Hunter Valley Operations South
Progression of Mining
(MP 06_0261 MOD 5)

Environmental Assessment Report

Section 75W of the *Environmental Planning and Assessment Act 1979*

1. BACKGROUND

Hunter Valley Operations (HVO) is a large multi-pit open cut coal mining complex located approximately 24 kilometres (km) northwest of Singleton in the Hunter Valley (see **Figure 1**).

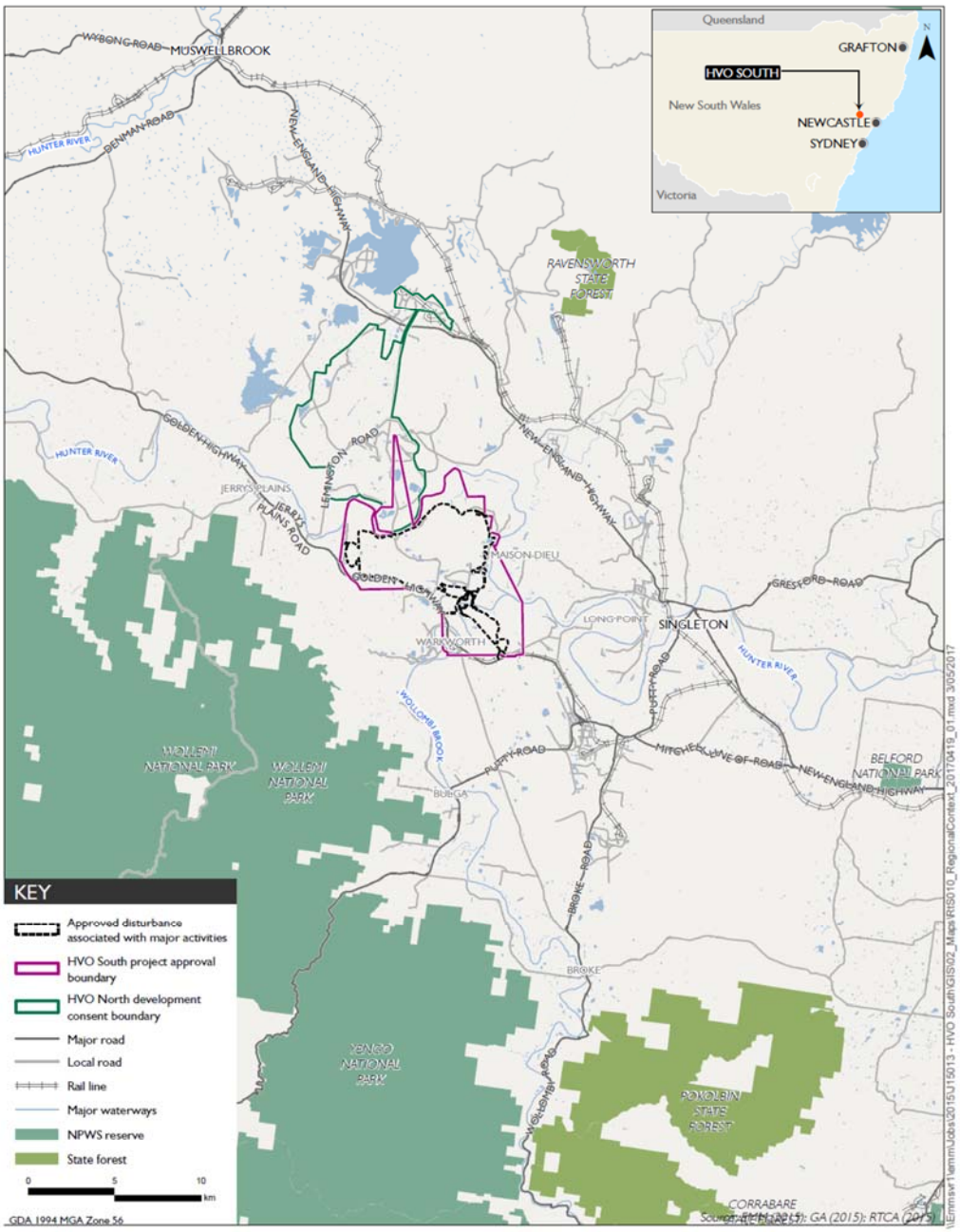

Figure 1: *Location of Hunter Valley Operations*

HVO is owned by Coal & Allied Operations Pty Limited and HVO Resources Pty Limited, and is managed by HV Operations Pty Ltd (Coal & Allied). At the time of the application, Coal & Allied was majority-owned by Rio Tinto Coal Australia Pty Limited. However, during assessment of the application, Yancoal Australia Limited completed its acquisition of Rio Tinto's stake in Coal & Allied.

HVO has been operating since 1949 and currently comprises two open cut coal mining areas, HVO North and HVO South, which are geographically separated by the Hunter River and regulated by two separate Ministerial approvals. HVO North is approved under development consent DA 450-10-2003, granted in 2004 by the then Minister for Infrastructure and Planning, and HVO South is approved under project approval MP 06_0261, granted on 24 March 2009 by the then Minister for Planning. This modification only applies to HVO South.

HVO is located within the Singleton local government area (LGA) and is surrounded by mining, agriculture, dairying and rural residential land uses. The topography around HVO South is gentle to undulating slopes with the site generally bound by the Golden Highway (Jerrys Plains Road) to the south and the Hunter River to the north and east. Nearby rural villages include Maison Dieu to the east, Long Point/Gouldsville to the southeast, Warkworth to the south, and Jerrys Plains to the west. Neighbouring coal mines include HVO North to the north, Ravensworth Operations and Ashton to the northeast, Rix's Creek to the east, Warkworth Mine to the southeast and United Collieries and Wambo Mine to the south.

Under MP 06_0261, HVO South is permitted to extract up to 16 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal until 2030. This includes open cut mining operations and ancillary activities such as overburden and reject emplacement. The open cut operation uses multi-seam dragline and truck and shovel mining methods to extract coal across four approved pits to varying depths, these being the:

- Riverview Pit approved to the base of the Vaux seam (in progress);
- Cheshunt Pit approved to the base of the Bayswater seam (in progress);
- South Lemington Pit 1 approved to the base of the Bowfield seam (suspended and currently used for mine water storage); and
- South Lemington Pit 2 approved to the base of the Bowfield seam (yet to be mined).

HVO South also has approval to rebuild the Lemington Coal Preparation Plant (LCPP) and construct a rail loop off the Wambo rail spur (see **Figure 2**). These facilities have not been constructed to date and Coal & Allied has no immediate plans to do so. All ROM coal from HVO South is currently transferred via private haul road across the Hunter River to HVO North for processing and despatch. HVO South produces thermal and semi-soft coking coal products that are supplied to the export market via 90 km of rail to the Port of Newcastle.

The project approval has been previously modified on four occasions, as follows:

- MOD 1 – approved on 17 December 2009, to change the storage capacity of Lake James, which forms part of HVO's water management system;
- MOD 2 – approved on 3 February 2012, to replace the Archerfield biodiversity offset area with an alternate site within Coal & Allied's larger Goulburn River biodiversity offset area; and
- MODs 3 & 4 – both approved on 31 October 2012, to provide specific reference to the Goulburn River biodiversity offset area in MP 06_0261, and to clarify that no mining-related development would occur in any biodiversity offset areas within the HVO project approval boundary.

2. PROPOSED MODIFICATION

On 31 January 2017, Coal & Allied submitted a fifth modification application to the Department, seeking to modify the project approval for HVO South under section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The proposed modification seeks to modify the project approval to facilitate the progression of mining at HVO South. The revised mine design includes mining deeper coal seams in the Riverview Pit and South Lemington Pit 2, increasing peak annual production rates from 16 to 20 Mtpa of ROM coal and redesigning the final landform to accommodate additional overburden material and to better blend in with the surrounding natural landscape.

The key proposed changes are summarised in **Table 1** below. The proposed modification is described further in the Environmental Assessment (EA, see **Appendix A**), prepared by EMM and supporting specialists, which accompanied the application.

Figure 2: *Approved general project layout*

***Table 1**: Approved project versus proposed modified project*

Component	***Approved Project***	***Proposed Modified Project***
Max. Annual Production and Processing Rate (ROM Coal)	16 Mtpa	20 Mtpa
Reserves (ROM Coal)	224 Mt	Additional 56.8 Mt
Approved Mine life	2030	No change
Mining Method	Dragline, truck and shovel, and highwall mining	No change
Mining Depths (by coal seam)	• Riverview Pit – Vaux seam • Cheshunt Pit – Bayswater seam • South Lemington Pit 1 – Bowfield seam • South Lemington Pit 2 – Bowfield seam	• Riverview Pit – Bayswater seam • Cheshunt Pit – no change • South Lemington Pit 1 – no change • South Lemington Pit 2 – Vaux seam
General Project Layout	See **Figure 2**	No change
Max. Blasting	3 blasts per day and 15 per week within the hours of 7 am and 6 pm Monday to Saturday	No change
Coal Processing	• Up to 16 Mtpa of ROM coal currently transferred to HVO North via private haul road for processing at the Hunter Valley Coal Preparation Plant (HVCPP); • Approval to build an overland conveyor to transfer ROM coal to HVCPP; and/or • Rebuild the LCPP for on-site processing	No change
Product Coal Transportation	• Via 7 km overland conveyor from HVCPP to the Hunter Valley Loading Point or Newdell Loading Point, then via 90 km rail to the Port of Newcastle; and/or • Approval to build the Lemington Loading Point (LLP) and rail loop off Wambo rail spur	No change
Coal Products	Thermal and semi-soft coking coal	No change
Surface Infrastructure/ Facilities	Water management structures, tailings storage facilities, storage hoppers and crushers, coal stockpiles, the decommissioned LCPP, haul roads, pipelines, powerlines, workshops, administrative offices, bathhouse, general stores, vehicle washing stations, laydown yards, bulk oil and fuel storages and explosive magazines	No change other than routine upgrades
Access	Light vehicle access off Comleroi Road or via internal haul roads from HVO North	No change
Project Approval Boundary	Approximately 6595 hectares (ha)	No change
Surface Disturbance Associated with Major Activities	Approximately 3160 ha	No change
Course Rejects and Tailings	Integrated coarse reject and tailings management with HVO North	No change
Water Management	• Integrated with HVO North • Water transfers to and from Mt Thorley/ Warkworth (MTW) and Wambo coal mines	No change
Rehabilitation	• Progressive rehabilitation • Final rehabilitation comprising approximately 30% native woodland corridors, 65% grassland and 5% final void	No change
Final Land Use	Undulating, free-draining, revegetated landform that facilitates sustainable agricultural production and enhanced biodiversity	No change

Component	Approved Project	Proposed Modified Project
Final Landform	Final landform with heights varying across the site up to a maximum of 160 metres Australian Height Datum (m AHD)	• Redesigned final landform to include micro-relief to provide a more natural looking landform complementing the existing environment • Increased height of the Cheshunt overburden area, up to 240 m AHD in places, to accommodate the additional volume of overburden material from mining deeper coal seams and to incorporate micro-relief
Final Void	• One final void within the Cheshunt Pit with a surface area of approximately 404 ha at the former natural surface level (70 m AHD) • Long term equilibrium water level ('final void pit lake') of approximately 32 m AHD and surface area of about 403 ha after 250 years • Evaporative basin 250 metres (m) from the Hunter River • Catchment area of approximately 1,190 ha • Low-wall slopes of 14-18 degrees • High-wall slopes of 35-42 degrees and a maximum of 75 degrees	• One final void within the Riverview Pit with a surface area of approximately 523 ha at 70 m AHD • Long term equilibrium water level at approximately 30 m AHD and surface area of about 372 ha after 300 years • Evaporative basin 500 m from the Hunter River • Catchment area of approximately 1,145 ha • Reduction in low-wall slopes to 8-10 degrees creating an additional 150 ha of long term 'useable' land (slope ≤ 10 degrees) • No change to high-wall slopes
Operating Hours	Continuous operations, 24 hours per day, seven days per week (excluding blasting restrictions)	No change
Capital Investment Value (CIV)	$130 million (2008)	Additional $10 million
Workforce	Approximately 1,500 full-time equivalent permanent staff or contractors across HVO	No change
Operating Hours	Continuous operations, 24 hours per day, seven days per week	No change

2.1 Proposed Mine Design

Coal & Allied reports that it has incorporated the following principles into its proposed revised mine design:

- provide an efficient and flexible mine plan;
- optimise coal extraction;
- no extension to the approved surface disturbance footprint;
- minimise environmental and amenity impacts on surrounding sensitive receivers, with a particular focus on noise, air quality and visual amenity;
- incorporate micro-relief design principles into emplacement areas;
- avoid reshaping or re-disturbing rehabilitated areas;
- minimise the size of the final void and the surface water catchment draining into it;
- increase the distance between the Hunter River and final void;
- create more usable land within the final void;
- align with the principles of ecologically sustainable development; and
- be consistent with contemporary legislative requirements and meet all relevant Government policies.

Coal & Allied also reports that a number of alternative overburden emplacement strategies/final landform designs were considered and discussed with nearby sensitive receivers. The option selected was based on minimising additional noise and dust impacts, minimising the visibility of overburden areas and maintaining the views of the Wollemi National Park from the east of HVO South. This resulted in overburden emplacement activities being focussed within the northern part of the Cheshunt emplacement area (set back from the existing rehabilitated face) and a final void within the south-western corner of the Riverview Pit. The final landform is further discussed in **Section 5.4**, below.

2.2 Justification

Increased production rates at HVO South would provide greater production flexibility for the HVO Complex and more capacity to meet market demand. The mining of deeper coal seams would provide an additional

56.8 Mt of ROM coal, which may have otherwise been sterilised, without the need for any additional surface disturbance or major capital investment.

The proposed modification would also create additional overburden waste material to be emplaced on site. This provides Coal & Allied with an opportunity to reconsider HVO South's overburden emplacement strategy and redesign the proposed final landform, to reflect current best practice. This would include improving the level appearance of the Cheshunt emplacement area to better blend in with the surrounding landform and to improve the visual amenity for sensitive receivers.

2.3 Relationship with HVO North

Mining operations at HVO South are integrated with those at HVO North. This includes sharing of mining equipment, workforce, surface facilities and infrastructure, as well as integration of coal production, processing, overburden and reject emplacement, water management and rehabilitation. Currently all ROM coal from HVO South is hauled via internal haul roads to HVO North for processing at the HVCPP. The HVO North consent restricts the HVCPP to receiving no more than 16 Mtpa of ROM coal from south of the Hunter River. Coal & Allied is not proposing to modify this transfer amount. Therefore the Department notes that, if this modification is approved, there would be a 4 Mtpa ROM coal shortfall between the approved production rate at HVO South and the approved amount that can be processed at HVCPP. In its Response to Submissions (RTS, see **Section 4.4** and **Appendix C**), Coal & Allied clarified that it would review its coal processing arrangements, including the feasibility of rebuilding the LCPP, prior to reaching peak production of 20 Mtpa at HVO South, which is expected during Stage 2 of the mine plan (~2022), to ensure a bottleneck does not occur. In the interim, Coal & Allied would continue to adhere to its approved processing limits and, if necessary, ROM coal could be stockpiled at HVO South.

