J – Pit lake: LSC Class 8 – covering approximately 558 ha. The percentage breakdown for native ecosystem vs agricultural land includes: • HVO Complex: – Domain A and Ka – Native ecosystem: 40% – Domain B – Agricultural: 60% • HVO North: – Domain A and Ka – Native ecosystem: 37% – Domain B – Agricultural: 63% • HVO South: – Domain A and Ka – Native ecosystem: 45% – Domain B – Agricultural: 55% Appendix K of the EIS (2022) states that the soil resources suitable in post mining landforms is approximately 7,336,370 m³. The total volume of material required to meet the final land use and LSC objectives was calculated to be approximately 7,791,000 m³. Therefore, it was calculated there would be a soil deficiency of approximately 454,630 m³. Additional alternate growth medium enhancement strategies were identified to potentially be employed to mitigate this deficit, which remain relevant and would be implemented for the amended Project. An Agriculture Impact Statement was also prepared for the EIS (Appendix Q of the EIS) (EMM 2022a). The original Project was not predicted to result in significant adverse impacts on surrounding private agricultural land and mining operations are expected to successfully continue to coexist with the surrounding agricultural land uses. With the exception of the post mining LSC, no change to the outcomes of the soil and land resources assessment and the agriculture impact statement (as detailed in the EIS) have been identified and impacts associated with soil resources and agriculture associated with the amended Project are generally consistent with the EIS.

Aspect	Considerations
Blasting	Blasting across the amended Project is proposed to be undertaken as per the Blasting Impact Assessment (BIA) prepared for the EIS (Appendix J of the EIS) (EMM 2022a). The limits adopted within the BIA are consistent with those provided in <i>Technical Basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration</i> (ANZECC 1990). The amendments proposed in Chapter 3 will not result in additional impacts as a result of blasting. Exposure to vibration and airblast overpressure can be effectively managed via the application of reduced charge masses. Consistent with the findings presented in the EIS (EMM 2022a), no impacts are predicted to declared dams, adjacent mines or the Hunter Valley Gliding Club from vibration or airblast overpressure. Consistent with the original Project, mitigation and management measures to mitigate the risk of impact from blasting activities include: • Blasting and vibration will continue to be managed and monitored as per the HVO Blasting Management Plan (BMP), which will be updated to reflect the amended Project. The BMP will describe aspects such as: – blasting times and frequency – pre-blast assessment protocol – road closure protocols – notification protocols – blast model review and optimisation – blast and vibration monitoring. • Blasting will be undertaken: – between the hours of 7:00 am and 6:00 pm, Monday to Saturday – no blasts on Sundays or public holidays – up to 3 blasts per day and 12 blasts per week at HVO North – up to 3 blasts per day and 15 blasts per week at HVO South. • When blasting within 1,500 m of the heritage sites the Great Lodge, Carrington Homestead and Wandewoi Homestead, blast design measures will be carried out to meet applicable ground vibration criteria. • Increased blast control measures will be employed when blasting within the identified sections of HVO North and HVO South (shown in Figures 11.3, 11.4 and 11.5 of the EIS (EMM 2022a)) to manage relevant overpressure and vibration levels below applicable limits for public infrastructure, private residences and heritage items. • The existing blast monitoring system will continue to be utilised for the Project. An additional three monitoring units will be installed at different stages of the amended Project and one portable monitor will be used as follows: – one monitor at a location representative of identified private residences in Jerrys Plains – one monitor at a location representative of the Great Lodge (heritage site) – one monitor at a location representative of the Oaklands Homestead and associated structures – one portable monitor positioned at a location representative of the closest heritage site (Carrington or Wandewoi Homestead) to the active blasting area. Timing for the commencement of additional blast monitoring will be detailed in the BMP.

Aspect	Considerations
Historic heritage	The Historic Heritage Assessment (HHA) prepared for the EIS (Appendix O of the EIS) (EMM 2022a) assessed the potential historic heritage impacts of the original Project. A number of heritage items are within the existing and proposed development consent boundaries for the Project. Notably however, mining activities will not occur closer to identified heritage items to that previously occurred or as currently approved. Impacts to historic heritage items as a result of the proposed Amendments are anticipated to remain consistent with the findings presented in the EIS (EMM 2022a). At HVO North, one unlisted item assessed as having local contributory significance will be directly impacted by the Project at HVO North, being the remnant stockyards. Archival recording in the form of digital photography will be undertaken to capture the pre-development state prior to disturbance of the remnant stockyards and remnant foundations at HVO North. No other historic heritage items at HVO North or HVO South would be directly impacted by the amended Project. General management and mitigation measures for items of historic heritage remain unchanged to those presented in the HVO North Amendment Report (EMM 2023b) and include: • A Historic Heritage Management Plan (HHMP) will be prepared for the Project, which will include the historic heritage items identified in the historic heritage study area, and will include: – a description of the condition and significance assessment of identified items – management measures and guidelines for the protection and conservation of each item – an unanticipated finds protocol. • Realigned transmission line structures will be sited so that no direct impacts occur to the remnant foundations identified at HVO North. • An assessment of significance will be prepared for the Great Lodge at HVO South.
Visual amenity	The Visual Impact Assessment (VIA) prepared for the original Project (Appendix S of the EIS) (EMM 2022) assessed the potential visual amenity impacts of the original Project. It assessed the potential incremental impacts of the continuation of HVO North and HVO South given separate development consents are being sought for each operation. The assessment was conducted from 12 representative viewpoints surrounding the Project area, including viewpoints representative of views from private dwellings in Maison Dieu, Long Point, Jerry Plains and Camberwell and views from the local road network. The VIA determined that, of the viewpoints assessed, Project elements may be visible to varying degrees from 10 of the 12 viewpoints (as is currently the case). Based on distance to the Project area, existing view types and context, variable elevation and undulation in the landscape and the presence of vegetation, the assessment predicted: • no visual impact for viewpoints 8 and 10 (in Jerrys Plains) • a negligible visual impact for viewpoints 1 and 2 (in Camberwell), and 9, 11 and 12 (in Jerry Plains) • a slight/moderate visual impact for viewpoints 3, 4 and 5 (in Maison Dieu), 6 (in Long Point) and 7 (Hunter Valley Glider Club). Following exhibition of the EIS, submissions were received raising concerns regarding the visual impacts the original Project would have on the Coolmore and the Hunters thoroughbred breeding activities at Jerrys Plains. To determine potential visibility of the Project two additional viewshed analyses were completed in the Submissions Report (EMM 2023b). The viewshed analyses and photomontages indicated that the views would not significantly change from the existing baseline views for Years 7 and 18 of mining and the final landform of HVO. The key potential for change to visual amenity associated with the amended Project is the removal of the LCPP and rail facilities approved for construction and operation at HVO South and changes in final landform heights compared to the original Project. In the VIA (Appendix S of the EIS), the LCPP if built would have been visible from residences in Long Point and Maison Dieu without screening. Impacts were expected to either be low or negligible. Removal of the LCPP and rail facilities will remove the visual impacts to these residences. Also, although there are minor changes in landform elevations compared to the original Project, all landform designs will remain below current approved heights and will not be materially different to the visual impacts of the original Project. Therefore, the changes proposed in this Amendment Report are not anticipated to have any greater impact on visual amenity beyond what was presented in the EIS, Submissions Report and previous HVO North Amendment Report.

