



Planning & Environment

STATE SIGNIFICANT DEVELOPMENT ASSESSMENT Drayton South Coal Project (SSD 6875)



Secretary's Environmental Assessment Report
Section 89E of the
Environmental Planning and Assessment Act 1979
August 2015

Cover Photos:
Drayton South Coal Project
Environmental Impact Statement 2015

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EXECUTIVE SUMMARY

The Drayton Coal Mine is located 13 kilometres (km) to the southwest of Muswellbrook in the Upper Hunter Valley, and is owned and operated by Anglo American Metallurgical Coal Pty Ltd (Anglo).

It was first approved by Muswellbrook Shire Council in 1980, and has been operating for over 30 years.

Under the current approval, Anglo is allowed to extract up to 8 million tonnes of run-of-mine (ROM) coal a year until 2017, after which it is required to rehabilitate the mine. However, mining has developed more quickly than expected, and almost all the coal covered by the existing approval has been extracted.

To sustain the operations of the existing mine, Anglo proposes to expand the Drayton mine into an area to the south that is currently used for cattle grazing, and bring it closer to two major thoroughbred horse studs – the Coolmore and Woodlands studs.

In 2012, Anglo lodged an application and Environmental Assessment to develop the Drayton South Coal Project. The project originally sought to extract around 120 million tonnes of ROM coal, at a rate of up to 7 million tonnes a year over 27 years, from four open cut pits (Whynot, Redbank, Blakefield and Houston).

In 2013, the former Minister for Planning requested the NSW Planning Assessment Commission (the Commission) to undertake an independent review of the merits of the Drayton South Coal Project. The Commission concluded that the mine 'should not proceed at the planned scale in this location', due to the potential impacts on the nearby thoroughbred horse studs (Coolmore and Woodlands).

Based on expert advice, the Commission recommended that any mining be restricted to zones north of the 'second ridgeline' from the Golden Highway. The Commission recommended that this setback is the 'absolute minimum' required and that additional work would need to be done to demonstrate that mining in the remaining northern area would not threaten the viability of the Coolmore and Woodlands horse studs.

Anglo subsequently amended the mine plan to partially reflect the Commission's recommendation, with a 'retracted mine plan' that kept mining north of the 'first ridgeline' from the Golden Highway.

However, on 17 October 2014, the Commission refused the project. The Commission's grounds for refusal included:

- the project did not provide a sufficient buffer to protect Coolmore and Woodlands horse studs as recommended in the Commission review;
- the project has not demonstrated that it would not adversely impact equine health and the operations of the studs;
- the approach of monitoring the response of thoroughbreds to mining operations to address uncertainty is not acceptable;
- the project's economic benefits do not outweigh the risk of losing Coolmore and Woodlands studs, and potential impacts on the thoroughbred and viticulture industry; and
- the project is not in the public interest.

Anglo has since reevaluated the project, and now believes that it can develop the Drayton South area in an economically viable manner that complies with the Commission's recommended setback.

On 12 May 2015, Anglo lodged a new development application and Environmental Impact Statement (EIS) for the Drayton South Coal Project. This new proposal seeks to extract approximately 75 million tonnes of ROM coal and is the subject of this assessment report.

Conceptually, the proposal the Drayton South Coal Project has 5 components:

- the establishment of a haul road from the existing mine to the new mining area, which would enable equipment and people to be moved between the two areas, and coal to be moved from the new mining area to the existing mine for processing and export to market;
- the creation of a new mining area and associated infrastructure to the south of the existing Drayton and Mt Arthur mines, and behind a natural ridgeline that would shield the new mining area from the horse studs to the south;
- the ongoing use of the existing infrastructure at the Drayton mine, including the coal handling and preparation plant, the Antiene rail spur, and surface facilities;
- the rehabilitation of both the Drayton and Drayton South areas following mining, focusing primarily on the establishment of woodland corridors that would complement the proposed rehabilitation at the adjoining Mt Arthur mine and the existing Drayton Wildlife Refuge to the north, and the protection and enhancement of three new offset areas to compensate for the residual flora and fauna impacts of the project; and
- consolidation of all existing planning approvals into a single, contemporary planning approval for the entire operation.

Anglo has mounted several arguments to justify the project.

These arguments include that the project would:

- extract a substantial coal resource of about 75 million tonnes of ROM coal from an area that has around 663 million tonnes of in-situ coal resources, in an area that is already dominated by large-scale coal mining operations;
- use the existing infrastructure of the existing Drayton mine, and therefore significantly reduce the costs associated with mining the coal resource;
- provide around \$233 million (present value) to the NSW Government in royalties and \$93 million (present value) to the Commonwealth Government in company tax, generating revenue for spending on infrastructure and services for the general community;
- provide around \$355,000 (present value) to Muswellbrook Shire Council each year for the provision of local infrastructure and services and community enhancement; and
- have significant consequential benefits for both the regional and State economy, through capital investment (around \$131 million), annual operational spending (around \$213 million), and the retention of the 500 strong existing workforce at the Drayton mine for another 15 years.

Anglo has also argued that it has incorporated a range of mitigation measures into the design of the project to minimise its impacts people, surrounding land uses – such as the Coolmore and Woodlands horse studs – and the environment.

These measures include:

- keeping the mining area behind the natural ridgeline and sterilising almost 100 million tonnes of an economic open cut coal resource, which has a current market value of at least \$5 billion;
- setting the mine back from the riparian zone around Saddlers Creek, and conserving and enhancing the existing vegetation within the riparian zone;
- minimising the size of the overburden dumps and backfilling the mining pits as much as possible to minimise the size of the final void;
- implementing best management practice to minimise the dust, noise, vibration, water, visual and heritage impacts of the project;
- creating a final landform with micro-relief that would blend in with the undulating hills of the surrounding landscape;
- restoring most of the mining area to woodland, including at least 471 hectares of the Central Hunter Box-Ironbark Woodland endangered ecological community (EEC); and
- implementing a comprehensive biodiversity offset strategy, which involves the protection and enhancement of more than 2,000 hectares of land, to compensate for any residual flora and fauna impacts of the project.

Importantly, the proposed mine plan complies with the recommendation made by the NSW Planning Assessment Commission in 2013 to keep open cut mining entirely behind the second ridgeline on the site.

In so doing, Anglo notes that compared to the previous mine plan, the current mine plan:

- doubles the buffer distance to the horse studs;
- significantly reduces the environmental impacts;
- ensures there would be no impact on equine health; and
- removes any views of the project from the operational areas of the horse studs.

Anglo has also written to the NSW Minister for Planning with two commitments to address concerns about future mining impacting the nearby horse studs. In particular, Anglo has committed to:

- relinquish any rights to further extend open cut mining in the Drayton South Exploration Licence (EL 5460) area beyond the southern and western extremities of the project currently under assessment; and
- voluntarily surrender any underground mining rights under EL 5460 beneath the Coolmore and Woodlands horse studs, as well as, any other land south of the Golden Highway.

The project is classified as a State Significant Development under Part 4 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) as it is development for the purpose of coal mining, and therefore met the criteria in Clause 5 of Schedule 1 of *State Environmental Planning Policy (Major Projects) 2005*.

The consent authority for the project is the Minister for Planning. However, the NSW Planning Assessment Commission will determine the application under delegation, as the project meets the terms of the Minister's delegation of 14 September 2011 due to the number of public objections to the project.

The Environmental Impact Statement for the project was exhibited from 15 May until 19 June 2015, and attracted over 4,100 submissions: 13 from public authorities, 15 from special interest groups – including the owners of the Coolmore and Woodlands horse studs and the Hunter Thoroughbred Association – and over 4,000 from the general public.

None of the public authorities objected to the project. Over 4,000 (or 98%) of public submissions supported the project citing job security and the broader economic benefits of the project. There were also 83 submissions from the community and special interest groups that objected to the project.

The objections were principally concerned about the potential impacts (i.e. dust, noise, vibration, visual, water and heritage) of the project on the adjoining horse studs, claiming open cut mining operations on the site would be incompatible with the thoroughbred breeding operations at both of these studs. Concerns were also raised about the broader potential for water, biodiversity, heritage, and traffic impacts of the project.

On 13 August 2015, the Minister for Planning requested that the Planning Assessment Commission review the merits of the project, and hold public hearings during the review. The Minister's terms of reference asked the Commission to assess merits of the project as a whole, with a particular focus on the potential impacts of the project on the operations of the Coolmore and Woodlands horse studs, and recommend any additional measures required to avoid and/or minimise the potential impacts of the project on the horse studs.

The Department has carried out a detailed assessment of the merits of the project, in accordance with its statutory obligations, and considered the material submitted both in support and against the project.

In doing this, it has had particular regard to the aims and objectives of the *Upper Hunter Strategic Regional Land Use Plan*. This plan outlines the Government's overarching strategic policy objective of seeking to strike an appropriate balance between competing land uses in the region (i.e. mining and the thoroughbred industry); and to achieve co-existence wherever possible between these land uses. The intent of the plan is not to favour one industry over another, but to ensure land use planning decisions are directed towards allowing both industries to prosper, but not at the expense of the other.

The Department is satisfied that the project would extract a significant coal resource of around 75 million tonnes from an area within the Hunter Coalfield that has long been earmarked for coal mining development.

It is also satisfied that the extraction of this coal resource would generate substantial economic benefits for the regional and State economy. While there are arguments about the precise scale of these benefits, the Department is satisfied that even with conservative sensitivity testing of the key variables involved in calculating such benefits (such as the long term price of coal), the economic benefits of the project would be overwhelmingly positive in terms of securing royalties and taxes for Government to spend on infrastructure and services, creating jobs, and stimulating the regional and State economy through capital and operational spending.

The critical issue is: the extent to which the project would result in unacceptable impacts on the Coolmore and Woodlands thoroughbred operations.

The Department's detailed assessment has found that the project would be able to comply with the relevant air, noise and blasting criteria at the Coolmore and Woodlands studs:

- noise levels would remain well below the intrusive and amenity criteria in the *NSW Industrial Noise Policy*;
- blasting impacts could be controlled to ensure compliance with the relevant overburden pressure and ground vibration criteria in the relevant ANZEC guidelines;
- air quality levels would remain well below the relevant cumulative annual average ambient quality criteria in the *Approved Methods for Modelling and Assessment of Air Pollutants in NSW*; and
- while the modelling indicates there could be up to 5 additional days in a year where the short term PM₁₀ criteria may be exceeded when mining is closest to the studs, Anglo is likely to be able to avoid such exceedances occurring by implementing best practice dust control on site, and curtailing its operations during adverse weather conditions.

Anglo has undertaken a comprehensive literature review to assess the potential impacts of the project on equine health. While there remains some uncertainty, the Department's view is that the changes to the mine plan have shifted the weight of evidence significantly. The Department now considers that the scientific evidence supports a view that the project would not result in adverse impacts on the health of horses residing either permanently or temporarily at the studs.

It has also found that the project is unlikely to have any significant impacts on the quantity or quality of water used by either of the two studs.

Consequently, the Department has concluded that the project is unlikely to have any significant physical impacts on the studs, and would certainly not affect the physical capability or suitability of the site to be used for horse breeding.

This leaves the potential impacts of the project on the visual amenity, and the broader reputation of the Coolmore and Woodlands operations.

By ensuring the mining operations would remain behind the major natural ridgeline on the site, Anglo's changes to the mine plan are wholly consistent with the Commission's recommendations, and there would be no direct views of the mining operations from the 'core operations' of either of the studs.

This means the mining operation would only be visible from the higher ground on both studs where in some areas there are already views of the industrial landscape to the north, including the existing Mt Arthur mine and AGL Macquarie power stations. In the Department's view, these impacts would be acceptable as these areas are not the core areas where horse breeding activities occur.

Having said this, the Department notes that regardless of the setbacks imposed on the mining operations there would still be some indirect (light glow, dust plumes) and dynamic (mining-related vehicles on public roads, media about the two industries being in close proximity to each other) impacts as a result of the project.

While the Department accepts that reasonable people may disagree about the significance that should be given to these impacts, it has concluded that:

- they can be mitigated to some degree;
- are common in the Hunter Valley where mines are located in close proximity to several horse studs in the Equine Critical Industry Cluster; and
- are unavoidable consequences of co-existence of these two important industries in the valley.

The Department does not consider these impacts to be significant enough to warrant making further changes to the mine plan, as this would jeopardise the viability of the project as a whole.

It also does not consider these impacts to be significant enough to cause the thoroughbred operations to leave the Hunter Valley.

In this regard, the Department notes that there are likely to be a number of economic and practical barriers to the relocation of these thoroughbred operations (such as the proximity to other thoroughbred operations in the Upper Hunter and Sydney, and the existing capital investment in the studs), and even if the owners of these operations did decide to leave the area, there is no reason why the properties could not continue to be used to breed thoroughbred horses in the future, albeit in all likelihood by operations without the international reputation of Coolmore and Darley.

Notwithstanding this conclusion, Anglo would need to employ best management practice on site during any mining operations, and minimise the impacts of the project on the Coolmore and Woodlands studs.

Finally, the Department has considered all the other potential impacts of the project (biodiversity, heritage, land, water, economic, social), and is satisfied that these impacts are unlikely to be significant and can be suitably mitigated and/or offset.

In this regard, the Department has recommended conditions that would require Anglo to comply with strict standards to ensure an acceptable level of environmental performance, and prepare a number of management plans for the project in consultation with relevant agencies and the owners of both thoroughbred studs.

These conditions would require Anglo to monitor the impacts of its project closely, and to implement appropriate mitigation measures in the unlikely event that the impacts of the project are greater than predicted.

Overall, the Department is satisfied that the benefits of the project would outweigh its costs, and believes that the proposed mine plan strikes an appropriate balance between protecting the interests of the horse studs and realising the significant economic benefits that would flow to the region and the State if the project is allowed to proceed.

Consequently, the Department considers the project to be in the public interest, and recommends that it be approved subject to strict conditions.

1. BACKGROUND

1.1 Existing Operations

The Drayton Coal Mine is located 13 kilometres southwest of Muswellbrook in the Upper Hunter Valley (see Figure 1), and is owned and operated by Anglo Metallurgical Coal Pty Ltd (Anglo).

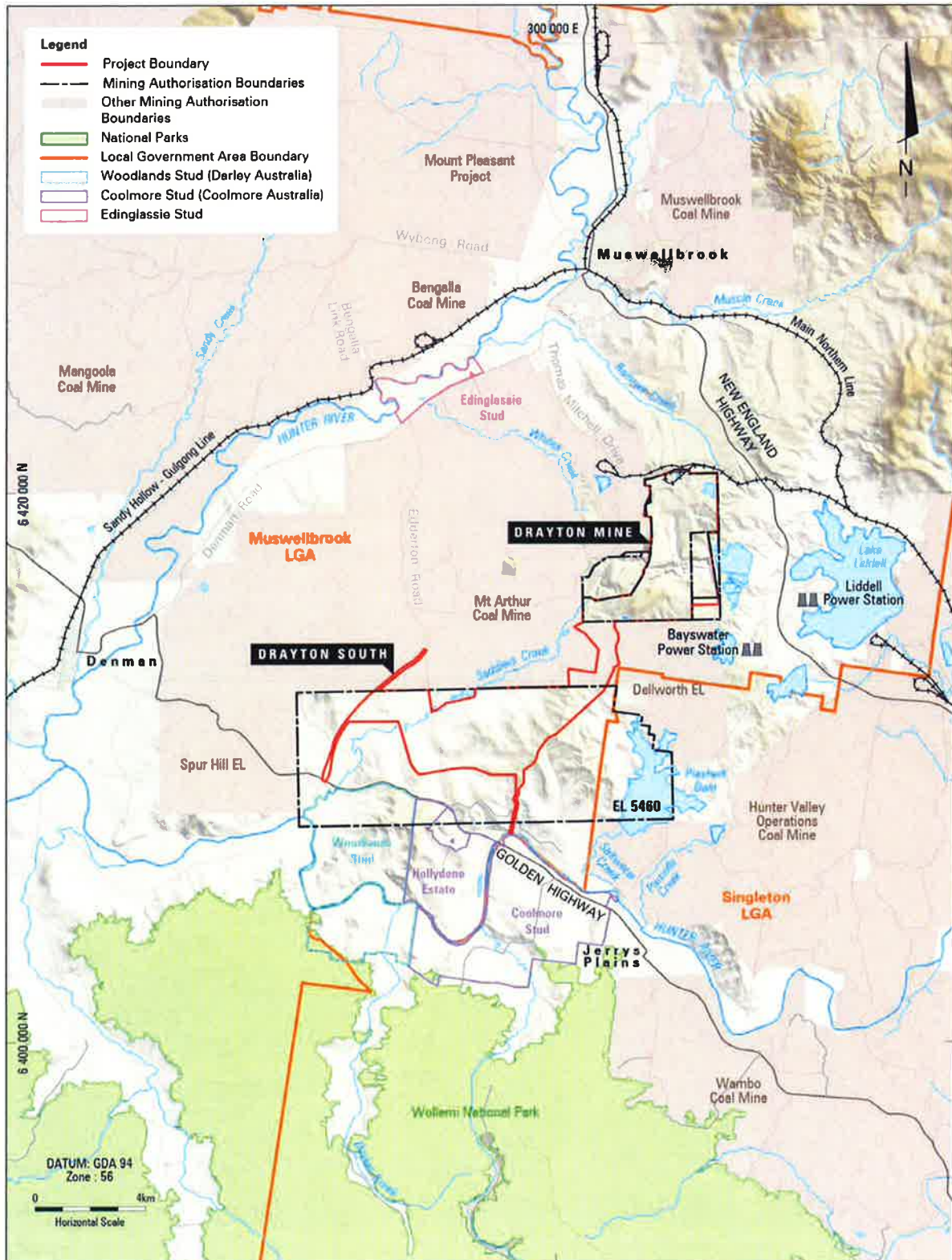


Figure 1: Location of Drayton Coal Mine

The mine was originally approved in 1980, and started mining operations in 1983. Since then, two major expansions of the mine have been approved, with the mine currently operates under a project approval granted by the then Minister for Planning in 2008 (PA 06_0202). The current approval allows Anglo to extract and process up to 8 million tonnes (Mt) of ROM coal a year, with mining operations allowed to continue until the end of December 2017.

Mining at Drayton is currently undertaken in three open cut pits (North pit, East pit and South pit), via a combination of dragline and truck and shovel methods. Coal reserves in the existing mine are now almost exhausted, and it is expected that mining will cease well before the end of 2017 when the current approval expires. The mine includes a range of mining related infrastructure, including a coal handling and processing plant (CHPP) and rail loop and loading facilities.

At full production, the mine employed around 530 workers. However, this number has fallen in recent months as mining operations gradually wind down.

1.2 Drayton South Area

Anglo is now proposing to develop the Drayton South Coal Project, a new open cut coal mine to the south of the existing Drayton coal mine.

The area has long been identified as having a significant coal resource. Prospecting in the area began in the 1940's and intensified in the 1960's and 1970's.

In 1986, the then Minister for Planning approved the development of a large open cut coal mine in the Drayton South area, and a mining lease was subsequently issued for the mine in 1989 to allow mining to commence. However, the proponent of that project (Mount Arthur South Coal Limited) did not commence the project, and the development consent and mining lease consequently lapsed in 1991 and 1994, respectively.

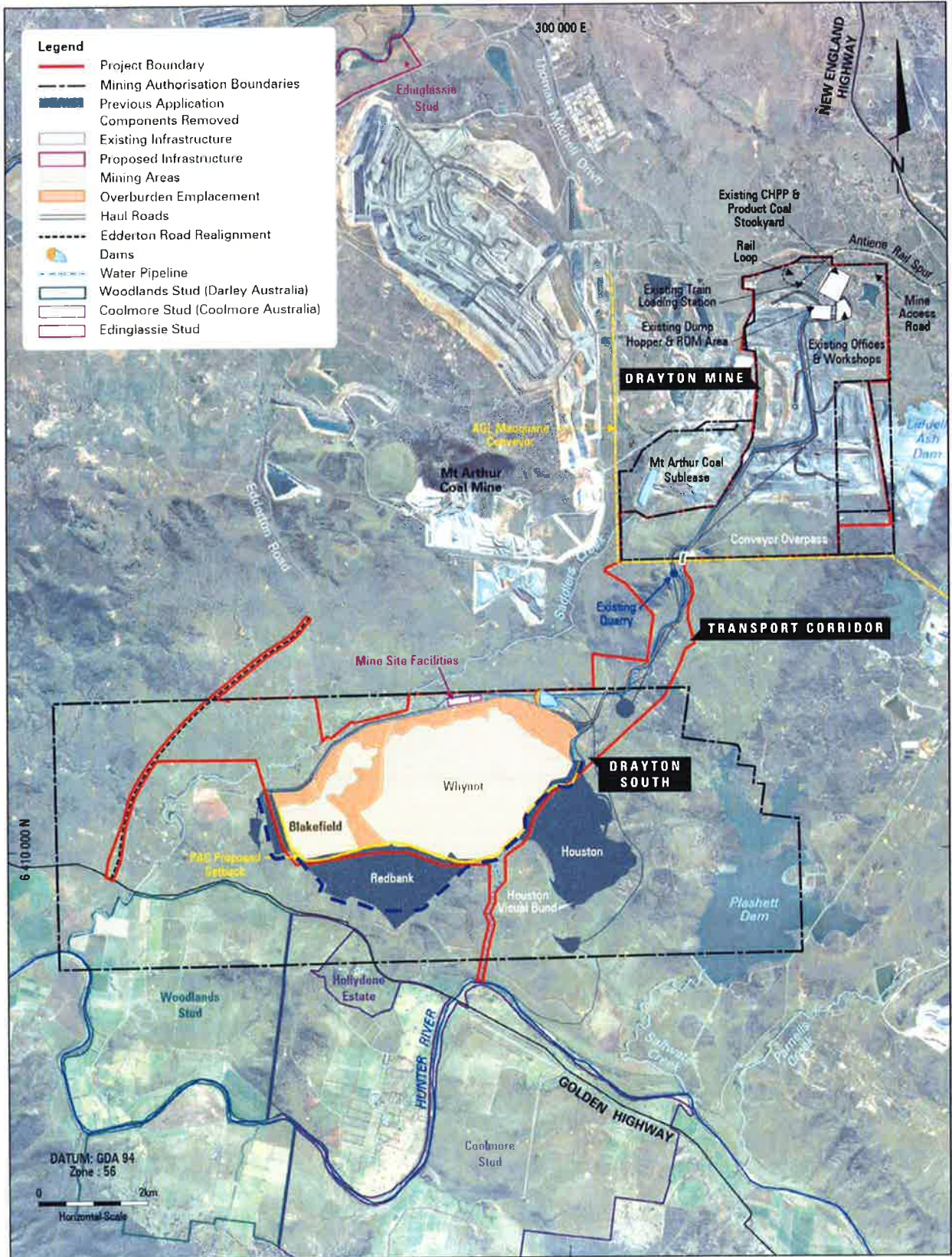
Anglo acquired an exploration licence (EL 5460) over the area in 1998 and has since undertaken a considerable amount of exploration activities to further define the coal resource. These activities have identified an in-situ coal resource of some 663 million tonnes, worth around \$50 billion.

In 2012, Anglo lodged an application and Environmental Assessment to develop the Drayton South Coal Project. The project originally sought to extract around 120 Mt of ROM coal, at a rate of up to 7 Mt a year, from four open cut pits (Whynot, Redbank, Blakefield and Houston) (see Figure 2).

The project also involved some limited underground mining off the open cut pit highwalls (known as 'highwall mining'). Extracted coal was to be transported by an internal haul road to the existing coal handling and processing facilities at Drayton mine, before transport to market by rail via Drayton's existing rail loop and infrastructure.

The Department exhibited the Environmental Assessment for the project in November and December 2012, and received 71 submissions, including submissions from the owners of the Coolmore and Woodlands horse studs which are located directly to the south of the Drayton South area, on the other side of the Golden Highway. The horse studs and the wider thoroughbred breeding industry was strongly opposed to the project due to the potential impact on the studs and the thoroughbred breeding activities.

In 2013, the former Minister for Planning requested the NSW Planning Assessment Commission (Commission) undertake an independent review of the merits of the Drayton South Coal Project, with a particular focus on the potential impacts on Coolmore and Woodlands horse studs. The Commission completed and released its review report in December 2013, concluding that the mine 'should not proceed at the planned scale in this location', due to the potential impacts on the studs.



While the project was predicted to meet applicable noise, dust and blasting criteria at the studs, the Commission considered that there would be reputational, visual and other impacts on the studs and that they should be afforded the 'highest level of protection from the impacts of mining.' Based on expert advice, the Commission recommended that any mining be restricted to zones north of the 'second ridgeline' from the Golden Highway, shown as the yellow line on Figure 2 above. The Commission recommended this setback as the 'absolute minimum' required and that additional work would need to be done to demonstrate that mining in the remaining northern area would not threaten the viability of the Coolmore and Woodlands horse studs.

The Commission's recommended yellow line essentially excised the Redbank, Houston and part of the Blakefield and Whynot pits from the proposed mine plan.

Anglo subsequently amended the mine plan to partially reflect the Commission's recommendation, with the 'retracted mine plan' amended to keep mining to the north of the 'first ridgeline' from the Golden Highway, shown as the blue dotted line on Figure 2. The retracted mine plan excised mining from the Houston Pit and parts of the Whynot and Redbank pits, with the change reducing the recoverable coal resource to approximately 100 Mt of ROM coal. Anglo argued that any future reductions would render the project economically unviable, and in any case were not warranted given the predicted compliance with applicable criteria.

The Department completed its assessment of the Drayton South project based on this retracted mine plan. In summary, the Department's assessment noted that the project was predicted to comply with the applicable noise, blasting, dust and water criteria at the studs, and that residual visual, landscape and other impacts of the project were acceptable. The Department recommended that the project be approved subject to a suite of comprehensive conditions, and referred the assessment package back to the Commission for final determination.