A similar misalignment exists between the approved period of mining operations for HVO North (to 2025) and HVO South (to 2030). Due to the integrated nature of the two sites, Coal & Allied would have to review its wider operational arrangements, regardless of this modification, well prior to 2022. Nevertheless, the Department considers that the associated risks of having two integrated operations with misaligned approval periods is currently low and can be sufficiently managed through proactive mine planning by Coal & Allied. There is also enough flexibility in the HVO South approval to allow it to operate as a stand-alone operation when HVO North ceases operations in 2025.

With all ROM coal from HVO South being processed at HVCPP for the foreseeable future it is important to recognise that this has been considered in HVO North's reject emplacement strategy. Some of the coarse reject material from HVCPP is currently transferred back to HVO South and co-disposed with overburden material and buried at least 5 m below the final surface level. However, tailings (fine reject material) from the HVCPP are currently emplaced in HVO North's North Void tailings storage facility (TSF). Coal & Allied recently modified the HVO North consent (MOD 6) to provide additional TSF capacity for life-of-mine tailings from the HVCPP. This included gaining approval for an in-pit TSF in the Carrington pit void.

There are no active TSFs at HVO South and the Department understands that there is no short term plan to pump tailings more than 6 km back to HVO South, due to the associated costs and impracticality. Nevertheless, HVO South has approval for the ongoing management of ten TSFs on site, of which seven are capped and rehabilitated (1a, 1b, 2, 3, 4a, 4b and 5) and three could be activated (South Lemington Pit 1 and the southeastern and eastern sections of the Riverview Pit). These are unlikely to be activated unless the LCPP goes ahead.

2.4 Surface disturbance footprint

This modification does not propose to change the approved surface disturbance footprint for major surface activities at HVO South, which is approximately 3160 ha and shown in a number of figures in the EA. This footprint has been recently mapped by Coal & Allied and is an amalgamation of the extension areas proposed in the original 2008 EA and all disturbance areas inherited from historic consents. This includes the Western out-of-pit (WOOP) emplacement area to the west and the old Lemington emplacement areas to the east where final rehabilitation is currently being undertaken. Some minor surface activities have and may continue to occur outside of this footprint, but within the project approval boundary, such as light vehicle movements and environmental monitoring.

The Department has reviewed this footprint and is satisfied that all areas shown have been previously approved for disturbance.

3. STATUTORY CONTEXT

3.1 Section 75W

HVO South was approved under the now-repealed Part 3A of the EP&A Act. In accordance with clause 8J(8) of the *Environmental Planning and Assessment Regulation 2000* and the transitional arrangements under Schedule 6A of the EP&A Act, the modification must be determined under the former section 75W of the EP&A Act.

The Department is satisfied that the proposal can be characterised under section 75W as a modification to the existing project approval. The additional coal proposed to be recovered is a relatively minor expansion to the mining operation, and the proposal could be achieved with limited environmental impact (see **Section 5**). Key elements of the project would remain the same, including life of the mine, surface disturbance footprint and mining methods. Given these considerations, the Department is satisfied that the proposed modification is within the scope of section 75W, and may be determined accordingly.

3.2 Approval Authority

The Minister for Planning is the approval authority for the modification application. Under the Minister's delegation of 16 February 2015, the Planning Assessment Commission must determine the application, as the application received more than 25 public objections (see **Section 4.3**).

3.3 Land Ownership

Coal & Allied owns a majority of the land within the project approval boundary, with the exception of small parcels owned by Hunter Valley Gliding Club Co-operative Limited (HVGC), Wambo Coal Pty Ltd (or related companies), Xstrata Coal Pty Limited (Glencore), Construction, Forestry, Mining and Energy Union (CFMEU), and other private and public owners.

3.4 Other Licences or Leases

Mining activities at HVO are also regulated under an Environmental Protection Licence (EPL 640) granted under the *Protection of the Environment Operations Act 1997* (POEO Act). The Department understands that an EPL variation would be required to reflect the proposed modification.

Coal & Allied also holds three mining leases (ML 1465, ML 1634 and ML 1682), two coal leases (CL327 and CL 398) and one consolidated coal lease (CCL 714) granted under the *Mining Act 1992* and administered by the Division of Resources and Geoscience (DRG) within the Department.

3.5 Commonwealth Approval

Coal & Allied made two referrals to the Commonwealth Department of the Environment & Energy for approval under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to potential impacts on matters of national environmental significance (MNES).

EPBC 2016/7640 related to impacts on listed threatened species and communities under section 18 and 18A of the EPBC Act in areas within the southwest of the Riverview Pit and the north of the Cheshunt Pit that have already been approved for disturbance under the State approval (MP 06_0261). The activities were determined to be a controlled action and were later approved with conditions by the Commonwealth on 10 October 2016. These actions are not discussed further in this assessment report as the areas of disturbance were already approved under MP 06_0261.

EPBC 2016/7641 related to impacts on water resources under sections 24D and 24E of the EPBC Act due to the proposed mining of deeper coal seams in the Riverview Pit and South Lemington Pit 2. The referral was later varied to remove the entire South Lemington Pit 2 because it did not have prior authorisation under sections 43A and 43B of the EPBC Act. Without prior authorisation, the Commonwealth would have to consider the pit as new, rather than just deepening to the Vaux coal seam. Coal & Allied therefore removed South Lemington Pit 2 from the referral to allow it to further consider these issues, including what additional work would be required. EPBC 2016/7641 is currently under assessment by the Commonwealth.

The above referrals did not fall within the scope of the Bilateral Agreement between the Commonwealth and NSW Governments and therefore all EPBC matters are being separately assessed and approved by the Commonwealth. Nevertheless, as the assessment of EPBC 2016/7641 is running in parallel, the Department has liaised with the Commonwealth to ensure that any overlapping matters, such as groundwater impacts, are appropriately considered by both approval authorities.

It is important to note that Coal & Allied has proposed to retain South Lemington Pit 2 in the State approval and continues to seek approval in this modification to deepen the pit. While it is less than ideal to have conflicting State and Commonwealth approvals, the Department sees no reason to remove the pit from the State assessment process. However, Coal & Allied would need approval from the Commonwealth before any development occurs at South Lemington Pit 2. Because of this, there is a possibility that South Lemington Pit 2 may never be mined during the approval period for MP 06_0261. The Department therefore requested Coal & Allied provide additional information in its RTS on the effects of not mining the pit, particularly with regards to coal resources and final landform design.

In its RTS, Coal & Allied stated that South Lemington Pit 2 would produce 11 Mt of ROM coal and approximately 83 million loose cubic metres (LCM) of overburden material. Under the current emplacement strategy, which relies on backfilling South Lemington Pit 2 with Riverview and Cheshunt Pit overburden material, the exclusion of South Lemington Pit 2 would result in a net increase of 8.3 million LCM, which equates to 0.58 % of the total overburden material moved within the Riverview and Cheshunt areas. This amount would not make a significant or readily visible physical change to the proposed final landform. Considering this, the Department accepts that Coal & Allied could still meet its rehabilitation objectives with or without mining South Lemington Pit 2. The economic implications of not mining South Lemington Pit 2 would also be minor, considering this satellite pit only comprises 4% of total ROM coal reserves at HVO South.

3.6 Environmental Planning Instruments

A number of environmental planning instruments (EPIs) apply to the modification, including the:

- *State Environmental Planning Policy* (SEPP) *(Mining, Petroleum and Extractive Industries) 2007* (Mining SEPP)*;*
- *SEPP (State and Regional Development) 2011;*
- *SEPP No 33 – Hazardous and Offensive Development*; and
- *Singleton Local Environmental Plan 2013*.

The Department has considered the modification against the relevant provisions of these EPIs, as well as Coal & Allied's consideration of these matters. Based on this assessment, the Department considers that the proposal can be undertaken in a manner that is generally consistent with the aims, objectives and provisions of the EPIs.

4. CONSULTATION

4.1 Coal & Allied Consultation

Coal & Allied conducted consultation with the local community and key stakeholders prior to submitting the modification application to the Department, and continued this consultation throughout the assessment process. As detailed in the EA, Coal & Allied utilised its regular engagement programs to inform the community of the proposed modification. These included:

- meeting with and presenting to the HVO Community Consultative Committee (CCC) and to Singleton Council (Council);
- directly contacting near neighbours;
- publishing newspaper advertorials in local newspapers;
- hosting bi-annual community barbeques;
- making information available on its company website;
- operating a free call information hotline;
- sending letters to surrounding residents; and
- providing regular updates to HVO employees.

The CCC meetings, community barbeque and near neighbour meetings were also used to better understand the community's specific concerns over the proposed modification, ensure that they were addressed in the EA and explain the relevant outcomes of the technical studies undertaken to support the proposed modification.

During the public exhibition period (see **Section 4.2** below), Coal & Allied held community information sessions in Jerrys Plains, Maison Dieu and Long Point, and met with all interested near neighbours and community groups to inform them of the exhibition and to seek feedback on the EA. Through this engagement, Coal & Allied acknowledged that there was an opportunity to improve amenity for its near neighbours through implementing further discretionary mitigation measures and to improve its community engagement strategy more broadly. Coal & Allied committed to establishing the HVO Near Neighbour Amenity Resource Fund to fund works and services to improve amenity for near neighbours, such as the

cleaning of all water tanks. The Department understands that this fund would be used for residences with statutory voluntary mitigation rights under the project approval and other identified residences where noise and dust levels from HVO are less significant yet still a nuisance for the residents.

4.2 Exhibition

After accepting the EA (see **Appendix A**) for the proposed modification, the Department publicly exhibited the modification application and EA from 9 February 2017 until 10 March 2017. The documents were viewable on the Department's website and at:

- the Department's Information Centre;
- Council's office; and
- Nature Conservation Council's office.

The Department advertised the exhibition of the EA in the *Singleton Argus* on 8 February 2017. The Department also directly notified relevant NSW Government agencies and Council of the exhibition and requested their comments on the proposal.

The Department is satisfied that the notification process met the requirements of the EP&A Act and the EP&A Regulation.

Considering the thorough engagement undertaken by Coal & Allied, the Department did not consider it necessary to hold a public meeting or information session.

4.3 Submissions

In response to the exhibition, the Department received 45 submissions, of which 32 were from the general public, 6 from special interest groups (SIGs) or organisations and 7 from Government agencies. A summary of the submissions is summarised in **Table 2**, showing that 32 submissions were in the form of an objection, 2 were in support and 11 were comments only.

***Table 2**: Submissions summary*

Type	*General Public*	*SIG/ Organisation*	*Agency*	*Total*
Object	29	3	-	**32**
Support	1	1	-	**2**
Comments	2	2	7	**11**

Half of the non-agency submissions generally came from addresses in Singleton LGA and the remaining half largely came from the nearby LGAs of Muswellbrook, Maitland and Newcastle.

Copies of the submissions are included in **Appendix B.**

4.3.1 General Public Submissions

Of the 32 general public submissions, 29 objected, one supported and two provided comments on the proposal. The common concerns raised in the objections were:

- noise, dust, blast, visual amenity and health impacts;
- the size/presence of the final void and its function as a perpetual groundwater sink;
- groundwater drawdown and its potential ecological impacts on groundwater dependent ecosystems (GDEs);
- mine water discharges into the Hunter River;
- cumulative impacts to the Hunter region;
- further loss of amenity for the surrounding local community;
- decrease in property values, particularly for those outside of mine acquisition zones;
- uncertainty surrounding flow-on public benefits;
- night lighting;
- diesel and greenhouse gas emissions, particularly in light of Australia's emissions targets; and
- wider concerns with coal mining and coal-fired power generation.

The Department's consideration of matters raised in the general public submissions is discussed in **Section 5** below.

4.3.2 SIG/Organisation Submissions

Of the six SIG/organisation submissions, three objected, one supported and two provided comments on the proposal.

Hunter Communities Network and the Hunter Environmental Lobby Inc. both objected to the proposed modification due to the associated cumulative environmental and social impacts of coal mining in the Hunter region. These two community groups raised similar concerns to the general public submissions, such as increased noise and dust pollution, further loss of amenity in an already highly disturbed landscape, further drawdown of alluvial and groundwater sources, increased threats to endangered ecological communities (EECs) and wetlands, additional discharge of polluted mine water into the Hunter River, increased size of the final void, poor justification and misleading information on public benefit, and failure to meet the Mining SEPP's non-discretionary development standards.

Lock The Gate Alliance objected to the proposed modification due to the increased impacts of mining on residents and water resources in an area that it considered to be already suffering from an over-concentration of coal mines. Lock The Gate Alliance raised specific concerns over the potential increased noise and dust impacts and the legacy of having a final void in the post-mining landform.

The Singleton Shire Healthy Environment Group supported the proposed modification, however raised a number of concerns with the associated air, noise, lighting and visual impacts, particularly for residents from Maison Dieu.

The Department's consideration of matters raised in these SIG submissions is discussed in **Section 5**.

The HVGC, which owns and operates the Hunter Valley Gliding Club, a single grass air strip within the southern part of the HVO South project approval boundary, provided comments on the proposed modification and requested additional information on the extent of the proposed changes to HVO South and specific noise, dust, and aviation impacts to HVGC's facilities. This information was provided in the RTS. The Department's consideration of specific interactions with HVGC is discussed in **Section 5.7**.

Glencore Coal Pty Limited provided comments on the areas of HVO South that overlap or encroach on land owned or partially owned by Glencore, of which some is subject to the proposed United Wambo Open Cut Coal Mine Project (United Wambo Project, SSD 7142), and noted that no commercial arrangement was in place to allow Coal & Allied to undertake works on its land. Coal & Allied clarified in the RTS that no mining would occur on Glencore's land unless a commercial agreement is in place.

4.3.3 Agency Submissions

The Department received comments back from all seven agencies (including Council) that were notified of the proposal.

Council raised no objections to the proposed modification and provided comments on the EA. Council also acknowledged its interest in ensuring that the final void is minimised and the end land use is compatible with agreed sustainable environmental, economic and social outcomes. The Department's consideration of the final void and final land use are discussed in **Section 5.3.5** and **Section 5.4**, respectively.

DRG raised no issues and advised that its rehabilitation requirements had been adequately addressed in the EA. The Department's consideration of rehabilitation is discussed in **Section 5.4**.

Department of Primary Industries (DPI), on behalf of the Crown Lands and Water Division (CLWD) of the Department of Industry, requested additional information on dam capacity and dam decommissioning, other surface water extractors and other groundwater users. DPI also recommended including additional water licensing and water management conditions in the project approval. The Department's consideration of potential water impacts is discussed in **Section 5.3**.