Aspect	Considerations
Hazards, public safety and health	The proposed amendments presented in Chapter 3 will not result in a change that would influence the outcomes of the Preliminary Hazards Analysis (PHA) as detailed in Chapter 22 of the EIS. The PHA determined that there would be no incidents which would result in offsite impacts; hence, the potential for fatality or injury or environmental impact to occur would be negligible. As the potential for offsite impacts is low to the point of negligibility. Areas of contamination identified during previous investigations (AECOM 2020, 2021) will not be impacted by the amendments proposed with Chapter 3. If contamination is identified during current or future operations, consideration of the EPA's duty to report guidelines should be undertaken to evaluate whether notification of contamination to the EPA is required.
Waste	The proposed amendments outlined in Chapter 3 will not result in additional impacts from waste to those presented in the EIS (EMM 2022a). Waste streams associated with the amended Project will be classified and managed in accordance with the POEO Act, <i>Waste Avoidance and Resource Recovery Act 2001</i>, <i>NSW Waste Avoidance and Resource Recovery Strategy 2014–21</i> (EPA 2014) and the <i>Waste Classification Guidelines</i> (EPA 2014b). Special waste (i.e. tyres, conveyor belts) will be managed in accordance with the requirements of EPL 640.

7 Justification

7.1 Introduction

This chapter provides a justification and evaluation for the amended Project as a whole, having regard to its economic, environmental and social impacts and the principles of ESD.

7.2 Project design

The justification for the original Project, as described in the EIS, remains valid for the amended Project. The development of the Project design for which approval is now sought has been an iterative one developed over a number of years and being further refined to address submissions received in respect to the original Project detailed in the EIS and respond to evolving legislation and policy on GHGs. Detailed design studies considering both mining options and infrastructure arrangements were carried out to inform the original Project design as presented in the EIS. As part of this Amendment Report, the Project has been redesigned to significantly reduce the GHG emissions and impacts to the Warkworth Sands Woodland EEC. Key aspects where the principles of avoidance and impact minimisation through design have been adopted are:

- Design changes:
 - Reduced the project mine plan to avoid coal extraction within gas Domain 1 at HVO North and reduced the total ROM coal to be extracted across both HVO North and HVO South. The proposed amendments, when compared to the original Project presented in the EIS, will result in a reduction of the total ROM coal extraction by approximately 220 Mt. When compared to the original Project, this will result in a:
 - ~31% reduction in diesel emissions over the life of the amended Project
 - ~55% reduction in fugitive emissions over the life of the amended Project, including an approximate ~89% reduction in fugitive emissions from 2040 onwards
 - ~43% reduction in total Scope 1 emissions over the life of the amended Project.
- Lemington CPP and associated rail loop:
 - Remove approval for the construction and operation of the LCPP and associated rail facilities, which is currently approved, but not constructed, under the HVO South Project Approval. This will result in the complete avoidance of the 0.3 ha of impact to the Warkworth Sands Woodland EEC proposed as part of the HVO North Amendment Report (and the 5.2 ha originally proposed to be disturbed as part of the original Project). The amended Project will now have no impact to any Warkworth Sands Woodland EEC.

7.3 Project objectives and need

The primary objective of the amended Project is to efficiently and economically recover approximately 430 Mt of ROM coal reserves across the HVO Complex, over approximately 19 years. Mining operations will continue within existing mining tenements and predominantly within existing and approved disturbance areas across the HVO Complex, using existing infrastructure. The amended Project will:

- enable the continuation of a brownfield mining complex in a long-established coal mining and power generation precinct

- maximise resource recovery by mining to the deeper Barrett seam in HVO North, within environmental constraints and existing mining tenements utilising existing or already approved infrastructure minimising further disturbance
- provide ongoing employment opportunities for the existing approximate 1,500 FTE workforce well beyond the life of the current planning approvals under which the complex operates, which will become increasingly important as the local and regional Hunter Valley economy continues to diversify beyond coal
- provide ongoing economic contributions to the local and regional community surrounding the amended Project area
- provide improvements in terms of reliability and accessibility of Lemington Road in heavy rainfall through the realignment of the road, which will include the construction of a new bridge over the Hunter River
- provide the opportunity to contemporise the HVO final landform by incorporating natural landform design principles. Areas disturbed by mining activities will reflect a landform that is sympathetic to the surrounding landscape
- continue the ongoing contribution to the local, regional, and State economies from a well-established mining operation.

7.4 Consistency with the strategic context

As described in Chapter 3, the amended Project involves the continuation of an existing mine in an established coal mining and power generation precinct, providing employment and other socio-economic contributions to the local and regional community consistent with that proposed under the EIS. The strategic planning framework for the area is well established, and mining projects are permissible with development consent on the land within the site.

The amended Project represents a brownfield mining proposal that aligns with strategic direction and policy objectives at a local, state and national level. Current national and NSW policy recognises the ongoing demand for coal, particularly in the Asian export market (which is the current key market for HVO) and its importance to the NSW and Australian economy (IPC 2022a, and IPC 2022b).

At a Commonwealth level, the CC Act commenced on 14 September 2022, which enshrines Australia's commitments under the Paris Agreement to reduce Australia's national GHG emissions to net zero by 2050. The life of the amended Project (2045 at HVO North and 2042 at HVO South) is consistent with the assumptions which underpin the net zero commitment timeline. One of the Federal Government's key policy measures designed to achieve its GHG emissions reduction target is the Safeguard Mechanism. The Safeguard Mechanism applies to 215 designated large facilities as defined by the NGER Act. HVO is a designated large facility, and therefore the Safeguard Mechanism applies and HVO will be subject to the emissions reduction requirements contained within it. Further, HVO commits to achieving a baseline with a reduction rate consistent with NSW NZF Act targets, to support NSW's overall GHG reduction objectives.

Both Yancoal and Glenore have developed robust climate change strategies for their global operations. Glencore has carefully considered its position regarding the future of its coal mining operations and how it intends to support the global transition to a low-carbon future. In 2020, Glencore announced it would adopt a responsibly managed decline of its global coal portfolio. Glencore believes that by managing the depletion of its coal portfolio and responsibly realising the remaining value in these assets it can make a meaningful contribution to global climate change goals. Glencore has factored the continued development of its coal project pipeline, including HVO, into its plan.

Yancoal also recognises that energy production associated with the consumption of traditional fossil fuel energy sources contributes to global warming through the release of GHG emissions, and it therefore has an important role to proactively manage the direct (scope 1) and indirect (scope 2) emissions and energy intensity of its operations, and to support research into technologies that will reduce GHG emissions from the downstream consumption of its products (scope 3). In this regard, GHG emission mitigation is a key consideration in the development of the mine plan, and measures to minimise or mitigate scope 1 and scope 2 GHG emissions have been considered throughout the development and assessment of the Project.