On 17 October 2014, the Commission refused the project. The Commission's grounds for refusal included:

- the project did not provide sufficient buffers to protect Coolmore and Woodlands horse studs as recommended in the Commission's review;
- the project has not demonstrated that it would not adversely impact equine health and the operations of the studs;
- the approach of monitoring the response of thoroughbreds to mining operations to address uncertainty is not acceptable;
- the project's economic benefits do not outweigh the risk of losing Coolmore and Woodlands studs, and potential impacts on the thoroughbred and viticulture industry; and
- the project is not in the public interest.

Anglo has since reevaluated the project, and now believes that it can develop the Drayton South area in an economically viable manner that complies with the Commission's 'second ridgeline' setback.

On 12 May 2015, Anglo lodged a new development application and Environmental Impact Statement (EIS) for the Drayton South Coal Project. This new proposal seeks to extract approximately 75 Mt of ROM coal and is the subject of this assessment report.

The key differences between the previous mine plan refused by the Commission and the current proposal are:

- adherence to the Commission's recommended setback from the Coolmore and Woodlands horse studs;
- a 25% reduction in the mining area;
- a 25% reduction in the resource to be extracted (73.5 Mt vs 98.5 Mt); and
- a 25% reduction in the life of the project (15 years vs 20 years).

2. PROJECT

2.1 Description of the Project

The proposal – which is known as the Drayton South Coal Project – is shown in Figure 3, summarised in Table 1 (below) and described in detail in the EIS for the project (see Appendix C).

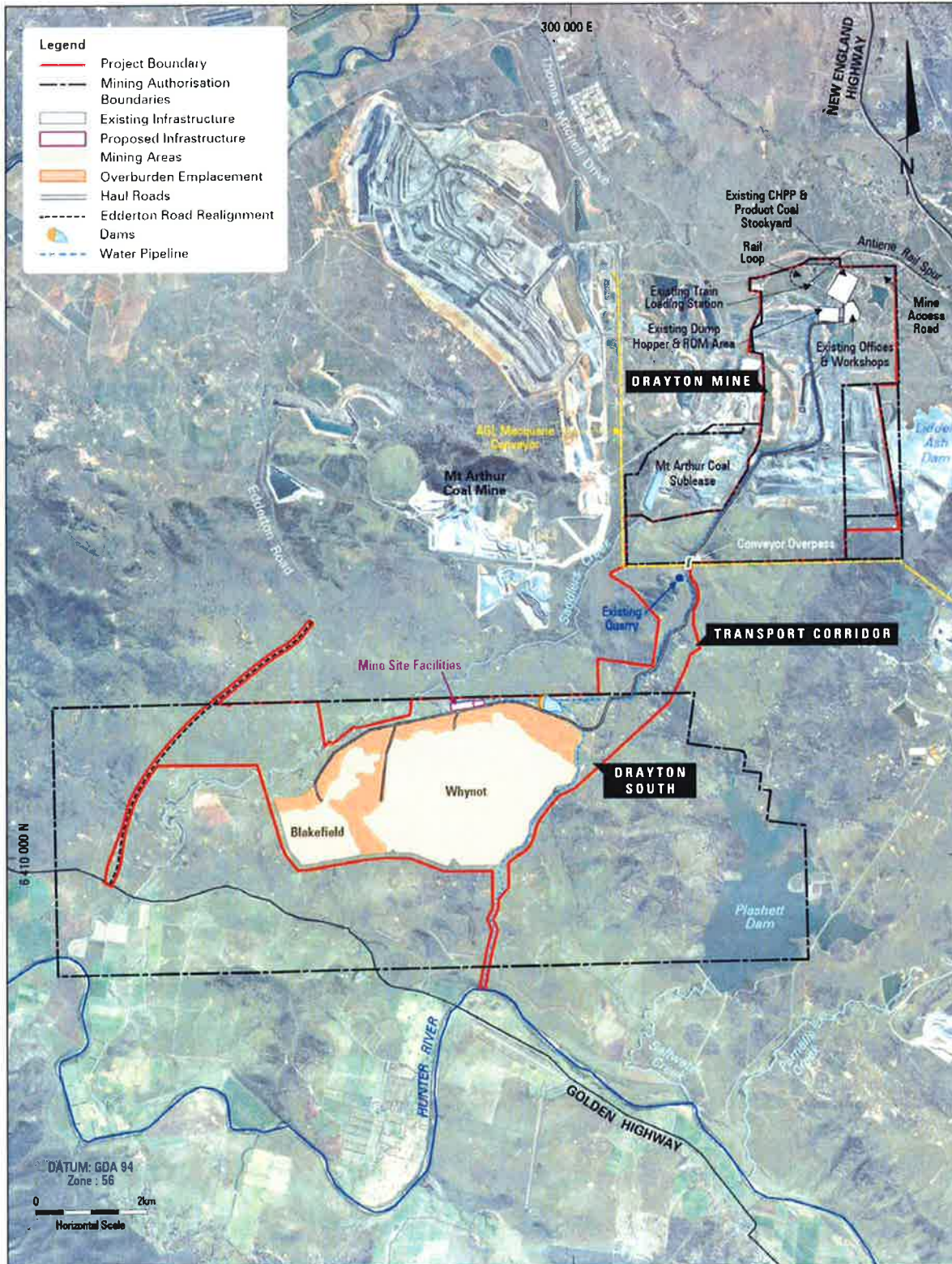


Figure 3: Drayton South Coal Project

Conceptually, the project has 5 components as described below.

New Mining Area

The new mining area would be located in a rural area to the south of the existing Drayton and Mt Arthur mines, and would be generally bounded by Saddlers Creek to the north and a natural ridgeline on the site to the south (see the yellow line on Figure 2).

Mining in this area would be a continuation of the dragline and truck and shovel operations currently being carried out at Drayton mine and would continue to utilise the existing equipment fleet. The operations would continue to be undertaken 24 hours per day, 7 days a week.

Anglo has amended its original mine plan to try and address some of the criticisms raised by the Commission during its review of the merits of the project and minimise the impacts of the mine plan on both the Coolmore and Woodlands horse studs.

The amended mine plan includes 2 open cut pits (Whynot and Blakefield) to extract a total of 73.5 Mt of coal at a rate of up to 6.4 Mt of ROM coal a year for 15 years. The workforce across both mines would be 500 full time equivalent (FTE) employees.

While the layout of the pits has changed, the footprint of the associated overburden dumps would largely remain the same. These dumps would be located to the north of the Blakefield and Whynot Pits adjacent to Saddlers Creek, and between the Blakefield and Whynot Pits.

A range of infrastructure would be developed to support the proposed mining operations, including:

- standard surface facilities (workshop, offices, etc.);
- a ROM hopper, crusher and stockpile; and
- a water management system to separate the mine's dirty water from the cleaner water in the catchment, a new mine water dam (i.e. 'Transfer Dam'), and a pipeline to the Hunter River for extracting water from the river under dry conditions.

As the proposal involves mining through a section of Edderton Road, the road would need to be relocated around the proposed mining operations. The new alignment of the road would be located to the west of Saddlers Creek and join the Golden Highway near the entry to the Woodlands stud (see Figure 3).

Transport Corridor

The proposal involves developing a transport corridor from Drayton mine to the new Drayton South mining area, about 3 km to the south of the existing mine (see Figure 3).

The corridor would include a dedicated 13 km haul road that would enable equipment and people to be moved from the existing mine to the new mining area, and coal to be moved from the new mining area to the existing mine for processing and export to market. The corridor would also be used to provide utility connections for the new mining area (i.e. power, water, etc.).

Ongoing Use of the Drayton Mine

The proposal relies on the existing infrastructure at the Drayton mine.

All coal from the new mining area would be processed at the existing mine, and exported via the Antiene rail spur. All rejects from this processing would be stored in existing mine voids.

Production rates would generally be consistent with existing production rates, at up to 6.4 Mt of product coal a year.

Staff and supplies would continue to access the mine via the existing mine access road off Thomas Mitchell Drive, although an emergency access point would be established off Edderton Road.

As it would take some time to develop the new transport corridor and begin to extract coal from the new mining area, Anglo is seeking approval for some minor extensions to the North, East and South pits at the existing Drayton mine (see Figure 4).

These extensions would disturb about 36.5 ha of land, and enable another 1.4 Mt of ROM coal to be extracted. The extraction of this coal would provide some continuity between the existing mining operations and the proposed mining operations at Drayton South, and take the total coal resource to be extracted under the project to 75 Mt of ROM coal.

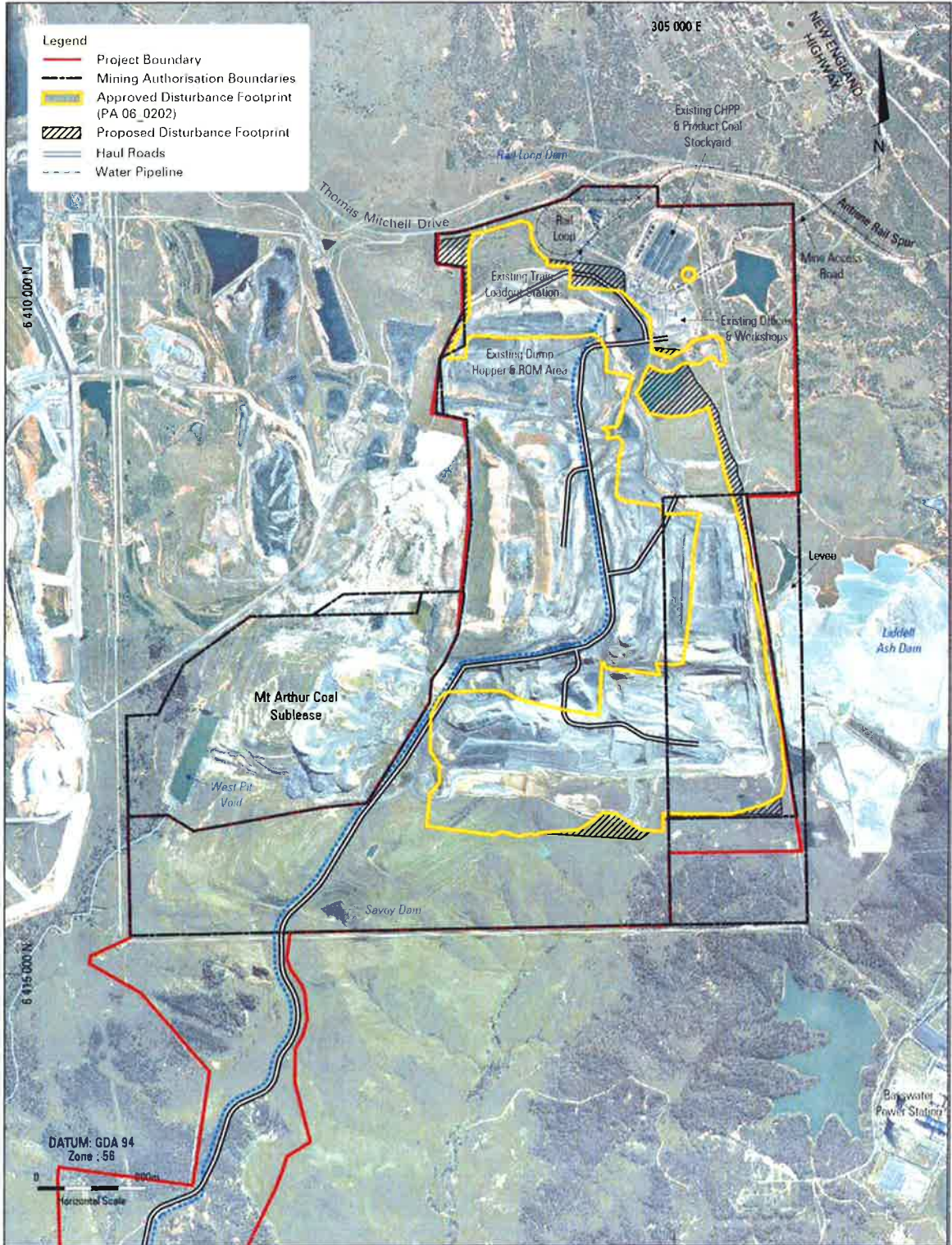


Figure 4: Drayton Coal Mine – Proposed Additional Mining Areas

Rehabilitation & Biodiversity Offsets

The proposal involves the rehabilitation of both the Drayton mine and Drayton South areas following mining, and the provision of biodiversity offsets to compensate for the residual biodiversity impacts of the project.

However, there remains some uncertainty about the final landform of the existing Drayton mine. This is principally because it would depend to a large extent on AGL Macquarie's future demand for fly ash storage for its power stations, and whether the Drayton South Coal Project is approved.

A previous expansion of the mine involved an eastward expansion of the East pit onto land owned by AGL Macquarie. In return for providing its land to facilitate the expansion of the mine, AGL Macquarie has a legally binding option to fill the East pit void with fly ash from its power station operations (subject to obtaining the necessary planning approvals).

AGL Macquarie has recently been granted approval by Muswellbrook Shire Council to increase the height of its existing ash dam wall, and so there is some prospect that it may not require access to the East pit void.

Nonetheless, Anglo has canvassed a number of scenarios for the rehabilitation of the Drayton mine. In its Response to Submissions, Anglo has added a further scenario (Scenario 4) which involves filling the North pit and the most of the East pit with coal rejects and tailings, leaving a significantly smaller, rehabilitated East pit void and final South pit void, which would be used to store water (see Figure 5).

The rest of the Drayton mine would be rehabilitated to either grassland or woodland, with a woodland corridor connecting to the proposed woodland corridor across the neighbouring Mt Arthur mine with the existing Drayton Wildlife Refuge and associated offset areas to the north of the Drayton mine.

The proposed rehabilitation of the Drayton South site is shown conceptually in Figure 6 below. It essentially involves leaving a final void and rehabilitating the rest of the site to woodland.

Anglo has made commitments to ensure the final landform of the mining area incorporates principles of micro-relief, creating rolling hills and natural features to improve its integration with the surrounding landscape. It has also agreed to minimise the size of the final void and its associated catchment area.

The woodland rehabilitation would cover an area of 1,127 hectares (ha), and be comprised of 471 ha of the Central Hunter Box-Ironbark Woodland EEC and 656 ha of the Narrabeen Foothills Slaty Box Woodland community.

The creation of this woodland would complement the permanent protection and enhancement of 3 offset areas that are proposed to be established on the site (see Figure 7):

- the *Ridgeline Conservation Area*, which covers an area of 242 ha to the south of the proposed mining area and involves protecting and enhancing around 77 ha of remnant vegetation from the Central Hunter Box-Ironbark Woodland EEC;
- the *North-East Offset Area*, which covers 92 ha to the northeast of the proposed mining area and involves protecting and enhancing around 59 ha of remnant vegetation from the Central Hunter Box-Ironbark Woodland EEC; and
- the *Saddlers Creek Restoration and Enhancement Area*, which covers an area of 86 ha and involves:
 - protecting and enhancing the existing riparian vegetation along the creek, including 62 ha of the Hunter Floodplain Red Gum Woodland EEC; and
 - building upon similar conservation initiatives being implemented along the upper reaches of the creek at the Mt Arthur mine.

Together, the rehabilitation of the mining area coupled with the offset areas is expected to create over 1,700 ha of woodland in the immediate vicinity of the project.

Finally, the project also includes the establishment of an offsite offset in the Liverpool Ranges, about 75 km north of the project (see Figure 8).

This offset involves the permanent protection and enhancement of 1,645 ha of land, which forms part of a larger property. The offset area currently has 773 ha of grassland and 872 ha of woodland, including 519 ha of the Box-Gum Woodland EEC (also classified as a critically endangered ecological community (CEEC) under Commonwealth legislation).

The primary aim of this offset is to compensate for the proposed clearing of around 173 ha of various EECs on the site, including 151 ha of Central Hunter Box-Ironbark Woodland EEC and 22 ha of Box-Gum Woodland EEC/CEEC.

Consolidate Existing Consents

Anglo currently operates under two planning approvals: the 2008 approval for the mine’s operations, and a 2000 consent to export up to 7 million tonnes of product coal a year on the Antiene rail spur.

The project involves the incorporation of these approvals into a single, contemporary planning approval for the entire operation.

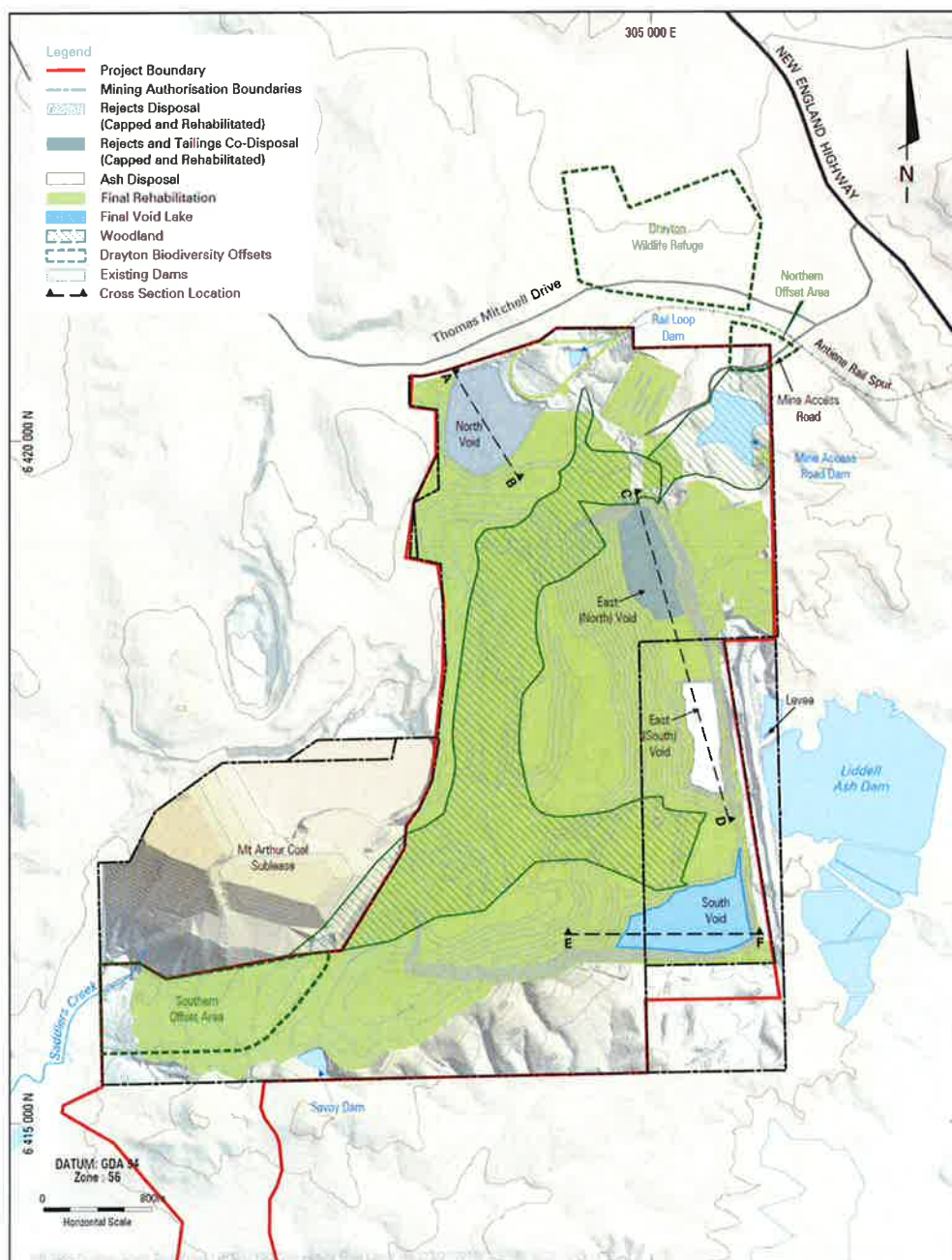


Figure 5: Drayton Mine Final Landform (Scenario 4)