The **Environmental Protection Authority** (EPA) requested additional information on prevailing weather conditions when noise criteria would apply, noise tonality and low frequency noise, noise monitoring, water quality in sediment dams and the air quality impact assessment. The Department's consideration of potential surface water impacts is discussed in **Section 5.3.1**, noise impacts in **Section 5.2** and air quality impacts in **Section 5.1**.

Hunter New England Population Health (HNE Health) provided comments on air quality, noise and blasting impacts in relation to human health. HNE Health requested additional information on the predicted

air quality emission levels in 2025 when the annual average $PM_{2.5}$ criterion reduces to 7 $\mu g/m^3$ under the *National Environmental Protection (Air Quality) Measure* (NEPM). HNE Health requested that Coal & Allied engage in clear and open consultation with residents, predicted to experience noise impacts, to ensure they are aware of the extent of the impacts and their options. HNE Health also emphasised the importance of controlling blasts to protect the public from the impacts of vibration, overpressure and blast fume emissions. The Department's consideration of matters raised in HNE Health's submission is discussed in various parts of **Section 5**.

Office of Environment and Heritage (OEH) raised no issues and advised that it was unlikely that this modification would have any additional impacts on Aboriginal cultural heritage, flooding or threatened species due to all activities being proposed within existing areas of approved disturbance.

Roads and Maritime Services had no objections to the modification as it would have no significant impact on the State road network.

4.4 Response to Submissions (RTS)

Coal & Allied provided an RTS on 15 June 2017 that addressed all submissions received during the exhibition period. The RTS was made publicly available on the Department's website. The RTS is included in **Appendix C**.

Upon receiving the RTS, the Department notified all agencies that provided a submission on the proposal and requested that they review the RTS and advise if their comments or recommendations had been adequately addressed. With the exception of the EPA, all agencies were satisfied with the RTS. The EPA requested additional information on the efficacy of the proposed air quality mitigation measures. This information was later provided by Coal & Allied and is further discussed in **Section 5.1**.

5. ASSESSMENT

The Department has assessed the merits of the proposed modification in accordance with the relevant objects and requirements of the EP&A Act. As part of this assessment, the Department has considered the:

- modification application and accompanying EA;
- relevant content of previous EAs, current environmental management plans and monitoring results;
- agency submissions received and the RTS;
- existing conditions of approval; and
- relevant EPIs, policies and guidelines.

The Department considers that the key issues associated with the proposed modification are air quality, noise, surface water, groundwater, rehabilitation/final landform, visual amenity and socio-economics. As the proposed modification is located entirely within the approved surface disturbance footprint, the Department notes that the predicted impacts assessed below are unusually low for this scale of modification. In particular, there would also be no change to the currently approved biodiversity and heritage impacts and these matters are not further addressed below. However, potential indirect impacts to GDEs are assessed in **Section 5.3.4**.

In respect to human amenity and health, the key sensitive receivers are located in Maison Dieu/ Knodler's Lane to the east, Long Point/Gouldsville to the southeast, Warkworth Village to the south, Jerrys Plains/ Moses Crossing to the west, and the neighbouring HVGC facilities (see **Figure 3**).

It is important to note that the EA includes updated air quality and noise impact assessments for the whole of the site. The original 2008 EA assessed air quality and noise impacts at 22 representative sensitive receivers whereas this EA has increased the assessment area and assessed impacts at 222 sensitive receivers (58 mine-owned residences, 161 privately-owned residences and 3 non-residences being the HVGC, Warkworth Hall and St Philips Church in Warkworth Village). In doing so, Coal & Allied consolidated its list of receivers with MTW and has updated the receiver identifiers compared to the original 2008 EA. To avoid confusion, in this report the Department has referenced the new identifiers, with the old identifiers in brackets, if applicable. The receivers assessed in this EA are also shown in **Figure 3**.

The air quality and noise impact assessments in the EA are based on worst-case mining scenarios, being when mining operations are at their maximum and meteorological conditions are at their most enhancing. The mine plan also includes the development of South Lemington Pit 2 and the construction of the LCPP, LLP and rail loop to ensure that all approved or proposed activities are considered in the assessments. Four representative mine plan years were considered in the EA and are referred to below, 2019 (Stage 1), 2022 (Stage 2), 2026 (Stage 3) and 2028 (Stage 4).

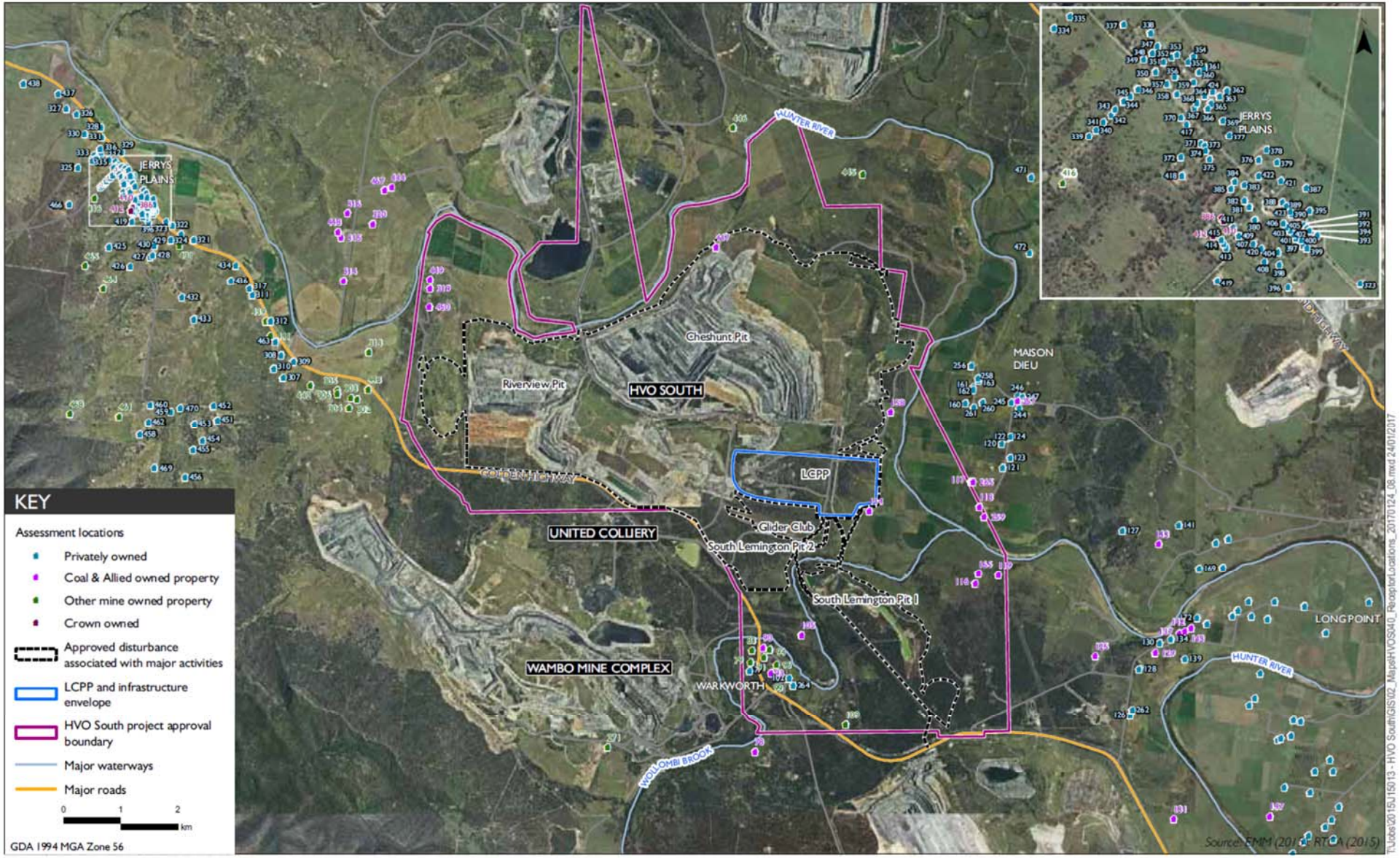

Figure 3: *Location of sensitive receivers*

5.1 Air Quality

5.1.1 Predicted Impacts

The EA included an air quality impact assessment (AQIA) undertaken by Todoroski Air Sciences (TAS) dated January 2017. The AQIA used air quality dispersion modelling to predict dust emissions from HVO South, including the proposed changes, and compared these results to the relevant predictions for the approved project. Two representative mine plan stages were modelled in the AQIA, Stage 2 when operations are closest to the receivers to the southeast and east near Maison Dieu and Stage 3 when operations are closest to receivers in the northwest and west near Jerrys Plains.

The AQIA was initially prepared in accordance with the EPA's 2005 *Approved Methods for the Modelling and Assessment of Air Pollutants* (Approved Methods); however, TAS later updated relevant sections of the AQIA following gazettal of the 2016 Approved Methods on 20 January 2017. TAS provided this supplementary information in a letter dated 3 March 2017 and further clarified the results in the RTS.

The Department notes that the 2016 Approved Methods were updated to align with the *National Environmental Protection (Ambient Air Quality) Measure* and now include new $PM_{2.5}$ criteria of 8 µg/m^3 (annual average) and 25 µg/m^3 (24-hour), which have already generally been adopted by industry, and a reduced annual average PM_{10} criterion of 25 µg/m^3. However, the Department notes that the *Voluntary Land Acquisition and Mitigation Policy* (VLAMP) and Mining SEPP (clause 12AB(4)) cumulative annual average PM_{10} criterion still remains at 30 µg/m^3.

The results of the AQIA show that the predicted emissions would have a generally similar extent to the concentrations predicted in the original 2008 EA. On average the changes due to the proposed modification would result in a significant reduction in 24-hour average PM_{10} concentrations (-28-30 µg/m^3), albeit changes range from -53 µg/m^3 to +5 µg/m^3. Cumulative annual average PM_{10} concentrations are also predicted to reduce by an average of 1-2 µg/m^3, with a range of -7 µg/m^3 to +2 µg/m^3.

A comparison of the AQIA's predictions for privately-owned residences against the 2016 Approved Methods appears in **Table 3** below. The key results are:

- eight receivers with exceedances of the cumulative annual average PM_{10} criterion (77[45], 307[4], 308[31], 309[36], 310, 312, 471 and 472) (see **Figure 4**);
- one receiver with an exceedance of the 24-hour average PM_{10} criterion (77[45]);
- two receivers with exceedances of the cumulative annual average $PM_{2.5}$ criterion (77[45] and 471);
- two receivers with exceedances of the cumulative annual average total suspended particulates (TSP) criterion (77[45] and 471); and
- no predicted exceedances of the 24-hour average $PM_{2.5}$ criterion or the annual average deposited dust criteria.

***Table 3**: Summary of predicted air quality exceedances*

Particulate Matter		***PM10***				***PM2.5***		***TSP***
Averaging Period		***Cumulative Annual (µg/m^3)***		***Increm. 24-hour (µg/m^3)***	***Days > 50 over the life of the project***	***Cumulative Annual (µg/m^3)***		***Cumulative Annual (µg/m^3)***
2016 Approved Methods Criteria		25		50	-	8		90
Mining SEPP Criteria		30		-	-	-		-
VLAMP Acquisition Criteria		30		50	5	-		90
VLAMP Mitigation Criteria		30		50	1	-		90
Receiver (privately-owned residences only)	***Location***	***AQIA (Stage 2/ Stage 3)***	***Revised (Stage 2)***	***AQIA (Stage 2/ Stage 3)***	***AQIA (Stage 2/ Stage 3)***	***AQIA (Stage 2/ Stage 3)***	***Revised (Stage 2)***	***AQIA (Stage 2/ Stage 3)***
77[45]*	Warkworth	*35/39*	43.4	64/56	1/1	*-/9*	11.9	-/93
307[4]	Jerrys Plains	*27/-*	n/a**	-	-	-	-	-
308[31]	Jerrys Plains	*28/-*	21.1	-	-	-	-	-
309[36]	Jerrys Plains	*29/-*	22.1	-	-	-	-	-
310	Jerrys Plains	*26/-*	20.2	-	-	-	-	-
312	Jerrys Plains	*26/-*	20.5	-	-	-	-	-
471*	Camberwell	42/40	n/a***	-	-	9/9	n/a**	97/94
472*	Camberwell	26/-	n/a***	-	-	-	-	-

** Receiver entitled to voluntary acquisition from neighbouring mine(s)*
*** Receiver 307 was later confirmed to be a shed*
**** Revised predictions are not applicable for receivers in Camberwell*

Table 3 also compares the AQIA's predictions against the VLAMP and Mining SEPP criteria to ascertain if the exceedances warrant additional voluntary mitigation or acquisition rights for the affected receivers. As a result of the proposed modification, two receivers (77[45] in Warkworth and 471 in southwest Camberwell) could be entitled to voluntary acquisition due to exceedances of PM_{10} and TSP criteria (highlighted in blue).