Since the submission of the EIS and HVO North Amendment Report, the 2024 WEO notes that continued investment in fossil fuels is essential in all of the scenarios modelled. It will be needed to meet increases in demand over the period to 2030 in the STEPS, which explores how the energy system will evolve if current policy settings are retained, and will also be needed to avoid a precipitous decline in supply that would far outstrip even the rapid declines in demand seen in the NZE scenario. While global coal demand is set to fall within the next few years, strong demand will remain for coal in the power sector out to 2050 under the STEPS.

The *International Energy Outlook 2023* also identifies that while renewable energy is growing the fastest as a share of the primary energy consumption across all cases it modelled, the demand for coal in 2050 is predicted to still be at a similar level in terms of tonnes of coal, to demand now, under all scenarios

7.5 Compliance with statutory requirements

The compliance of the amended Project with statutory requirements is explained in detail in Chapter 4, and in Table 4.1 and Table 4.2, demonstrating compliance with all relevant requirements.

An assessment of the consistency of the amended Project with the objects of the EP&A Act is provided in Table 7.1, consistent with the Project as presented within the EIS.

Table 7.1 Amended Project’s consistency with the objects of the EP&A Act

Object	Consistency with the amended Project
To promote the social and economic welfare of the community and better environment by the proper management, development and conservation of the State’s natural and other resources.	The amended Project involves a mining operation that will, consistent with the objects of the Mining Act, extract a State-owned resource for the benefit of the State of NSW. The Project will facilitate the extraction of approximately 430 Mt of ROM coal from a brownfield mine in a well-established mining and power generation precinct. Through the amended Project, HVO will therefore develop a valuable resource by providing the necessary capital and skills, without which the resource would likely remain in situ and the economic benefits and social benefits documented in the EIS and this Amendment Report would not be realised.
To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	The EIS and this Amendment Report describe the economic, environmental and social context of the Project and the potential impacts of it to allow informed consideration of these aspects in determining the development application. Consideration of the amended Project against the principles of ESD is provided in Table 7.4.
To promote the orderly and economic use and development of land.	The orderly and economic use of land is best served by development that is permissible under the relevant planning regime and predominately in accordance with the prevailing planning controls. The amended Project is permissible with development consent, as presented in the EIS, and is consistent with statutory and strategic planning controls. It is a brownfield mining proposal involving the continuation of a well-established mining operation using predominantly existing infrastructure. As detailed in the EIS and this Amendment Report, the amended Project will result in positive economic impacts, with appropriate mitigation measures and management strategies being proposed to minimise any adverse environmental and social impacts.

Object	Consistency with the amended Project
To promote the delivery and maintenance of affordable housing.	This objective is not directly applicable to the amended Project. However, the amended Project will deliver substantial royalties to the NSW Government which can be used in full, or part, to help the government deliver on its commitments to affordable housing.
To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	Measures to avoid and minimise impacts to native vegetation and threatened species habitat were considered during the initial design stages of the Project and reviewed following receipt of public and agency submissions, resulting in avoidance of significant biodiversity values and minimisation of impacts on other areas of native vegetation. Significantly, as part of the amended Project, there will be no impacts to the Warkworth Sands Woodland EEC. All unavoidable impacts will be offset in accordance with NSW Government biodiversity offset scheme.
To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	Avoidance of Aboriginal cultural heritage values has been a key aspect of the Project refinement process, with the amended Project specifically designed to avoid CM-CD1 and culturally modified trees: TR212-ST1 (37-3-1629) and TR216-ST1 (37-3-1635).
To promote good design and amenity of the built environment.	Potential air and noise impacts on sensitive receptors have been fully assessed and described in Section 6.2 and Section 6.3, respectively. Visual impacts have been fully assessed in Chapter 20 of the EIS and remain generally consistent for the amended Project.
To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Over the life of the amended Project, infrastructure will be maintained, or upgraded, to ensure safe and efficient operations. Construction associated with the amended Project will be compliant with the Building Code of Australia, as relevant, and all other relevant statutory requirements.
To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	This is a matter for the different levels of government in the State. As summarised in Chapter 5 of the EIS, Chapter 3 of the Submissions Report and Chapter 5 of this Amendment Report, a wide range of government agencies have been consulted regarding the project, including Singleton Council, Muswellbrook Shire Council, DPHI, EPA and DCCEEW.
To provide increased opportunity for community participation in environmental planning and assessment.	As described in Chapter 5 of the EIS, Chapter 3 of the Submissions Report and Chapter 5 of this Amendment Report, a range of engagement activities have been undertaken to inform the community about the Project and to seek community (and other stakeholder) feedback. The EIS, Submissions Report and this Amendment Report provide further detailed information regarding the Project and its potential impacts.

7.6 Consideration of community views

Consultation and engagement activities conducted for the Project are described in Chapter 5 of the EIS, Chapter 6 of the Submissions Report and Chapter 5 of this Amendment Report. Feedback from the community during exhibition of the EIS included both positive and negative views on a range of topics.

During the public exhibition of the EIS, a total of 1,060 submissions were received by DPHI from government agencies, councils, public authorities, organisations, and individuals. The majority of the submissions received (91%) were in support of the Project.

Most stakeholders recognised the benefits of the Project. In particular, stakeholders acknowledged the Project as a source of local employment, particularly in reference to the established workforce. Stakeholders were also interested in understanding how the benefits of the Project could be shared within the community.

Some concerns were raised by community stakeholders regarding the associated environmental impacts and the ongoing reliance of coal both nationally and internationally.

A summary of the submissions relating to the Project (HVO North and HVO South combined), including the total number of submissions that supported, objected, commented or provided advice on the Project, is provided in Table 7.2. Further detail regarding submissions is available within the Submissions Report.

Table 7.2 Submissions summary

Submission source	Support	Comment	Advice	Object*	Total
Government agencies and Councils	0	0	13	0	13
Organisations	31	0	0	18	49
Individuals	932	11	0	54	997
Public authorities	0	1	0	0	1
Total	963	12	13	72	1,060

Notes *: of the 72 objecting submissions, 67 are considered unique submissions for the purposes of section 2.7(6) of the State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP).

The Project has been amended to address some concerns raised in submissions and to respond to the evolving legislative and regulatory context in relation to GHG emissions.

7.7 Summary of amended Project impacts

7.7.1 Environmental

The potential impacts to the biophysical environment as result of the amended Project are summarised in Table 7.3. As the table demonstrates, with the exception of impacts to biodiversity and Aboriginal cultural heritage, and the generation of GHG emissions, which have been reduced, the impacts of the amended Project are largely consistent with those reported in the EIS and HVO North Amendment Report for the Project.

Table 7.3 should be read in conjunction with the EIS and HVO North Amendment Report, for clarification regarding specific aspects of the considered environmental aspects.