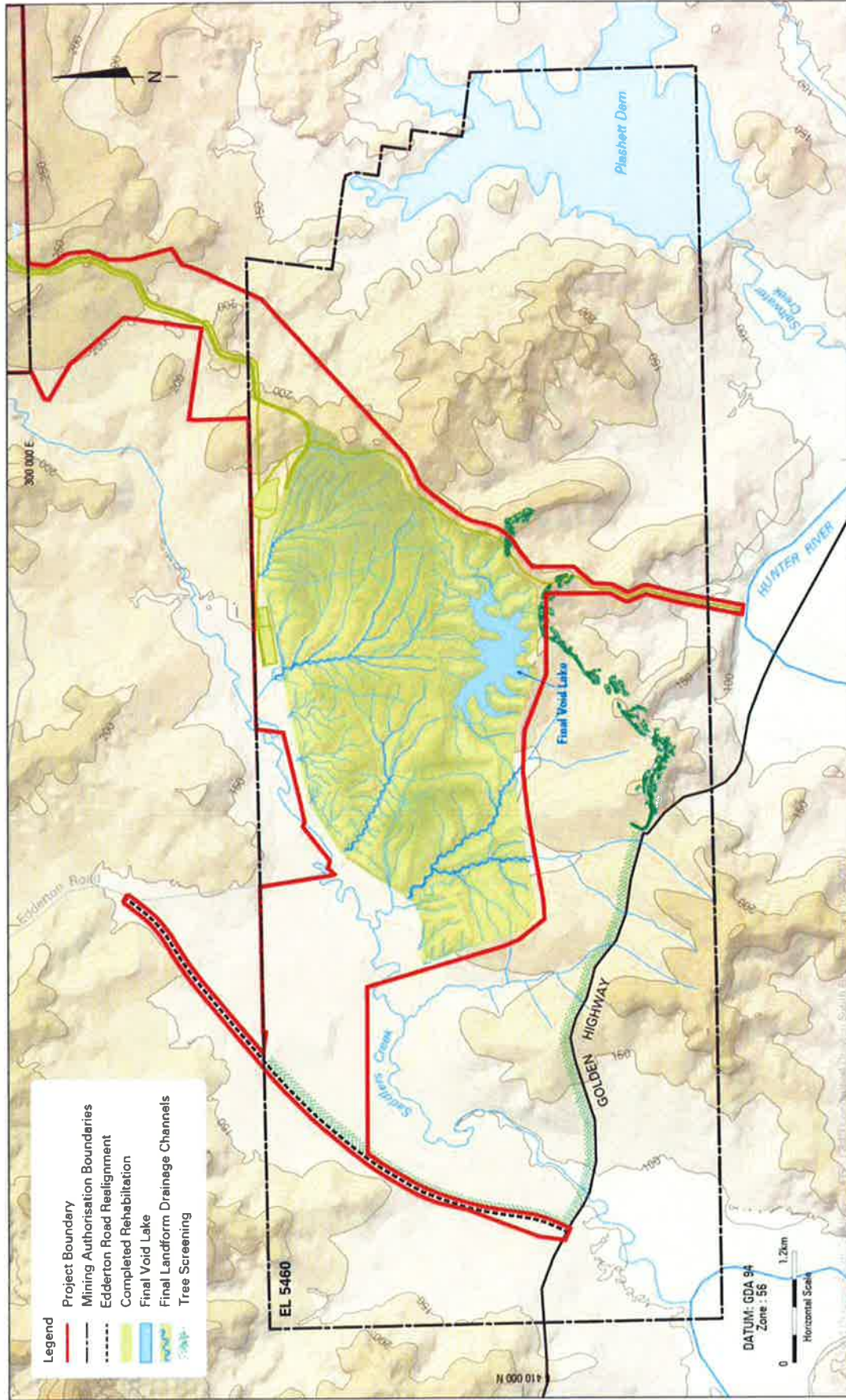


Figure 6. Drayton South Final Landform

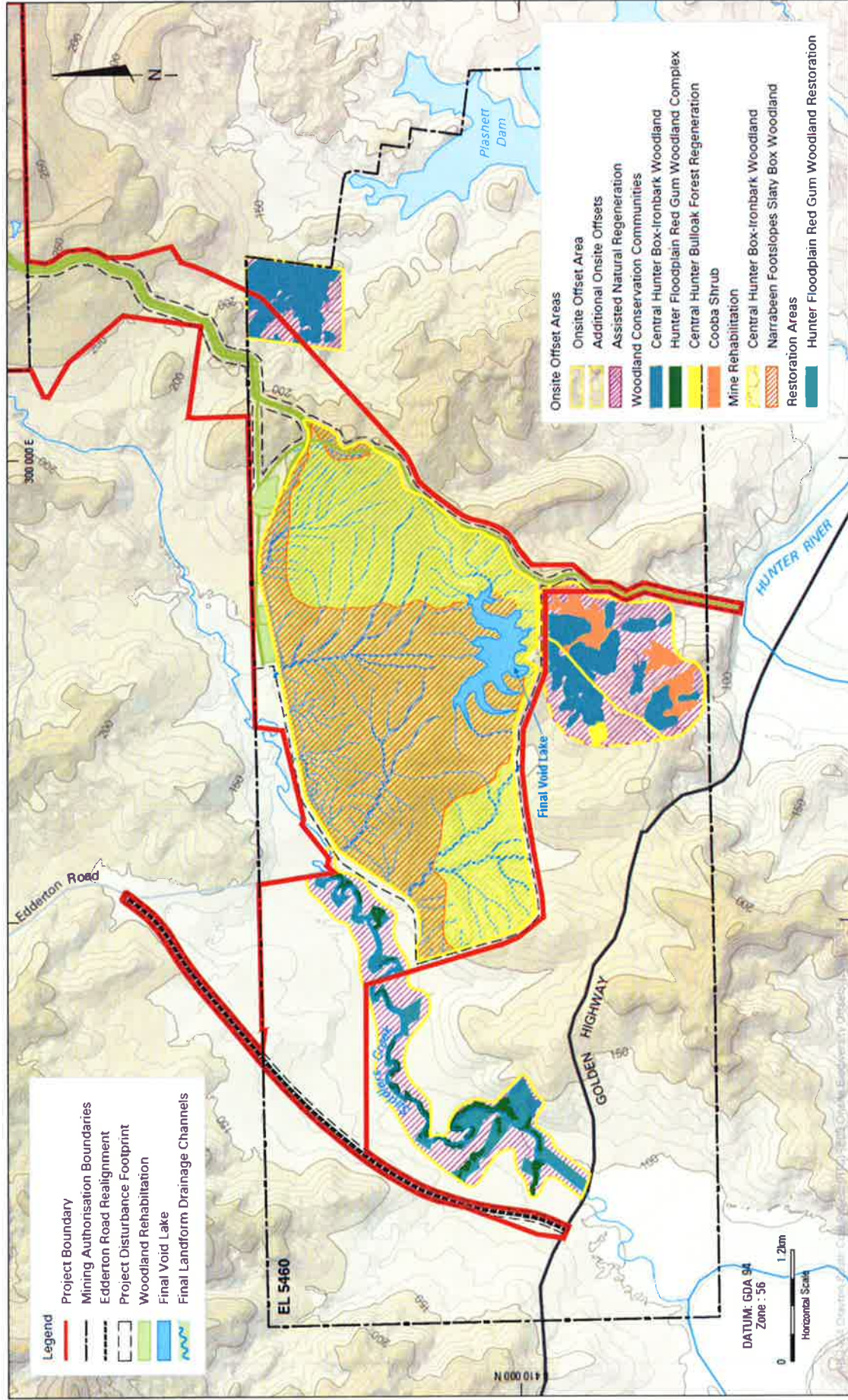


Figure 7: Drayton South – Onsite Biodiversity Offsets

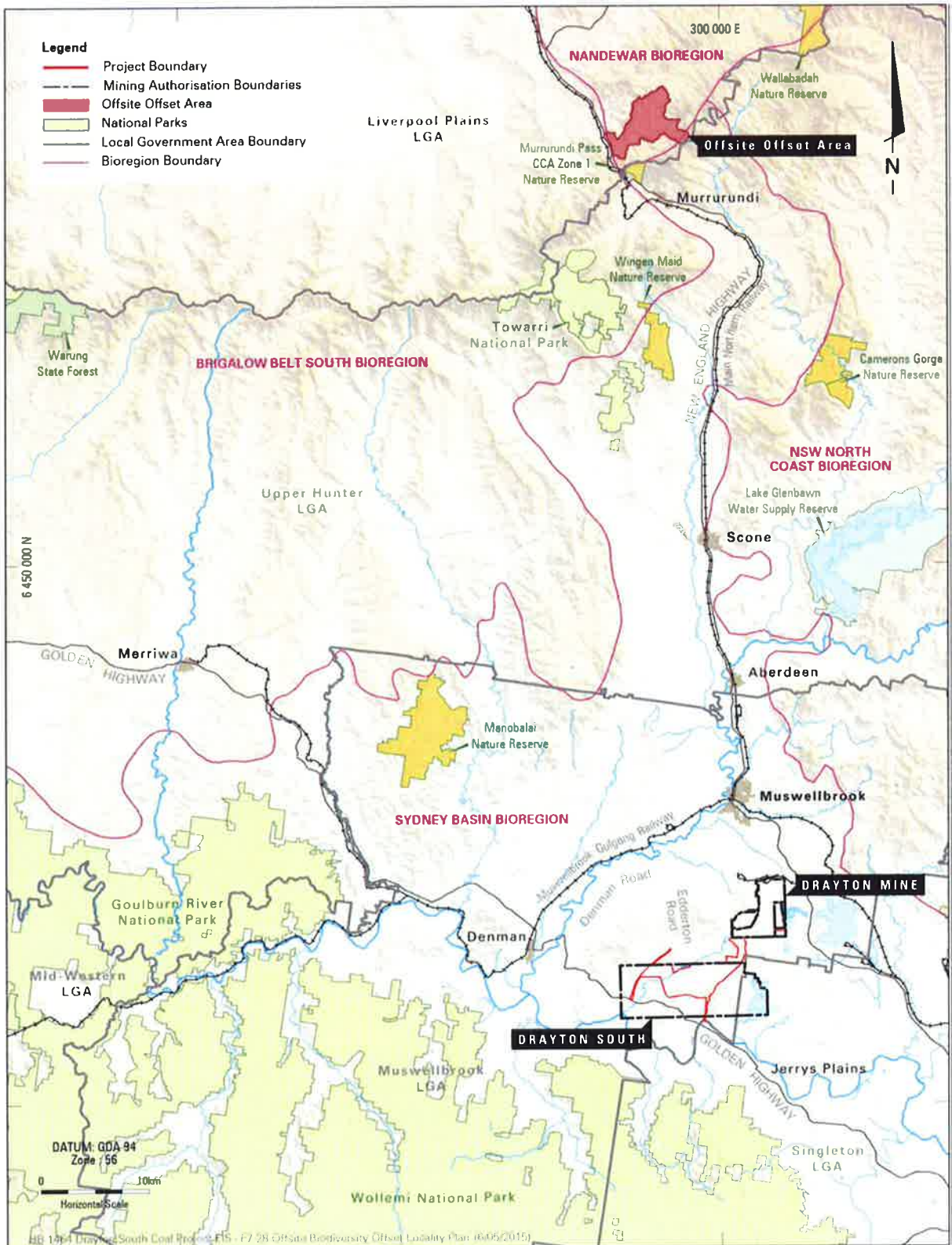


Figure 8: Drayton South – Offsite Biodiversity Offsets

Table 1: Key Project Components, including comparison with the previously proposed project

Aspect	Current Project	Previous Proposal
<i>Life of Mine</i>	<ul style="list-style-type: none"> ▪ 15 years 	<ul style="list-style-type: none"> ▪ 20 years
<i>Mining Areas</i>	<ul style="list-style-type: none"> ▪ Minor extensions (36.5 ha) to existing open cut pits (North, East and South) at Drayton mine ▪ Establish 2 new open cut pits (Whynot and Blakefield) at Drayton South 	<ul style="list-style-type: none"> ▪ Minor extensions (36.5 ha) to existing open cut pits (North, East and South) at Drayton mine ▪ Establish 3 new open cut pits (Whynot, Redbank, and Blakefield) at Drayton South ▪ Auger mining from the highwall of each of the mining pits at Drayton South
<i>Coal Recovery</i>	<ul style="list-style-type: none"> ▪ 74.9 Mt of ROM coal at a rate of up to 6.4 Mtpa ▪ Traditional open cut mining methods using a combination of a dragline, trucks and shovels 	<ul style="list-style-type: none"> ▪ 98.4 Mt of ROM coal at a rate of up to 7 Mtpa ▪ Traditional open cut and underground mining methods using a combination of a dragline, a highwall auger, trucks and shovels
<i>Overburden Emplacement</i>	<ul style="list-style-type: none"> ▪ Overburden from minor extensions at Drayton mine to be placed in existing voids ▪ Establish overburden emplacements to the north of the Whynot and Blakefield pits ▪ Progressively backfill mining pits at Drayton South behind the active mine front 	<ul style="list-style-type: none"> ▪ Overburden from minor extensions at Drayton mine to be placed in existing voids ▪ Establish overburden emplacements to the north of the Whynot and Blakefield pits ▪ Progressively backfill mining pits at Drayton South behind the active mine front
<i>Coal Processing</i>	<ul style="list-style-type: none"> ▪ Use the existing Drayton mine CHPP facilities to process and stockpile coal 	<ul style="list-style-type: none"> ▪ Use the existing Drayton mine CHPP facilities to process and stockpile coal
<i>Coarse rejects and tailings disposal</i>	<ul style="list-style-type: none"> ▪ Co-emplacement of coarse rejects in the North pit void at the Drayton mine ▪ Completion of approved tailings disposal in the East (South) pit void at Drayton mine, followed by disposal in the East (North) pit void 	<ul style="list-style-type: none"> ▪ Co-emplacement of coarse rejects in the North pit void at the Drayton mine ▪ Three tailings disposal scenarios involving emplacement in the North, East (North) and/or East (South) pit voids at Drayton mine
<i>Coal Transport</i>	<ul style="list-style-type: none"> ▪ Export of product coal using the Antiene rail spur and the Main Northern Railway 	<ul style="list-style-type: none"> ▪ Export of product coal using the Antiene rail spur and the Main Northern Railway
<i>Blasting</i>	<ul style="list-style-type: none"> ▪ Up to 5 blasts a week 	<ul style="list-style-type: none"> ▪ Up to 5 blasts a week
<i>Infrastructure</i>	<ul style="list-style-type: none"> ▪ Use and augmentation of existing infrastructure at the Drayton mine ▪ Create a new transport corridor between the existing mine and Drayton South ▪ Extend utility services to Drayton South ▪ Construct site facilities at Drayton South, site access roads and water management systems (including an optional pipeline to the Hunter River) ▪ Realign Edderton Road along a preferred alignment to the west of Saddlers Creek 	<ul style="list-style-type: none"> ▪ Use and augmentation of existing infrastructure at the Drayton mine ▪ Create a new transport corridor between the existing mine and Drayton South ▪ Extend utility services to Drayton South ▪ Construct site facilities at Drayton South, site access roads, a ROM coal hopper, crusher and stockpile area; and water management systems (including 2 pipelines to the Hunter River) at Drayton South ▪ Realign Edderton Road along one of two alignment options to the west of Saddlers Creek
<i>Site Access</i>	<ul style="list-style-type: none"> ▪ Use existing access off Thomas Mitchell Drive 	<ul style="list-style-type: none"> ▪ Use existing access off Thomas Mitchell Drive
<i>Disturbance area</i>	<ul style="list-style-type: none"> ▪ 36.5 ha at Drayton mine ▪ 1,441 ha at Drayton South 	<ul style="list-style-type: none"> ▪ 36.5 ha at Drayton mine ▪ 1,618 ha at Drayton South
<i>Rehabilitation</i>	<ul style="list-style-type: none"> ▪ Progressively rehabilitate the disturbed areas with woodland and pasture species, including at least 1,127 ha of rehabilitated woodland ▪ Final landform to incorporate micro-relief and conform to the surrounding landscape ▪ 2 final voids (East and South) at Drayton mine, some of which could be filled in the future ▪ 1 final void at Drayton South 	<ul style="list-style-type: none"> ▪ Progressively rehabilitate the disturbed areas with woodland and pasture species, including at least 1,319 ha of rehabilitated woodland ▪ Final landform to incorporate micro-relief and conform to the surrounding landscape ▪ 3 final voids (North, East and South) at Drayton mine, some of which could be filled in the future ▪ 1 final void at Drayton South
<i>Biodiversity Offsets</i>	<ul style="list-style-type: none"> ▪ Conserve and enhance of at least 3,359 ha of land in perpetuity, comprising: <ul style="list-style-type: none"> ○ 335 ha of native vegetation on site; ○ 252 ha of restoration and enhancement along Saddlers Creek; ○ 1,645 ha of native vegetation in the Upper Hunter Shire; and ○ 1,127 ha of rehabilitated woodland on the Drayton South site 	<ul style="list-style-type: none"> ▪ Conserve and enhance of at least 3,478 ha of land in perpetuity, comprising: <ul style="list-style-type: none"> ○ 266 ha of native vegetation on site; ○ 250 ha of restoration and enhancement along Saddlers Creek; ○ 1,643 ha of native vegetation in the Upper Hunter Shire; and ○ 1,319 ha of rehabilitated woodland on the Drayton South site
<i>Operating Hrs</i>	<ul style="list-style-type: none"> ▪ 24 hours a day, 7 days a week. 	<ul style="list-style-type: none"> ▪ 24 hours a day, 7 days a week.
<i>Employment</i>	<ul style="list-style-type: none"> ▪ Operational workforce of up to 500 ▪ No additional construction workforce 	<ul style="list-style-type: none"> ▪ Operational workforce of up to 530 ▪ Temporary construction workforce of up to 369
<i>Equipment Fleet</i>	<ul style="list-style-type: none"> ▪ Use of existing dragline, excavators, dozers and truck fleet 	<ul style="list-style-type: none"> ▪ Use of existing dragline, excavators, dozers and truck fleet, and a new highwall auger

2.2 Justification for the Project

Anglo has mounted several arguments to justify the project.

Coal Resource

Exploration work has been carried out on the site since the 1940's. According to Anglo, this exploration work has identified an estimated in-situ coal resource of 663 million tonnes of coal.

Following detailed studies over the last decade, Anglo identified a large open cut coal resource of around 172 million tonnes that could be extracted economically from the exploration area.

During detailed mine planning for the Drayton South Coal Project, the size of this resource was reduced to around 120 million tonnes.

This followed the implementation of a range of measures to reduce the likely impacts of any mine on the adjoining Coolmore and Woodlands horse studs, including proposed setbacks between the mine and the studs and the use of highwall mining methods to minimise the loss of coal within these setback areas.

Following the Commission review process, Anglo has made a number of further revisions to the mine. These revisions have reduced the size of the resource firstly to around 98.5 million tonnes, and now to 75 million tonnes under the current proposal.

This is still a substantial coal resource for NSW and, if the mine is approved, the proposed production rate of up to 6.4 million tonnes of coal a year would rank Drayton South thirteenth among the 59 mines producing coal in NSW.

Mine Design

Anglo claims it has incorporated a range of mitigation measures into the design of the project to minimise its likely impacts on people, surrounding land uses and the environment. These measures include:

- keeping the mining area behind the natural ridgeline and sterilising almost 100 million tonnes of an economic open cut coal resource, which has a current market value of at least \$5 billion;
- setting the mine back from the riparian zone around Saddlers Creek, and conserving and enhancing the existing vegetation within the riparian zone;
- minimising the size of the overburden dumps and backfilling the mining pits as much as possible to minimise the size of the final void;
- implementing best management practice to minimise the dust, noise, vibration, water, visual and heritage impacts of the project;
- creating a final landform with micro-relief that would blend in with the undulating hills of the surrounding landscape;
- restoring most of the mining area to woodland, including at least 471 ha of the Central Hunter Box-Ironbark Woodland EEC; and
- implementing a comprehensive biodiversity offset strategy, which involves the protection and enhancement of more than 2,000 ha of land, to compensate for any residual flora and fauna impacts of the project.

Commission Recommendations

The proposed mine plan complies with the recommendation of the Commission to keep open cut mining entirely behind the second ridgeline on the site.

In so doing, Anglo notes that compared to the previous mine plan, the current mine plan:

- doubles the buffer distance to the horse studs;
- significantly reduces the environmental impacts;
- ensures there would be no impact on equine health; and
- removes any views of the project from the operational areas of the horse studs.

Anglo has also written to the NSW Minister for Planning with two commitments to address concerns about future mining impacting the nearby horse studs. In particular, Anglo has committed to (see Figure 9):

- relinquish any rights to further extend open cut mining in the Drayton South Exploration Licence (EL 5460) area beyond the southern and western extremities of the project currently under assessment; and
- voluntarily surrender any underground mining rights under EL 5460 beneath the Coolmore and Woodlands horse studs, as well as any other land south of the Golden Highway.

Use of Existing Infrastructure

One of the benefits cited for the project is that it would use the existing infrastructure at the Drayton mine, which avoids the need to construct a range of surface infrastructure to support the new mining operation.

By doing this, the project would reduce the cost of mining the coal resource at Drayton South and provide an easy way to connect the new mining area to the Main Northern Railway and the Port of Newcastle. Securing access to this infrastructure has always been a significant constraint to developing mines to the south of the existing Drayton and Mt Arthur mines.

Royalties & Taxes

According to Anglo, the total net production benefit of the project would be \$464 million (present value), including \$233 million in royalties to the NSW Government for the extraction of the publicly owned coal resource, and \$93 million in company taxes to the Commonwealth Government.

These royalties and taxes would be spent on providing infrastructure and services to the broader community.

These estimated production benefits are most sensitive to the changes in the price of coal and foreign exchange rates. To account for potential fluctuations in the coal price and exchange rates, these estimates have been subjected to sensitivity testing.

The base case for coal used in the benefit cost analysis was US \$72 per tonne in 2016, US \$82 per tonne in 2017 and US \$87 per tonne thereafter. The assumed AUD/USD exchange rate used was 0.85.

The sensitivity testing assumed these coal prices and exchange rates (along with a range of other variables) could increase or decrease by up to 20% over the life of the project.

Based on this testing, Anglo has estimated the total royalties to the NSW Government over the life of the project could range between \$149 and \$357 million (present value).

Voluntary Planning Agreement

Anglo has made an offer to enter into a Voluntary Planning Agreement with Muswellbrook Shire Council for the project. The offer includes making following contributions to Council:

- \$50,000 a year for road maintenance;
- \$290,000 a year, which would be paid into a Community Fund and spent on projects 'related to the promotion of economic and social health (health and education) or environmental benefit in the LGA'; and
- \$15,000 a year to help Council monitor the impacts of the project.

In addition, Anglo has agreed to use its best endeavours to engage at least 3 apprentices a year from the local area.

Anglo argues that this offer is reasonable given the project represents a continuation of existing mining operations, and would make little additional demand on Council for the provision of local infrastructure and services.

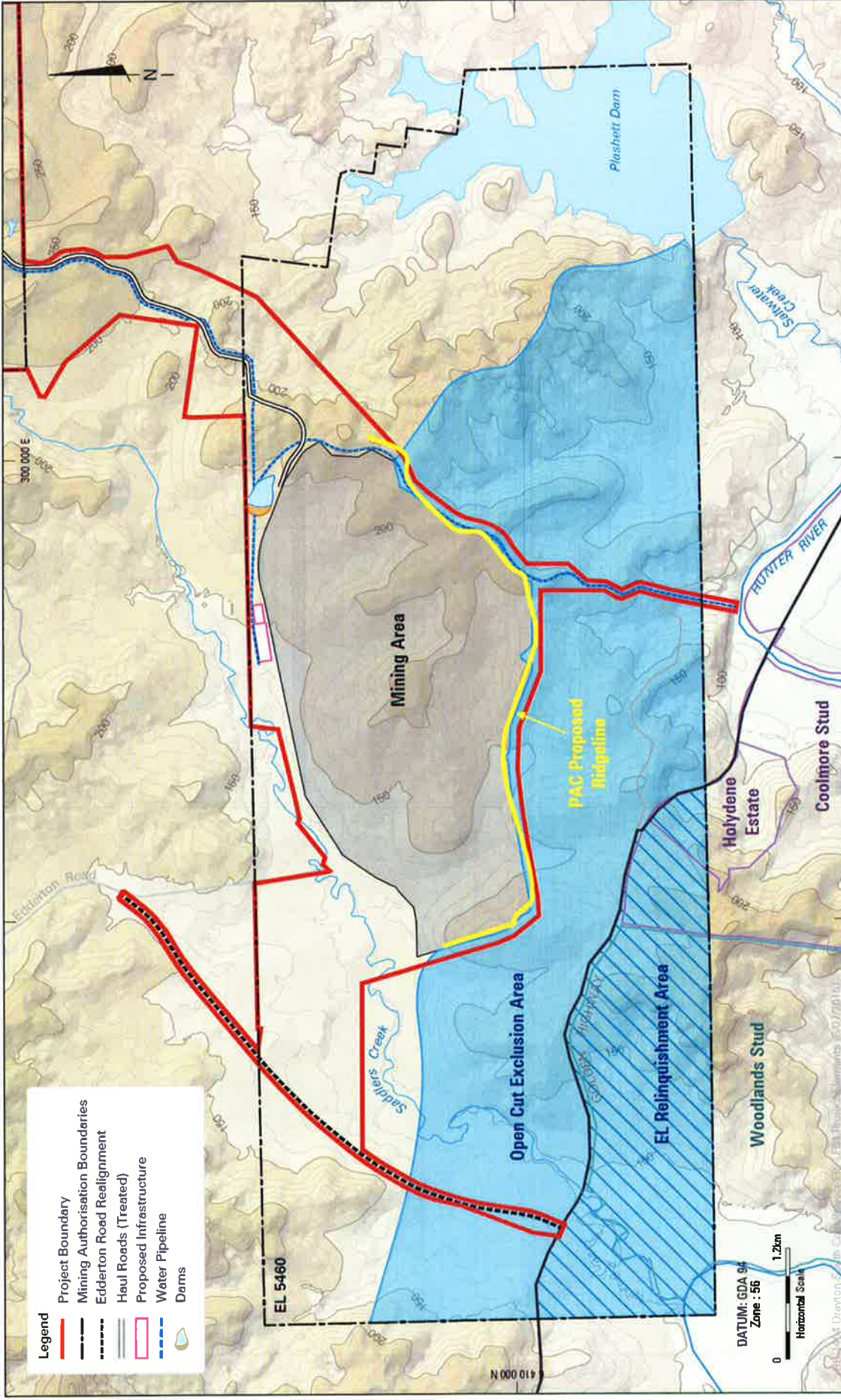


Figure 9: Proposed Lease Relinquishment and Exclusion Areas

Spending

The project would result in both capital and operational spending, which would have beneficial economic impacts on both the regional and State economy.

Anglo estimates, the project would have:

- a capital investment value of around \$131 million (present value); and
- annual operating costs of around \$213 million (present value).

This spending is predicted to increase the annual output of the:

- region by \$559 million (present value); and
- the rest of NSW by \$906 million (present value) during operations.

Employment

During operations the mine would employ 500 workers, most of which are likely to be filled by existing workers at the Drayton mine, with around 76% of employees residing in the Upper Hunter Region.

This employment is expected to support a range of other jobs in the region and the rest of NSW, depending on the multipliers used. Anglo estimates this could range from 984 jobs in the Hunter Region to 2,085 jobs across NSW.

Net Benefit

Anglo provided a detailed cost benefit analysis of the project.

This analysis estimated the net production benefits of the project by subtracting the production costs (land, capital, operating costs, rehabilitation) from the production benefits (deferred rehabilitation costs, coal revenue, residual land and capital value).

The net production benefits were then assumed to be the threshold value against which any other externalities (agricultural, noise, air quality, greenhouse gas, biodiversity, water, visual, social impacts) should be offset. An attempt was made to quantify some of these externalities, whereas others were dealt with in a qualitative way.

The cost benefit analysis predicted that the project would have a net production benefit to Australia of \$330 million (present value).

This estimate was subjected to further sensitivity testing to account for the fact that 100% of the Anglo's profits could leave Australia, and fluctuations in the coal price and exchange rates.

Under all scenarios, the project was predicted to result in a significant net benefit to Australia.

3. STRATEGIC CONTEXT

3.1 NSW Coal Industry

Society is heavily reliant on coal to meet its basic energy needs, both at the domestic and international level, with coal currently providing around 90% of NSW's electricity needs, 75% of Australia's electricity needs and 40% of the world's electricity needs.

The International Energy Agency (IEA) expects the world's energy consumption to grow by 37% by 2040. While steps are being taken across the world to reduce the reliance on fossil fuels for electricity generation, the IEA has forecast increasing demand for coal over the life of the Drayton South Coal Project.

NSW has a large and mature coal industry based around substantial coal reserves.

Coal is by far NSW's biggest mineral commodity, with the industry generating around 84% of the State's mining income. Over the past decade, NSW coal production has grown steadily due to growing demand from Asian export markets.

In 2012-13, NSW produced approximately 196 million tonnes of coal, and exported 136 million tonnes of coal, principally through the Port of Newcastle. This coal production was worth some \$15.2 billion, and generated around 31% of the State's export revenue.

Port and rail capacity are currently being expanded to enable up to 230 million tonnes of coal to be exported a year, and NSW coal exports are expected to continue to rise in line with the growth in this capacity in the medium term, subject to short term fluctuations in market demand.

In 2014, employment in the NSW coal industry reduced by about 1,400 to just over 22,000 people.

At present, the Hunter Coalfield is the largest and most significant coalfield in NSW, producing around 60% of the State's coal. It is comprised of 15 large mining complexes, including the Drayton mine, that stretch in a broad corridor on either side of the Main Northern Railway between Singleton and Muswellbrook.

The Hunter Coalfield accounts for around half of the mining jobs in NSW (i.e. about 11,000 full time jobs). The 500 people working at the Drayton mine therefore represent around 5% of the jobs in the Hunter Coalfield.

Traditionally, mining in this region has been dominated by large open cut mining operations. However, in recent years there has been an increase in the scale of underground mining operations as mines move to access some of the deeper coal resources in the region.

Two key areas have long been earmarked for the potential expansion of the mining operations in the region: the area to the west of Muswellbrook surrounding the existing Bengalla and Muswellbrook mines, and the area to the south of the existing Mt Arthur and Drayton mines between Jerrys Plains and Denman.

This is reflected in the number of coal exploration licences that have been granted in these areas, including the Drayton South, Dellworth, Spur Hill and former Doyles Creek exploration licences.

Expansion of the mining industry into these areas has the potential to create land use conflicts with existing agricultural industries, including the thoroughbred horse breeding industry and the viticulture industry.

The Drayton South Coal Project represents the first foray of the mining industry into the Jerrys Plains to Denman area since the Mt Arthur South Project was approved on the same site in 1986, and has significantly heightened concerns about the potential land use conflicts between mining and the Hunter thoroughbred industry.

3.2 Hunter Thoroughbred Industry

The Hunter thoroughbred industry is one of the largest and most important thoroughbred breeding clusters in the world, along with Newmarket in the United Kingdom and Kentucky in the USA.

It is comprised of a number of stud and broodmare farms, which are supported by a network of equine supply and support industries such as specialised veterinary services, bloodstock agents and farriers.

These farms and support industries are generally located in two broad corridors stretching from Jerrys Plains in the south to the area surrounding Scone in the north and the Bylong Valley in the west.

The land in these corridors is seen as being particularly conducive to horse breeding with its combination of excellent soils on the alluvial flats and undulating hills, proximity to water and scenic rural landscapes.

The industry produces around half of all the thoroughbred horses in Australia, and around 70% of Australia’s thoroughbred horse exports. The industry generates around \$300 million in income each year, including horse exports estimated at over \$100 million.