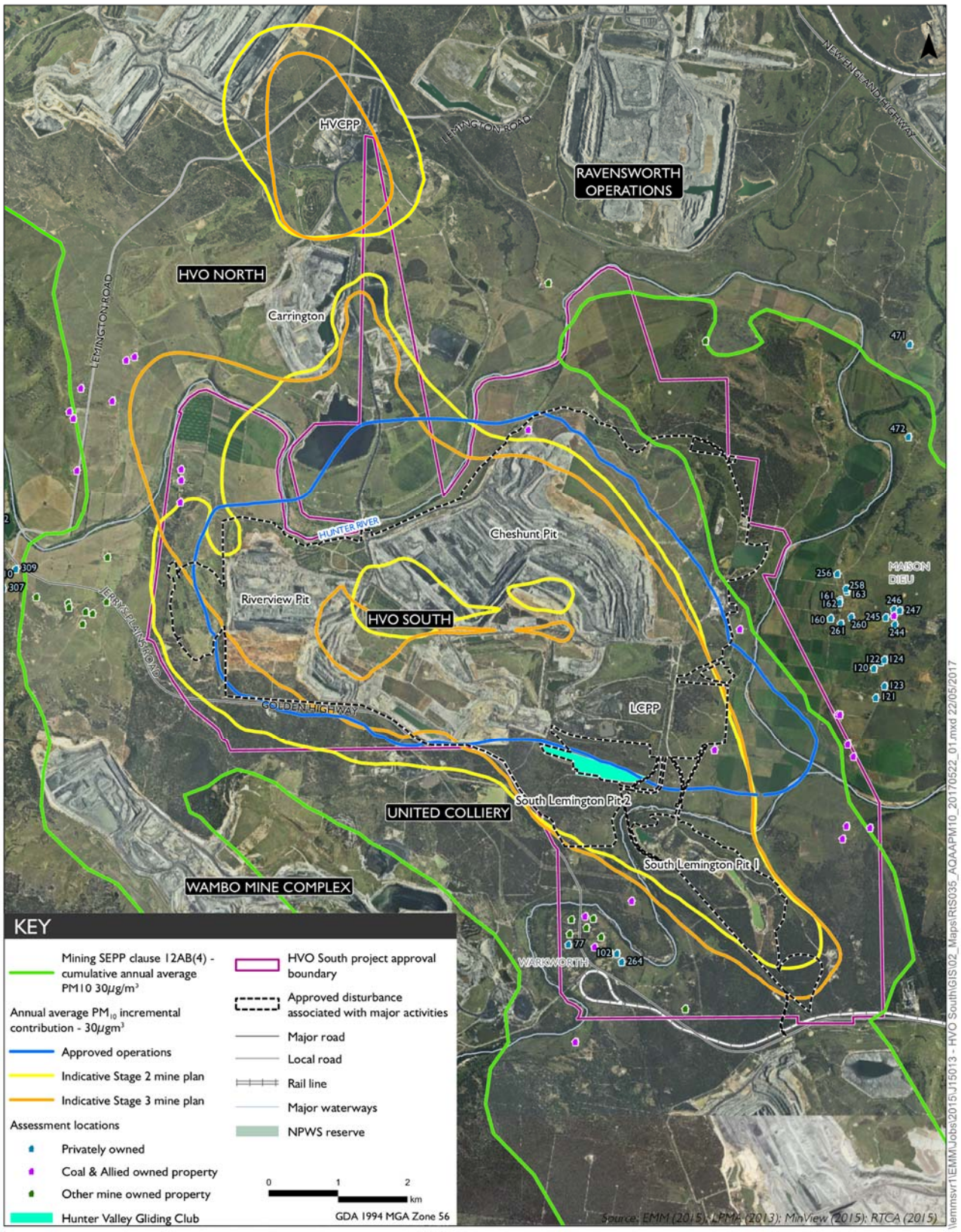

Figure 4: *Predicted annual average PM_{10} emissions*

Receiver 77[45] has existing voluntary acquisition rights under the development consents for Wambo Mine and Warkworth Mine and receiver 471 has existing voluntary acquisition rights under the project approval for the Ashton South East Open Cut Project.

Nevertheless, the Department has recommended adding receiver 77[45] to the list of land subject to voluntary acquisition under condition 1 of Schedule 3 of the project approval because the relevant exceedances are based on both cumulative and project-specific impacts (ie. irrespective of the neighbouring mines). However, Coal & Allied would only be required to acquire 77[45] if the owner of this land no longer has voluntary acquisition rights under the development consents for Wambo Mine or Warkworth Mine.

The Department does not consider that receiver 471 should be entitled to voluntary acquisition rights under this project approval because the relevant exceedances are all based on cumulative impacts and HVO South's contribution is relatively minor (~5-7% of total dust levels). In the event that Ashton South East Open Cut Project never commences development, then the predicted impacts would be below the relevant threshold for voluntary acquisition. Instead, the Department proposes to add receiver 471 to the list of land subject to voluntary air quality mitigation under condition 21 of Schedule 3 of the project approval. No other additional receivers would be entitled to voluntary mitigation rights.

Warkworth Hall (102) and St Philips Church (264) are also predicted to receive 24-hour average PM_{10} concentrations of up to 73 µg/m^3 and cumulative annual average PM_{10} concentrations of up to 38 µg/m^3 and 36 µg/m^3, respectively. Cumulative annual average $PM_{2.5}$ concentrations at Warkworth Hall are also predicted to reach 9 µg/m^3. These concentrations exceed the 2016 Approved Methods criteria. However, as these are non-residences, visitors would only be subject to brief periods of potential exposure and therefore the actual experienced levels would be much less. For these reasons, the predicted levels for these non-residences are considered acceptable.

Peer review and revised cumulative assessment

The Department's assessment identified inconsistencies between the cumulative predictions in the AQIAs for this modification and the neighbouring proposed United Wambo Project, which is concurrently under assessment by the Department. Given the simultaneous nature of these two applications and the close proximity of the mining operations, the Department was concerned with the degree of variation in the predicted impacts. Consequently, the Department commissioned Ramboll Environ Australia Pty Ltd (Ramboll) to undertake an independent technical review of the adequacy of predicted air quality impacts associated with each proposal, both individually and cumulatively.

This review identified that, while each AQIA provided detailed and rigorous predictions of air quality impacts, when considered together, there were notable differences and variations in the cumulative predictions, particularly for the areas of Warkworth Village and Jerrys Plains. This was largely due to assumptions made for each mine's emissions inventories and, to a lesser extent, differences in meteorological data and background air quality levels.

To address these inconsistencies, the Department requested that the two relevant companies prepare a coordinated and objective assessment of the cumulative air quality impacts of both proposals, using shared modelling inputs and jointly validated outputs. TAS and Jacobs (air quality consultant for the United Wambo Project) then jointly prepared a cumulative assessment and provided this to the Department on 18 September 2017. In preparing this assessment, TAS and Jacobs undertook the following tasks:

- aligned model inputs by consolidating sensitive receivers, establishing worst-case scenarios and exchanging project-specific emission inventories and meteorological monitoring data;
- updated the respective dispersion models and exchanged the results for annual average PM_{10} and $PM_{2.5}$ concentrations;
- established suitable background levels and totalled the relevant mine contributions to attain cumulative levels for each sensitive receiver; and
- compared the revised predictions to the 2016 Approved Methods and VLAMP.

In undertaking the above, the dispersion model for HVO South was updated with additional meteorological data and the emissions inventory was updated to account for lower wind speed data, lower material bulk densities and an updated wind erosion factor. The Department understands that these changes were made to better reflect actual site conditions while still maintaining an element of conservatism. As a result, the emissions reduced by approximately 25%.

Background PM_{10} levels were determined by averaging measured data from all monitoring locations near the mines in 2014 and subtracting the predicted mine contributions resulting in an average background level of

12.8 µg/m^3 (19.5 µg/m^3 - 6.6 µg/m^3). A background $PM_{2.5}$ level of 6 µg/m^3 was used based on regional Hunter Valley data due to the lack of locally available representative data.

The updated model results predict that fewer receivers in Warkworth and Jerrys Plains would experience cumulative impacts above the annual average PM_{10} criterion when compared to the AQIA. This is demonstrated through the revised Stage 2 predictions shown in **Table 3** and **Figure 5**. The revised annual average $PM_{2.5}$ predictions increased marginally, with receiver 77[45] still predicted to exceed the criterion.

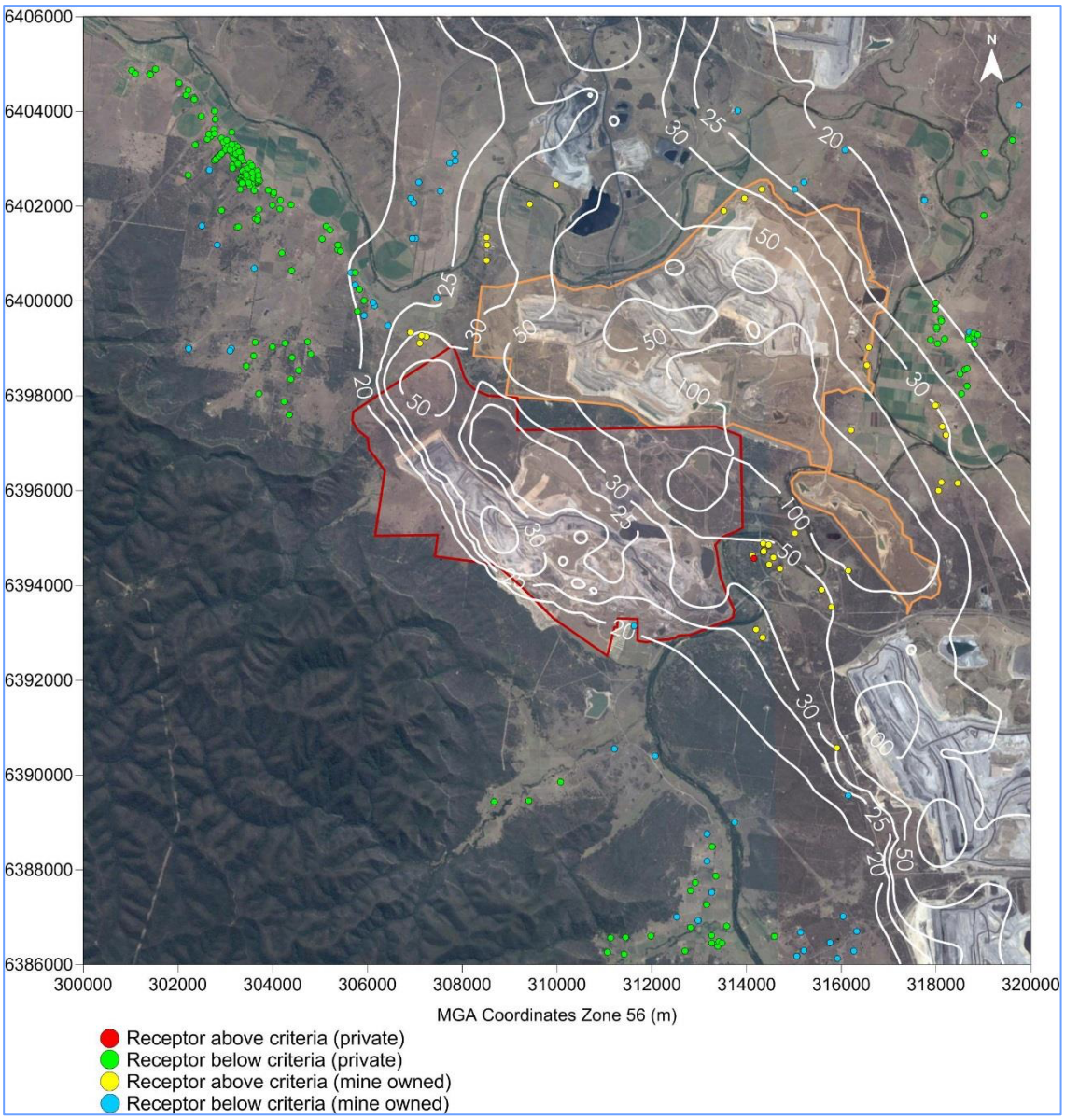

Figure 5: *Revised predicted annual average PM_{10} emissions*

The Department notes that this cumulative assessment only updated the annual average predictions because they have the greatest scope to exceed the criteria and are the most challenging to operationally control. An analysis of selected 24-hour average concentrations confirmed that the short term predictions were unlikely to significantly change from the EA's AQIA. Additionally, provided the annual average criteria can be met, generally the short term 24-hour effects can be more easily controlled using day-to-day proactive and reactive management measures at each mine.

Following review of this cumulative assessment, Ramboll advised that all issues identified in its independent technical review had been adequately addressed, with the exception of the use of a fixed background $PM_{2.5}$ level instead of deriving it from the ratio of ambient $PM_{2.5}$ to PM_{10} in the area. Nevertheless, Ramboll acknowledged that even with derived $PM_{2.5}$ levels, the ultimate conclusions of the cumulative assessment were unlikely to change. Considering this, the Department sees no sufficient reason to update the cumulative $PM_{2.5}$ analysis. Nonetheless, Ramboll's advice should be considered in any future air quality modelling for the project.

In conclusion, the results of this cumulative assessment demonstrate that the AQIA included conservative predictions and that HVO South and the proposed United Wambo Project could operate concurrently without significant adverse cumulative impacts to residences in Warkworth and Jerry Plains.

5.1.2 Mitigation and Management

As discussed in **Section 2.1**, the revised mine layout was designed to minimise additional air quality impacts for sensitive receivers, particularly through the strategic emplacement of overburden further away from residences and by minimising re-disturbance of already shaped or rehabilitated areas.

Coal & Allied currently operates an Air Quality Management Plan for the HVO Complex. This plan includes reasonable and feasible management measures to comply with the air quality criteria and to minimise air quality impacts. Coal & Allied proposes to continue using its existing proactive and reactive management measures, which include:

- controlling dust sources using interim or permanent vegetation and water sprays, such as water carts along haul roads;
- altering or reducing operations during adverse weather conditions, such as dumping overburden on lower benches or protected locations during high winds;
- using meteorological forecast data to proactively guide day-to-day planning of mining operations;
- using real-time air quality monitors and automatic alarm systems to identify and respond to rising dust levels; and
- installing mitigation measures at receivers, such as air filters, first flush roof water drainage systems or air conditioning.

As mentioned in **Section 4.4**, the EPA requested that Coal & Allied provide additional information, in accordance with the 2016 Approved Methods, on the efficacy of the proposed air quality mitigation measures to mitigate additional exceedances of the cumulative 24-hour average PM_{10} criterion as predicted in the AQIA. To evaluate the effectiveness of the operational controls, TAS re-ran the dispersion modelling to consider the effects of temporarily pausing activities in the pit and overburden areas. TAS provided these results in a letter dated 15 September 2017. The findings were that reactive operational controls can mitigate exceedances of the 24-hour average PM_{10} criterion, however even if emissions and impacts are reduced as far as practicable, there may still be a few days when cumulative dust levels exceed the criterion due to high prevailing background levels. The EPA was satisfied with this additional information.

5.1.3 Consideration

The Department is satisfied that the potential air quality impacts of the proposal have been adequately assessed in the EA, the RTS, the cumulative assessment and the additional information provided on 15 September 2017. The proposed modification would not significantly change the air quality impacts at sensitive receivers, when compared to the approved project. The predicted dust levels would remain within acceptable criteria, with the exception of receivers 77[45] and 471, which would be afforded voluntary acquisition and/or mitigation rights in accordance with the VLAMP.

The Department is also satisfied that Coal & Allied's continued implementation of dust mitigation and management measures would effectively minimise air quality impacts as far as reasonable and feasible.

Nevertheless, the Department acknowledges that public submissions raised concern over the potential increased air quality impacts of the proposal. To ensure that Coal & Allied appropriately manages and monitors air quality impacts from HVO South, the Department, in consultation with the EPA, has recommended the following changes to the conditions of approval:

- updating the air quality impact assessment criteria to align with the latest 2016 Approved Methods, including adding criteria for $PM_{2.5}$ and removing criteria for deposited dust;
- adding receiver 77[45] to Table 1 'Land subject to acquisition upon request' and receiver 471 to Table 14 'Land subject to additional air quality mitigation upon request';
- adding footnotes below the tables to clarify which receivers are no longer privately-owned;
- strengthening the operating conditions;
- requiring Coal & Allied to prepare and implement a comprehensive Air Quality Management Plan instead of the previous Air Quality Monitoring Program; and
- adding a specific condition for mine-owned residences, where there are no applicable air quality criteria, to ensure that any tenants of these residences are aware of the possible health and amenity impacts from HVO South.

These changes are consistent with Coal & Allied's existing approvals for HVO North and MTW and align with other contemporary approvals for Hunter Valley coal mines.