Table 7.3 Summary of environmental impacts

Environmental aspect	Key findings
GHG	- Compared to the original Project assessed in the EIS the amended Project will: - reduce diesel emissions by 31% - reduce fugitive emissions by 55%, including by 89% from 2040 onwards - reduce scope 1 emissions by 43%. - The estimated annual average scope 1 GHG emissions are 795 kt CO₂-e/year and the estimated annual average scope 2 GHG emissions are 11.3 kt CO₂-e/year. The net emissions from the Project (under the combined Safeguard Mechanism and NSW decline trajectory) represent between 0.25% and 0.81% (depending on the year) of state-wide emissions in the NSW current policy case. Annual average scope 3 GHG emissions are 41,777 kt CO₂-e/year. In total, approximately 15,104.2 kt CO₂-e of scope 1 and 214.9 kt CO₂-e scope 2 are anticipated to be emitted over the amended Project life. - HVO will continue to manage its contribution to Australian GHG emissions inventories through reporting under the NGER Act, as well as other government initiatives implemented to manage emissions at a national level. As a designated large facility under the NGER Act, the Safeguard Mechanism applies to HVO, and therefore ongoing operations at HVO will be subject to the emissions reduction requirements that are contained within it. Given HVO is already, and will remain, a covered facility under the Safeguard Mechanism, project-level emission reduction requirements will apply to HVO as a result of the Safeguard Mechanism reforms. - Countries importing product coal from the HVO Complex for power generation have submitted NDCs under the Paris Agreement or have followed international standards recognized by the UNFCCC and published NDCs in line with the Agreement.

Environmental aspect	Key findings
Air quality	- HVO has additionally volunteered to adopt a higher decline rate than legislated under the Safeguard Mechanism, to reduce the emissions profile of the amended Project in light of the NSW emissions reduction targets under the NZF Act. - HVO will also continue to undertake regular reviews of technologies and abatement measures to reduce GHG emissions from the amended Project, including whether these measures are reasonable and feasible to implement at HVO. These reviews will be undertaken every three years and will include consideration of the use of alternate fuels including biofuels and hydrogen, and the transition to an electric powered fleet, as these technologies advance and more information becomes available. - HVO will also conduct a trial of gas pre-drainage in areas identified with higher potential, to investigate the feasibility and effectiveness of gas pre-drainage. The design of the trial will be developed in consultation with relevant stakeholders to the satisfaction of the Planning Secretary and be provided within two years of commencement of the amended Project. - Construction activities, largely through the realignment of Lemington Road, have the potential to increase the overall dust emissions in the early phase of the amended Project (that is, the first two to three years) but these increases are not predicted to be of a magnitude that will change the air quality outcomes for privately owned sensitive receptors. Nevertheless, appropriate management and monitoring will need to continue during the construction activities. - Operational dust emissions due to ongoing mining activities are not expected to cause significant adverse air quality impacts at nearby privately owned residential sensitive receptors. 24-hour average PM₁₀ concentrations may continue to exceed air quality criteria from time-to-time; however, these events would be within the range of historically measured days above the criteria, excluding extraordinary events. - The amended Project proposes significantly (approximately 23%) lower quantities of material moved in each year. As such, particulate matter emissions and impacts are expected to be lower than originally estimated and presented in the EIS. - Under the VLAMP, one receptor (121) is anticipated to be afforded voluntary acquisition rights due to predicted exceedances of applicable criteria (annual average PM₁₀, annual average PM_{2.5} and annual average deposited dust). This receptor, and receptor 308, were predicted to trigger VLAMP for the original Project, and the amendment therefore represents a reduction in properties subject to acquisition rights with respect to air quality as a result of the Project from two to one.
Noise	- Development of the Project design has been an iterative one, undertaken in conjunction with the noise assessment and in response to submissions received, in which all reasonable and feasible mitigation measures have been considered in accordance with the NPfI (EPA 2017) to minimise noise impacts on sensitive receptors. These measures include progressive attenuation of the mining fleet, haul route selection to minimise exposure of significant noise generating mobile fleet, construction of a roadside bund on the exposed side of the haul road from the Mitchell Pit towards the Howick CPP, and equipment shutdowns during enhancing meteorological conditions. With all of these measures considered, achievable noise levels have been developed for HVO in accordance with the NPfI, which are proposed as the noise criteria for the amended Project, as presented in Appendix G. - Residual noise impacts were evaluated for the amended Project, with the outcomes as follows: - No receptors are predicted to experience a significant residual impact (i.e. >5 dB above PNTL), meaning that voluntary acquisition rights are not triggered at any receptor as a result of the Project. - The residual impact at all receptors is predicted to be either negligible (1–2 dB above PNTL) or marginal (3–5 dB above PNTL). 30 receptors (equivalent to 24 landholders) are predicted to experience a marginal impact due to the amended Project. - Of these 30, 13 receptors will be entitled to voluntary mitigation rights based on predicted marginal residual noise impacts associated with the amended Project, eight of which already have existing rights under existing HVO approvals. In addition, there are 17 receptors in the village of Jerrys Plains where marginal noise impacts are predicted; however, they do not qualify for mitigation as per Section 4.2 of the NPfI. - The 13 receptors to be afforded voluntary noise mitigation rights in accordance with the VLAMP as a result of the Project are as follows, including the eight receptors with existing rights under existing HVO approvals: 326, 328, 330, 437, 487, 121, 160, 161, 162, 256, 258, 261, 497. - In addition, 12 receptors that already have mitigation rights in accordance with the HVO South Project approval are not predicted to experience noise levels such that they would be entitled to voluntary

Environmental aspect	Key findings
	mitigation rights for the Project; however, HVO proposes to retain voluntary noise mitigation rights for these receptors.
Biodiversity	• The amended Project allows for the complete avoidance of direct impacts to Warkworth Sands Woodland EEC as a result of Project refinements. • The landscape within and surrounding the Project is characterised by extensive historical clearing for agricultural, mining and rural development. • After accounting for the implementation of avoidance and minimisation strategies, the amended Project will directly impact 179.2 ha of native vegetation that meets the offsetting threshold under the BOS. Of this, 86.8 ha conforms to TECs under the BC Act (84.5 ha in HVO North and 2.3 ha in HVO South). • HVO is committed to delivering a biodiversity offset strategy that appropriately compensates for the unavoidable loss of biodiversity values and residual impacts of the Project. The offsetting options available under the BC Act and BC Regulation include the following options: – land based offsets: HVO will retire the required number and class of credits determined in accordance with the BDAR and the offset rules in the BC Regulation through the establishment of new stewardship sites (and the subsequent retirement of credits) or by retiring credits from existing stewardship sites) – purchasing credits from the market – paying into the Biodiversity Conservation Fund. • HVO proposes to stage the retirement of credits as clearing of the additional disturbance area occurs. The biodiversity offset strategy will be finalised in consultation with DPHI and CPHR and will be developed so that there is a net beneficial outcome for biodiversity values as a result of the amended Project.
Aquatic ecology and GDEs	• Amendments to the Project will not change the impacts of the Project on aquatic ecology and GDEs as reported in the EIS. • No impacts are predicted on the aquatic ecology of the Hunter River, particularly as flow will be mitigated through regulated releases from Glenbawn Dam, and only minor impacts to the aquatic ecology in the tributaries to the Hunter River are expected. • Groundwater modelling predicts minor incremental drawdown (up to 0.5 m) in a small area of the Hunter River alluvial aquifer north of the Carrington Billabong during mining. Alluvium along the main channel of the Hunter River is largely buffered from drawdown by impermeable groundwater barriers installed along sections of the aquifer and because infiltration from the Hunter River recharges the aquifer, so impacts to this aquifer ecosystem and terrestrial GDEs are likely to be minor or negligible. The alluvial aquifer will continue to be recharged from regulated flows in the Hunter River. • River red gums that opportunistically use shallow groundwater will continue to have access to shallow alluvial groundwater. • In addition, the amended Project is predicted to have a negligible impact on Hunter River flow and flooding regime post-mining. Therefore, river red gum communities will continue to rely on flooding for germination. • Stygofauna was collected during sampling, and most came from the paleochannel aquifer north of the Hunter River and west of the existing mine. This area is already planned for excavation as part of the approved Carrington West Wing pit for HVO North. However, the regional impact is likely to be negligible as all taxa collected from the paleochannel were also collected at other locations along the Hunter River and within the Hunter Valley. • There is no incremental drawdown predicted in the Wollombi Brook due to the amended Project.