The industry is also a significant employer in the region, directly providing jobs for around 1,100 people, and a significant contributor to the regional economy with over 85% of all operating costs being spent in the region.

Finally, it plays a major role in the cultural identity of the region, particularly in the area around Scone in the Upper Hunter Shire.

The Coolmore and Woodlands studs are located just to the south of the Drayton South Coal Project, and play an important role in the Hunter thoroughbred industry (see Figure 10 below).

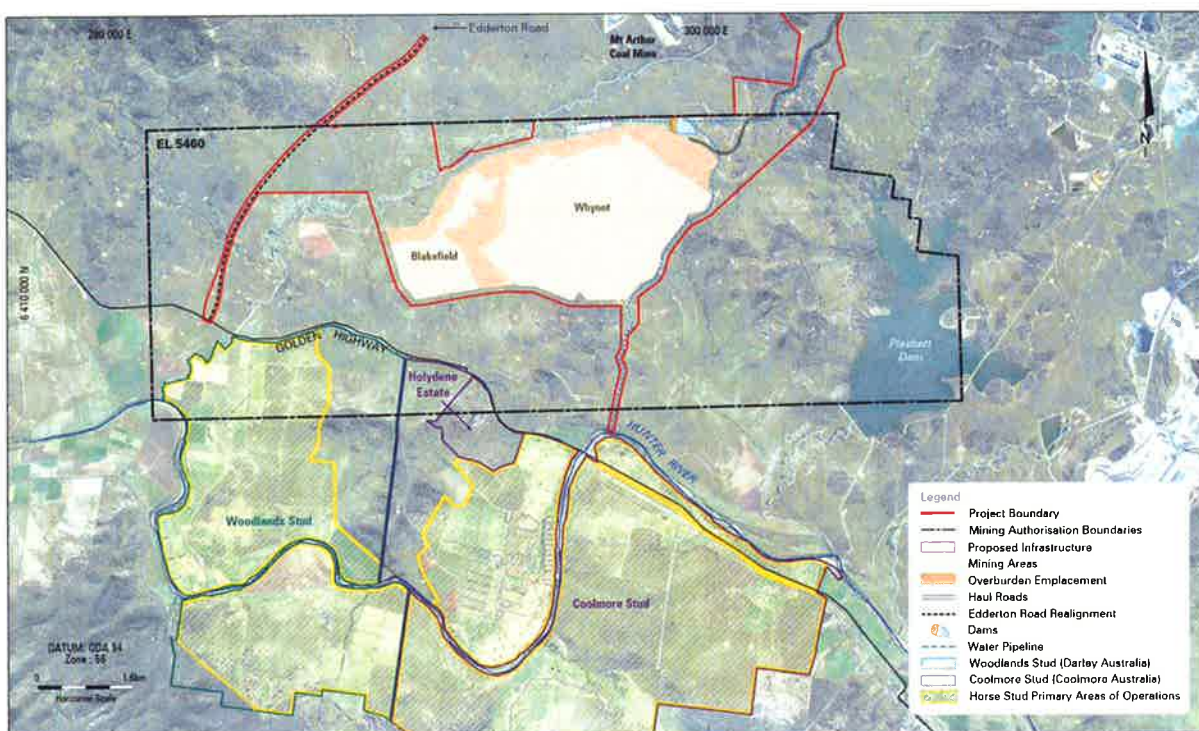


Figure 10: Proximity of Coolmore and Woodlands Studs

The Coolmore stud was originally part of the Arrowfield, Stowan and Oak Range properties developed for farming, grazing and thoroughbred breeding as early as 1912. Coolmore Australia purchased the property in 1991. The stud is a fully integrated operation with around 12 stallions standing. These stallions service mares from other farms within the Hunter thoroughbred industry, and are also shuttled to service mares overseas. The stud includes its own veterinary hospital and laboratory,

and has facilities for mares, foals and yearlings. It also has a small airstrip, 3 guest units, a number of historic homesteads and accommodation for many of its employees.

During the breeding season, Coolmore directly employs up to 150 people, with up to 90 people residing on the property.

The Woodlands stud is primarily a broodmare operation with facilities for foals and yearlings. It is used in conjunction with Kelvinside stud near Aberdeen, which has around 13 stallions standing. It also has a historic homestead and accommodation for some of its staff.

Both the Coolmore and Woodlands studs are located 1 km south of the project boundary, although Anglo claims that the primary operational areas of the studs are located more than 2 km from the nearest part of the proposed mine plan (see yellow hatching on Figure 10).

The owners of these studs are strongly opposed to the development of the Drayton South Coal Project. They say that open cut mining is incompatible with the thoroughbred breeding operations being carried out on their farms, and have advised that they may leave the Hunter Valley if the project is approved. This is discussed further in Section 6.2.

3.3 Hunter Wine Industry

The Hunter region is Australia's oldest wine making region. The viticulture industry in the region tends to be concentrated around Pokolbin and the Broke-Fordwich sub-regions to the south of the Hunter Coalfield, and the Upper Hunter sub-region around Denman. It is comprised of vineyards, wineries and a range of tourist facilities, including restaurants and cellar doors.

The region currently produces about 2% of Australia's wine, and around 25 million litres a year.

Like the thoroughbred industry, it plays a strong role in the region's identity and economy.

The Hollydene Estate (formerly Arrowfield Estate) is located approximately 1 km south of the project boundary, and was purchased by Coolmore Australia in 2013.

A vineyard was established on the site as early as 1894. Over the years, a winery, cellar door and restaurant was added to the estate; and grapes from other vineyards in the region were processed on site.

Although most of the vineyards at the estate were later removed to facilitate the development of the Coolmore horse stud, it has continued to play a role in the region's viticulture industry. It is the only existing winery in the immediate vicinity of the project.

In March 2013, the former owners of the estate obtained development approval for the redevelopment of the estate. The approval allows the construction of 28 tourist cabins, 2 function centres with chapels, and the refurbishment of the existing cellar door and restaurant facilities.

At this stage, it is unclear whether Coolmore would proceed with the approved redevelopment plans for the estate, or use the land to expand its existing thoroughbred operations.

3.4 Strategic Regional Land Use Plan

In September 2013, the NSW Government published the *Strategic Regional Land Use Plan* (SRLUP) for the Upper Hunter region.

The plan identified key regional challenges as:

- improving the balance between competing land uses – particularly achieving co-existence where possible between mining, coal seam gas development and agriculture;
- maintaining or enhancing opportunities for environmentally responsible mining and coal seam gas development to deliver reliable energy supplies to the state that reduce energy costs and carbon emissions and that generate economic wealth for the state;
- maintaining or enhancing future opportunities for sustainable agriculture; and
- defining and protecting strategic agricultural land.

The key policy response to address these challenges was to identify and map the strategic agricultural land in the region, and require all resource development projects that could have a significant impact on this land to go through a new 'gateway process' prior to starting the planning approvals process.

Gateway Process

The gateway process involves an independent, scientific and upfront assessment of how these resource development projects could affect strategic agricultural land against strict criteria by an expert panel; and if these projects cannot meet these criteria, then they would be subjected to much closer scrutiny during the development assessment process.

The plan identified three types of strategic agricultural land in the region:

- Biophysical Strategic Agricultural Land (BSAL), which is essentially the best farming land in the region due to its landforms, soils and access to productive water resources;
- Equine Critical Industry Clusters (Equine CICs), which are comprised of a highly integrated concentration of horse breeding facilities and related infrastructure, such as specialised veterinary services; and
- Viticulture Critical Industry Clusters (Viticulture CICs), which are comprised of a highly integrated concentration of vineyards and associated wineries and tourism infrastructure in a rural landscape.

While the plan included preliminary mapping of the strategic agricultural land in the region, it deferred the final mapping of this land as well as the development of the specific assessment criteria for the gateway process.

The *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (Mining SEPP) was subsequently amended to give effect to the new gateway process, and include both the final strategic agricultural land mapping and the specific assessment criteria to guide the gateway process. The Mining SEPP maps all three types of strategic agricultural land in NSW.

Under the *Environmental Planning and Assessment Regulation 2000* and the Mining SEPP, applicants for new mining projects that are not located within an existing mining lease must determine whether the site contains BSAL prior to lodging a development application.

Gateway Certificate

If the site does contain BSAL, the development application must be accompanied by a gateway certificate issued by the NSW Gateway Panel, which may include recommendations for assessing and/or minimising impacts on BSAL.

While the strategic agricultural land maps identify potential BSAL at a broad scale across NSW, applicants are still required to verify whether this or other land within their project disturbance area comprises BSAL (unless they elect to go straight to the gateway certificate process).

In this regard, applicants may apply to the Department for a site verification certificate to certify that this land does not contain BSAL.

There are no mapped CICs or BSAL within the project boundary, however the strategic agricultural land maps do identify BSAL and both Equine CIC and Viticulture CIC about 1 km to the south of the site, taking in the Coolmore and Woodlands studs and the Hollydene Estate (see Figure 11).

However, Anglo has identified approximately 78.8 ha of land within the project boundary as meeting the criteria for BSAL using the site verification criteria in the NSW Government's *Interim Protocol for Site Verification and Mapping of Biophysical Strategic Agricultural Land* (2013).

Consequently, Anglo was required to obtain a gateway certificate prior to lodging a development application for the project. The gateway certification process is discussed in Section 4.7 of this report.

The CIC mapping is different. The land directly to the south of the project has been included in both the Equine and Viticulture CICs. These clusters form a broad corridor heading to the northwest towards Scone and west towards Bylong.

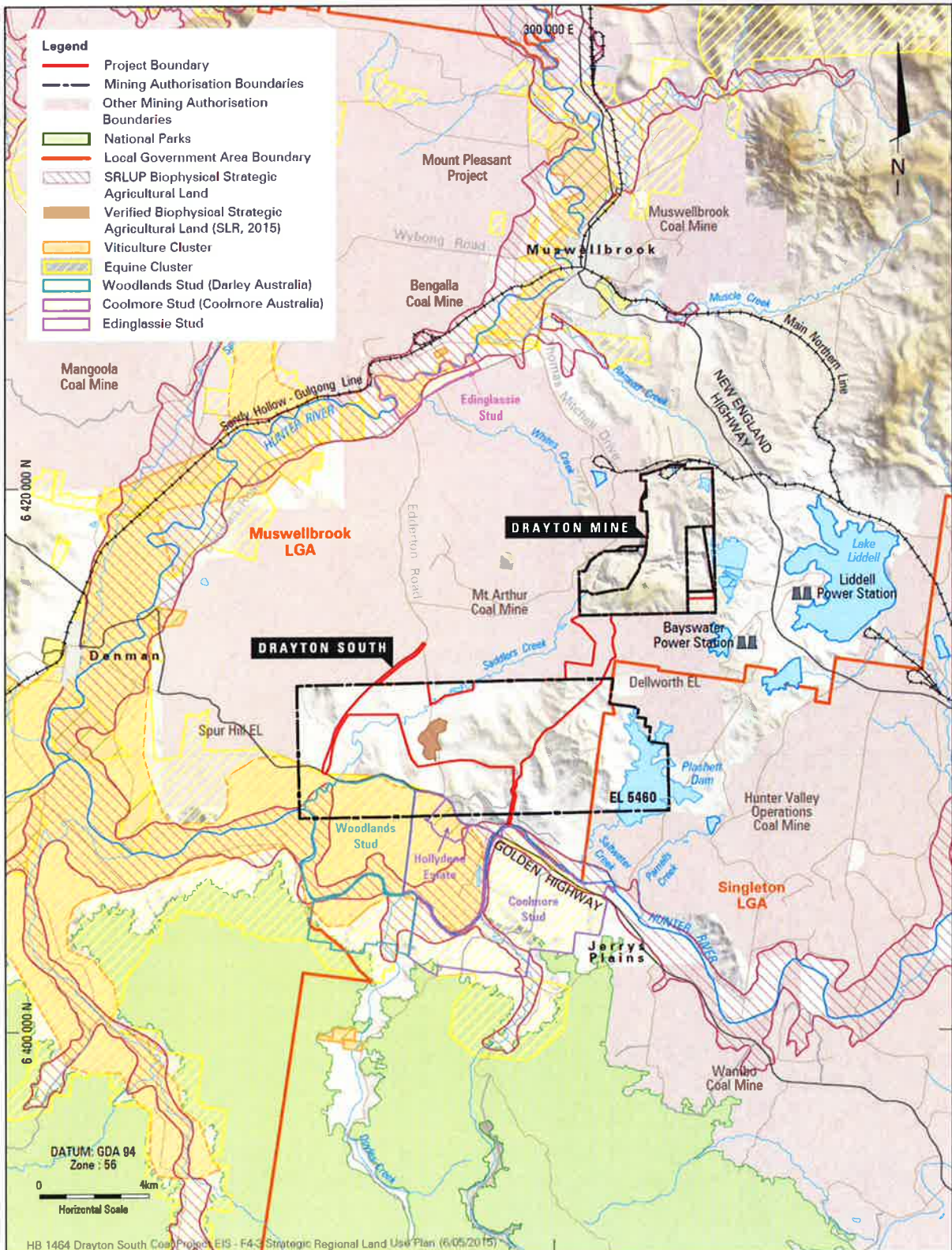


Figure 11: Strategic Agricultural Land

In relation to CIC land – both equine and viticulture – the relevant criteria for the gateway process under the Mining SEPP are:

...that the proposed development would not have a significant impact on the relevant critical industry based on a consideration of the following:

- (i) Any impacts on the land through surface area disturbance and subsidence,*
- (ii) Reduced access to, or impacts on, water resources and agricultural resources,*
- (iii) Reduced access to support services and infrastructure,*
- (iv) Reduced access to transport routes,*
- (v) The loss of scenic and landscape values.*

In considering these criteria, the gateway panel is required to have regard to:

- (a) The duration of any impact; and*
- (b) Any proposed avoidance, mitigation, offset or rehabilitation measures in respect of any such impact.*

While these criteria do not strictly apply to the consideration of such matters at the development application stage, the Department thinks they provide a useful framework for considering the potential impacts of the Drayton South project on the adjoining Equine and Viticulture CICs. The Department has considered these matters further in Section 6.2 of this report.

3.5 Water Resources

The project is located entirely in the Hunter River catchment, with the areas to the north draining to the Hunter River via either Ramrod Creek or Whites Creek, and areas to the south draining to the Hunter River via either Saddlers Creek or Saltwater Creek. All of these creeks are generally ephemeral watercourses with brackish to saline water quality. The retracted mine plan is now located almost exclusively in the Saddlers Creek catchment.

The most significant groundwater resources in the region are associated with the Hunter River alluvium, and to a much lesser extent the Saddlers Creek alluvium. The extent and storage capacity of the alluvium varies over the length of the river, ranging from 11 to 18 m thick and between 500 m and 1.5 km wide in the vicinity of the site. Groundwater quality tends to be brackish in the Hunter River alluvium and moderately saline in the Saddlers Creek alluvium. The new mining area has been set back from both of these alluviums.

Other groundwater resources in the region include the:

- Permian hard rock aquifer (the coal seam), which is low yielding and generally contains poor quality water; and
- weathered bedrock aquifer (regolith), which has limited storage capacity.

The NSW Office of Water regulates the take of water from these water sources under the *Water Management Act 2000*.

The NSW Environment Protection Authority (EPA) administers the Hunter River Salinity Trading Scheme in the region. This scheme regulates the discharge of saline water into the Hunter River from various industrial and agricultural sources to protect the water quality of the river. This is done by capping the allowable discharge and auctioning tradeable credits to dischargers. Dischargers are then allowed to discharge saline water, generally during high river flows, in line with the credits they hold.

3.6 Conservation Areas

The vegetation on the valley floor on site is broadly related to the key topographic features and historic land uses of the region, with the flatter areas being largely cleared of woodland and characterised by derived native grasslands, and the hillier areas still containing some patches of remnant woodland (see Figure 2).

Due to historic clearing, the remaining vegetation on the valley floor tends to have some conservation significance for EECs or threatened species.

In recent years, clearing for development in the region has generally gone hand in hand with the provision of offsets to compensate for this clearing and ensure the conservation of the region is improved in the medium to long term.

To this end, the Drayton Wildlife Refuge was established immediately to the north of the mine in 1987 following the original approval of the mine. It has 117 ha of native woodland, and has been augmented in recent years with offsets from both the Drayton and Mt Arthur mines. Further, the Mt Arthur mine has committed to rehabilitate at least 40% of the mine land to woodland, and to ensure this woodland further augments the woodland in both the Drayton Wildlife Refuge and nearby offset areas. It has also committed to protect and enhance the riparian zone along the upper reaches of Saddlers Creek to the north of the Drayton South mining area (see Figure 5).

Further afield, the Wollemi National Park is located to south of the mine and forms part of the Greater Blue Mountains World Heritage Area that stretches all the way to the Lithgow region.

3.7 Residential Areas & Land Ownership

The area around the mine is not densely populated, with the major population centres – Muswellbrook (10,000 population), Denman (1,500) and Jerry's Plains (700) – all located more than 10 km from the site.

The closest residential area is the Antiene rural-residential estate, which is located immediately north of the Drayton mine between the New England Highway and the Antiene rail spur. There are currently 21 residences in the estate.

These residences are affected to some extent by the dust, noise and visual impacts of the existing operations of the Drayton and Mt Arthur mines, and in particular the noise from the rail operations along the Antiene rail spur. They are also affected by traffic noise from the New England Highway.

There are also a number of residences on the surrounding rural properties to the south and west of the mine, including worker accommodation on the Coolmore and Woodlands studs and recently approved tourist accommodation on the Hollydene Estate. These residences are currently relatively unaffected by the impacts of mining operations in the region.

Anglo owns all of the land within the project boundary with the exception of a parcel of land required for the proposed relocation of Edderton Road, owned by a subsidiary of BHP Billiton, and a parcel of land required for the proposed transport corridor which is owned by AGL Macquarie.

3.8 Infrastructure & Industry

Land use surrounding the Drayton South area comprises a combination of mining and coal fired power generation to the north and east, and agriculture (including thoroughbred and viticulture) to the south and west, particularly along the alluvial flats adjacent to the Hunter River (see Figure 1).

In terms of industrial land uses, two of the Hunter Valley's largest coal mines, BHP Billiton's Mt Arthur and Rio Tinto's Hunter Valley Operations, are located to the north and east of the proposed mine. Mt Arthur has approval to extract up to 36 Mt of coal a year and Hunter Valley Operations has approval to extract up to 38 Mt a year. If operating at full production, this would represent well over half the annual coal supply from the Hunter Coalfield.

Two of the State's largest coal fired power stations (Liddell and Bayswater) are located to the east of the site, along with their respective water storages (including Lake Liddell and Plashett Dam) and other infrastructure. These two power stations supply about 30% of NSW's electricity demands. The proposed Bayswater B power station is located directly to the east of the Drayton South area. This power station was approved in concept only in 2010 but is yet to be built.

There are also several coal exploration licences covering land in the vicinity of the project site, including Dellworth to the east and Spur Hill to the west.

Key infrastructure in the region includes (see Figure 1):

- the regional road network, which includes three State Roads (the New England Highway, the Golden Highway and Denman Road) and two important local roads:
 - Thomas Mitchell Drive, which links the New England Highway to Denman Road and allows traffic heading west to bypass Muswellbrook; it provides access to both the Drayton and Mt Arthur mines as well as the Mt Arthur industrial estate; and
 - Edderton Road, which links the Golden Highway to Denman Road and allows traffic heading to Muswellbrook to bypass Denman; it provides a useful link between the Coolmore and Woodlands stud farms and many of the other stud farms in the Upper Hunter Shire;
- various private rail spurs – such as the Antiene rail spur – that link the mines in the region to the Main Northern Railway and the Port of Newcastle, as well as the mines to the north and west of the region with the power stations; and
- a number of regional electricity transmissions lines, including:
 - a 550kV transmission owned by Transgrid running from the Bayswater power station to the west just to the south of the existing Drayton and Mt Arthur mines; and
 - a 132 kV transmission line owned by Ausgrid running on a north-south alignment between the Drayton and Mt Arthur mines to the Golden Highway and on to Jerrys Plains.

The new transport corridor between Drayton and Drayton South has been designed to ensure there are no disruptions to the regional electricity transmission lines. The project also involves the realignment of a section of Edderton Road (see Figure 2).

4. STATUTORY CONTEXT

The Department has considered statutory requirements for the assessment of the project under the EP&A Act, the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and other relevant legislation. In regard to the EP&A Act, this has included consideration of the:

- objects found in Section 5 of the EP&A Act;
- matters relating to threatened species found in sections 5A-5D of the EP&A Act;
- the matters listed under Section 79C of the EP&A Act,
- applicable environmental planning instruments and draft instruments, such as the recently proposed amendment to Clause 12AA of the Mining SEPP; and
- various other requirements under the EP&A Act and Regulations, including those relating to public exhibition.

The Department confirms that it has considered all of these matters in its assessment of the project. A summary of this assessment is provided below, and further details are provided in Appendix B. A summary of the matters relevant to the EPBC Act are discussed in Sections 6.4, 6.5 and Appendix L.

4.1 State Significant Development

The proposed development is declared to be State Significant Development under Section 89C of the EP&A Act as it is 'development for the purposes of coal mining', which is specified in clause 5 of schedule 1 to *State Environmental Planning Policy (State and Regional Development) 2011*.

Consequently, the Minister for Planning is the consent authority for the development. However, the development application falls within the Minister's delegation to the NSW Planning Assessment Commission (Commission) dated 14 September 2011, because there were more than 25 public submissions in the nature of objections. Consequently, the Commission must determine the application.

4.2 Permissibility

The project site is located in the Muswellbrook local government area. Under the *Muswellbrook Local Environmental Plan 2009* (Muswellbrook LEP) the vast majority of the subject land is zoned RU1 (Primary Production). Open cut mining is permissible with consent in this zone.

Some areas of the East and South Pits in the existing Drayton mine that occur within the AGL Macquarie sublease area are zoned SP2 (Infrastructure). Mining is not listed as permissible in this zone. However, under clause 7(b) (ii) of the Mining SEPP, mining is permissible within a mining lease that applied before the Mining SEPP was introduced in February 2007. In this case, the applicable mining lease (ML 1531) existed prior to this date.

A small portion of land required for the Edderton Road realignment is zoned E3 (Environmental Management) under the Muswellbrook LEP. Development for the purpose of roads is permissible in this zone.

Consequently, all components of the project are permissible with development consent and the Commission may determine the application.

4.3 Objects of the EP&A Act

The Minister must consider the objects of the EP&A Act when making decisions under the Act. The objects of most relevance to the Minister's decision on whether or not to approve the project are found in Section 5(a)(i),(ii),(vi) and (vii). They are:

To encourage:

- (i) *the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment;*

- (ii) *the promotion and co-ordination of the orderly and economic use and development of land;*
- (vi) *the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats; and*
- (vii) *ecologically sustainable development.*

The Department is satisfied that the project encourages the proper development of resources (Object 5(a)(i)) and the promotion of orderly and economic use of land (Object 5(a)(ii)), particularly as:

- the project is a permissible land use on the subject land;
- the site has been identified as having a significant coal resource for more than 30 years, including a Ministerial approval for the Mt Arthur South Project in 1986;
- the Department of Trade and Investment has confirmed that the coal reserve is significant from a State and regional perspective;
- the existing exploration licence for the site was granted by the NSW Minister for Resources in 1998;
- the project can be largely carried out using existing surface and transport infrastructure; and
- the project would provide considerable economic benefits to the region and to NSW as a whole.

The Department acknowledges that the project has the potential to impact other land uses and resources, particularly agricultural resources associated with the nearby Coolmore and Woodlands studs. The Department has considered these potential impacts in detail in its assessment of the project, and has concluded that with the implementation of appropriate management measures, the project can proceed without significant impacts on the operations of the studs (see Section 6.2).

Consideration of environmental protection (Object 5(a)(vi)) is provided in Section 6 of this report. Following its assessment, the Department considers that the project is able to be undertaken in a manner that would maintain or improve the biodiversity values of the region in the medium to long-term. The Department is also satisfied that the impacts to threatened species and habitats can be managed and/or mitigated by imposing appropriate conditions, including a detailed biodiversity offset strategy and rehabilitation strategy.

The Department has considered the principles of ecologically sustainable development (ESD) (Object 5(a)(vii)) in its assessment of the Drayton South Coal Project (see Appendix B). It has also considered Anglo's consideration of these principles (see Section 9.7 of the EIS).

Following its consideration, the Department considers that the project is able to be carried out in a manner that is consistent with the principles of ESD.

4.4 Threatened Species

Sections 5A to 5D of the EP&A Act relate to threatened species assessment and management. The Department confirms that its assessment of the project has taken into account the matters listed in these sections in assessing whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats.

These matters include the:

- factors in Section 5A(2), known as the '7 part test of significance';
- threatened species assessment guidelines¹ identified in Section 5A(1); and
- register of critical habitat as identified in Section 5B.

The Department's consideration has had regard to Anglo's ecological assessment and the 7 part tests of significance included the EIS, along with the threatened species assessment guidelines which assist in the interpretation and application of the 7 factors (or tests) of significance. This assessment has considered the direct and indirect impacts of the project on threatened species, populations or

¹ Assessment guidelines means assessment guidelines issued and in force under section 94A of the *Threatened Species Conservation Act 1995* or, subject to section 5C, section 220ZZA of the *Fisheries Management Act 1994*, including the *Threatened Species Assessment Guidelines – The Assessment of Significance*, prepared by the then Department of Environment and Climate Change, dated August 2007.

ecological communities, or their habitats – both on the site and the broader study area, as defined under the threatened species assessment guidelines.

As outlined in the EIS, in the absence of any avoidance, mitigation or offsetting measures, the project is likely to have a significant impact on a number of endangered ecological communities and threatened species. The project is not likely to affect any listed critical habitat. The Department's assessment concludes that these impacts are able to be mitigated or compensated to an acceptable standard through a mix of avoidance, mitigation and offsetting measures that form part of the project.