5.2 Noise

5.2.1 Predicted Impacts

The EA included a comprehensive noise impact assessment (NIA) undertaken in accordance with the *Industrial Noise Policy* (INP). The NIA predicted noise levels from HVO South under calm and prevailing weather conditions during four representative mine plan stages, including the proposed changes, and compared these results to the approved project. The predicted noise levels were compared to the predictions in the original 2008 EA and the current noise impact assessment criteria in Table 2 of the project approval.

The NIA's predicted noise levels are similar to the original 2008 EA for sensitive receivers to the east in Maison Dieu and marginally higher for sensitive receivers to the west in Jerrys Plains. As a result of this modification, 20 of the 161 assessed privately-owned residences would exceed the current noise impact assessment criteria in the project approval. These exceedances range from 1-4 decibels (dBA, $L_{Aeq,15minutes}$ unless otherwise specified) and are expected to occur in the evening/night time periods under prevailing weather conditions. These exceedances are compared against the project specific noise levels (PSNLs) in **Figure 6**. The key results are:

- four receivers (127 in Maison Dieu and 321, 434 and 436 in Jerrys Plains) would experience exceedances of up to 2 dBA above the PSNLs, which are considered negligible under the VLAMP;
- three receivers in Maison Dieu with existing voluntary noise mitigation rights under the project approval (124, 120 and 122 [collectively referred to as '24 – Clifton and Edwards and residences located within 250 m of this residence']) would experience exceedances of 4 dBA above the PSNLs;
- 12 additional receivers (244 to 247 [collectively referred to as 'Maison Dieu residences within 1 kilometre of Shearers Lane'] and 307[4], 308[31], 309[36], 310, 311[3], 312, 317 and 463 from Jerrys Plains) would experience moderate exceedances of 3-5 dBA above the PSNLs and would therefore be entitled to voluntary noise mitigation rights in accordance with the VLAMP; and
- one receiver from Warkworth (77[45]) would experience exceedances of greater than 5 dBA above the PSNL and would therefore be entitled to voluntary acquisition rights in accordance with the VLAMP.

The NIA also included an assessment of noise levels at Warkworth Hall (102) and St Philips Church (264). These predicted levels would remain well below the target noise criteria of 65 dBA for a commercial receiver and 40 dBA (internally) for a place of worship, as per the INP amenity criteria.

The predicted noise levels would continue to remain under the sleep disturbance criterion of 45 dB (L_{Amax}) for all locations. The proposed modification satisfies the INP's and Mining SEPP's (clause 12AB(3)) acceptable cumulative night time criterion of 40 dB ($L_{Aeq,\ 9\ hour}$) at all locations except for receiver 77[45].

As mentioned in **Section 4.4**, at the request of the EPA, Coal & Allied confirmed in its RTS that the NIA predictions under prevailing weather conditions included inversions up to F class. In its RTS, Coal & Allied also provided additional assessment of low frequency and tonal noise which was undertaken in line with the methodology in the new *Noise Policy for Industry* (NPI), gazetted on 27 October 2017. This demonstrated, to the EPA's satisfaction, that the proposal would not result in excessive low frequency noise impacts. However, any future compliance monitoring would still have to consider appropriate modifying factors in accordance with the NPI.

5.2.2 Mitigation and Management

As discussed in **Section 2.1**, the revised mine layout was designed to minimise additional noise impacts, particularly through the strategic emplacement of overburden further away from residences and in valleys to block noise transmission pathways.

Coal & Allied currently operates a Noise Management Plan for the HVO Complex. This plan includes management measures to ensure compliance with noise criteria and to minimise noise impacts. Coal & Allied proposes to continue using these existing proactive and reactive management measures, which include:

- attenuating haul trucks and other equipment with noise suppressing devices;
- altering or reducing operations during adverse weather conditions, such as relocating or shutting down noisy equipment;
- utilising meteorological forecast data to proactively guide day-to-day planning of mining operations;
- using real-time noise monitors that are fitted with alarms at representative locations to identify and respond to rising noise levels; and
- installing mitigation measures at receivers, such as window treatments.

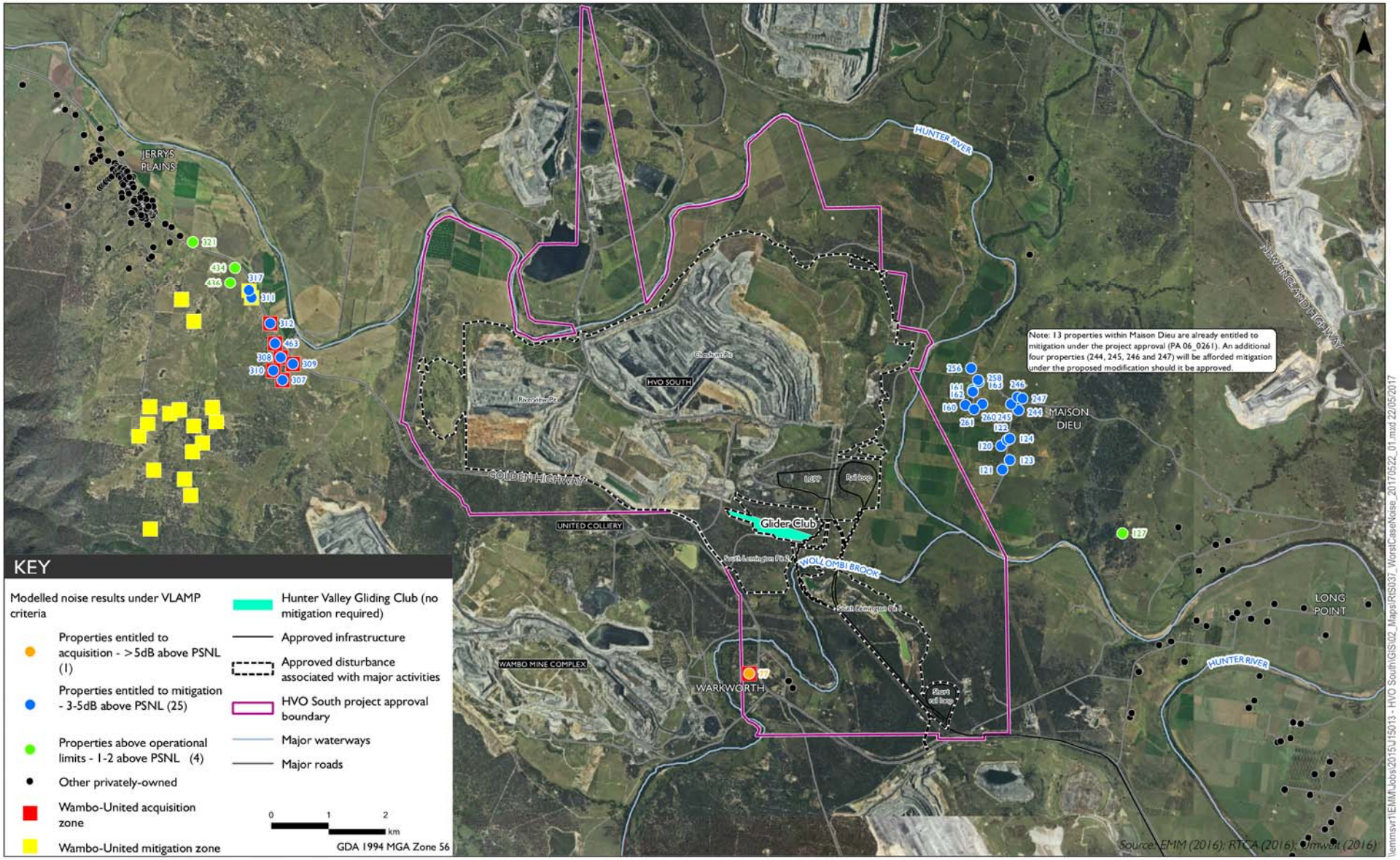

Figure 6: *Predicted worst-case noise levels*

In its RTS, Coal & Allied also committed to investigating other mitigation and management measures to implement during noisier emplacement activities as this was a common concern raised by members of the community.

5.2.3 Consideration

The Department is satisfied that the potential noise impacts of the proposal have been adequately assessed in the EA and the RTS. The Department is satisfied that Coal & Allied's continued implementation of noise mitigation and management measures would effectively minimise noise impacts as far as reasonable and feasible.

The proposed modification would not significantly change the noise impacts for sensitive receivers to the east in Maison Dieu, however receivers to the west in Jerrys Plains would experience higher noise levels. The Department considers these impacts are practicably unavoidable. As a result, 12 additional receivers would be afforded voluntary mitigation rights and one receiver would be afforded voluntary acquisition rights (the same receiver that triggers acquisition due to air quality impacts), in accordance with the VLAMP.

The Department acknowledges that public submissions raised concern over the potential increased noise impacts of the proposal and therefore the Department considers there is opportunity to strengthen the conditions of approval to ensure that Coal & Allied appropriately manages and monitors noise impacts from HVO South. The Department, in consultation with the EPA, has recommended the following changes to the conditions of approval:

- updating the noise impact assessment criteria in Table 2 to align with the predictions in the EA;
- adding the 12 additional receivers to Table 4 'Land subject to additional noise mitigation upon request';
- adding footnotes below the tables to clarify which receivers are no longer privately-owned;
- strengthening the operating conditions;
- requiring Coal & Allied to prepare and implement a comprehensive Noise Management Plan instead of the previous Noise Monitoring Program;
- moving the detailed noise monitoring requirements to a new Appendix 4A; and
- including a condition in Appendix 4A to ensure that tonal and low frequency noise, if present, is appropriately factored into the compliance monitoring data in accordance with Fact Sheet C of the new NPI.

These changes are consistent with Coal & Allied's existing approvals for HVO North and MTW and align with other contemporary approvals for Hunter Valley coal mines. The Department also notes that the proposed modification predates the release of the NPI. The transitional arrangements for the NPI stipulate that, apart from those aspects that relate to low frequency noise, the INP continues to apply as the relevant NSW Government policy for the assessment and determination of this proposal.

5.3 Water

5.3.1 Surface Water

The EA included a surface water study prepared by WRM Water and Environment Pty Ltd to assess the potential impacts of the proposed modification on surface water resources. The proposed modification would not significantly change the captured catchment area within the affected Hunter River and Wollombi Brook catchments. HVO South's current captured catchment area is approximately 1,877 ha and this is predicted to increase to a peak of 2,067 ha in Stage 2 (+10%) and decrease to 1,567 ha during Stage 4 (-17%). These changes are unlikely to result in additional impacts to downstream surface water flows.

The surface water study also demonstrates that the existing HVO Complex Water Management System (WMS) would largely remain appropriate for the proposed modification, albeit with a few minor changes. The existing WMS comprises a comprehensive network of surface water dams, inactive mining pits, water transfer infrastructure, smaller sediment dams and drainage structures with a total out-of-pit storage capacity of approximately 6,450 megalitres (ML). At HVO South, this includes the Riverview Void (4,000 ML), Dam 15S 'Lake James' (715 ML) and Dam 16S (280 ML), the first two of which are prescribed dams under the *Dam Safety Act 1978*.

The existing WMS segregates water on site by catchment area, quality and end use. Mine water (pit, processing and tailings water) that is typically saline due to interactions with coal seams and mine spoils, is treated and released into the Hunter River opportunistically under controlled discharges regulated by the Hunter River Salinity Trading Scheme (HRSTS). Clean water run-off is diverted away from the site and as such there are no clean water dams. Sediment-laden run-off from rehabilitated and disturbed areas is

collected in smaller sediment dams that are designed to overflow during wet periods. Poor quality run-off water is returned to the mine water system.

The WMS would continue to be adapted over the course of the project, particularly during the later stages when the landform is reshaped and rehabilitated. As a result of this modification, some of the existing mine water storages would be slowly removed; however, five additional sediment dams would likely be required to collect run-off from overburden areas. New sediment dams would continue to be constructed in accordance with the design standards in OEH's *Managing Urban Stormwater: Soils and Construction Volume 1 and Volume 2E Mines and Quarries*, to capture and treat water up to a five-day 90th percentile rainfall event. The Department notes that Coal & Allied clarified in its RTS that these new sediment dams would in fact generally correspond to existing structures that may be adjusted over time.

In its submission, the EPA raised concern over potential unregulated discharges of saline sediment dam water. The RTS clarified that water quality within sediment dams would be monitored, and if found to be unsuitable for release to the environment, the water would be pumped back into the mine water system. Water is considered unsuitable if it does not comply with section 120 of the POEO Act and has an electrical conductivity greater than 400 µs/cm, in accordance with the definition of saline water in the *Protection of the Environment Operations (Hunter River Salinity Trading Scheme) Regulation 2002*. If monitoring confirms that sediment dam water is of a suitable quality, then the dams could continue to overflow during wet weather events when water levels exceed the design storage capacity.

The Department acknowledges that water sampled within sediment dams may not be representative of water that overflows during wet weather events as the latter would likely be diluted with rainwater. Therefore if Coal & Allied can demonstrate that the contained sediment dam water is of suitable quality then it would be unlikely for sediment dam overflows to impact receiving water quality. Coal & Allied would also continue to monitor water quality of receiving waters upstream and downstream of the site to identify any potential water pollution incidents.

Following review of the RTS, the EPA was satisfied with Coal & Allied's management measures, however recommended that a condition of approval be added to ensure that water quality monitoring is undertaken during sediment dam discharges and that the analysed pollutants include all parameters that potentially pose a risk of non-trivial harm to human health and the environment, such as total suspended solids, turbidity, electrical conductivity (EC), total dissolved solids, pH and individual metals. The Department agrees that these pollutants should be analysed, but considers that specific details (location, type, frequency, analysis suite) would be better placed in the Water Management Plan.

As the proposed modification would not change the approved disturbance footprint, flooding impacts have not been assessed.

5.3.2 Water Balance

The surface water study included an updated water balance prepared by Hatch Pty Ltd to assess the ability of the WMS to accommodate the proposed modification and to provide sufficient water storage to buffer against periods of both drought and flooding. The water balance takes into consideration water inputs from:

- captured rainfall and run-off;
- groundwater inflow to the open cut mining areas for which Coal & Allied has water take entitlements under the *Hunter Unregulated and Alluvial Water Sources 2009*, the *Hunter Regulated River Water Source 2004* and the *North Coast Fractured and Porous Rock* 2016 Water Sharing Plans (WSPs);
- moisture entrained in ROM coal;
- water transfers from MTW via a connected pumping system to the Riverview Void;
- water extracted, as needed, from the licensed Lemington Underground Bore that is shared with MTW;
- water extracted, as needed, from the Hunter River for which Coal & Allied holds both High and General Security Water Access Licences (WALs); and/or
- external water supplied from neighbouring mines, as needed, through water sharing agreements (eg. from Liddell Colliery (via HVO North) and Wambo Mine).