Environmental aspect	Key findings
Water resources	• The groundwater and surface water assessments demonstrate that the amended Project can operate within and meet the requirements of the water regulatory framework. • The water management system is predicted to maintain an overall balance without excess accumulation or shortfall of mine water demands. • Impacts on Hunter River and Wollombi Brook streamflow will be negligible. • HVO holds sufficient entitlement for the predicted reduction in Hunter River streamflow due to the amended Project. • The amended Project is not anticipated to result in a lowering of the beneficial use category of the local water sources. • No changes to the flood impacts are anticipated from the EIS (i.e. no changes to flooding at third-party properties or impact on land use; improved flood immunity of the realigned Lemington Road; and no changes to flood hazard categories). No impact is predicted at third-party groundwater bores. • In comparison to the approved HVO South operations, the amended Project will result in less drawdown in the Wollombi Brook and there is no incremental drawdown predicted for the Project in that area. • Construction of the Carrington West Wing low permeability barrier wall prior to mining within 100 m of the remnant connected western arm of the paleochannel, as per the existing development consent requirement, will mitigate potential drawdown in the Hunter River alluvium and the potential for seepage from the backfilled mine area to the alluvium. • The final voids will act as regional groundwater sinks, and the long-term lake level will be considerably deeper than the base of the alluvium and the base of weathering. Therefore, the risk of seepage from the void lakes or backfilled mine areas is minor. • The risk of spill from the void lakes is negligible. • HVO holds considerable water entitlement in the relevant surface water and groundwater sources in the Project area, which is sufficient to account for the predicted direct and indirect take in most water sources. Prior to the groundwater take occurring, HVO will either apply to convert sufficient existing unregulated river entitlements to aquifer entitlements or purchase entitlement via the open market to account for the small predicted indirect groundwater take in the Jerrys Water Source (4 ML/yr during operations and up to 26 ML/yr post-mining). Take associated with runoff captured from storages on non-minor streams within the Jerry water source (Jerrys management zone) during the closure transition period that exceeds HVO's existing entitlement will be sourced from the open market (including trade, in accordance with the water sharing plan rules). A water licensing strategy for the Project is included in Appendix I (EMM 2025d).
Aboriginal cultural heritage	• Impacts as a result of the original Project were reviewed in consideration of the public and agency submissions relating to Aboriginal cultural heritage. Following review, the key outcomes of the Aboriginal heritage advice report (EMM 2025a)) are outlined below. • 279 extant Aboriginal sites and places have been documented within the amended Project disturbance area (which is a combination of the existing and approved disturbance area at HVO, and the additional disturbance area associated with the amended Project). Of these: – 11 sites have been assessed as having high significance – 16 sites have been assessed as having moderate significance – the remaining 252 sites are considered to be of low/low-moderate significance. • Following an iterative design process for the original Project, the HVO North Amendment and the amended Project as presented in this Amendment Report, the amended Project has avoided through re-design impacts to: – 9 sites assessed as having high significance – 7 sites assessed as having moderate significance – 66 sites assessed as having low significance. • Consequently, the amended Project will have an adverse impact on: – 2 sites (artefact scatters with archaeological deposit) assessed as having high significance – 10 sites assessed as having moderate significance – 187 sites assessed as having low/low-moderate significance. • Management and mitigation measures will include the cultural collection of surface stone artefacts and/or the passive/active avoidance of sites not proposed to be adversely affected.

Environmental aspect	Key findings
	- Archaeological investigative and salvage excavations will be implemented focussing on nine identified sites with high artefact densities and/or containing stratified cultural deposits, and where these sites are proposed for impact. - A consolidated HVO North and HVO South ACHMP will be prepared should the amended Project be approved in consultation with the RAPs and Heritage NSW, to guide the mitigation and management of sites in the Project area.
Traffic and transport	- Amendments to the Project will largely not change the traffic and transport impacts of the Project as reported in the EIS and HVO North Amendment Report. Notwithstanding this, due to the reduced project life and the omission of the LCPP and associated rail facilities, operational impacts are likely to be less. - During continued operations, the impact of amended Project on the local road network is anticipated to be minor. - The realigned Lemington Road will deliver an improved travel experience for users in terms of reliability, safety and average speed, by providing improved travel conditions via a larger radius, improved clear zone and shoulder widths, and replacement of the existing single-lane low level bridge crossing over the Hunter River (Moses Crossing) with a new bridge. - In terms of changes to travel time due to the Lemington Road realignment, it was found that: - trips to/from the west of the Lemington Road/Golden Highway intersection will increase between 1.40 minutes and 2.30 minutes indicating minor impact to travel time, affecting approximately 5% of the trips currently recorded on Lemington Road; and - trips to/from the east of the Lemington Road/Golden Highway intersection will decrease by approximately 9–10 minutes, which is an improvement in travel time. - The amended Lemington Road realignment may potentially increase trips by 20-25 seconds dependant on travel speed.
Blasting	- Amendments to the Project will not change the blasting impacts of the Project as reported in the EIS. - Exposure to vibration and airblast overpressure will be effectively managed by the Project via the application of reduced charge masses for private residential receptors at Maison Dieu and Jerrys Plains, heritage items (Great Lodge, Carrington Homestead and Wandewoi Homestead), infrastructure (public roads and bridges, high voltage powerlines and electrical substations) and livestock and the equine industry in Jerrys Plains. - HVO has a well-established pre-blast assessment protocol, blast monitoring system and weather monitoring system in place, that will continue to be implemented for the amended Project.
Historic heritage	- Amendments to the Project will not change the impacts of the Project on historic heritage as reported in the EIS. - At HVO North: - One unlisted item assessed as having local contributory significance, remnant stockyards, will be directly impacted by the amended Project at HVO North. Mitigation measures comprising archival recording are proposed for this item. No other historic heritage item will be directly impacted by the Project. - While the proposed realigned Lemington Road corridor at HVO North intersects with a portion of the mapped area related to the locally listed Archerfield, no physical items of heritage significance associated with the Archerfield Homestead and Outbuildings are within the Lemington Road alignment, and no direct impacts will occur. - The State listed Chain of Ponds Inn is within the HVO North existing and proposed development consent boundary. However, this item is outside of the existing and approved disturbance area associated with HVO and the additional disturbance area for the amended Project, as is more than 5 km from the proposed mining area. Therefore, Project related impacts are not predicted to occur to the Chain of Ponds Inn. - At HVO South: - No direct impacts will occur to historic heritage items. - The Dog Leg Fence, an ungazetted item but assessed as potential State significance, is located within the HVO South proposed development consent boundary; however, it is not within the Project disturbance area. No direct impacts will occur due to the amended Project and blasting activities are not proposed to occur any closer then currently approved. - The Great Lodge, an ungazetted item but assessed as potentially State significant, has been identified within the HVO South proposed development consent boundary; however, it is outside of the Project disturbance area. No direct impacts will therefore occur because of the Project, and the blasting