These measures include a range of avoidance measures, rehabilitation of the mine with woodland, a comprehensive on-site and off-site land-based offset strategy, and supplementary measures for particular threatened species in accordance with the NSW Biodiversity Offsets Policy for Major Projects.

The Department also notes that surveys for the project did not record any threatened aquatic species in Saddlers Creek and that the biodiversity assessments undertaken for the project found that the Hunter River catchment does not provide suitable habitat for threatened species and communities listed under the *Fisheries Management Act 1994* or EPBC Act.

4.5 Environmental Planning Instruments

Under Section 79C of the EP&A Act the consent authority is required to consider amongst other things the provisions of relevant environmental planning instruments (EPIs), including any exhibited draft EPIs and development control plans.

The Department has considered the project against the relevant provisions of several EPIs (see Appendix B), as well as Anglo's consideration of these instruments (see Section 4 of the EIS).

The key instruments include:

- *Muswellbrook LEP 2009*;
- *Hunter Regional Environmental Plan 1989 (Heritage)*;
- *SEPP No. 33 – Hazardous and Offensive Development*;
- *SEPP No. 44 – Koala Habitat Protection*;
- *SEPP No. 55 – Remediation of Land*;
- *SEPP (State and Regional Development) 2011*;
- *SEPP (Infrastructure) 2007 (Infrastructure SEPP)*; and
- *SEPP (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP)*.

On 7 July 2015, the Minister for Planning released the Draft *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) Amendment (Significance of Resource) 2015 (Draft Mining SEPP Amendment)* for public consultation.

The Draft Mining SEPP Amendment, if made, would repeal Clause 12AA of the Mining SEPP. Clause 12AA requires, amongst other things, a consent authority to consider the significance of the resource when determining an application for the purposes of mining, and to make resource significance the consent authority's 'principal consideration' under Part 3 of the Mining SEPP when determining whether or not to grant consent to the development.

Under Section 79C, the consent authority is required to consider the Draft Mining SEPP Amendment when determining the development application for the Drayton South Coal Project.

Should the Draft Mining SEPP Amendment be made before the application is determined, or if it remains a draft instrument in the terms of Section 79C at the time the application is determined, the significance of the resource and the economic benefits of mining-related development remain relevant considerations under the aims of the Mining SEPP, and under the objects and Section 79C of the EP&A Act.

Accordingly, the Department considers that the Draft Mining SEPP Amendment does not change the conclusions of the Department's assessment or its recommended conditions, and would not change the conclusions of the Department's assessment or its recommended conditions if the Draft Mining SEPP Amendment was made before the application was determined.

Based on its assessment of these instruments and its broader environmental assessment in Section 6, the Department considers that the Drayton South Coal Project can be undertaken in a manner that is consistent with the aims, objectives and provisions of these instruments. However, this is subject to a range of mitigation, monitoring and management measures, as outlined in Section 6.

4.6 Integrated & Other Approvals

Under Section 89J of the EP&A Act, a number of other approvals are integrated into the State Significant Development approval process, and consequently are not required to be separately obtained for the proposal. These include:

- an authorisation under the *Native Vegetation Act 2003* for the clearing of native vegetation; and
- an Aboriginal heritage impact permit under the *National Parks and Wildlife Act 1974*.

Under Section 89K of the Act, a number of other approvals are required to be obtained, but must be approved in a manner that is consistent with any State Significant Development consent for the project. These include:

- granting variations to the existing mining lease (1531) for the Drayton mine and a new mining lease for the Drayton South area under the *Mining Act 1992*;
- variations to the existing environment protection licence for the Drayton mine under the *Protection of the Environment Operations Act 1997*; and
- consent under Section 138 of the *Roads Act 1993* from Muswellbrook Shire Council (as the responsible roads authority) for realignment of Edderton Road.

Anglo also requires other approvals for the project which are not integrated into the State Significant Development approval process, including certain water licences under the *Water Act 1912* and the *Water Management Act 2000*.

The Department has consulted the relevant public authorities responsible for granting these integrated and other approvals, and considered the relevant issues relating to these approvals in its assessment of the project (see Sections 5 and 6).

4.7 Gateway Certificate

As outlined in Section 3.4, the subject land contains BSAL and consequently Anglo was required to obtain a gateway certificate prior to lodging the development application for the project.

In considering the application, the Gateway Panel concluded that:

- the open cut mining would have significant direct impact on the agricultural productivity of the BSAL within the project disturbance area; and
- there is unlikely to be any significant direct or indirect impacts on highly productive groundwater (within the meaning of the *NSW Aquifer Interference Policy*) as a result of the project.

To address some uncertainties in the information provided, the Gateway Panel recommended that Anglo:

- reassess current site survey data, and undertake further site observation as necessary, for the accurate verification of BSAL within the project disturbance area;
- update groundwater modelling to provide more accurate water flow and quality information; and
- provide a clearer program for proposed reinstatement of BSAL and the final land use of the rehabilitated landform.

The Gateway Panel issued a conditional gateway certificate for the project on 2 April 2015, which included a number of recommendations focusing on the provision of additional information regarding BSAL (see Table 2 and Appendix J). Anglo has addressed these issues in the EIS, and the Department has considered the recommendations in its assessment of the project (see Section 6.9).

Table 2: Gateway Certificate Recommendations

Relevant Criteria	Consideration	Recommendations
17H4(a) (i), (ii), (iii), (v), (vi)	Open cut mining is expected to significantly impact the agricultural productivity of identified BSAL, however relevant Project information lacks relevant detail and/or is conflicting	<ol style="list-style-type: none"> 1. Provide a detailed program for proposed stripping and restoration of BSAL soil. 2. Provide a detailed program for the rehabilitation of the post-mining landform and the proposed landuse. 3. Construct a post-mining BSAL verification survey program where BSAL restoration is proposed. 4. Update application documents to reflect the current Project scale and plan.
17H4(a) (vi)	Extent of verified BSAL has not been finalised.	<ol style="list-style-type: none"> 1. Reassess soil salinity classification and provide laboratory data for all observation sites in Soil Unit 2. 2. Undertake further sampling and laboratory analysis as required to enable an accurate assessment of Soil Unit 2 boundaries to complete BSAL verification. 3. Provide an accurate BSAL map for the Project Disturbance Area

4.8 Commonwealth Approvals

A delegate of the Commonwealth Minister for the Environment determined on 3 March 2015 that the Drayton South Coal Project is a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The project was determined as likely to have a significant impact on controlling provisions and matters protected under the EPBC Act, including:

- listed threatened species and communities, in particular the following 4 species were identified as being likely to be significantly impacted:
 - *White box-Yellow box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* critically endangered ecological community (Box-Gum Woodland);
 - Regent Honeyeater (*Anthochaera phrygia*);
 - Swift Parrot (*Lathamus discolor*);
 - Spotted-tail Quoll (*Dasyurus maculatus*);
 - Large-eared Pied Bat (*Chalinolobus dwyeni*);
 - with a further 9 listed flora and fauna species also listed as having a real chance or possibility of being significantly impacted subject to further detailed assessment;
- water resources.

Further requirements were issued by the Commonwealth Department of the Environment on 30 April 2015, and were included as a supplement to the environmental assessment requirements issued by the NSW Department of Planning and Environment in December 2014.

On 26 February 2015, the Commonwealth and NSW Government's signed a Bilateral Agreement in relation to environmental assessment under the EP&A Act. Under the Bilateral Agreement, State environmental assessment processes, including those under Part 4 of the EP&A Act, are accredited. The potential impacts on controlling provisions have been assessed under Part 4 of the EP&A Act. The Department will refer the Drayton South Coal Project to the Commonwealth Minister for the Environment for separate determination under the EPBC Act, following the NSW determination on the proposal.

The Department's assessment of the potential impact of the Drayton South Coal Project on controlling provisions relating to biodiversity and water resources is provided in relevant subsections of Section 6 and a discussion of additional relevant considerations for the Commonwealth Minister is provided in Appendix L.

As required under the bilateral agreement, the Drayton South Coal Project was jointly referred to the Commonwealth's *Independent Expert Scientific Committee on Coal Seam Gas and Large Mining Development* (IESC) by the NSW and the Commonwealth governments for advice on surface and ground water impacts, as well as potential impacts on downstream watercourses and receiving environments.

The advice provided by the IESC has been considered by the Department in Section 6.5 and informed the recommended conditions of consent in Appendix A.

4.9 NSW Planning Assessment Commission

On 13 August 2015, the Minister for Planning asked the NSW Planning Assessment Commission (the Commission) to review the merits of the Drayton South Coal Project. Due to the level of interest in the projects, the Minister also requested that the Commission hold public hearings during the review.

The terms of reference for the Commission review are set out below (see Table 3).

Once it receives the Commission's review report, the Department would finalise its assessment of the merits of the project and refer the project application back to the Commission for determination.

Table 3: Terms of Reference for the Drayton South Coal Project Commission Review

1. Carry out a review of the Drayton South Coal Project, and:
 - a) consider the EIS for the project, the issues raised in submissions, the formal response to submissions, and any other information provided on the project during the course of the review;
 - b) assess the merits of the project as a whole having regard to all relevant NSW Government policies, and paying particular attention to the potential impacts on the operations of the Coolmore and Woodlands horse studs; and if necessary,
 - c) recommend further measures to avoid, minimise, and/or manage the potential impacts of the project.
2. Conduct public hearings during the review as soon as practicable after the Department of Planning and Environment provides its preliminary assessment report to the Commission.
3. Submit its final report on the review to the Department of Planning and Environment within 9 weeks of receiving the Department's preliminary assessment report, unless the Secretary of the Department agrees otherwise.

4.10 Exhibition and Notification

Under Section 89F of the EP&A Act the Secretary is required to publicly exhibit the Environmental Impact Statement (EIS) for the project for at least 30 days.

After accepting the EIS for the project, the Department:

- publicly exhibited the EIS from 15 May 2015 until 19 June 2015 at the:
 - Department's Information Centre in Sydney;
 - Singleton Shire Council;
 - Nature Conservation Council's office; and
 - Department's website;
- notified relevant State government authorities and Council by email;
- notified relevant electricity supply and transmission authorities in accordance with the infrastructure SEPP;
- notified relevant road authorities in accordance with the Mining SEPP;
- notified Aboriginal stakeholder groups, in accordance with the Muswellbrook LEP; and
- advertised the exhibition in the Newcastle Herald, Hunter Valley News and Singleton Argus.

In undertaking these processes, the Department has satisfied the notification requirements of Section 89E of the EP&A Act, the Mining SEPP, the Infrastructure SEPP and the Muswellbrook LEP.

5. CONSULTATION

During the exhibition period, the Department received over 4,100 submissions on the project, including:

- 13 from public authorities, including Muswellbrook Shire Council and Upper Hunter Shire Council;
- over 4,000 individual or special interest group public submissions in support of the project; and
- 83 individual or special interest group public submissions objecting to the project.

The Department also received advice from IESC, established under the EPBC Act to provide independent scientific advice on the potential impacts of large mining and CSG projects on water resources.

A summary of the issues raised in submissions is provided below, and a full copy of the submissions is provided in Appendices E and F. Anglo's formal response to the issues raised in submissions is provided in Appendix G.

5.1 Additional Assessment

To address some residual issues raised during consultation and broader road network matters, the Department commissioned two independent expert reviews and an independent traffic study that relate to the assessment of the project:

- **Economic Review** – the Department commissioned Deloitte to undertake a review of the economic assessment, focusing on the Benefit Cost Analysis undertaken by Gillespie Economics for the project (see Appendix H);
- **Air Quality Review** – the Department commissioned Jacobs to undertake an independent peer review of the air quality impact assessments contained in the EIS to verify the adequacy and accuracy of the predicted air quality impacts of the project (see Appendix I); and
- **Thomas Mitchell Drive Contributions Study** – the Department commissioned GHD to prepare a road traffic assessment and contributions study, which provides a basis for apportioning funding contributions from mining companies for the upgrade and maintenance of Thomas Mitchell Drive.

5.2 Public Authorities

No public authorities objected to the project. However, most of the public authority submissions raised issues with specific aspects of the project and/or made recommendations relating to a range of matters relevant to their administrative and regulatory responsibilities.

Specifically, the Department notes that, while not directly objecting to the project, the Upper Hunter Shire Council expressed its views that the Coolmore and Woodlands studs should be afforded appropriate protection from the impacts of mining and highlighted its updated Position Statement of *"protecting the wider equine industry by opposing coal mining developments that have the potential to adversely impact upon those major thoroughbred breeding farms located outside the Shire."*

Following provision of additional information in the RTS, all agencies (apart from Council) have confirmed that they are satisfied that their concerns have been addressed and/or can be managed through appropriate conditions of approval. Accordingly, the following summary focuses primarily on the key residual issues that require further consideration in Section 6 (below).

Muswellbrook Shire Council (Council) did not object to the project as described in the EIS. However, Council raised concerns about the potential impacts of the project on the local road network (namely Thomas Mitchell Drive and Edderton Road) and local biodiversity, along with the proposed final landform and rehabilitation plans. Council also raised concerns that low coal prices might impact the project's viability and recommended the economic assessment be peer reviewed.

Upper Hunter Shire Council (UHSC) highlighted its revised Position Statement (stated above) regarding the cumulative impacts of coal mining on the agricultural industry and particularly horse studs, advocating that exclusion zones be adopted to prevent land use conflicts between mining and agriculture. UHSC also emphasised its support for the Commission's finding in the determination report for the original project 'that Coolmore and Woodlands studs be afforded the highest level of protection'.

Environment Protection Authority (EPA) raised concerns about discharges from sediment dams and potential impacts on downstream receiving waters. In particular, the EPA advised that it would require monitoring from sediment dams (particularly in wet weather events) and would require a more detailed assessment of likely pollutants before authorising any discharges from the premises.

The EPA did not raise any concerns with the air and noise modelling and impact assessments completed for the project, however noted that cumulative air impacts were predicted at at least four privately-owned receivers. The EPA considered that further air mitigation measures may be possible and noted that any EPL would include similar blast fume conditions to those in place at Drayton mine.

Office of Environment and Heritage (OEH) assessed the impact on biodiversity against the NSW Biodiversity Offsets Policy for Major Projects, including the Framework for Biodiversity Assessment (FBA). OEH acknowledged that it had previously advised that the project had met relevant State requirements for offsetting and that the impacts on biodiversity had now decreased with the reduction in mining area. OEH advised that while the proposed offset did not strictly meet all FBA offsetting rules under the current offsets policy, during the transitional period of this new policy, the Department may use some discretion in the application of the policy.

With respect to Aboriginal Cultural Heritage, OEH is satisfied that the impact assessment has been undertaken in accordance with relevant requirements and noted that the predicted impacts on Aboriginal heritage items could be appropriately managed through revisions to the Aboriginal Cultural Heritage Management Plan in place at Drayton mine.

OEH raised concerns with the limited consideration of flood impacts on external properties associated with the project and Edderton Road realignment. The Department has recommended conditions requiring the road realignment be designed to meet contemporary road standards and constructed to the satisfaction of the appropriate road authority, and incorporated into the Water Management Plan through detailed design objectives and surface water performance criteria for the realignment.

Department of Primary Industries (DPI) provided two separate submissions on behalf of the DPI Water and the Office of Agricultural Sustainability and Food Security (OASFS).

DPI Water was satisfied that the potential impacts on water resources were appropriately modelled and assessed against the considerations of the *NSW Aquifer Interference Policy (AIP)* and identified that the predicted impacts would comply with the acceptable level 1 minimal impact thresholds.

However, to ensure that Anglo fully accounts for its water take and holds adequate licences for all aspects of its proposed operations, DPI Water has recommended a number of conditions concerning the management of water take from the project and the preparation a Water Management Plan. These conditions have been incorporated in the recommended conditions of consent.

OASFS requested additional information in relation to the mapping of BSAL, mitigation of impacts on agricultural resources, topsoil balances, the use of soil resources in rehabilitation and the economic assessment. Following a site inspection and receipt of additional information on soil resources, OASFS accepted that the extent of BSAL on the site was restricted to around 79 ha (largely due to salinity issues) and that the area of BSAL itself had significant constraints (waterlogging and erosion).

OASFS also identified that appropriate land management practices could provide considerable improvements to the productive capacity and productivity of agricultural land surrounding the project and recommended that such practices be conditioned as part of any development consent. The Department agrees that improvements could be made to the Agricultural Land Reserve and has recommended that these measures be developed further under an Agricultural Management Plan for the project.

Division of Resources and Energy (DRE) identified the need for further information to identify opportunities to maximise beneficial final land uses and eliminate final voids across the mine complex, ensure a comprehensive tailings management strategy that minimises final mine closure risks, and clearly define the project rehabilitation objectives and completion criteria for each land use domain.

To address these matters, Anglo provided an additional scenario for tailings and reject emplacement at Drayton mine. The optimised 'Scenario 4' rehabilitation plan replaces the need for three alternative final void scenarios, by providing a single option that incorporates sufficient flexibility to meet operational and commercial requirements, while also reducing the number and size of residual voids, continuing the emplacement of rejects and tailings in the same general locations to those used for the current Drayton mine, and optimising the potential for both land and final void uses post-mining.

Having reviewed this scenario and acknowledging the constraints associated with Anglo's existing commercial agreements with AGL Macquarie, DRE recommended a range of conditions to ensure that the project would achieve the highest level of rehabilitation outcomes and provide for appropriate final lands uses following the completion of mining activities. The Department has adopted DRE's recommended conditions, including the preparation of a constraints and opportunities analysis as part of a tri-annual review of the Rehabilitation Management Plan for the Drayton Complex.

NSW Health emphasised the need to implement all reasonable and feasible measures to minimise dust and noise from the project, even where relevant assessment criteria would be met, and ensure that dust from the project does not adversely impact nearby drinking water supplies. NSW Health also noted that the potential for future changes to the *Ambient Air Quality National Environment Protection Measure* (NEPM) that may result in stricter standards and licence conditions for annual average PM₁₀.

The Department has recommended conditions that require Anglo to implement best management practice to minimise the air, noise and blasting impacts of the project, including through the use of proactive management and all reasonable and feasible mitigation measures to comply with applicable EPA criteria.

Roads and Maritime Services (RMS) noted that the traffic assessment did not adequately assess potential impacts on State Roads, particularly with respect to the intersection of the realigned Edderton Road and the Golden Highway. However, the RMS identified that this issue could be satisfactorily addressed by ensuring that any proposed road works involving classified State Roads adhere to relevant RMS/Austrroads standards, and that any impacts on these roads be appropriately funded. These requirements have been reflected in the Department's recommended conditions.

Transport for NSW noted that its issues had not changed from the original project application. Specifically, Transport for NSW noted that Anglo should demonstrate engagement with the Australian Rail Track Corporation (ARTC) and sufficient rail network capacities to accommodate the predicted rail traffic, include further consideration of local road traffic impacts and identify whether there are any potential efficiency gains that could be achieved by aligning the proposed Edderton Road realignment with HVEC's approved works.

Rural Fire Service (RFS) noted that the project would need to comply with relevant bushfire safety standards and recommended that a Bushfire Emergency Evacuation Plan be developed, should the project be approved.

Australian Rail Track Corporation (ARTC) identified that any increase in train movements arising from the project should be assessed against the Rail Infrastructure Noise Guideline (RING) and that the assessment should consider any potential impacts on the Hunter Valley rail network. The Department notes that the project meets the requirements of the RING and that Anglo has advised it has renewed its contract with ARTC for continuing use of the rail network until 2024. The Department also notes that the project would not increase the number of train movements compared with Anglo's existing operations.

Dam Safety Committee (DSC) advised that any mining within the notification area that surrounds the Liddell Ash Levee would require consent from the DSC. Anglo confirmed it would seek any relevant approvals from DSC.

5.3 Community and Special Interest Groups

The public exhibition of the EIS attracted significant community interest, with the Department receiving over 4,100 public submissions. Of these submissions, around 98% supported the project.

Those submissions in support of the project came from a range of stakeholders including local and regional businesses, as well as direct and indirect employees and their families. These submissions primarily cited job security and the socio-economic and community benefits associated with a 15 year extension to the mine life, and expressed concerns over the potential implications should the mine close. One special interest group, the Upper Hunter Valley Education Fund also supported the project and noted the financial support the company provides towards local tertiary education.

The Department also received 83 community and special interest group submissions that objected to the proposal. These objections included a number of comprehensive submissions and significant representation from the local thoroughbred breeding, viticulture and tourism industries.

These submissions raised a broad range of issues associated with the general impacts of mining and the cumulative impacts of mining in the Hunter Valley. Having reviewed these submissions, the Department notes the key issues that specifically relevant to the consideration of this project are:

- *Air quality* – concerns regarding predicted dust levels and associated impacts on the health of both the local community and the residential employees and horses at the nearby studs;
- *Noise and blasting* – concerns regarding the predicted noise and blasting impacts, primarily for the nearby studs and private properties in the surrounding areas;
- *Visual* – concerns regarding temporary and long term impacts on landscape amenity, tourism and the perceived reputation of the nearby studs;
- *Agriculture* – potential impacts on BSAL land, the nearby Equine and Viticulture CICs (namely the Coolmore/Woodlands Studs and Hollydene Estate) and associated indirect impacts on the broader horse breeding, wine and tourism industry in the Hunter Valley;
- *Water* – concerns about impacts on surface and groundwater resources, particularly related to potential salinity issues and impacts on the Hunter River;
- *Biodiversity* – concerns regarding vegetation clearing, biodiversity impacts and the adequacy of the proposed biodiversity offset package;
- *Aboriginal heritage* – objections to impacts on areas of Aboriginal cultural heritage;
- *Traffic* – concerns regarding the predicted traffic impacts on local roads and the potential impacts of the proposed realignment of Edderton Road;
- *Social* – concerns regarding additional demand on community services; and
- *Economics* – concerns with the impacts on the local economy due to additional demand for limited resources and claims that the project's economic benefits have been exaggerated.

Equine Industry Submissions

The Department received numerous submissions from members of the Upper Hunter equine industry, objecting to the potential impacts of the project on the nearby thoroughbred studs and by association, the broader equine industry. Most notably, Coolmore Australia, Darley (Woodlands) Australia and the Hunter Thoroughbred Breeders Association provided substantial submissions outlining the key grounds for their continuing, strong objection to the proposal.

In addition to highlighting the general impacts of mining, these submissions raised several concerns that specifically relate to the protection and operation of the nearby Coolmore and Woodlands studs, and built upon the findings of the Commission determination of the original project to support their objection to the current proposal. The key issues and matters of concern raised in these submissions include:

1. **Significance** – that the Coolmore and Woodlands studs are at the centre of and essential to both the Upper Hunter Equine CIC and broader equine industry in NSW, and should therefore be afforded the highest level of protection (including through legislative instruments and NSW Government policies).
2. **Incompatibility** – that open cut mining and a viable international-scale thoroughbred breeding enterprise are fundamentally incompatible land uses, and cannot co-exist unless adequate buffers are imposed to remove any mining impacts on the studs.

3. **Unacceptable Impacts** – the project would result in unacceptable impacts on the amenity and reputation of the studs, and if it is approved, would immediately and permanently put at risk the economic viability of the studs and may force them to relocate outside the Hunter Valley.
4. **Original Commission Determination** – that the Commission's review and determination of the original project emphasised a need for any future mining on the Drayton South site to demonstrate that there would be no adverse impacts on the operation of the Coolmore or Woodlands thoroughbred studs.
5. **Economic Viability** – questions regarding the veracity of the economic assessment and several economic parameters (including forecast coal prices), especially given that Anglo has previously stated that any reductions beyond those of the original project would be uneconomic.

The specific concerns of the studs are described and considered in detail in Section 6 below.

6. ASSESSMENT

In accordance with Section 79C of the EP&A Act, the Department has considered the following in its assessment of the project:

- the environmental, social and economic impacts of the project, including Anglo's EIS and RTS;
- the findings and recommendations of the Commission's review of the previous proposal;
- all submissions received throughout the assessment process, including advice from public authorities;
- the gateway certificate for the project;
- independent reviews commissioned by the Department of the air quality assessment and the economic appraisal of the project;
- advice from the IESC;
- applicable environmental planning instruments and draft instruments, including the recently proposed amendment to Clause 12AA of the Mining SEPP;
- other relevant NSW Government policies and guidelines, including the *Upper Hunter Strategic Regional Land Use Plan (SRLUP)* and the *Voluntary Land Acquisition and Mitigation Policy*;
- the suitability of the site for the project;
- relevant provisions of the EP&A Act and Regulations, including the objects and Section 5A of the Act; and
- the public interest.

6.1 COMMISSION REVIEW AND REFUSAL

The primary grounds for the Commission's refusal of the previous proposal related to the impacts on the Coolmore and Woodlands horse studs and the broader implications for the Hunter thoroughbred industry if these studs were to relocate.

In refusing the project in October 2014, the Commission stated that:

- the project did not provide sufficient buffers to protect the Coolmore and Woodlands horse studs;
- Anglo has not demonstrated that the project would not adversely impact equine health and the operations of the studs;
- the approach to monitoring the response of thoroughbreds to mining operations to address uncertainty is not acceptable; and
- the project's economic benefits do not outweigh the risk of losing Coolmore and Woodlands studs, and potential impacts on the thoroughbred industry.

In its 2013 review of the previous proposal, the Commission also made a number of recommendations about the consideration of a revised mine plan that are relevant to the consideration of the current application. In particular, that:

- Coolmore and Woodlands horse studs should be recognised as essential to the broader Equine CIC and given the highest level of protection from the impacts of mining;
- any open cut mining on the site should be required to demonstrate that its impacts would not affect the viability of the Coolmore and Woodlands horse studs;
- if mining on any portion of the site is to proceed, at a minimum, it would:
 - need to be setback behind the second ridgeline on the site (see Figure 2); and
 - be subject to further rigorous assessment to ensure that worst-case visual, noise, blasting, dust and water impacts can be managed to an acceptable level at the nearby horse studs, and more broadly.