The water balance also takes into consideration water used on site for coal processing, dust suppression and other industrial uses; and other water outputs including evaporation, HRSTS controlled discharges, sediment dam overflows and transfers to neighbouring mines.

Key changes to the water balance modelling included the revised captured catchment areas, staged removal of mine water storages, increased groundwater inflow rates from mining deeper coal seams, changes in

water use practices such as haul road dust suppression and coal processing, improved pump and pipeline flexibilities and available water transfers to or from neighbouring mines.

The results of the water balance modelling indicate that the existing WMS could accommodate the proposed modification without substantial change, such as new mine water storages. While there would be a 10-25% probability that the combined water storage capacity of the site would be exceeded in any given year, excess water could be temporarily stored in an active pit. This may interrupt operations, however it would prevent uncontrolled spills of mine water into receiving waters. The results also demonstrate that Coal & Allied has sufficient water supply for the life of the project and sufficient discharge allowances under the HRSTS.

5.3.3 Groundwater

The EA included a groundwater study prepared by Australasian Groundwater and Environmental Consultants Pty Ltd (AGE) and undertaken in accordance with the *Aquifer Interference Policy* (AIP) to assess the potential impacts of the proposed modification on groundwater resources. Groundwater resources at HVO South comprise two key stratigraphic units, the Quaternary alluvium associated with Hunter River and Wollombi Brook and the Permian Wittingham Coal Measures. Alluvial groundwater is used in the area for stock water and irrigation, however the Permian groundwater is generally un-useable due to high levels of salinity.

As part of the study, AGE updated the groundwater model for HVO and had it peer reviewed by Kalf and Associates Pty Ltd. The modelling results indicate that mining would continue to directly remove groundwater from the Permian aquifer, and indirectly from the alluvial aquifer and connected streams as a result of depressurisation of the underlying strata. However, HVO South's mine plan would continue to avoid the flood plain and direct intersection of the alluvial aquifers.

Groundwater take is predicted to peak at 1,591 ML/year of direct take from Permian strata (regulated under the *North Coast Fractured and Porous Rock* WSP), 489 ML/year of indirect take from alluvium (regulated under the *Hunter Unregulated* WSP) and 584 ML/year of indirect take from alluvium (regulated under the *Hunter Regulated* WSP). These volumes combined would be within the peak prediction in the original 2008 EA of 2,672 ML/year. Post-mining, long term groundwater take is predicted to be 206 ML/year from Permian strata and 318 ML/year of indirect take from alluvium. Coal & Allied has sufficient water licence entitlements to account for this predicted water take for the life of the project. As requested by CLWD, Coal & Allied would also be required to surrender sufficient water entitlements to account for the long term groundwater take of 524 ML/year.

Loss of groundwater from the alluvium would also induce some loss of baseflow within Wollombi Brook and the Hunter River. The groundwater study predicts peak indirect baseflow take of 584 ML/year from the Hunter River and 107 ML/year from the Wollombi Brook. Compared to the average stream flows of the Hunter River and Wollombi Brook, HVO South's attributable reduction would equate to 0.2% of both total flows.

No privately-owned bores are predicted to experience a cumulative decline in groundwater levels in excess of 2 m, as a result of the proposed modification. However, a single mine-owned bore on land owned by the Ravensworth mine (10011459) is predicted to decline by up to 2.7 m, of which the proposed modification would contribute 0.3 m. At the request of CLWD, the RTS included additional details of the 43 groundwater bores assessed by AGE. The RTS also further clarified that no privately-owned bores would experience a drawdown in excess of 1 metre within the alluvium due to the proposed modification.

As shown in **Figure 7**, the proposed modification is predicted to generate small zones of groundwater level drawdown at the fringes of the alluvium where it is close to active mining areas. Drawdown from the proposed modification is not predicted to exceed 0.5 m within the Hunter River alluvium because of prior depressurisation from mining in the nearby Bayswater Pit and thick interburden layers that retard and decrease the hydraulic connectivity between the underlying Permian coal measures and the alluvial system. Drawdown from the proposed modification is predicted to cause an additional 2.8 m of drawdown, on top of the existing approved 7 m, in areas north of Wollombi Brook due to mining of the deeper Vaux seam in South Lemington Pit 2. The Department accepts that these predictions are conservatively based on worst-case 'model drawdown levels' that do not consider the actual saturated thickness of the alluvium. Cumulative drawdown levels of the Permian aquifers are not dissimilar to the approved project.

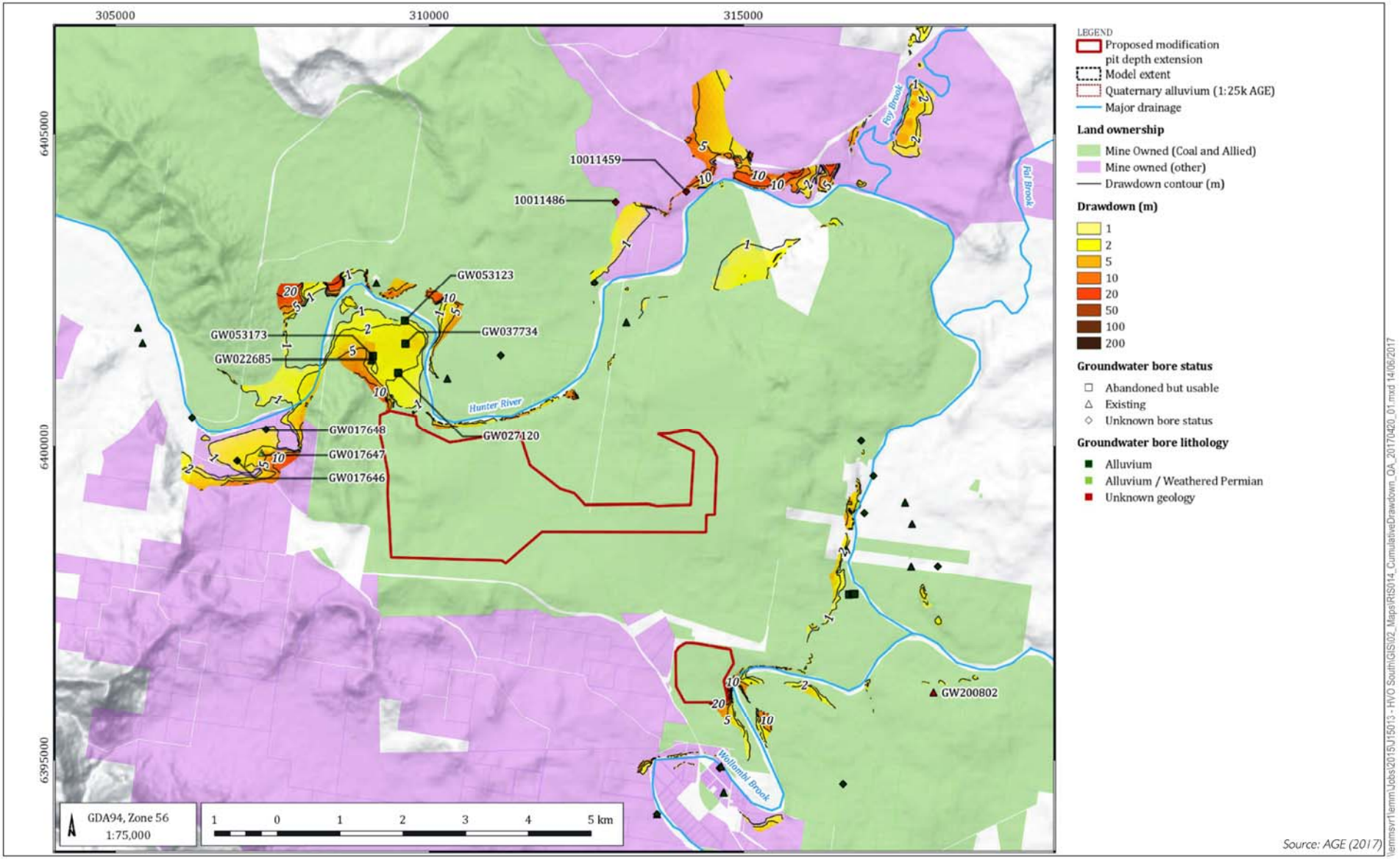

Figure 7: *Predicted maximum cumulative alluvial drawdown*

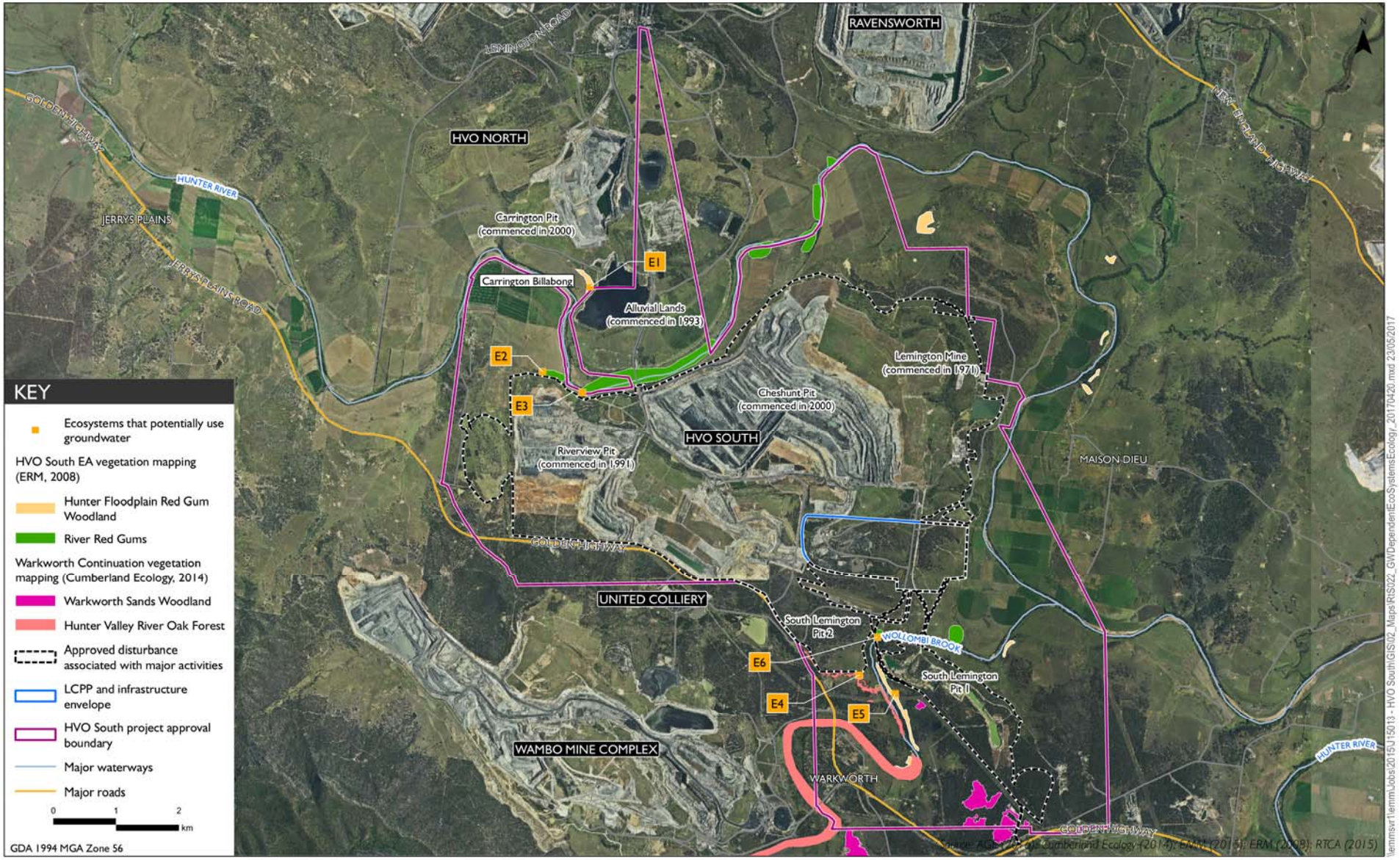

Figure 8: *Ecosystems that potentially use groundwater*

5.3.4 Groundwater Dependent Ecosystems (GDEs)

The EA included a desktop ecology assessment of potential indirect impacts to ecosystems from the changing groundwater regime. A number of ecosystems that potentially depend on groundwater have been identified in riparian zones within the flood plains along the Hunter River and Wollombi Brook. However, there are no identified GDEs in the vicinity of the project area as mapped in the Commonwealth Government's *National Atlas of Groundwater Dependent Ecosystems*. Ecosystems that potentially use groundwater were previously identified at six locations within the project area (see **Figure 8**), comprising vegetation communities and populations of River Red Gums, Hunter Flood Plain Red Gum Woodland and Hunter Valley River Oak, as well as ephemeral wetland, Carrington Billabong.

The ecology assessment concludes that the predicted groundwater drawdown levels discussed above, would not materially impact the identified ecosystems that potentially use groundwater because these ecosystems are opportunistic groundwater users only, inhabiting the niche on the flood plain due to the flooding regime rather than water supplied directly from the alluvial system. As the proposed modification would not change the local flooding regime, impacts on these ecosystems are not expected. The proposed modification would therefore have no additional impacts on ecology other than those already approved and offset for the existing operations.

5.3.5 Final Void

As discussed in **Section 2.1**, the final void design has been revised, along with the overall final landform, to reduce the size of the surface water catchment draining into the void, to increase the distance between the evaporative basin and the Hunter River and to reduce the low-wall slope to increase the area of usable post-mining land.

As a result, the proposed final void has changed in size, location and geometry compared to the approved Deep Cheshunt Pit final void in the original 2008 EA (see **Figure 9**). As summarised in **Table 1**, the proposed final void in the Riverview Pit has a smaller surface water catchment of 1,145 ha (compared to the previous 1,190 ha) and an evaporative basin located a further 250 m from the Hunter River. This greater distance from the river would reduce the hydraulic gradient and potential long term impacts on the alluvial and surface water systems.

The proposed final void has a larger surface area of 523 ha (at the former natural surface level of 70 m AHD), compared to the previous 404 ha void. This is largely due to having gentler low-wall slopes of generally less than 10 degrees compared to the previous 14-18 degrees. Gentler low-wall slopes provide an additional 150 ha of land available for post-mining sustainable agriculture, consistent with the requirements of the *Synoptic Plan – Integrated Landscapes for Coal Mine Rehabilitation for the Hunter Valley of NSW* (Synoptic Plan).

The proposed final void would continue to function as a groundwater sink to prevent the release of saline water into the surrounding environment. Water would slowly recover in the final void and reach a long term equilibrium water level of approximately 30 m AHD after 250 post-mining years, which is around 20 to 30 m lower than the regional water table, indicating that the void would act as a sink in perpetuity. This equilibrium water level is also more than 42 m below the natural surface (spill level), minimising the potential for overflows into the Hunter River. This equilibrium water level is significantly higher than the 0 m AHD level predicted for the approved Deep Cheshunt Pit void in the original 2008 EA. However, remodelling of the approved void identified that previously predicted equilibrium conditions may have been inaccurate and the remodelled approved final void and proposed final void are not dissimilar in terms of storage capacity, water levels and quality.