Environmental aspect	Key findings
	assessment found that potential impacts to the Great Lodge can be managed effectively via appropriate blast design. Given the nature of the item's condition, monitoring and further assessment to determine significance will be undertaken.
Soil, land resources and agriculture	- The post-mining LSC is as follows: - Domain A and Ka – Native ecosystem: LSC Class 5/6/7 – covering approximately 3,186 ha. - Domain B – Agricultural: - Grazing: LSC Class 4/5/6 – covering approximately 4,756 ha. - Domain Kb – Grazing alluvial areas: LSC Class 2 and 3 – covering 62 ha. - Domains G – Water storages and Domain J – Pit lake: LSC Class 8 – covering approximately 558 ha. - The percentage breakdown for native ecosystem vs agricultural land includes: - HVO Complex: - Domain A and Ka – Native ecosystem: 40% - Domain B – Agricultural: 60% - HVO North: - Domain A and Ka – Native ecosystem: 37% - Domain B – Agricultural: 63% - HVO South: - Domain A and Ka – Native ecosystem: 45% - Domain B – Agricultural: 55% - The available soil resources listed in the EIS (2022) are generally consistent with the amended Project. The EIS states that the soil resources suitable in post mining landforms is approximately 7,336,370 m³. The total volume of material required to meet the final land use and LSC objectives was calculated to be approximately 7,791,000 m³. Therefore, it was calculated there would be a soil deficiency of approximately 454,630 m³. Additional alternate growth medium enhancement strategies were identified to potentially be employed to mitigate this deficit, which remain relevant and will be implemented for the amended Project. - The Project disturbance area primarily consist of existing mining areas, existing rehabilitation areas and low intensity grazing land. - The amended Project is not predicted to result in significant adverse impacts on surrounding private agricultural land and mining operations are expected to successfully continue to coexist with the surrounding agricultural land uses.
Visual amenity	- Amendments to the Project will result in a negligible change to visual impacts compared to the original Project as presented in the EIS. - Visual impacts associated with HVO's existing mining operations have previously been assessed and approved and are considered as part of the existing environment. While it is acknowledged that there are privately-owned receptors and road corridors that are already subject to a high visual impact from HVO's existing mining operations and other surrounding mining operations, the level of visual impact on these properties will not materially change when compared with the approved Project.

i Ecologically sustainable development

The Commonwealth's *National Strategy for Ecologically Sustainable Development* defines ESD as 'using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased'. The NSW EP&A Act adds to this by providing a set of ESD principles.

Table 7.4 evaluates the principles of ESD against the amended Project.

Table 7.4 **Evaluation of ESD principles**

Principles	Evaluation against the amended Project
Precautionary principle	The precautionary principle holds that where there are threats of serious or irreversible environmental damage, a lack of full scientific certainty should not be used as a reason for postponing measures to prevent such damage. The proposed mine plan and overall project design has been developed based on the assessment of environmental, engineering and financial considerations. The amended Project has been designed to avoid and minimise potential environmental and social impacts whilst achieving positive Project outcomes. Each technical assessment has included multiple rounds of review and refinement to avoid impacts or, if unavoidable, minimise or offset them. Importantly, the principle of avoidance has been adopted wherever possible, particularly with respect to: • Greenhouse gas emissions through the avoidance of coal extraction in gas domain 1 • Warkworth Sands Woodland EEC • CM-CD1 • noise and visual amenity impacts to sensitive receptors, notable the Jerrys Plains locality, associated with mining north-west of Mitchell Pit • Aboriginal heritage items and biodiversity features associated with the Lemington Road realignment, transmission line realignment, and Lemington CPP and associated rail loop • historic heritage items associated with the transmission line realignment. A biodiversity offset strategy will also be implemented to achieve a net positive biodiversity outcome. With respect to GHG and potential impacts of climate change, HVO has committed to making additional, voluntary contribution towards emission-reduction targets to reflect consideration of the NZF Act. HVO will therefore implement a net emissions decline rate for the amended Project that is more ambitious than the Safeguard Mechanism requirements, involving: • a reduction of 5.9% per year from 1 July 2023 to 1 July 2029 • a reduction of 4.0% per year from 1 July 2030 to 1 July 2034 • a reduction of 2.58% per year thereafter. The amended Project's contribution to global GHG concentrations, and therefore to anthropogenic climate change, is proportionately very small. With respect to climate change impacts on the locality, this contribution is not sufficient to materially affect the extent or timing of climate change impacts in the local region, which are largely driven by global cumulative emissions. Unavoidable impacts will meet applicable regulatory criteria. An extensive list of mitigation measures is proposed to mitigate and manage the impacts, where unavoidable. These mitigation measures have been informed by the technical assessments prepared in support of this EIS, Submissions Report, HVO North Amendment Report and this Amendment Report which have been prepared by technical experts in each relevant field. For environmental aspects where a potential high risk or particular community concern was identified in the early stage of project planning, further experts were engaged to peer review technical studies to ensure the robustness of the Project design and the environmental assessment. Therefore, the amended Project addresses the precautionary principle because there will be no serious or irreversible environmental damage.
Inter-generational equity	Inter-generational equity is the concept that the present generation should ensure the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. The only beneficial land use that could be affected by the amended Project is agriculture. In this regard, the agricultural capability of the land to be disturbed will be progressively reinstated so that, with the exception of the final voids, significant parts of the amended Project area can be used for agriculture at the end of the mine life. The total area allocated for agriculture land use (Domain B: Agricultural – grazing) following the life of the Project is 4,818 ha which is a net increase from the baseline area of land use for agriculture. Some impacts to biodiversity will occur through the disturbance of native vegetation and habitat for species credit species listed under the BC Act. However, an offset strategy has been developed and once implemented, will mean a net beneficial gain in biological resources. The water management system for the amended Project is predicted to maintain an overall balance without excess accumulation or shortfall of mine water demands, minimising business disruption and potential impacts on surface water resources. The amended Project will not result in adverse changes to the environmental and community values of groundwater or surface water.