The Department has considered each of these issues in detail in its assessment below - firstly, in regard to the impacts on the horse studs, and secondly an assessment of the broader environmental, social and economic impacts of the project in accordance with applicable legislation and NSW Government policies.

6.2 COOLMORE AND WOODLANDS STUDS

6.2.1 Policy Framework

The Coolmore and Woodlands horse studs are significant thoroughbred breeding operations situated within an Equine CIC identified in the *Upper Hunter SRLUP*.

A brief description of the Coolmore and Woodlands horse studs is provided in Section 3 above. A comprehensive description of the horse studs is provided in the 2013 Commission review report, including the operations at the studs themselves, their interactions with other horse breeding operations, and their significance to the broader Equine CIC in the Hunter Valley and the horse breeding industry as a whole.

For the purposes of this assessment, and in accordance with the Commission's recommendation (see above), the Department recognises that both the Coolmore and Woodlands studs are essential to the equine industry in the Upper Hunter, and should be afforded the highest level of protection from the impacts of mining.

This is supported by the SRLUP which was introduced by the NSW Government in 2012 to define and protect strategic agricultural land (such as CICs) through a number of policy mechanisms, including the gateway process. The main purpose of creating the Equine and Viticulture CICs is to establish measures to protect these industries from the impact of coal seam gas and mining activities.

However, the Department does not believe that the Government's policy position equates to no or nil impacts from mining on CICs.

In this regard, it would be unreasonable to expect that in areas where mining is a permissible land use, has historically been a major industry, and where there are current exploration licences, that indirect visual impacts associated with noise, blasting and dust emissions from mining can be avoided entirely.

The Department also considers it is important to note that the EPA has established acceptable criteria for noise, blasting and dust emissions for industrial projects across NSW. There is nothing in the SLRUP that would require the imposition of stricter criteria than would normally be applied to mining projects under existing NSW Government policy.

In its 2014 decision report, the Commission agreed that the SLRUP does not require no or nil impacts from mining on CICs, but any mining impacts should be kept at a reasonable distance from these areas to allow the CICs to remain in the area and prosper.

The Department agrees with this policy position, as it is consistent with the Government's overarching strategic policy objective of:

- seeking to strike an appropriate balance between competing land uses in the region (i.e. mining and the thoroughbred industry); and
- to achieve co-existence wherever possible between these land uses.

Accordingly, the Department's assessment focuses on whether the concessions made under the new mine plan are sufficient to enable co-existence and afford adequate protection to the operations of the studs. Specifically the assessment considers those attributes of the stud properties that contribute to their suitability in supporting successful horse breeding enterprises, including visual amenity, air quality, noise, and access to water. Other less tangible (but equally important) aspects associated with having a mine in the vicinity on the reputation of these businesses are also considered.

Detailed consideration of amenity impacts (i.e. air quality, noise and blasting) at the residences on the stud properties against applicable EPA criteria has been incorporated into the relevant sections below.

6.2.2 Co-existence of Land Uses

Submissions on the project fall into two categories:

- those that consider the proposed mine plan is a reasonable compromise to allow co-existence of mining and the equine industry in the Hunter Valley; and
- those of the view that the two industries cannot co-exist if there is any further encroachment of mining towards the studs.

The studs and other objectors are of the view that the debate should not be characterised as the mining industry against the equine industry. It is more actually characterised as just one mine against the entire equine industry.

In other words, if Drayton South is not approved, other major mines in the region would continue to operate. However, if Coolmore or Darley decide to relocate because of the impacts of mining, there would not be an equine industry in the Hunter Valley. These submissions contend that the debate is therefore more appropriately cast as a short term gain at the expense of the long term sustainability of the equine industry.

In its review of the previous proposal, the Commission noted that no other world renowned thoroughbred breeding centres have an open cut mine in such close proximity, and that other internationally recognised centres (such as Kentucky in the USA and Newmarket in the UK) have protection in place to protect the industries from incompatible developments.

The Commission considered that similar protection should be afforded to the equine industry in the Hunter Valley to ensure not only the survival of the equine industry, but also to allow it to further develop. It also considered that if Coolmore and Darley decided to relocate, it would be extremely unlikely those studs would be replaced by others with a similar international reputation or economic significance.

In characterising the debate in this manner, *the merits of the project hinge on the risk of the studs relocating* rather than on whether the project can meet applicable environmental criteria.

It also relies on at least two assumptions:

- that the viability of the equine industry in the Hunter Valley is reliant on Coolmore and Darley, which cannot be replaced by other operators; and
- that if the mine proceeds, the worst case scenario of both Coolmore and Darley leaving the Hunter Valley would occur, rather than a less extreme alternative.

The Department agrees to some extent with the first of these assumptions, but considers that the risk of the studs departing the Hunter Valley has been overstated.

In refusing the previous proposal, the Commission clearly considered that the likelihood of the studs departing the Hunter Valley was credible. The Commission noted that both Coolmore and Darley have operations and networks in Australia and overseas, and the practical difficulties of relocating prize stallions could easily be overcome, particularly where this was required to maintain investor confidence.

However, the Department considers there are also considerable economic and practical barriers to relocation, and significant benefits of the current location within an existing CIC, including:

- the proximity of and reliance on other horse breeding operations near Scone;
- the significant capital investment that Coolmore and Darley have made in developing the studs; and
- the various support industries and services that can be easily accessed in the Upper Hunter.

Clearly, these are all reasons for ensuring the current locations are afforded an appropriate level of protection, but are also strong disincentives for the studs to abandon the current location if the project proceeds.

The Department also considers that the significant benefits of the Coolmore and Woodlands properties would equally apply to an alternative operator, and the Department has no evidence that the properties would not continue to form a central role in the Upper Hunter Equine CIC.

In weighing the risk, the Department considers that the revised mine plan adheres to the minimum setback recommended by the Commission, and would considerably reduce the potential environmental impacts of the project.

The Commission also recommended that the assessment of any revised mine plan would need to demonstrate that it would not affect the operation of the studs. Based on its detailed assessment of the project, the Department considers that Anglo would be able to comply with all applicable environmental criteria at the stud properties and there is no evidence that the mine would result in any impacts on equine health (see following sections).

While compliance with applicable criteria is not the sole determining factor in considering the merits of the project, it provides a robust indicator of the acceptability of the impacts of the project on surrounding land uses.

The Department also notes that the project involves a maximum of 15 years of active mining compared with 21 years under the previous proposal. Mining in the nearest pit (i.e. the Blakefield pit) would be completed by about Year 9 of the project. For 74% of the 15 year period, active mining would be occurring at a distance of at least 2 km from the operational areas of the studs, and for 62% of the time it would occur at a distance of at least 3 km from the studs. This is about the same distance from Coolmore as the existing open cut mining at Hunter Valley Operations.

Importantly, Anglo has committed to relinquish its rights to open cut mining beyond the southern and western extremities of the project currently under assessment, and any underground mining rights beneath the studs.

The NSW Government would formalise this commitment through an appropriate regulatory instrument in the near future. This would provide the stud operators with confidence that any impacts from mining would not increase over and above those associated with the current project, and provide greater investment certainty for maintaining and expanding operations at Coolmore and Woodlands in the longer term.

6.2.3 Social and Economic

Commission Issues

In its assessment of the previous proposal, the Commission noted the substantial social and economic benefits of both mining and the equine industry, and the importance of maintaining both industries in the Hunter Valley.

It also acknowledged the competing concerns about the economic implications of proceeding or not proceeding with the project, but determined that it was in the public interest to foster a diversified economic base in the region to support the community once coal resources are exhausted.

While the Commission acknowledged the economic benefits of the project, it found that these benefits do not outweigh the potential risks to the equine industry as a whole. In particular, the Commission concluded that this one mining project has the potential to severely impact the studs, and represents a serious risk to the equine CIC.

Stud Submissions

Representatives of the equine industry have provided a number of submissions about the economic benefits of the studs, and have questioned the assumptions used by Anglo in its assessment of the benefits of the project. In short, the studs claim that the benefits of the equine industry have been devalued and the benefits of mining exaggerated.

Key matters raised in submissions include:

- the project is not economically viable;
- the economic analysis does not comply with NSW Government guidelines;
- the coal price assumptions remain unspecified, unjustified and unrealistically high;
- the economic analysis continues to overestimate the benefits, particularly in regard to coal production and employment at the mine; and
- the economic analysis ignores the impact of the project on Coolmore and Woodlands and their critical contribution to the regional and NSW economies.

The submissions also continue to rely on a review of the project undertaken by Marsden Jacob Associates in 2013, which states that a decision to approve the project could:

- jeopardise 640 sustainable jobs in the Hunter Valley equine industry;
- strip over \$120 million a year in production from the regional economy;
- result in a net economic loss to the NSW economy of between \$153 and \$457 million.

Consideration

Economic Assessment

An economic assessment of the project was undertaken by Gillespie Economics and peer reviewed by Drew Collins (BDA Group). The economic assessment was carried out in accordance with applicable NSW Government guidelines, and included a Benefit Cost Analysis (BCA), an input-output analysis, and assessment of the project against the relevant considerations under the Mining SEPP.

The BCA predicted that the project would have a net production benefit to Australia of \$330 million.

This estimate was subject to further sensitivity testing to account for a 20% fluctuation in the coal price and exchange rate, and using discount rates of 4%, 7% and 10%. Even under the most pessimistic scenario, the project was found to have a significant net social benefit to Australia and NSW of at least \$151 million.

The Department accepts that benefit cost analysis is not a precise science and dependent on valuing environmental and social externalities in monetary terms which may vary from one expert to another.

To test the methodology and assumptions in the BCA provided by Anglo against applicable NSW Government guidelines, the Department commissioned Deloitte Access Economics to review the economic assessment for the project (see Appendix H).

In summary, Deloitte's concluded that the BCA provides a broadly robust coverage of the economic costs and benefits of the project to the region and NSW, and meets the majority of the requirements set out in the:

- *NSW Government guidelines for economic appraisal* (NSW Treasury 2007); and
- *Guideline for the use of cost benefit analysis in mining and coal seam gas proposals* (NSW Government 2012).

However, the review also identified a number of aspects of the assessment that should be improved to provide a more detailed assessment of the project-level cost and benefits, although Deloitte's acknowledged these matters would be unlikely to significantly alter the overall findings of the BCA.

Gillespie Economics has provided a detailed response to the matters raised by Deloitte's, and noted that much of the information requested by Deloitte's would have no material impact on the outcomes of the BCA and/or constitutes commercial-in-confidence information (Appendix H).

The Department accepts the inherent confidentiality constraints of private sector proposals, and considers that the industry benchmarks used in the BCA are reasonable. The Department also notes that the NSW Government guidelines (2012) allow costs and benefits that would have no material bearing on the decision to be excluded from a BCA.

Accordingly, the Department considers that the economic assessment provides a reasonable basis for considering the macro-economic costs and benefits of the project.

Economic Viability

Concerns about the economic viability of the project focus on statements made by Anglo during the assessment of the previous retracted mine plan that the mine would be unlikely to proceed without retaining the Redbank pit in the mine plan.

While the Redbank pit has now been excised from the mine plan, Anglo states that the project remains economically viable.

This statement is explained by a number of key factors that have changed since the last proposal was considered. These include:

- a significant reduction in the capital cost as a result of the delay in the development of the project (the delay means that the existing workforce and mining fleet can be re-deployed for the construction of the project, rather than using more expensive external contractors);
- increasing the proportion of lower cost mining methods (i.e. dragline operations) on the site;
- the long term forecast for export thermal coal is expected to improve as the market adjusts to balance the supply and demand position; and
- further weakening of the Australian dollar against the US dollar is expected to continue.

The Department notes that many submissions have criticised the coal price used in the economic appraisal of the project, as it does not match the current thermal coal export price. Anglo argues it is not reasonable or responsible to use the current rate of US \$61 a tonne for the entire life of the project, as credible forecast of the coal price indicate an average coal price of between US \$72 and US \$87 a tonne over the next 15 to 20 years. It also argues that the assumed rate is equivalent to US \$65 a tonne at current exchange rates, which is only 7% higher than the current spot price.

The Department expects there to be continued volatility in the export coal and foreign exchange markets, but considers that the assumptions made by Anglo over the life of the project are reasonable and in line with international forecasts. Furthermore, the economic appraisal has considered fluctuations of 20% in these markets, with all scenarios delivering a substantial net economic benefit to Australia and NSW.

The economic viability of the project is supported by NSW Trade & Investment, which forecasts that the medium to long term export thermal coal price is likely to be between US \$67 and US \$88 a tonne (assuming an AUD/USD exchange rate of 0.75). This is somewhat higher than that used by Anglo, and would result in a higher economic return to both Anglo and the NSW Government than those presented in the EIS.

There have also been some questions raised in submissions about the accuracy of the employment benefits of the project.

Anglo has provided a comprehensive response to these matters in its RTS (Section 5.2.2). The response states that the average employment numbers at the Drayton mine over the last 4 years have varied from 579 and 595 full time positions (including Anglo employees and contractors). The apparent discrepancy with other documents referred to in submissions appear not to have included contractors in the employment numbers.

Concerns have also been raised about the efficiency of the mining operations, and that the number of people employed per tonne of coal produced is higher than any other mine in the Hunter Valley. However, the response from Anglo makes it clear that these claims do not take into account the strip ratios of the different mines, and that when this is factored into the comparison, the Drayton South project would be about average for the Hunter Valley in terms of efficiency.

Finally, the Department considers that it is important to distinguish between private and public interests when considering the merits of a State Significant Development. For a private resource project, the profitability of the proposal is not a relevant matter for consideration under Section 79C of the EP&A Act.

International mining companies routinely make investment decisions across their portfolios that on the surface may appear sub-economic, but for other strategic reasons are attractive to the broader business. Even if Anglo does not make a significant profit from the mine, the State would still realise the royalties for each tonne of coal produced, a significant number of people would be employed, and there would be a range of associated flow-on benefits for the regional economy.

Ultimately, if the mine is truly not economically viable (as claimed in many submissions) the project would be unlikely to proceed. This would result in the claimed benefits of the project not being realised, but would equally mean that none of the impacts of the mine would eventuate either.

In the Department's view, a consent authority need only be satisfied that there is a reasonable prospect of the project proceeding, that the claimed economic benefits of the project are credible, and that the project represents an efficient use of the State's coal resources.

For the Drayton South project, the evidence from a number of experts and the advice from NSW Trade & Investment confirm this is the case.

Comparative Economic Value

The Department is concerned that the assessment of this project is being characterised as a choice about the relative economic benefits of the equine industry and the Drayton South Coal Project.

This has stemmed from concerns expressed by the equine industry about the impacts of the project being so significant that the studs would have no choice but to leave the Hunter Valley. Various economic assessments have been submitted by both sides of the debate highlighting the relative economic importance of the equine industry and the project, and relying on these findings as the basis for making a decision about whether or not the project ought to be approved.

However, it is clear that both the success of the equine industry and the Drayton South Coal Project are important to the region and NSW as a whole.

While the Department acknowledges the professional differences of opinion about the relative economic benefits of the mine and the studs (and the consequences of losing either), the Department believes that this is not a debate that needs to be resolved in the assessment of this proposal.

In the Department's view, the primary role of the consent authority is not to choose between the mine and the studs, but to determine whether the potential impacts of the proposed development on surrounding land uses are acceptable having regard to relevant standards, policies and guidelines.

If the consent authority is satisfied that the impacts on the studs are acceptable, it is then a matter for the stud owners and operators if they choose to relocate. The risk of this occurring should not be the sole focus in the assessment of the proposal, and should not be the basis for ignoring the broader economic implications of any recommendation to refuse or further constrain the project.

6.2.4 Visual

Commission Issues

In its consideration of the previous proposal, the Commission concluded that the mine would result in significant impacts on the visual amenity, landscape and image of the Coolmore and Woodlands studs. The Commission considered direct and indirect visual impacts - direct impacts comprising those aspects of the project that would be directly visible from the stud properties, and indirect impacts being where there is no direct visibility of the mining operations, but there is evidence of them (e.g. light glow at night).

The Commission noted the unique sensitivity or vulnerability of the studs to any direct or indirect visual impacts that may compromise or conflict with their image of being situated in a quiet rural area with clean air, clean water, and isolated from other industrial activities. The Commission also considered that this sensitivity is inherent to the branding and identities of the studs (also known as 'brandscape'), and warrants special consideration with regard to the acceptability of the potential visual impacts of the proposed mine.

In regard to indirect visual impacts, the Commission noted a number of aspects of the mining operations that would result in indirect impacts and may be evident to visitors to the studs, including the glow associated with night time lighting, noise and dust from blasting, and visible dust plumes associated with haul roads and overburden emplacement.

The Commission also considered 'dynamic views' which comprise a range of matters, including mining-related vehicles on roads and images presented in the media that taken together, which could affect the public perception of a particular location. The concern being that the presence of a large coal mine in the immediate vicinity would clash with the stereotypical view of the studs as having clean air, clean water, clean pastures, and picturesque scenery.

Overall, the Commission concluded that the only effective mitigation measure available to address both direct and indirect visual impacts would be to increase the distance between the mine and the studs. The general principle being that the further the operations are from the boundaries of the studs, the less likely that there would be noticeable indirect visual impacts.

Stud Submissions

In regard to visual impacts, the studs raised a number of objections and concerns in their submissions on the project, including that:

- parts of the mining operations would remain visible from the studs throughout the life of the mine;
- increasing the setback distance by 500 metres is not sufficient to avoid a range of unacceptable direct and indirect visual impacts on the studs;
- an open cut mine within 1km of the studs is fundamentally incompatible with the image and reputation of the studs as one of the world's leading thoroughbred and racing operations; and
- the visual impact assessment is inadequate and does not represent the full range of visual impacts of the mine on the operations of the studs.

Consideration

The Department acknowledges that image and visual presentation are critical to the business model of the studs as they are inherently linked to client perception, investor confidence and the reputation of the thoroughbred breeding operations. If meaningful protection is to be afforded to the studs, in accordance with the SRLUP, the proximity of mining must not be permitted to materially diminish the brandscape of these businesses.

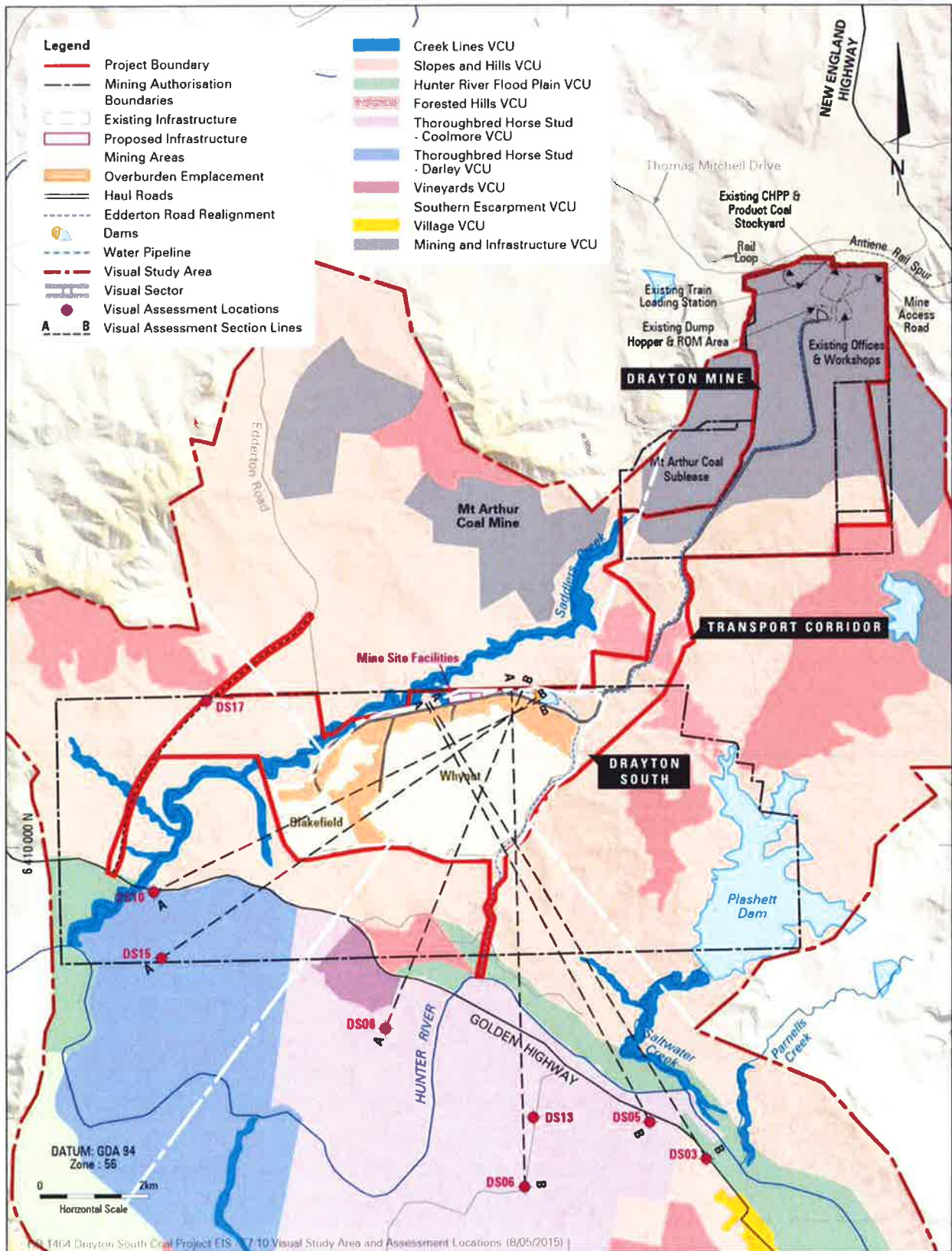
The question then becomes – can the mining take place in the area proposed without materially diminishing the brandscape of the stud operations.

Direct Impacts

Anglo claims that its mine plan has specifically been designed to ensure that views of the project would be screened from key operational areas of both Coolmore and Woodlands studs. To confirm that this is the case, the visual impact assessment includes a number of photomontages and cross sections illustrating views from five sensitive viewing locations representative of the key operational areas within the stud properties (see Figure 12).

These montages and cross sections confirm that there would be no direct views of the project from the locations assessed, with the proposed mining activities fully screened by the ridgeline on the site. It also confirms that the buffer recommended by the Commission would be effective in screening direct views of the mining operations from both the stud properties and from Hollydene Estate.

That being said, the visual impact assessment does not specifically consider all parts of the stud properties. Based on submissions from the studs and site visits undertaken by the Department, it is likely that the mine would be visible from the elevated ridge associated with Trig Hill, which is located on the Woodlands property.



The visibility of the mine from Trig Hill is confirmed by Anglo in its RTS, but it is pointed out that this is the only area in either of the stud properties where the assessment indicates the mine would be visible. Further, Anglo claims that this area has relatively low visual sensitivity as it comprises steep and rocky slopes unsuitable for horse breeding, and that existing mining operations (i.e. Mt Arthur) and Bayswater Power Station are clearly visible from Trig Hill (see Figure 13).



Figure 13: View looking north from Trig Hill

Darley Australia objects to the characterisation of Trig Hill as having low visual sensitivity, and the demarcation of operational and non-operational areas of its property. It claims that all areas of its property are integral to its operations, and that using the visibility of Mt Arthur mine (which is more than 8 km away) as a justification for the Drayton South project (which would only be 1 km from the edge of the property boundary) demonstrates Anglo's misunderstanding of the importance of a 'clean green' image to the ongoing economic viability of the studs.

The Department notes that the Commission has previously made a distinction between the studs' primary areas of operations and other parts of the properties which may be closer to the mine, but where little in the way of horse breeding activity occurs. This is not to negate the fact that the non-primary areas of operation are important to the stud owners, and clients may visit these areas from time to time. However, the Department believes it is reasonable to make the distinction between these two components of the stud properties, and has broadly adopted this distinction in its assessment of the project.

In this regard, the Department does not consider that protecting the CIC from the impacts of mining requires that all future mining be screened from elevated areas of Coolmore and Woodlands, particularly where these areas arguably do not form part of the principal horse breeding activities. Given the commanding views from Trig Hill, to impose such a prohibition could potentially sterilise large volumes of economic coal resources to the south of Muswellbrook, with profound social and economic impacts on the region as a whole.

Accordingly, the Department does not consider the fact that the mine would be visible from these areas as inconsistent with the intent of the SRLUP or a reason (in and of itself) for the mine to be refused.

Indirect Views

Indirect visual impacts include those effects that are not related to direct views of project elements, but where evidence of project activities can be perceived from time to time. These impacts could include:

- visible dust emissions from mining activities;
- visible blast impacts, including blast fumes and dust from blast events;
- lighting impacts from mining equipment and project infrastructure; and
- mine-related vehicle movements on public roads.

Anglo is also proposing a range of best practice mitigation measures to minimise the potential for indirect visual impacts, including dust suppression, progressive rehabilitation, blast management protocols, and directional lighting in accordance with Australian Standards. It is also proposing tree screens along the Golden Highway, Edderton Road, and along ridgelines in the project area.

Anglo has also committed to working with neighbouring landowners to further manage and reduce indirect impacts, including a commitment to development and implement a horse stud management and communication protocol, in consultation with Coolmore and Woodlands. This would establish two-way communication protocols between the studs and the mine to ensure activities (such as blasting) are scheduled at times that would limit disruptions to activities or events at the studs.

The Commission found that constraining mining to the north of the second ridge line was the absolute minimum required to buffer against noise, dust, blasting and lighting. The proposed mine plan complies with the Commission's recommended buffer behind the second ridgeline and provides a setback of around 1 km from the property boundaries of both studs, and 1.6 km from Woodlands' area of primary operations, and 2.3 km from Coolmore's area of primary operations (see Figure 14).