The proposed final void would accumulate salt over time from surface water and groundwater inflows. The salinity of the evaporative basin would therefore gradually increase and eventually reach levels exceeding 20,000 microSiemens per centimetre (µS/cm) EC which is approximately equivalent to 12,800 mg/L. This hypersaline water would not be released into the surrounding environment; however, it would ultimately be unusable.

The Department recognises that public submissions raised concern with the mere presence of the final void and its function as a groundwater sink. The Department acknowledges that Coal & Allied has prior approval to retain a void in the landform and, in the absence of a NSW government policy on final voids, the proposed design aligns with the Department's current objectives of being designed as a long term groundwater sink and minimised in size to the greatest extent practicable.

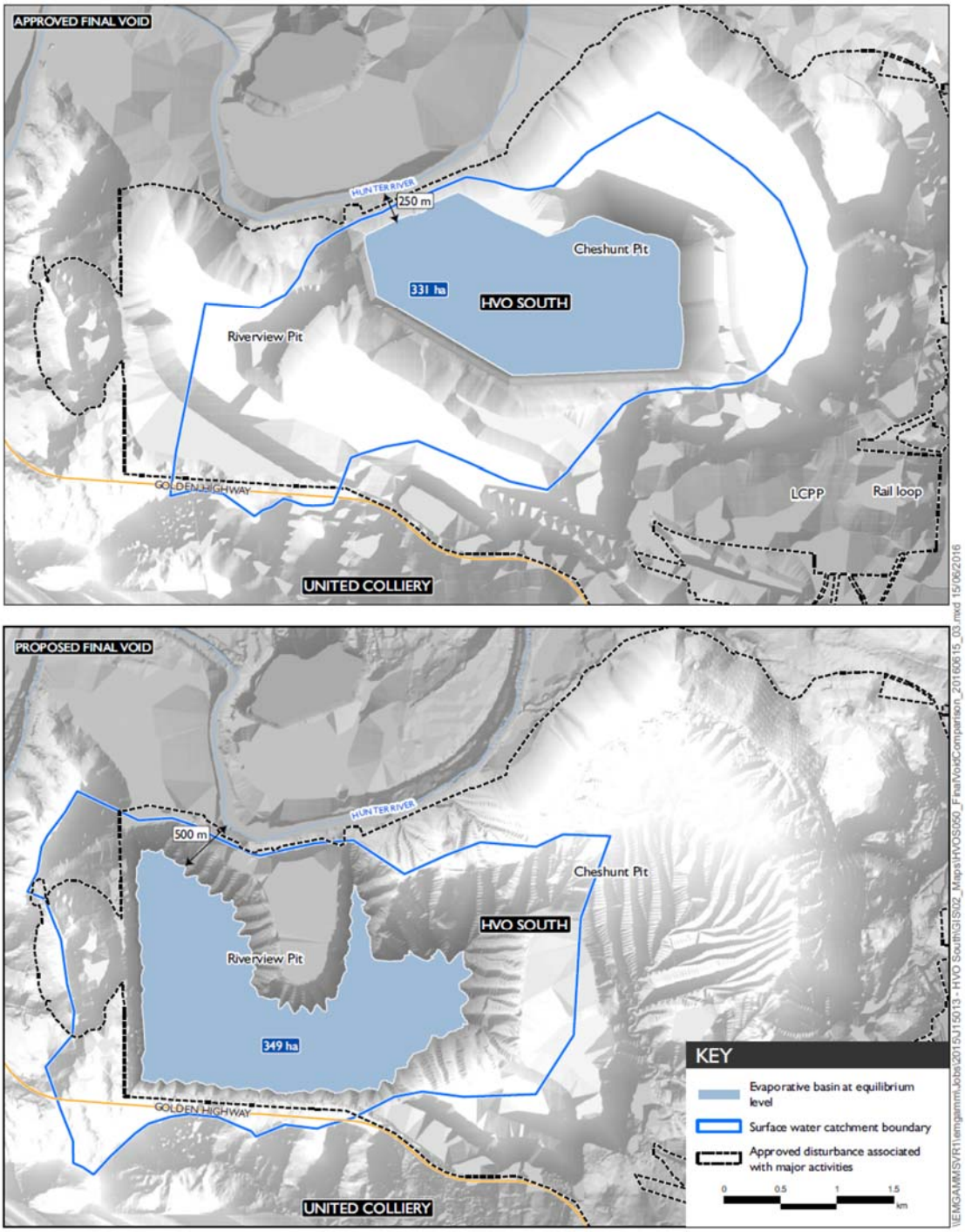

Figure 9: *Existing approved Deep Cheshunt Final Void vs proposed Riverview Final Void*

5.3.6 Mitigation and Management

Coal & Allied would continue to rely on its WMS to manage water on site. The WMS would be updated to take into account the proposed modification and would continue to focus on minimising fresh water use, impacts on the environment and other water users; and interference with mining operations.

Coal & Allied currently has a comprehensive Water Management Plan for the HVO Complex which describes the WMS and includes specific management measures to minimise surface and groundwater impacts, such as balancing site water inputs and outputs, detailing erosion and sediment controls for ground disturbing activities and monitoring water quality and quantity both on site and in receiving waters. As a result of this modification, no additional management measures are proposed.

5.3.7 Consideration

The Department is satisfied that the potential surface water and groundwater impacts of the proposal have been adequately assessed in the EA and RTS. The proposed modification would not significantly change the water regime at HVO South, when compared to the approved project. The Department also accepts that the proposed modification would be unlikely to significantly affect potential GDEs.

Coal & Allied's existing management measures would generally remain sufficient to avoid or minimise surface and groundwater impacts to the greatest extent practicable. The monitoring programs would also be generally suitable to monitor water quality, levels and flow rates. However, the Department considers that additional conditions of approval should be added to reflect CLWD's and EPA's advice, and to address the number of public submissions that raised concerns with the predicted additional groundwater drawdown and potential impacts to GDEs.

On this basis, the Department has recommended a number of changes to conditions of approval to provide greater certainty in how impacts would be mitigated and managed, including:

- adding additional operating conditions to ensure that Coal & Allied retains sufficient Water Access Licences for all regulated water take and provides 'make good' water for any privately-owned bores that lose water supply as a result of HVO South;
- clarifying the permissibility of water transfers with neighbouring mines;
- expanding the surface water monitoring program requirements to include monitoring of controlled and uncontrolled discharges and seepage/leachate from the site;
- expanding the groundwater monitoring program requirements to ensure that monitoring encompasses GDEs and riparian vegetation health; and
- requiring the water balance and groundwater model to be periodically updated and validated.

These changes are consistent with Coal & Allied's existing approvals for HVO North and MTW and align with other contemporary approvals for Hunter Valley coal mines.

5.4 Final Landform, Rehabilitation and Land use

A key component of the proposed modification is the redesigned indicative final landform. The existing approved final landform was designed in keeping with the Synoptic Plan to support biodiversity enhancement with sustainable agricultural practices, with varying heights to a maximum of 160 m AHD. The approved final rehabilitation includes improved pastures and native vegetation corridors that connect with existing remnant vegetation to provide opportunities for wildlife habitat and migration (see **Figure 10**). By area, the approved final rehabilitation comprises approximately 30% native woodland corridors, 65% grassland and 5% final void. Coal & Allied has progressively rehabilitated the site, with more than 1,000 ha of revegetated land (predominantly grassland) already established (either permanently or temporarily) on site. This equates to a rehabilitation to active disturbance area ratio of approximately 0.5.

As part of this modification, Coal & Allied has redesigned its final landform to accommodate the additional overburden material produced from mining deeper coal seams and to better blend in with the surrounding natural landscape. **Section 2.1** summarises Coal & Allied's design objectives used to guide the mine plan and final landform design. To avoid significant additional impacts to surrounding sensitive receivers, additional overburden emplacement would be focused in the northern part of the Cheshunt emplacement area. As a result, the maximum height would increase by 80 m to 240 m AHD, in places. This height is similar to the overburden emplacement areas to the north at Ravensworth Operations and HVO North. However, this height is notably higher than the surrounding undulating hills (70-130 m AHD) and at least 50 m higher than the approved overburden emplacement areas to the south at Warkworth and the proposed United Wambo Project. Visual impacts associated with the proposed final landform are further considered in **Section 5.5**.

The proposed final landform, shown in **Figures 11** and **12**, incorporates micro-relief design techniques and is designed with slopes and undulations to better replicate and assimilate with the natural landscape in the area. The proposed final landform also aims to complement the previously created landforms to avoid re-disturbing rehabilitated areas and/or re-shaping existing emplacement areas. The proposed final landform would be free-draining with slopes of generally 10 degrees for overburden emplacements and up to 18 degrees for internally draining faces. The post-mining land use would be generally consistent with that currently approved and being established on site, and would remain in keeping with the Synoptic Plan. The land would continue to be revegetated to areas of grassland, trees over grassland and woodland, in order to support agricultural land uses and native habitat.

At the request of the Department, Coal & Allied provided additional justification for the design of the final void in its RTS, particularly the angle of the highwall and the placement of the void in the southwestern corner of the project area. Coal & Allied clarified that the design was particularly constrained by the strip-mining methods and the proximity of the Golden Highway to the south, with additional consideration given to ensuring that future coal resources are not sterilised in the process of shaping the final landform. Coal & Allied further clarified that the slope angles of the proposed highwall would be consistent with the approved mine plan (~35-42 degrees) and that this was a compromise to prioritise the reduced slope of the low wall. Coal & Allied also investigated further techniques to blast or buttress the highwall. However, Coal & Allied considered that these slope remediation techniques would be unviable due to the cost and complexity.