Principles	Evaluation against the amended Project
	The amended Project will contribute to global GHG emissions. However, this contribution will be very small as a proportion of global GHG emissions and is not sufficient to materially affect the extent or timing of climate change impacts in the locality, which are driven by global cumulative emissions. It is also not possible to conclude that the amended Project's GHG emissions will lead to a net increase in global emissions, and therefore contribute to an increase in global temperatures, as this outcome is dependent on multiple factors external to the amended Project. The mitigation measures outlined in Appendix C of this Amendment Report will be implemented for the life of the amended Project to ensure the health, diversity and productivity of the environment for the present generation and generations to come.
Conservation of biological diversity and ecological integrity	This principle holds that the conservation of biological diversity and the maintenance of ecological integrity should be a fundamental consideration for development proposals. The amended Project is on land that has a long history of disturbance from mining and agricultural land uses. There have been many refinements in the Project design to avoid impacts to biodiversity and to maintain ecological integrity. Including amending the Lemington Road alignment as proposed under the EIS and HVO North Amendment Report and removing approval for the construction and operation of the LCPP and associated rail facilities, to avoid all direct impacts to Warkworth Sands Woodland EEC. A final biodiversity offset strategy will be developed in consultation with DPHI and CPHR.
Improved valuation, pricing and incentive mechanisms	This principle includes activities which involve valuation, pricing and/or incentive mechanisms for the production, delivery, distribution or consumption of goods and services, especially those that are derived from natural or social capital or from ecological services. As demonstrated by the EIS and Section 6.8 of this Amendment Report, the Project's benefits significantly outweigh its costs. HVO accepts the financial costs associated with all the measures required for the amended Project to avoid, minimise, mitigate and manage potential environmental and social impacts.

7.7.2 Social

The impacts and benefits associated with the amended Project, consistent with the EIS, are likely to be experienced most acutely by those people who live nearby; however, they also extend throughout the broader region. No residual social impacts rated as a high risk have been identified for the amended Project. All potential impacts ranked as medium or low remain unchanged from that reported in the EIS with the exception of one which reduced from medium to low (impact of continued traffic congestion and road delays – construction). A number of social benefits have also been identified with a very high or high benefit rating.

The key social impacts that were identified by the SIA for the amended Project (all ranked as 'medium' risks) are:

- impacts due to continued generation of dust
- impact on community cohesion due to divergent opinions on the Project
- impact on an increased housing demand impacting rental affordability and availability
- impacts from ongoing noise and vibration
- impact of continued anxiety about potential effects on water quality
- impacts of continued exposure to dust and decreased air quality.

A range of mitigation measures are proposed to minimise these impacts.

The key social benefits of the amended Project that were identified by the SIA are:

- benefit of rehabilitation, future land use and ongoing land management

- benefit of the realigned Lemington Road and new bridge over the Hunter River, improving the reliability and safety of this road
- benefit of the Project contributing to ongoing stability of the local population
- benefit of continued royalty payments to the NSW state government
- benefit related to community grants and sponsorship
- benefit from the ongoing support of empowerment programs for local Aboriginal groups
- benefit of the continued opportunities for local employment and training opportunities – construction and operation
- benefit related to employment and training pathways for Aboriginal and Torres Strait Islander people
- benefit of the continuation of procurement opportunities for local businesses – construction and operation
- benefit of allowing more time for transition planning.

In addition to these identified benefits, HVO has committed to the establishment of a social mitigation funding framework, which will be further developed as part of the preparation of the SIMP for the Project and will be focussed on funding Closing the Gap initiatives. The framework will include:

- a program to assist in increasing job readiness and work experience for local Aboriginal people
- a funding framework to enable funding of programs and projects that align to Closing the Gap initiatives or community mental health, to the value of \$1,000,000 over the first 10 years of the Project
- HVO will liaise further with the Aboriginal Community to define an appropriate location and frequency where briefings could be held on the HVO procurement processes to enable Aboriginal suppliers to be able to tender for work. In addition to briefings, HVO will consider providing funding to support business/procurement training programs.

7.7.3 Economic

The amended Project is justified economically due to the significant net economic benefits and the economic stimulus it will provide locally and to NSW. Importantly, the Project involves a mining operation that will, consistent with the objects of the Mining Act, extract a State-owned resource for the benefit of the State of NSW.

A project is economically beneficial if its benefits exceed its costs measured in today's values. The net benefit of the amended Project for NSW is estimated at \$5,692.4 million in NPV terms (a reduction of \$2,143.8 million from the original Project), comprised of the following:

- direct benefits of \$2,768.1 million (NPV), comprising:
 - royalties, payroll tax and council rates of \$2,395.2 million
 - company income tax apportioned to NSW of \$372.9 million
- indirect benefits of \$2,941 million (NPV), comprising:
 - net economic benefit to NSW workers of \$1,158.4 million
 - net economic benefit to NSW suppliers of \$1,783.5 million

- incremental indirect costs of \$17.6 million, noting this value is considered conservative given the reduction in GHG gas emission as documented in the Section 6.1.

A number of flow-on effects will occur as a result of the amended Project's capital and operating expenditure, and ongoing employment opportunities, which will benefit the regional economy.

The amended Project will deliver an estimated net benefit of \$1,778.1 million to the Lower Hunter region (SA3) in NPV terms, comprised of:

- royalties, payroll tax and council rates of \$72.1 million
- net economic benefit to NSW workers of \$990.9 million
- net economic benefit to NSW suppliers of \$780.3 million
- indirect costs \$75.2 million.

Given the significant net benefits of the amended Project, it is desirable and justified from an economic efficiency perspective.

It is noted that amendments to Project, identified in this Amendment Report, will not change the CIV of the Project as reported in the EIS.

7.7.4 Cumulative

HVO has a long history of operations, and in this time has developed an extensive understanding of the environment in which it operates, and its interaction with neighbouring mines. An extensive monitoring network assists HVO in adapting its operations so that operations meet relevant criteria in conjunction with surrounding mines and other industry. The technical studies undertaken to inform the EIS and this Amendment Report considered cumulative impacts of surrounding development, as described in Section 6.10 of this Amendment Report and Chapter 26 of the EIS.

7.8 Conclusion

HVO is seeking approval to continue mining operations at the HVO Complex beyond the life of current approvals. Significant coal resources remain across the HVO Complex beyond what is currently approved for extraction, the amended Project will facilitate the efficient extraction of this high quality coal resource, via mining through existing tenements and predominantly within existing or previously approved disturbance areas.

Numerous technical investigations have been carried out to support the EIS, Submission Report, HVO North Amendment Report and this Amendment Report. These assessments identified impacts of the amended Project and appropriate mitigation measures to address these impacts. The amended Project's design and proposed management measures are based on a comprehensive understanding of the environmental conditions in and around the Project area, gained over a very long history of mining at HVO and further reviewed in acknowledgement of public and agency submissions received on the Project during exhibition of the EIS.