The Department considers that the increased distance, the topographical shielding afforded by the second ridgeline, and the additional mitigation and management measures would substantially reduce the potential for indirect visual impacts.

However, the Department does not believe that adhering to the Commission's recommended setback or the proposed mitigation measures would eliminate these impacts altogether.

The Department's view is that dust and blast fumes generated by the mine would be visible from time to time, and that there would be a noticeable light glow during the night. Although not a visual impact, noise may also be audible under both scenarios, particularly during adverse weather conditions.

Dynamic Views

The Department does not discount the reality of 'dynamic views', but it is difficult for the Department to quantify the extent to which this issue is of concern to the broader community in NSW and beyond. The Department believes it is more likely that visitors to the site would be far more influenced by site-based visual cues that indicate the presence of mining in the vicinity of the studs rather than media coverage (i.e. direct and indirect views).

The Department notes that the Hunter Valley is well known for coal mining (as well as for horse breeding) and one of the largest mines (Hunter Valley Operations) is located 3 km from the eastern boundary of Coolmore (a similar distance to the proposed Whynot pit). Consequently, the proximity of large open cut mining projects to horse breeding operations is not something new to the region, and it does not appear to have prevented the Coolmore and Woodlands studs from operating successfully for many years.

Furthermore, the Department understands that many horse owners do not visit the studs, and even if they did, it is difficult to visit this area without seeing other coal mines. For example, the most direct route to the studs is via the Golden Highway, and there are many existing mines that are close to the road and highly visible. This would tend to have the effect of diminishing the perception that mines and horse studs cannot successfully co-exist.

In regard to the road network, the Department notes that mining-related vehicles are frequently visible on the Golden Highway, which is used by employees of various mines to the west of Muswellbrook. The project is not proposing to alter the access arrangements for the Drayton mine via Thomas Mitchell Drive. Consequently, while there may be a marginal increase in mining-related vehicles on the Golden Highway associated with activities such as planting tree screens, the vast majority of project-related vehicles would not need to use the Golden Highway and would therefore not materially increase the dynamic views of mining for the studs.

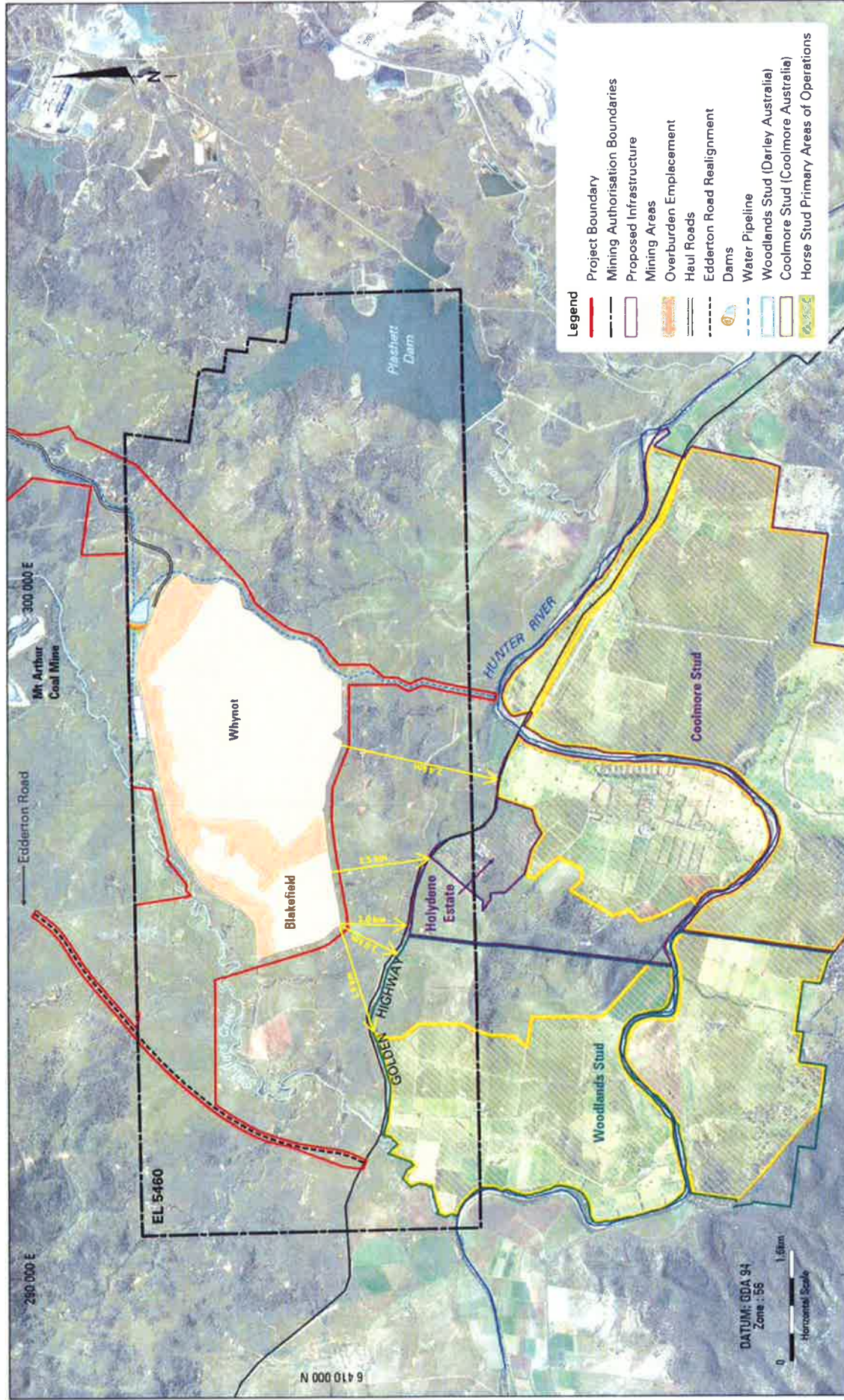


Figure 14: Setback Distances from Studs

Conclusion

By relying on the second natural ridge across the site, the project would not be directly visible from either Coolmore or Woodlands studs, apart from some elevated land associated with Trig Hill. While existing mining operations are visible from these areas, the project would bring mining far closer to the studs than has previously been the case. The Department also acknowledges that the topographic shielding would not eliminate the indirect and dynamic visual impacts of the project.

That being said, the studs are already exposed to indirect and dynamic visual impacts associated with mining in the region, including Hunter Valley Operations which is located around 3 km to the east of Coolmore. While this is not a reason to expose the studs to greater impacts from mining, it is evidence that the studs can operate successfully in an area where mining has historically been a major feature of the broader landscape.

The Department also believes that a mining company should enjoy a reasonable expectation that if it develops a mine plan in a valid exploration licence area and demonstrates that it would comply with established air quality, noise and blasting criteria at sensitive receivers, it should not also need to adhere to indirect or dynamic visual impact criteria that are not defined in government policy.

The Department has recommended that Anglo be required to establish and maintain a substantial vegetation buffer to the north of the Golden Highway. While not eliminating indirect visual impacts, the Department considers the screening would enhance the perception that the landscape is not dominated by mining, and assist in reducing indirect views of mining-related activities.

Overall, when compared to the current footprint of mining in the area, the Department is not convinced that the incrementally greater indirect visual impacts associated with developing the project is sufficient justification for sterilising over \$3 billion of coal, and risking the substantial economic benefits of the project as a whole. Consequently, the Department does not believe that the project should be refused on the grounds of unacceptable visual impacts.

6.2.5 Equine Health

Commission Issues

The Commission found that there was significant uncertainty about the impacts of dust, noise and blasting associated with mining operations on equine health, and that this uncertainty is unlikely to be resolved in the foreseeable future.

It noted that the regulatory environmental criteria for dust, noise and blasting were designed to minimise annoyance to human receivers and protect the amenity of the community. However, the Commission concluded that there is insufficient scientific evidence to support the contention that meeting these criteria would not adversely impact equine health, and hence the operations of the studs.

In the circumstances when there is uncertainty about the potential impacts on equine health, the Commission considered that a precautionary approach should be adopted. In coming to this conclusion, the Commission had regard to the economic importance of Coolmore and Darley not only to the Hunter Valley CIC, but also to NSW and Australia.

Stud Submissions

The studs maintain their strong concerns about the impacts of the project on equine health, and claim that Anglo has not presented any new relevant information to alleviate these concerns. In particular, the studs point out that:

- the thoroughbred horses at the studs are among the most valuable in Australia;
- thoroughbred horses have a heightened flight response compared with other breeds;
- the mine would jeopardise the respiratory health of the horses at the studs;
- the assertions about the fact that thoroughbreds can adapt to high levels of dust and noise is inaccurate; and
- human health and amenity criteria are not necessarily applicable to thoroughbreds.

Consideration

The EIS includes a comprehensive equine health impact assessment prepared by Dr Kannegieter (a specialist equine surgeon). The assessment included a detailed literature review with regard to the effects of dust, noise, vibration and lighting on horses.

Dr Kannegieter's report has been peer reviewed by two other recognised equine specialists. Both peer reviews concur with the finding of Dr Kannegieter. In particular, Associate Professor Kristopher Hughes states:

"The assessments and conclusions made in the report that in terms of dust, noise, vibration and light, there would be no adverse effects on horse health are justified, based on the available scientific data, modelling performed and consideration of comparative precedents of air quality, noise and vibration within the Hunter Valley and other equine breeding regions internationally. I concur with the findings and interpretations of available scientific data made in this report."

Air Quality

While some concerns have been raised in submissions about the air quality impacts on horses, the majority of the commentary has been focused on noise and blasting impacts.

As described in Section 6.3.1 below, with best practice mitigation, the project would be able to comply with the ambient air quality goals set by the EPA. Despite some claims to the contrary, the Department considers there is no reason to believe that horses are more sensitive to dust than people or that a more stringent criteria should be applied to horses.

In terms of relative change, the revised modelling indicates that under worst case conditions the project would generate an additional 1 or 2 $\mu\text{g}/\text{m}^3$ to the annual average PM_{10} concentrations at the studs, and less than 5 $\mu\text{g}/\text{m}^3$ for at least 83% of the time in regard to 24-hour PM_{10} concentrations.

The Department has no evidence to suggest that absolute levels of dust or the relative change of this magnitude would result in any adverse health impacts on horses. In fact the findings of studies cited in the literature review recommend dust levels of 230 $\mu\text{g}/\text{m}^3$ for stables and between 80 and 170 $\mu\text{g}/\text{m}^3$ for paddocks. These levels are well above the concentrations predicted at the studs if the project proceeds.

Consequently, if Anglo is required to ensure compliance with the EPA criteria at the studs (as recommended in the draft conditions of consent), the Department is satisfied that this would provide adequate protection for the horses that visit and/or reside at the studs.

The nature of the dust particles have also been raised in submissions, particularly in regard to endotoxins and coal particles. However, any dust that would reach the studs from the mine would be crustal in origin, and therefore be no different to the dust that may arise from the stud properties themselves. The results of analysis from soil samples taken across the site showed very low levels of endotoxins. Even under the worst case scenario, concentrations of endotoxins would be several orders of magnitude below thresholds recommended in the literature.

In regard to coal dust, Anglo argues that the concentrations of dust would be well below thresholds likely to cause health issues in horses, and that the proportion of coal in fugitive dust emissions from the site would be extremely low. The Department considers this is a credible argument as coal particles are relatively large, and fugitive dust emissions are generally derived from overburden handling and emplacement, and from haul roads (rather than from the coal seams themselves).

Lighting

Due to the shielding offered by the ridgeline, the project would not result in any direct lighting impacts on the horses residing at the studs. The Department notes the concerns about lighting impacts on the breeding cycle of mares at the studs. However, the equine health impact assessment in the EIS states that any artificial light needs to be of relatively high intensity and duration to affect the breeding

cycle. The assessment concludes that the indirect lighting impacts of the project would not be sufficient to result in any negative effect on breeding cycles. Given that there are many successful thoroughbred horse studs in locations where there would be an equivalent amount of ambient light (e.g. Edinglassie Stud), the Department accepts this conclusion.

Noise & Blasting

The Department notes that opinion presented in the EIS and in the submissions from the studs regarding the impacts of noise and blasting on the horses is contradictory.

The noise assessment in the EIS indicates that the new mine plan would comfortably comply with the relevant EPA amenity criteria at the studs (see Section 6.3.2 below). In fact, the assessment predicts that there would be no measurable increase above existing background noise levels at the primary areas of operations of the studs.

While this does not mean that mining noise would not be audible under adverse weather conditions, it adds evidence that the Commission's recommended setback would afford a high level of protection to the studs.

The Department notes the concerns raised by the studs about the particular sensitivity of horses and foals to sudden noises, and the fact that many horses do not stay at the studs for sufficient time to become habituated to blasts.

In response to these concerns, and based on the equine health impact assessment, Anglo argues that:

- the assessment demonstrates that the mining operations would be able to comply with applicable blasting criteria at the studs (see Section 6.3.3 below);
- the ridgeline on the site would provide an effective barrier to noise from blasting, particularly in regard to attenuation of high frequency sound;
- sudden noises associated with the operations of the studs (e.g. tractors, helicopters, irrigation pumps, etc) would be far more likely to startle horses than a distant rumbling associated with blasting on the site;
- equine hearing is less sensitive than human hearing, and that horses would rapidly habituate to any noise that may arise from the project (including the transient horse population); and
- there have been no reported impacts on the health of thoroughbred mares at the Edinglassie stud, which is located only 130 metres from the largest coal mine in NSW (i.e. Mt Arthur).

In regard to the Edinglassie case study, thoroughbred horses are exposed to blast impacts up to 124 dBL and vibration of up to 6 mm/s. This compares to an expected overpressure range of between 98 and 105 dBL and a maximum vibration of 1.2 mm/s when mining is occurring at its closest point to the studs.

While the Department acknowledges that the Edinglassie stud does not have the same scale or reputation as Coolmore and Woodlands, it does provide a practical comparison for the purposes of gauging potential impacts on equine health and behaviour.

Conclusion

The Department acknowledges that there is some uncertainty about the potential impacts of the project on horses at the studs. However, the Department considers that with the changes to the mine plan, the weight of evidence has shifted significantly. In the Department's view, the scientific evidence now supports a view that there would not be any adverse impact of the project on the safety and reproductive capacity of the horses residing at either Coolmore or Woodlands.

6.2.6 Other Environmental Issues

The studs raised a range of other concerns about the environmental impacts of the project. These include concerns about the impacts of the project on water resources, transport and traffic, and impacts on the amenity of the people that live and work on the stud properties. As these issues are

broader than just the potential impacts on the studs, the Department has integrated the consideration of these matters in the applicable sections below.

6.3 AIR QUALITY, NOISE AND BLASTING

The EIS includes specialist air quality and acoustic/ blast assessments undertaken by Pacific Environment Limited (PEL) and Bridges Acoustics respectively.

These assessments were undertaken in accordance with the applicable guidelines and policies, in particular the *NSW Industrial Noise Policy* (INP); the *NSW Roads Policy*; the *Interim Construction Noise Guideline* (ICNG); the *Rail Infrastructure Noise Guideline* (RING); the EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*; and the *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (ANZECC, 1990) and the NSW Government's *Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments* (VLAMP).

In addition to considering the advice provided by the EPA, the Department also engaged Jacobs to undertake a comprehensive review of the air quality assessments completed for the project (refer Appendix I).

6.3.1 Air Quality

Air quality modelling of dust² was undertaken for a range of years that represented the highest annual emissions and proximity to sensitive receivers to assess worst case ambient air quality impacts. In addition to the modelling undertaken for the EIS, the Department requested that Anglo undertake additional air quality and noise modelling for Year 9 when mining in the Blakefield pit would be further to the south and in closer proximity to the studs. The results of the additional modelling are provided in the RTS.

While concerns were raised in some submissions that the air quality modelling did not represent worst case conditions or consider cumulative impacts, both the Department and the EPA are satisfied that the air quality predictions are a conservative and robust representation of the dust impacts from the project.

To this end, the overall conclusion of Jacob's review was that *"the changes in predicted impacts are reasonable, reliable and suitably modelled; and the modelling provides a reasonable basis for the Department's assessment of the likely impacts associated with the revised project."*

The EPA did not raise any concerns with the modelling methodology. However, it noted that while a range of best practice dust minimisation measures have been adopted by Anglo, further feasible dust mitigation may be possible. In its RTS, Anglo advised that existing operations have been assessed through Pollution Reduction Programs and measures implemented to reduce dust emissions and that these best practice management procedures were adopted for the project. The Department notes that the current approval conditions require ongoing review and implementation of reasonable and feasible best practice management measures. This would remain a requirement for the project under the recommended conditions of consent.

Human Health and Amenity Impacts

The modelling predicted that the incremental dust generation from the project (alone) would meet acceptable amenity levels established by the EPA and VLAMP, and would not warrant the application of mitigation or acquisition rights for impacts at any nearby private residences or over 25% of privately owned land. The assessment also predicted that the project would not result in any exceedances of the cumulative annual average dust criteria for PM₁₀, TSP or deposited dust. As is usual for mining projects, the key dust criterion for consideration is the short term 24-hour PM₁₀ criterion of 50 µg/m³.

² The dust modelling included Total Suspended Particulates (TSP), fine particulate matter (PM₁₀), deposited dust and PM_{2.5}.

The predicted worst case dust contours across all modelled years for the Drayton South area are shown in Figure 15 below. These contours show that the majority of impacts would be confined to land owned by Anglo, the neighbouring Mt Arthur mine or the AGL Macquarie power stations. Table 4 provides a summary of the predicted 24-hour PM₁₀ project alone and annual average PM₁₀ impacts for the project, and illustrates that the project would comply with both of these criterion for all private receivers surrounding the project, except for one mine-owned property (i.e. property 60 - Edderton Homestead).

Table 4: Residential receivers – PM₁₀ impacts (range of predicted impacts for highest impacted year)

Receivers	Project only (incremental) 24-hour PM ₁₀ Criterion 50 µg/m ³	Annual PM ₁₀ Cumulative Criterion 30 µg/m ³	Annual PM ₁₀ Incremental increase due to the project µg/m ³
Private Receivers South			
Hollydene Estate			
226 A-D	25-29	22-23	2-3
Coolmore			
227 A-F	16-19	19-20	1-2
217 A-B	8-11	21-22	1-2
219 A-D	11-12	21-22	2
Other	4-10	18-20	0-1
Woodlands			
240 A-E	9-10	19	0-1
Other residences	6-7	18	0
Other Residences	3-10	18-22	0-2
Private Receivers –North Area (Antiene)			
All receivers	3-12	19-21	0-1
Mine-owned receivers			
57	41	24	3
58A-B	22-24	24	2
60	80	44	14
145A-D	17-27	25-26	2-3
Other	8-16	21-22	0-1

To provide an indication of the likely short-term impacts arising from the project and background dust sources, a Level 2 cumulative impact assessment for 24-hour PM₁₀ was undertaken in accordance with EPA's approved methods. This assessment used representative receiver locations to predict the likely cumulative impacts surrounding the project. These locations correspond to the residences predicted to experience the highest PM₁₀ concentrations from the project only and include residences 226A-C located on Hollydene Estate and residence 217A (Year 4 only) located on Coolmore stud.

This assessment model combines the highest predicted 24-hour PM₁₀ concentrations generated by the project with the highest observed background concentrations for a given day. It is important to note that by combining the highest predicted project impact with the highest historical background levels this assessment provides a conservative estimate of the potential impacts of the project.

The cumulative assessment showed that when the predicted dust generated by the project is added to background levels, there would be up to 5 additional days above the 24-hour cumulative PM₁₀ criteria at residence 226C and up to 4 days for residences 226A, 226B and 217A. Importantly, as the project is predicted to generate a maximum of 5 additional exceedances of the 50 µg/m³ 24-hour PM₁₀ criteria at receivers to the south (under worst case conditions), the VLAMP would not require Anglo to provide air quality mitigation measures or acquire any privately-owned residences.

In addition, the Department notes that the cumulative modelling is not calibrated to consider the application of mitigation measures that could significantly reduce the likelihood of dust exceedances. Anglo has already adopted a real-time meteorological monitoring and dust management system, including predictive air quality modelling and real time monitoring of ambient dust levels. This system would be extended to the Drayton South mining area with Anglo committing to actively monitor dust levels and establish triggers to inform the mine when operations need to be modified or ceased.

These 'active' management systems are increasingly being used in the Hunter Valley, with results indicating that predicted impacts are able to be significantly reduced or eliminated. With such a system, the Department believes that Anglo should be able to avoid significantly contributing to the potential cumulative short term dust impacts identified above.

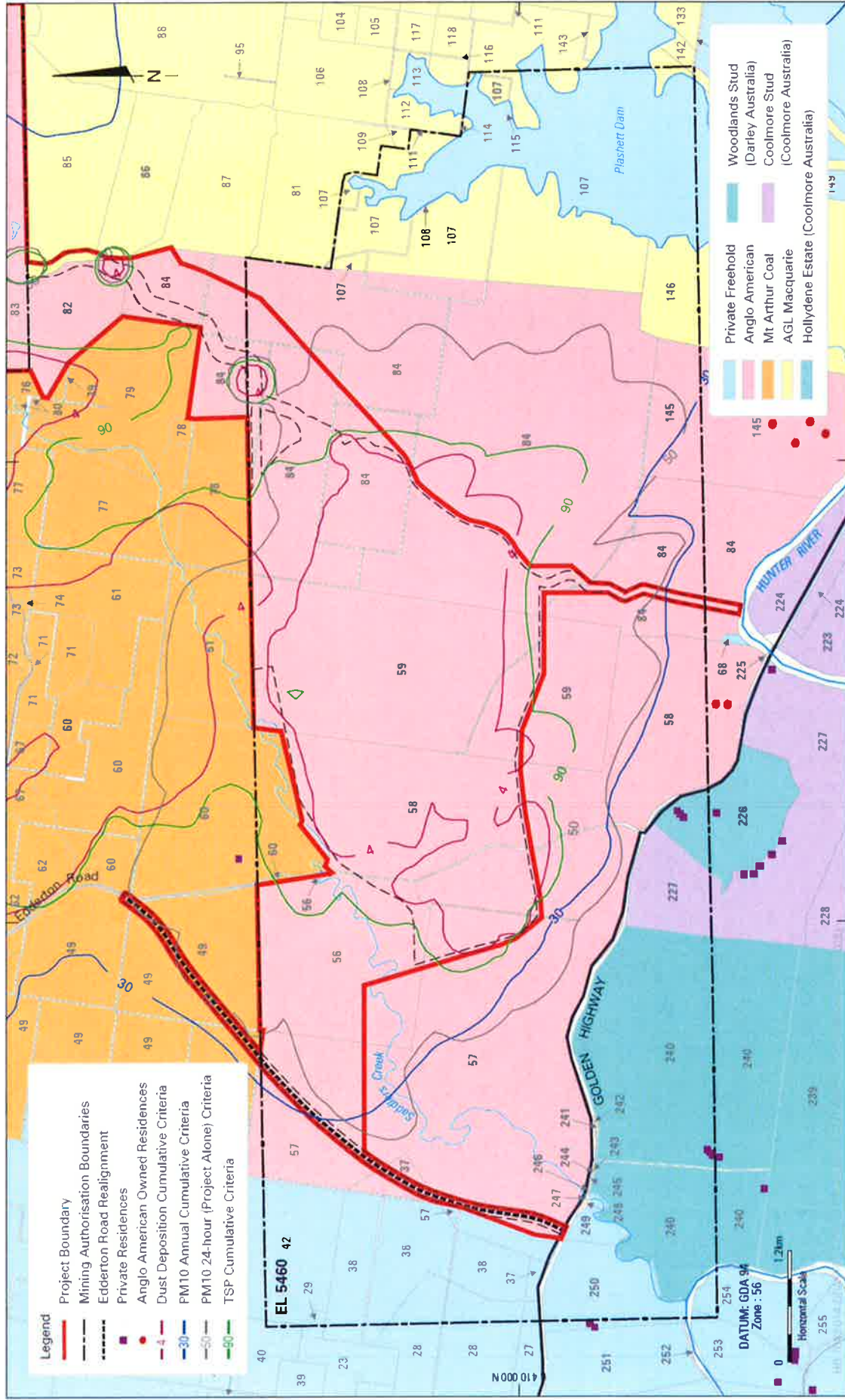


Figure 15: Dust Contours – Worst Case All Modelled Years

Mine-Related Residences

Given the predicted dust levels at the mine-related property Edderton homestead exceed dust criteria and predicted levels are elevated at other residences, the Department has recommended conditions that require current and future tenants be made aware of the potential health implications of dust generated by the mine and that there is opportunity for tenants for early termination of leases.

Blast Fumes

The potential health impacts associated with blast fumes was raised in submissions. Poor blast design and adverse weather contribute towards increasing the risk of generation of blast fumes.

The air quality assessment included consideration of the potential impacts of Nitrogen Dioxide (NO₂) generated in blast fumes against the 1-hour average criterion of 246 µg/m³. The assessment was conservative in its assumptions regarding blast size area and in applying a fume rating of 3,³ with sensitivity testing also undertaken assuming a fume rating of 4. The Department notes the advice in the EIS that blasting monitoring undertaken at the Drayton mine over the period January 2013 to December 2014 indicates that 99% of the 254 blasts were rated at a fume rating of 3 or below.

The modelling predicted that for a rating 3 blast and a 500x100 m blast area, up to 6 hours per year (of a total of 2,920 modelled hours) would exceed the criterion at a private residence (226B), reducing to 4 hours for a smaller 300x100 m blast area. Analysis of the modelling results indicated that exceedance of the NO₂ criterion only occurs under adverse meteorological conditions in the cooler months (May to July) in the early morning or late in the day with light winds from the northwest quadrant and low mixing height, combined with increase in atmospheric stability.

The Department notes that the predicted exceedances are conservative in that it assumes that a high rating blast fume event would occur at the same time as adverse meteorological conditions. Good blast design and appropriate risk management approaches would avoid adverse meteorological conditions and thereby significantly minimise the risk of fume being generated.