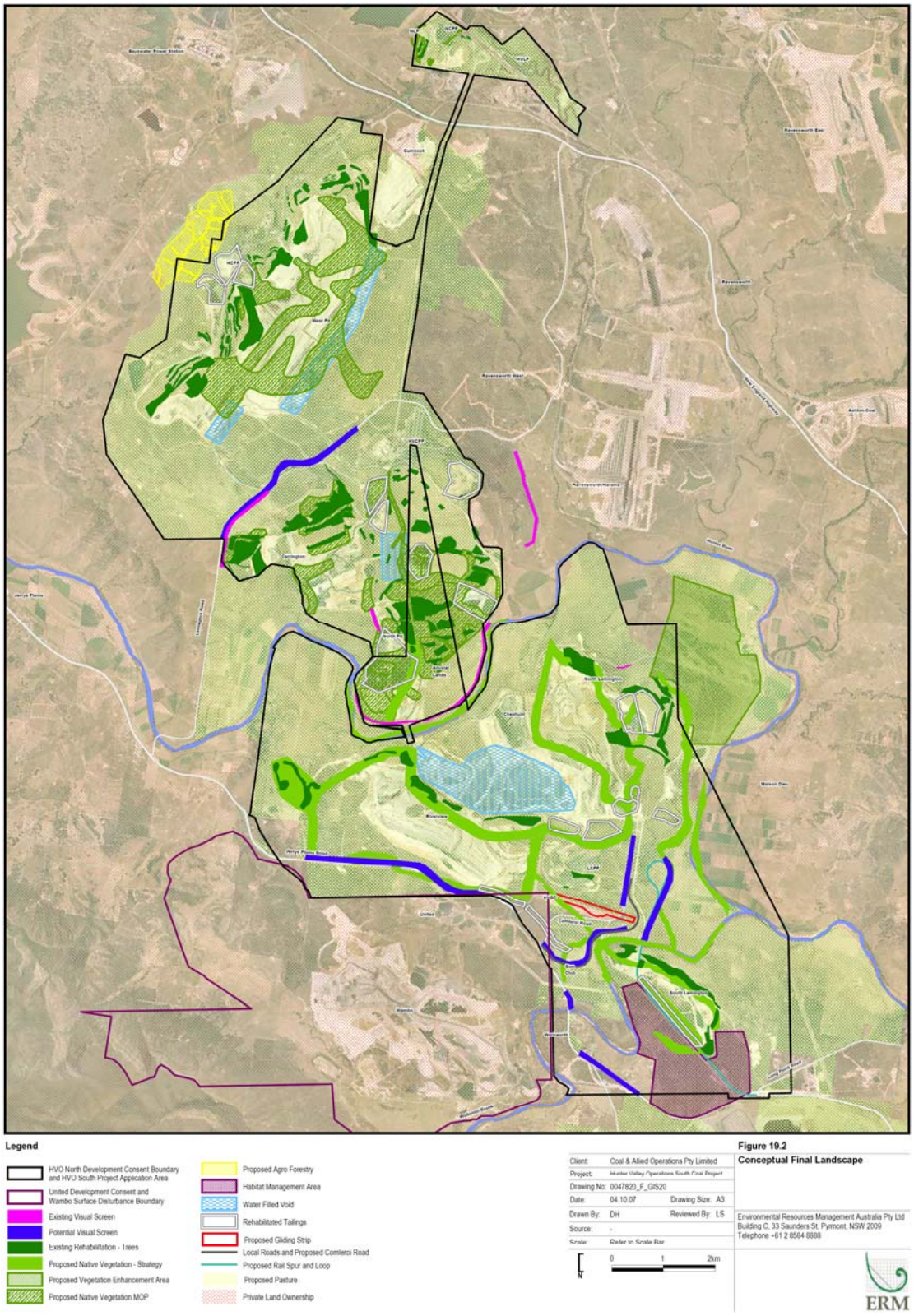

Figure 10: *Existing approved final landform and final rehabilitation*

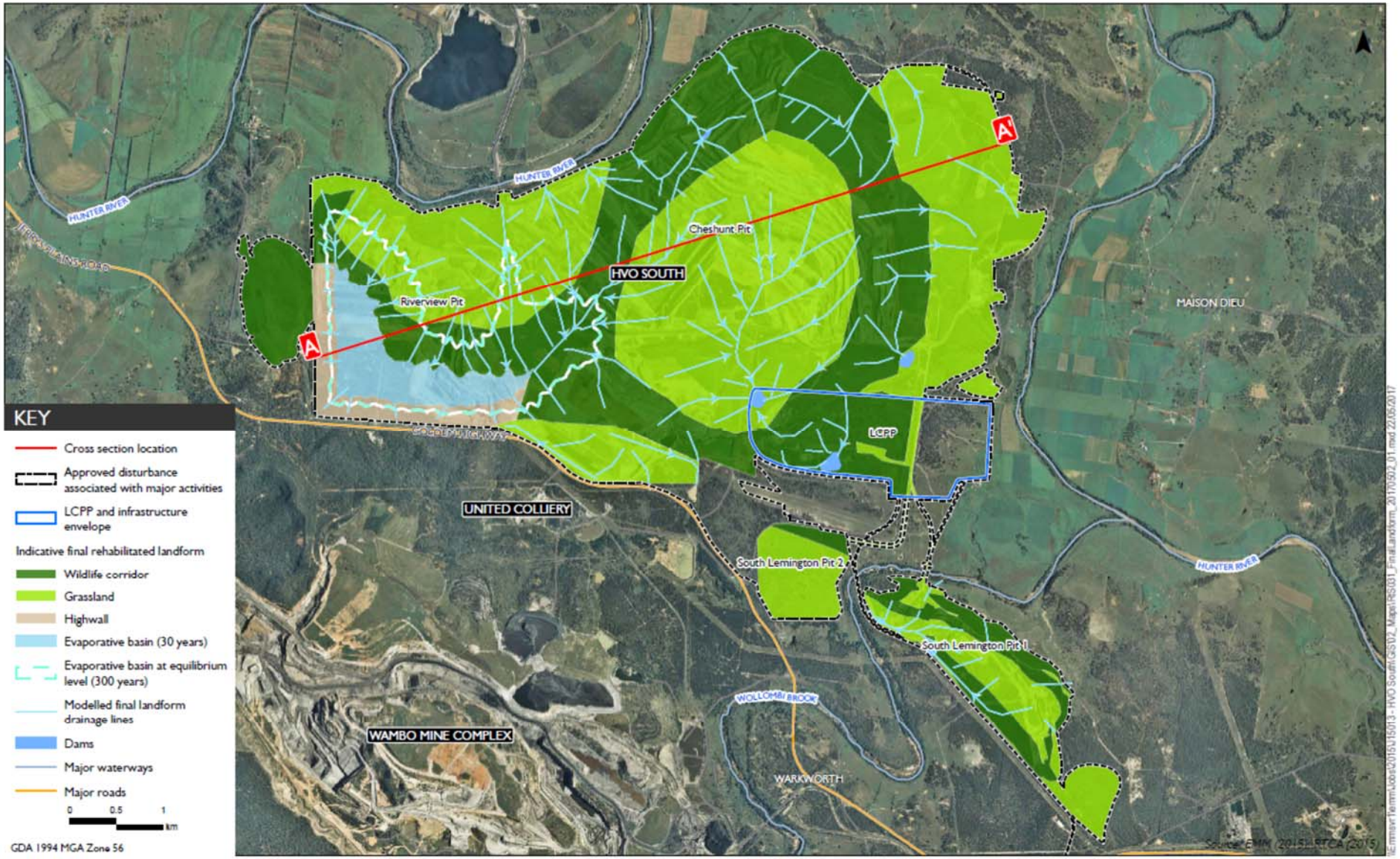

Figure 11: *Proposed final landform and final rehabilitation*

Figure 12: *Proposed final landform and final rehabilitation cross sections*

The Department accepts this justification and considers that Coal & Allied has undertaken all reasonable and feasible efforts to improve the final landform at HVO South, particularly considering it is working with a legacy landform. Overall, the Department is of the view that the proposed changes represent an improvement compared to the design approved 10 years ago, which was based on overburden emplacement areas with generally flat tops and uniform slopes. The proposed final landform includes appropriate micro-relief features, promotes optimal post-mining land uses and meets current standards for final landform design.

Coal & Allied would continue to progressively rehabilitate the site, with the ratio of rehabilitation to active mining areas steadily improving over time from 0.6 during Stage 1 up to 1.2 during Stage 4. Coal & Allied would continue to undertake progressive rehabilitation in accordance with HVO's approved Mining Operations Plan (MOP), required by DRG under the existing mining leases. This MOP currently incorporates the relevant requirements of the Landscape Management Plan under the project approval (conditions 35-38 of Schedule 3).

As DRG is the key government sub-agency responsible for the regulation of rehabilitation, final landforms and closure processes, the Department has recommended replacing the existing Landscape Management Plan conditions to clarify regulatory responsibilities and to refine expectations for rehabilitation and biodiversity management. This would include complying with best practice rehabilitation objectives for large open cut mines (see Table 16) and further detailing rehabilitation and mine closure objectives and final landform commitments in a Rehabilitation Management Plan. This plan would continue to be incorporated within the mine's MOP. Specific requirements to prepare a Final Void Management Plan and Mine Closure Plan have been removed from the project approval.

The Department has also recommended a new requirement for Coal & Allied to prepare a stand-alone Biodiversity Management Plan to manage remnant vegetation and fauna habitat on site and manage the Goulburn River biodiversity offset area. The condition requiring this offset area be secured in perpetuity has also been revised to reflect recent legislative changes and OEH's preferred conservation mechanisms.

5.5 Visual Amenity

The EA included a visual assessment of the potential impacts of the proposed modification on the visual amenity of surrounding sensitive receivers. The assessment used view shed analyses and photomontages to assess the potential visual impacts of the proposed final landform, as well as changes to views during the remaining mine life.

As discussed in **Section 2.1**, the proposed final landform has been designed to look more consistent with natural landforms in the area and to improve the overall aesthetics of the project as far as practicable, both during and post-mining. The design includes emplacing additional overburden material within the northern part of the Cheshunt emplacement area to avoid blocking views of the Wollemi National Park for receivers to the east. The material would also be set back from the existing rehabilitated face to reduce the visual impacts.

Receivers in Maison Dieu and Long Point, with direct views of HVO South, would experience moderate visual impacts when the Cheshunt emplacement area is being shaped and established during Stages 1 and 2 of the mine plan (approximately 2022). However, these impacts would reduce over time to moderate/low as rehabilitation progresses and vegetation matures. Over time this rehabilitation/vegetation would minimise the contrast between the emplacement areas and the distant landscape, thereby improving the visual amenity (see **Figure 13**).

Receivers in Jerrys Plains would experience moderate/low impacts while the landform is being established, and again decrease over time with rehabilitation. Views from the north, south and west would generally be constrained due to intervening topography and distance. In its RTS, Coal & Allied included visual fly-through video to assist with visualising the proposed modification.

To further minimise visual impacts during mining operations, Coal & Allied proposes to continue implementing the following the management measures:

- using overburden emplacement areas to visually shield the active mining operations;
- minimising active area of disturbance;
- undertaking progressive reshaping, topsoiling and rehabilitating using temporary cover crops; and
- completing annual visual surveys to monitor rehabilitation.

The visual assessment demonstrates that the proposed final landform has been appropriately redesigned to integrate with the existing landscape. The shape and undulations would reduce the contrast with surrounding

landforms and the proposed vegetation, particularly the treed vegetation on the slopes and along the Hunter River, would better blend in with more distant views without significant change to the final land use.

With the additional emplacement activities and periods of unrehabilitated surfaces, the short term visual impacts are generally similar to the approved project. However, with the reshaping of the landform and the improved rehabilitation measures, the Department is satisfied that the long term visual impacts should noticeably reduce.

The Department considers that no additional visual impact or amenity conditions are necessary. Progressive rehabilitation would have the most influence over minimising visual impacts and these activities would be addressed under the conditions and in the proposed Rehabilitation Management Plan.

Figure 13: *Photo montages from Shearer's Lane, Maison Dieu*

5.6 Socio-economics

The proposed modification is forecast to provide approximately $243 million in royalties to the NSW Government and $160 million in taxes, based on 21% of revenue and discounted at 7%. These economic benefits are largely attributable to the extraction of an addition 56.8 Mt of ROM coal. Capital expenditure associated with the modification is estimated to be $10 million and is largely attributable to minor fleet and equipment upgrades.

HVO currently employs around 1,500 employees and contractors, a majority of which reside in the Hunter region. The proposed modification does not seek to increase HVO South's workforce nor extend the project approval period. Accordingly, Coal & Allied considers that there is unlikely to be any additional demand for community services and therefore there is no need to increase its Community Development Fund (CDF). The Department understands that the CDF has been operating for more than 18 years and has invested over $14.5 million in community projects across the region in areas of health, education, environment, land management and economic development. Coal & Allied states that recent current community contribution commitments for the period between January 2015 and December 2017 are approximately $4 million. The Department agrees that additional community funding would not be necessary for the proposed modification.

The Department acknowledges that public submissions raised concerns over Yancoal's acquisition of Coal & Allied and the effects this could have on the socio-economic benefits to NSW. The Department notes that Yancoal's investment has been subject to strict regulatory approvals, including review by the Commonwealth Foreign Investment Review Board (FIRB) to ensure that Australia continues to receive flow-on benefits regardless of whether the asset is foreign-owned. FIRB gave its approval to the transaction in April of this year.

5.7 Other impacts

Other minor impacts are discussed in **Table 4** below.

***Table 4**: Other impacts*

Issue	*Impact and Consideration*	*Recommendation*
Blasting	• The project approval includes air blast overpressure and ground vibration criteria, restricted blasting hours, blasting frequency and blast monitoring requirements. • Coal & Allied currently operates a Blast Management Plan for the HVO Complex. • No changes are proposed to blasting methodology or frequency, or the existing monitoring and management measures.	• The Department has recommended minor changes to strengthen conditions of approval, particularly with regards to restricting blasting near public roads and co-ordinating blasts with nearby mines. • Coal & Allied would also be required to prepare and implement a comprehensive Blast Management Plan instead of the previous Blast Monitoring Program.
Greenhouse Gas Emissions	• The AQIA included an assessment of greenhouse gas emissions (GHGEs). • The proposed modification is predicted to generate additional annual average GHGEs of 0.71 million tonnes of carbon dioxide equivalent (Mt CO2-e) (Scope 1 and 2), which is approximately 0.13% and 0.5% of Australia's and NSW's, respectively. • Due to differences in estimation methods, the AQIA could not directly compare these amounts with the approved project; however, it is estimated to be an approximately 0.03% increase. • The Department considers this increase to be negligible. • Nevertheless, Coal & Allied would continue to be required to implement all reasonable and feasible measures to minimise GHGEs from the project.	• The Department is satisfied with Coal & Allied's assessment of potential GHGEs. • The Department considers that GHGEs could be appropriately managed under the proposed Air Quality Management Plan and has recommended removal of the stand-alone Greenhouse Energy and Energy Efficiency Plan.
Climate Change	• A number of public submissions raised concerns with approving further coal production in light of Australia's recent signing of the *Paris Agreement 2016*, which sets out a global action plan to combat anthropogenic global warming and climate change. • However, in the absence of a strategic national or State wide policy on the future of coal mining and coal consumption	No additional conditions or amendments are considered necessary.

Issue	*Impact and Consideration*	*Recommendation*
	(domestic or export) in relation to the emissions targets, the Department is unable to give significant weight to these concerns.	
Lighting	• Public submissions raised concerns with night lighting, which would continue to be used to facilitate 24-hour operations. • To minimise lighting effects, HVO implements a number of proactive lighting management measures such as limiting external lighting and directing lights below the horizontal away from sensitive receivers. • Reactive lighting adjustment would continue to be made following any lighting-related complaint. • Coal & Allied would continue to be required to take all practicable measures to mitigate off-site lighting impacts from the project.	No additional conditions or amendments are considered necessary.
Interactions with HVGC	• HVGC generally accepted the additional information provided in the RTS. • HVGC would continue to experience noise and dust amenity impacts and potential air safety impacts due to the proximity between its runway/glider paths and the active mining areas at HVO South. • Coal & Allied currently has in place an agreement with HVGC to manage interactions between the two sites, and an Amenity Management Plan to minimise mining-related impacts when HVGC facilities are in use.	In consultation with both Coal & Allied and HVGC, the Department has recommended updating the requirements of the Amenity Management Plan to ensure the plan is more adaptive with protocols to review effectiveness of the management measures and formalise notification procedures.
Property Values	• Public submissions raised concerns over property devaluations resulting from the proposed modification, particularly for those residences located outside of the zone of affectation. • The Department notes that property values are influenced by a variety of factors and it would difficult to attribute any reductions (or increases) to this proposed modification.	No additional conditions or amendments are considered necessary.

6. RECOMMENDED CONDITIONS

The Department has drafted a recommended notice of modification (see **Appendix D**) and a consolidated version of the approval as it is proposed to be modified (see **Appendix E**). The Department is satisfied that its recommended conditions represent current best practice for the regulation of open cut coal mining projects in NSW and provide a high level of protection for the local environment and the amenity and health of the local community.

In addition to the changes discussed in **Section 5**, the Department has taken the opportunity to review the approval and update a number conditions to reflect current practice and contemporary drafting standards. These include:

- updating relevant Appendix figures to show the project approval boundary and approved disturbance footprint;
- updating the Schedule of Lands to reflect changes in ownership and lot identifiers since 2008;
- replacing references to the disapproved Warkworth Extension Project (MP 09_0202) with the approved Warkworth Continuation Project (SSD-6464);
- providing clarification that management plans can be consolidated with similar plans for HVO North;
- updating definitions to reflect current agency names and terminology;
- updating agency references to reflect current agency responsibilities;
- replacing the word ‘shall’ with ‘must’;
- removing ‘additional’ air quality and noise mitigation and acquisition criteria as these scenarios are now addressed in the VLAMP;
- updating the conservation bond condition to require triennial reviews;
- providing for management plans to be prepared and then ‘implemented as approved by the Secretary’;
- adding a number of conditions to Schedule 5 relating to environmental management, monitoring, auditing and reporting; and
- updating reference to the requirements for operating the CCC to reflect the Department’s latest 2016 *Community Consultative Committee Guidelines for State Significant Projects*.

Coal and Allied has reviewed and accepted the recommended conditions of approval.

7. CONCLUSION

The Department has completed its assessment of the proposed modification, including consideration of the potential environmental, social and economic impacts and the relevant requirements of the EP&A Act.

The Department considers the proposed modification is acceptable and would provide Coal & Allied with an opportunity to sustainably extract additional coal, and at a higher rate, without significant additional adverse impacts. The Department considers that the proposed modification provides an appropriate balance between the minimisation of potential amenity and environmental impacts and the efficient recovery of the State's resource. Based on its assessment, the Department is satisfied that the proposal would not significantly increase the impacts compared to the approved project, and that the residual impacts can be adequately mitigated and/or managed through implementing the recommended conditions. The Department is therefore satisfied that the proposed modification is in the public interest, and is approvable, subject to conditions.

Following its assessment of the modification, the Department considers that the modification is approvable, subject to modified conditions of approval (**Appendices D & E**). This assessment report is hereby presented to the Planning Assessment Commission for determination.

Megan Dawson 27-11-17
Team Leader
Resource Assessments

Howard Reed 27.11.17
Director
Resource Assessments

APPENDIX A: ENVIRONMENTAL ASSESSMENT

See the Department's website at
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8223

APPENDIX B: SUBMISSIONS

See the Department's website at
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8223

APPENDIX C: RESPONSE TO SUBMISSIONS

See the Department's website at
http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8223

APPENDIX D: RECOMMENDED NOTICE OF MODIFICATION

APPENDIX E: CONSOLIDATED APPROVAL