The amended Project, consistent with the EIS, represents a brownfield mining proposal that aligns with the strategic direction and policy objectives at a local, state and national level. It will provide ongoing employment opportunities for around 1,500 workers and will deliver significant economic benefits to the state and local region.

Abbreviations

Abbreviation	Extension
ACHA	Aboriginal Cultural Heritage Assessment
ACHMP	Aboriginal Cultural Heritage Management Plan
ACP	Ashton Coal Project
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
AIP	<i>NSW Aquifer Interference Policy</i>
ANEP	Ammonium Nitrate Emulsion Plant
ANL	Acceptable noise level
AQGHGMP	Air Quality and Greenhouse Gas Management Plan
AQIA	Air Quality Impact Assessment
ARI	Average Recurrence Interval
BAM	Biodiversity Assessment Method
BAM-C	BAM calculator
BC Act	<i>NSW Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
BMP	Blasting Management Plan
CBA	Cost benefit analysis
CCC	Community Consultative Committee
CEMP	Construction Environmental Management Plan
CLM Act	<i>NSW Crown Land Management Act 2016</i>
CM-CD1	Carrington Mine – Colluvial Deposit 1
CPHR	Conservation Programs, Heritage and Regulation
CPP	Coal Preparation Plants
dB	Decibel
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DPHI	NSW Department of Planning, Housing and Infrastructure
EEC	Endangered Ecological Community
EIA	Economic Impact Assessment
EIA	Energy Information Administration
EIS	Environmental impact statement
EL	Exploration licences
EMM	EMM Consulting Pty Ltd

Abbreviation	Extension
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPA	Environment Protection Authority
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
EPI	environmental planning instrument
ERP	Ecological Restoration Plan
ESD	Ecologically sustainable development
FM Act	<i>NSW Fisheries Management Act 1994</i>
FTE	Full-time equivalent
GHG	Greenhous gas
GL	Gigalitre
ha	Hectare
HHA	Historic Heritage Assessment
HHMP	Historic Heritage Management Plan
HRP 2041	Hunter Regional Plan 2041
HRSTS	Hunter River Salinity Trading Scheme
HV	Hunter Valley
HVGC	Hunter Valley Gliding Club
HVLP	Hunter Valley Load Point
HVO	Hunter Valley Operations
ICNG	Interim Construction Noise Guideline
IEA	International Energy Agency
IEAPM	NSW Independent Expert Advisory Panel for Mining
IPC	Independent Planning Commission
EPL	Environment protection licence
km	Kilometre
kV	Kilovolt
LCPP	Lemington Coal Preparation Plant
LEA	Local effects analysis
LEP	Local Environmental Plan
LGA	Local government area
LLS	<i>NSW Local Land Services Act 2013</i>
LoS	Level of service
LP	Load Point

Abbreviation	Extension
LPBW	Low permeability barrier wall
µg	Micrometre
µg/m ³	Micrograms per cubic metre
m	Metre
MIA	Mine infrastructure area
ML	Mining lease
mm/sec	millimetres per second
MSC	Muswellbrook Shire Council
Mtce	Million tonnes of coal equivalent
Mtpa	Million tonnes per annum
MTW	Mount Thorley Warkworth
NAF	Non-acid forming
NAG	Noise assessment groups
NIA	Noise Impact Assessment
NO _x	Nitrogen oxides
NO ₂	Nitrogen dioxide
NPfi	Noise Policy for Industry
NPV	Net present value
NPW Act	<i>NSW National Parks and Wildlife Act 1974</i>
NSW	New South Wales
NT Act	<i>Commonwealth Native Title Act 1993</i>
NZE	Net Zero Emissions
NZF Act	<i>NSW Climate Change (Net Zero Future) Act 2023</i>
OCE	Commonwealth Office of the Chief Economist
PA	Project Approval
PAF	Potentially acid forming
PCT	Plant community type
PER	Public environment report
PHA	Preliminary Hazards Analysis
PM _{2.5}	Particulate matter with a diameter of 2.5 µm or smaller
PM ₁₀	Particulate matter with a diameter of 10 µm or smaller
PMF	Probable maximum flood
PNTL	Project noise trigger levels

Abbreviation	Extension
POEO Act	NSW <i>Protection of the Environment Operations Act 1997</i>
Project	HVO Continuation Project
RAPs	Registered Aboriginal parties
RBL	Rating background level
RCS	Rixs Creek South
RCT	Ravensworth Coal Terminal
REQ	Resources and Energy Quarterly
REZ	Renewable Energy Zone
RFI	Request for information
RO	Ravensworth Operations
ROM	Run of-mine
RRG	River Red Gum
RRGRS	HVO River Red Gum and Restoration Strategy
RTS	Response to submissions
SA2	Statistical Areas Level 2
SAII	Serious and Irreversible Impacts
SAL	Suburbs and Localities
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SIA	Social Impact Assessment
SSD	State significant development
STEPS	Stated Policies Scenario
SVC	Site verification certificate
SWIA	Surface Water Impact Assessment
t	Tonne
TARP	Trigger Action Response Plan
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened ecological community
TfNSW	Transport for NSW
TMP	Transport Management Plan
TSF	Tailings storage facility
TSP	Total Suspended Particulate
TTIA	Traffic and Transport Impact Assessment

Abbreviation	Extension
UWJV	United Wambo Joint Venture
VEC	Vulnerable Ecological Community
VIA	Visual Impact Assessment
VLAMP	Voluntary Land Acquisition and Mitigation Policy
VPA	Voluntary planning agreement
WAL	Water access licence
WEO	World Energy Outlook
WEPP	Water Erosion Prediction Project
WM Act	<i>NSW Water Management Act 2000</i>
WMS	Water management system
WSP	Water sharing plan
WU	Wambo Underground

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Australia

SYDNEY

Level 10 201 Pacific Highway
St Leonards NSW 2065
T 02 9493 9500

NEWCASTLE

Level 3 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE

Level 1 87 Wickham Terrace
Spring Hill QLD 4000
T 07 3648 1200

CANBERRA

Suite 2.04 Level 2
15 London Circuit
Canberra City ACT 2601

ADELAIDE

Level 4 74 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE

Suite 8.02 Level 8
454 Collins Street
Melbourne VIC 3000
T 03 9993 1900

PERTH

Suite 3.03
111 St Georges Terrace
Perth WA 6000
T 08 6430 4800

Canada

TORONTO

2345 Yonge Street Suite 300
Toronto ON M4P 2E5
T 647 467 1605

VANCOUVER

422 Richards Street Unit 170
Vancouver BC V6B 2Z4
T 604 999 8297

CALGARY

700 2nd Street SW, Floor 19
Calgary AB T2P 2W2



[linkedin.com/company/emm-consulting-pty-limited](https://www.linkedin.com/company/emm-consulting-pty-limited)



emmconsulting.com.au