As discussed above, Anglo has already installed and committed to ongoing development of its real time air quality, meteorological monitoring and forecasting management system. Anglo has also committed to revising the existing Blast Management Plan to ensure that management measures are implemented to minimise potential for NO₂ formation and to limit blasting activities under the adverse meteorological conditions identified from the modelling.

The EPA acknowledged that the modelling included results from periods when blasting was unlikely to occur. However, the EPA advised that impacts from blast fumes other than from NO₂ emissions can occur and that the existing Drayton mine Environment Protection Licence (EPL) includes a condition that 'offensive blast fume must not be emitted from the premises'. The EPL defines under what circumstances blast fumes become offensive blast fumes. The EPA has advised that this condition would be extended to the Drayton South area, if the project were to be approved.

The Department is satisfied that with the application of risk management measures formalised in the Blast Management Plan (and any associated Blast Fume Management Protocol) that impacts from blast fumes at receivers can be managed to minimise these risks.

In regards other air quality impacts, the EIS identified a low risk of spontaneous combustion due to low sulphur content in coal and overburden/interburden at Drayton South. Anglo has committed to revising its existing Spontaneous Combustion Management Plan to include the Drayton South mining area.

³ Fume ratings are based on the 2011 *Queensland Guidance Note for Management of Oxides in Open Cut Blasting* with fume ratings ranging from 0 to 5.

Greenhouse Gas Emissions

The Greenhouse Gas Assessment identified that direct or indirect (i.e. scope 1 and 2) greenhouse gas emissions (GHG) emissions from the project would contribute some 385 kt CO₂-e per year, or around 0.06% of Australia's annual average emissions under the Kyoto Protocol. Further, this assessment indicates that including total indirect (i.e. scope 3) GHG emissions (which represent around 96% of project emissions or 8,534 kt CO₂-e) the project would comprise a very small contribution to annual global anthropogenic emissions.

The Department believes there is limited scope for reducing scope 1 and 2 emissions as this primarily comes from fugitive emissions from the mine itself. However, the Department notes that it is in Anglo's financial interests to minimise its GHG emissions from diesel and fugitive emissions.

The Department has recommended conditions to ensure that Anglo implements all reasonable and feasible measures to minimise GHG emissions from the site and prepare and implement a detailed Air Quality Management Plan that describes the measures to minimise GHG emissions.

6.3.2 Noise

Noise impacts from the project occur from mining, ancillary operations, construction activity, train movements along the Antiene rail spur, and road traffic noise.

Receivers to the north of the project are currently impacted by the existing Drayton mine operations and the Antiene rail spur which includes cumulative impacts from the Mt Arthur mine. Receivers to the south, southwest and southeast of the project boundary would be predominantly impacted by mining operations from the Drayton South mining area with some limited influence from cumulative impacts from other mining and industrial operations.

As described above, the existing Drayton mine currently operates under two separate approvals for the existing Drayton mine and the Antiene rail spur. Each approval applies different noise criteria as summarised in Table 5 below.

Table 5: Existing noise criteria for Drayton mining operations

Noise	Drayton mine approval	Antiene spur line consent
Noise criteria – project specific	Yes	Yes
Noise criteria – cumulative	Yes	Yes
Up-front noise mitigation rights	Yes – 17 receivers identified	No
Mitigation rights based on noise monitoring	Yes	No
Up-front noise acquisition rights	No	No
Acquisition rights based on noise monitoring	Yes	Yes
Sleep disturbance criteria	Yes	No

Submissions from the horse studs raised concerns that the Noise Impact Assessment (NIA) was inadequate and did not comply with relevant guidelines. The Department and EPA have reviewed these documents and are generally satisfied that the assessment methodologies adopted were sound and provide a reasonable basis for assessing the likely noise and blast impacts of the project. Accordingly, the EPA has provided recommendations for noise and blast levels consistent with contemporary noise criteria.

Background Noise

The background noise levels to the south of the project and in the vicinity of the studs are relatively low. This is particularly the case at Woodlands stud and other rural receivers that are less influenced by traffic noise from the Golden Highway. The noise assessment found that the background noise at Coolmore Stud, Hollydene Estate and other receivers near the Golden Highway is approximately 33 dB(A), and as low as 25 dB(A) in the vicinity of the Woodlands stud during the evening and night.

In accordance with the *NSW Industrial Noise Policy* the noise assessment adopted 33 dB(A) as the relevant evening and night-time Rated Background Level (RBL) for Coolmore, Hollydene Estate and Jerrys Plain village, and 30 dB(A) for Woodlands, which is the lowest applicable under the INP. This

results in a Project Specific Noise Level (PSNL) of 38 dB(A) for Coolmore and 35 dB(A) for Woodlands.

The background noise levels for the receivers to the north of the project affected by the existing Drayton mine and Antiene rail spur were adopted from the 2007 Drayton Extension Project EA which was accepted by the Department and the EPA at that time as being representative of noise without the influence of the Drayton mine. The Department accepts that these established levels of 35 – 37 dB(A) continue to be appropriate background levels for receivers to the north of the project.

Operational Noise

The noise impact assessment undertaken for the EIS included predictions of intrusive noise levels from the Drayton South mine, truck movements on haul roads, CHPP operations, reject/ tailings emplacement and rail loading facilities (including rail movements) for representative mine plans for years 4, 6 and 12. As with the air assessment, the Department requested an additional modelling for Year 9.

With regard to the Drayton mine, the Department understands that the additional coal extraction is likely to generate noise levels akin to those of the existing operations. As the EIS noise modelling did not include extractive activities from Year 4 onwards, the Department requested further information to clarify the worst case impacts from simultaneous extraction at Drayton mine and Drayton South.

Southern Receivers

The noise assessment predicts that worst case noise impacts over the life of the project would remain below 35 dB(A) for all receivers located to the south of the project, including all residences on Coolmore and Woodlands studs and Hollydene Estate. The highest predicted noise level of 32 dB(A) would occur in Year 12 at a number of residences located southeast of the mine on Coolmore stud (locations 219C,E,W), and aligns with the southerly progression of mining in the Whynot pit. All other receivers to the south of the project are predicted to experience noise levels of up to and including 30 dB(A) as a result of mining activities.

It is important to recognise that these predicted impacts would comfortably comply with the applicable intrusive noise criteria at all receivers to the south of the project.

Figure 16 illustrates the predicted worst case noise contours for all modelled years for those receivers located to the south of the project. While the 35 dB(A) contour extends onto land owned by Woodlands, Coolmore and Hollydene Estate, it does not extend over key sensitive receiver locations. The Department notes that while the 40 dB(A) noise contour marginally extends over land owned by Coolmore, acquisition rights under the VLAMP only apply where 25% of a landholding exceeds an amenity noise criterion of 45 dB(A) for rural receivers. Importantly, the 45 dB(A) contour is entirely confined to land owned by Anglo, the neighbouring Mt Arthur mine and AGL Macquarie.

In considering the acceptability of the predicted noise levels, it is also important to note that the INP sets out acceptable and maximum day time, evening and night time amenity criteria for different land use categories. The relevant land use category in this case would be 'rural', noting that there are no special provisions for horse studs.

Given the criteria for this land use category ranges from 40 dB(A) at night to up to 55 dB(A) during the day, the predicted impacts would remain at least 8 dB(A) below the minimum recommended amenity criteria established by the NSW Government for rural areas.

This does not mean that the mine would not be audible from time to time. However, audibility is not the test against which new developments are assessed. The NSW Government has established an existing assessment regime that considers the acceptability of noise generated by new developments, while providing sufficiently flexible to take into account the sensitivities of different land uses. It would not be appropriate to discard the established regime and adopt alternatives on a case by case basis, and to do so would create unacceptable uncertainty and confusion in land use planning and future economic investment in NSW.

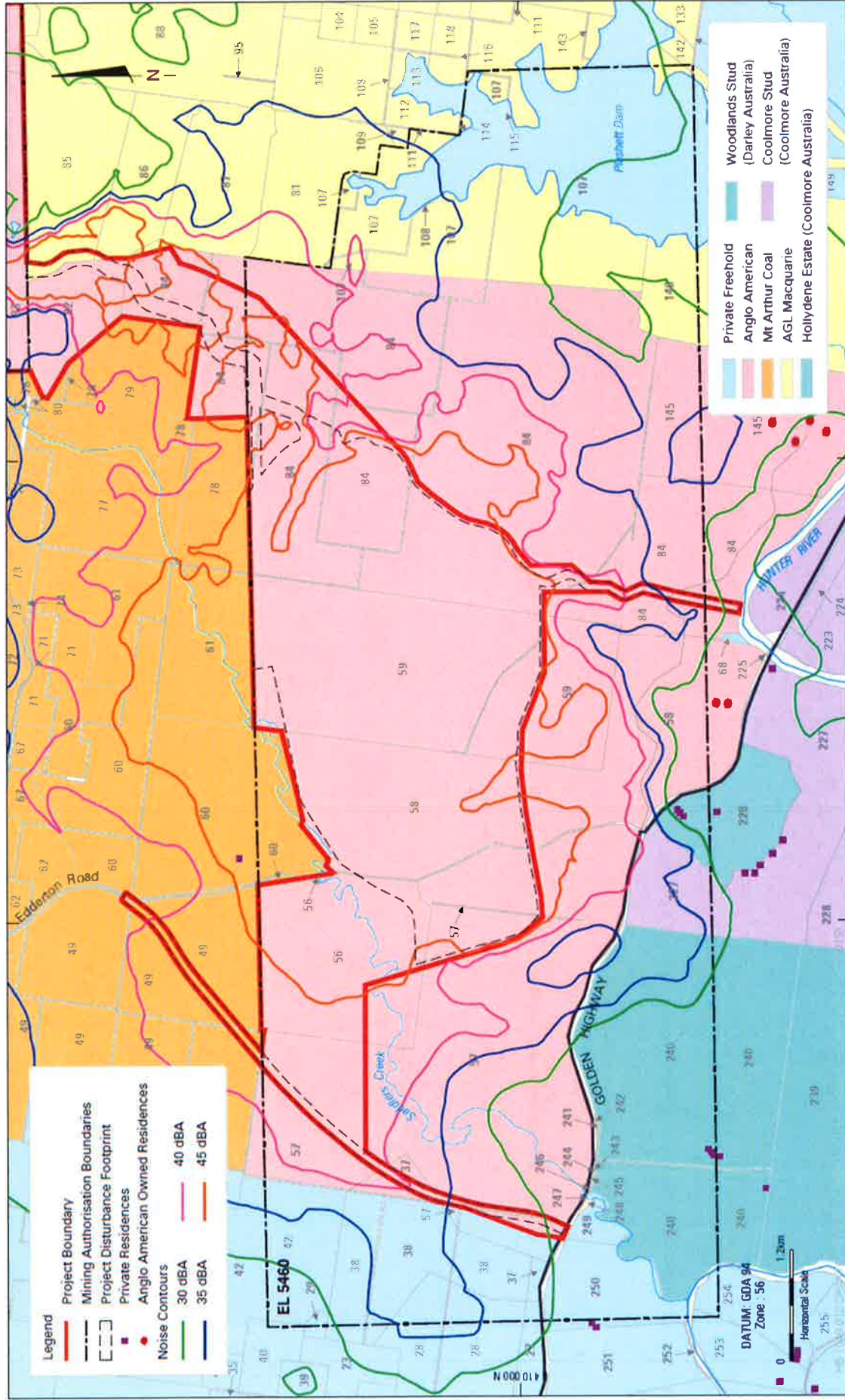


Figure 16: Noise Contours Southern Receivers – Worst Case Contour All Modelled Years

Notwithstanding the above, to minimise the potential noise impacts at residences located around the Drayton South mining area, the Department has recommended that Anglo be required to comply with the default *lowest noise criteria* applicable under the INP of 35 dB(A). In making this recommendation the Department realises that the PSNLs for residences along the Golden Highway (including Coolmore and Hollydene Estate) are 38 dB(A). However, given the EIS noise modelling indicates that the project would generate noise levels of less than 35 dB(A) for all southern receivers, the Department believes that Anglo should be required to comply with these predictions.

Northern Receivers

Table 6 below compares the existing noise limits at sensitive receivers for the Drayton mine approval against the noise predictions for coal extraction, ongoing materials handling, reject emplacement and rail loading on the Drayton rail loop. While the Drayton South EIS modelling assumes that all mining activity has ceased at Drayton mine and confines noise sources to ancillary mining activities, the supplementary modelling of the Drayton mine operations has been updated to incorporate coal extraction in the Drayton mine extension areas (see Appendix D). Receivers highlighted in red represent those with existing or recommended mitigation rights, based on predicted exceedances of the PSNLs by more than 2 dB(A).

Table 6: Existing operational noise limits ($L_{Aeq\ 15\ minute}$) compared with predicted noise levels¹

Receiver ²		PSNL	Drayton mine Existing Approval (above PSNL)	Drayton South EIS modelling (above PSNL)	Drayton South Supplementary modelling of Drayton mine operations (above PSNL)
ID1	ID2				
411	72	37	42 (+5)	39	40 (+3)
418	76	37	42 (+5)	38	39
402	20	35	40 (+5)	38 (+3)	39 (+4)
403	61	35	40 (+5)	38 (+3)	39 (+4)
390	16	37	41 (+4)	39	40 (+3)
398	19	37	40 (+3)	39	39
421	70	37	41 (+4)	38	39
423	69	37	41 (+4)	38	39
419	75	37	41 (+4)	37	38
425	28	37	40 (+3)	36	38
420W	71	37	41 (+4)	37	38
399	18	37	39	37	38
401	22	35	38 (+3)	36	37
424	27	37	39	36	
420E	71	37	41 (+4)	37	37
400	21	35	38 (+3)	35	36
427	26	37	38	35	
444	32	35	40 (+5)	<35	
387	17	37	38	<35	
429	25	37	37	<35	
432	12	37	36	<35	
440	31	37	37	<35	
443	33	35	38 (+3)	<35	
446	86	35	38 (+3)	<35	
460	29	37	36	<35	
386	13	35	36	<35	
441	34	35	36	<35	
433E,W	23	37	35	<35	
Other receivers			35	<35	

Notes:

1. The highest predicted evening or night time prevailing noise impact is included in the table. Red text indicates residences with noise mitigation rights based on existing approval conditions or application of the VLAMP.
2. Different receiver IDs are used in the various assessments – the IDs in the table are based on the Drayton South EIS (ID1) and existing Drayton approval (ID2) for ease of reference.

Table 6 illustrates an important trend in the noise impacts for the project, namely a reduction in the predicted noise impacts at nearby receivers compared with the existing Drayton operations. These predicted reductions in noise impacts are a result of a number of factors, including improved noise management practices and protocols, upgrades to the existing Drayton CHPP and rail loading facilities, attenuation of the mobile plant and equipment fleet, and the relocation of a large portion of the existing mining fleet for the establishment and operation of the Drayton South mining area.

Nevertheless, the project would still generate ongoing noise impacts above the PSNLs for a number of receivers to the north of the project. While these exceedances of the PSNLs would all remain below the currently approved noise impact and acquisition criteria for the Drayton mine, the Department has reviewed these impacts in light of the requirements set out under the INP.

Specifically, the supplementary modelling requested by the Department to clarify the potential impacts of ongoing extractive activities at Drayton mine identifies 4 residences (that would experience ongoing exceedances of 3 to 4 dB(A) above the PSNLs (i.e. receivers 411, 402, 403 and 390).

However, the Department notes that Anglo has volunteered to provide upfront mitigation (upon request) for any private receiver with mitigation rights under the existing Drayton mine consent, irrespective of whether these receivers are predicted to experience reduced noise impacts as a result of the infrastructure upgrades, equipment attenuation and management measures proposed under the project.

Consequently, the Department has included recommended conditions that formalise this commitment and expressly afford mitigation rights (upon request) to 17 receivers to the north of the project (i.e. receivers 390, 398, 400, 401, 402, 403, 411, 418, 419, 420E, 420W, 421, 423, 425, 443, 444 and 446). As no other receivers to the north of the project are predicted to exceed the PSNLs by more than 2 dB(A), the Department is satisfied that noise impacts at these locations would be negligible and would not require further mitigation, as set out under the VLAMP.

The Department acknowledges that it previously recommended that Receiver 411 be afforded acquisition rights for noise impacts associated with the previous Drayton South proposal (which were largely driven by rail noise and wagon bunching on the Antiene rail spur). However, the Department notes that impacts along the Antiene rail spur are now considered under the RING, and that the intrusive noise impacts of the project under the INP are now predicted to be 3 dB(A) above the PSNLs at this residence, and under the VLAMP only warrant noise mitigation upon request. Nevertheless, the Department notes that this receiver is still eligible for acquisition upon request from the neighbouring Mt Arthur mine and would not experience any change in these rights, irrespective of whether the Drayton South project proceeds.

The Antiene rail spur was originally approved under DC 105-04-00 and DC 106-040-00 as a joint development application between Coal Operations Australia Limited (subsequently consolidated by the Mt Arthur Mine) and the Drayton mine, respectively. Under this consent, the Mt Arthur and Drayton mines were required to share the approved rail capacity and collectively manage amenity impacts, including the implementation of a joint acquisition management plan for privately-owned residences.

Mt Arthur surrendered DC 105-04-00 in 2010 as part of the Mt Arthur Consolidation Project, incorporating the operation of the Antiene rail spur into the Mt Arthur mine - Open Cut Consolidation Project approval. This consolidated project was approved with conditions, including the re-negotiation of commercial arrangements with Drayton mine for the shared use of the Antiene rail spur and implementation of a revised joint acquisitions management plan.

In considering impacts associated with the Antiene rail spur, the Department notes that noise assessment criteria for private rail spur lines are to be assessed under the RING. These criteria are based on noise amenity criteria for various land uses as defined in the INP. While the project may generate occasional peak noise impacts associated with rail bunching, Anglo would not be expected to trigger the mitigation requirements for the noise amenity criteria set out under the RING.

Nevertheless, the Department has sought additional information from Anglo concerning how it proposes to manage the commitment it made under the existing approvals to establish a joint acquisitions management plan in conjunction with Mt Arthur.

Cumulative Noise

A cumulative noise assessment was completed which considered the impact of the project together with surrounding mining operations and other industrial sources, including Hunter Valley Operations, AGL Macquarie's Bayswater and Liddell Power Stations, AGL Macquarie's Hunter River Pump

Station and the Mt Arthur mine. The assessment indicates that cumulative noise levels are predicted to comply with the relevant acceptable night-time amenity criteria for rural areas under the INP of 40 dB(A).

Sleep Disturbance

The EIS includes an assessment of the potential for sleep disturbance from mining operations and rail movements. This assessment identified that mining operations at the Drayton mine and Drayton South would comfortably comply with relevant EPA guidelines for sleep disturbance. Importantly, the Department notes that the maximum noise level predicted at the closest receiver to the south of the project (receiver 219W) would be 11 dB(A) below the recommended L_{Amax} noise levels where further investigation of sleep disturbance potential would be warranted.

Nevertheless, the assessment identifies the potential for occasional sleep disturbance impacts at nearby receivers to the north, as a result of wagon bunching and stretching for trains on the rail loop. In effect, these impacts would be a continuation of the existing rail noise associated with the current operation at the Drayton and Mt Arthur mines and would not increase in frequency under the project. The EPA has advised that as these impacts are part of the existing Drayton mine operations it could address these exceedances through a Pollution Reduction Program (PRP) condition under Anglo's EPL for the premises.

Further, as wagon bunching and stretching does not occur for all train movements and the project only involves an average of 4 train movements per day, it would be unlikely that these movements would occur frequently enough to cause sleep disturbance at night. The Department also notes that Anglo has already volunteered to provide mitigation (upon request) to 17 residences in close proximity to the Drayton mine, which align with those residences most likely to experience peak noise events.

The Department is therefore satisfied that the project alone has a low probability of causing sleep disturbance, and that any potential wagon bunching and stretching could be appropriately minimised through relevant management plans for the project and the conditions of an EPL with the EPA.

Notwithstanding, the Department has recommended conditions requiring Anglo to implement all reasonable and feasible mitigation measures to minimise peak noise levels from rail wagon bunching and stretching, and establishing sleep disturbance noise limits for mining operations of 15 dB(A) L_{Amax} above the rating background level, consistent with the EPA's guidelines.

Construction Noise

Construction activity for the project includes construction of the internal transport corridor between Drayton mine and the Drayton South mining areas, mine infrastructure facilities at Drayton South and the Edderton Road realignment. The mine infrastructure components have been assessed together with project against the INP, while the realignment of Edderton Road has been assessed against the *Interim Construction Noise Guideline* (ICNG). This is acceptable to the Department as the construction activity would only be undertaken during the day and, as a linear infrastructure project, would only generate impacts for a short duration.

The NIA predicted that the construction of the Edderton Road realignment would comply with the noise management levels of the ICNG at all private residences. The Department has recommended conditions requiring Anglo to manage noise in accordance with the ICNG and restrict construction hours to the standard hours defined in the ICNG, with any additional short term construction activities to be subject to preparation and approval of an out of hours work protocol.

Traffic Noise

The cumulative contribution of the project's increase in operational and construction traffic was assessed against the EPA's *Road Noise Policy*. Apart from construction of the Edderton Road realignment, all operational and construction traffic would continue to access the project site from the existing Drayton Mine Access Road to the north. The assessment indicates that the traffic from the project does not significantly increase traffic noise levels with an increase of between 0.1 to 0.2 dB(A) over the day time assessment period, which would not be discernible against the background levels.

Noise impacts as a result of the Edderton Road realignment are predicted to comfortably comply with the day time noise criterion of $L_{Aeq, 15\text{ hr}}$ 55dB(A) with an existing calculated road traffic noise level of 36.6 dB(A) at the closest receiver 60 – noting that this receiver is also a mine-related residence owned by Mt Arthur mine. This receiver would experience a calculated relative increase of 0.5 dB(A) which is significantly lower than the relative increase criteria of 12 dB(A) above background levels allowed under the *Road Noise Policy*. The Department is therefore satisfied that the additional traffic noise from the project would not result in any significant impacts for nearby sensitive receivers.

Rail Noise

There are no substantive changes proposed to the currently approved Drayton mine export arrangements including freight capacity, train movements, loading of product coal at the Drayton mine rail loop and transportation via the Antiene rail spur to the Main Northern Railway, for export at the Port of Newcastle. As the combined noise impacts arising from the Drayton mining operations and rail movements on the private Antiene rail spur are not predicted to exceed 40 dB(A) L_{Aeq} (15 minute) (see Table 6), the noise impacts associated with the use of the rail spur would not exceed the relevant acceptable rural residential noise amenity criteria of 50/45/40 dB(A) L_{Aeq} (period) under the RING. Consequently, the project would not trigger any mitigation requirements for rail noise under the RING.

The RING requires that rail noise impacts be assessed where the project contribution exceeds 10% of total rail corridor traffic. Along the public rail network, the average 4 train movements per day from the project represent less than 6% of the total freight train movements along the Main Northern Railway which contributes around 0.4 dB(A) to total rail noise levels. The Department is therefore satisfied that the project would not significantly contribute to additional cumulative impacts on the public rail corridor and that any noise impacts can be effectively managed under the ARTC's existing EPL with the EPA.

6.3.3 Blasting and Vibration

Blasting has the potential to affect people, livestock, structures and private property in four main ways: annoyance and discomfort, or amenity impacts; structural damage to homes, buildings and property improvements; direct risks to the safety of people and livestock; and blast fumes. Impact of blast fumes on human health is discussed above in the air quality section.

Blast and vibration criteria adopted for the project and the predicted impacts on receivers for amenity and structural damage are summarised in Table 7 below.

Fourteen representative receiver locations were assessed, including 7 private residences, 3 project or mine-related residences and 4 infrastructure locations. The predictions in Table 7 are based on the highest proposed maximum instantaneous charge (MIC) of 2,000 kg to be used for the project.

Table 7: Worst Case Blast Impacts

Receiver ID	Amenity Criteria		Structural Damage Criteria		Predicted Level (@ max 2000kg MIC)	
	Airblast	Vibration	Airblast	Vibration	Airblast	Vibration
6 privately-owned residences	115 dB (Lin) for 95% of blasts in any year	5 mm/sec for 95% of blasts in any year	Not applicable as more conservative amenity criteria adopted		98 - 105	0.5-1.2
Hollydene Estate	120 dB (Lin) for 100% of blasts	10 mm/sec for 100% of blasts			107	3.1
3 project or mine owned heritage homesteads ¹	Not applicable – as owned by Anglo or agreement in place		120 dB (Lin)	10 mm/sec	103-119	0.9 – 7.3
Plashett Dam	Not applicable		-	10 mm/sec	-	0.9
Hunter River Pump Station	Not applicable		-	2 mm/sec	-	0.4
AGL Macquarie Pipeline	Not applicable		-	10 mm/sec	-	0.5
Bayswater Power Station	Not applicable		-	2 mm/sec	-	0.4

Note: Edderton homestead is owned by Mt Arthur mine and there is an agreement to apply the structural damage criteria of 10 mm/s at this residence.

Amenity

As indicated in Table 7, blast charges of up to 2,000 kg MIC can be used such that blast and vibration criteria are met at all residences. It is noted that the existing Drayton approval allows up to 2 blasts on any given day and a maximum of 8 blasts a week, averaged over a 12 month period. As such, the project would not require significant changes to the existing annual average blast frequency as under normal operations a maximum of only 1 blast per day would be required.

The Department also notes that the blast assessment relies on the assumption that significant topographical shielding between blast sites and receivers at Hollydene Estate and the Coolmore Stud office would reduce overpressure levels at these receiver locations by 5 dBL.

Furthermore, while there would be some limited construction related blasting to quarry engineering materials, the MIC used in these blasts are significantly smaller (down to 100 kg) with the nearest residential sensitive receiver being the mine-owned Edderton homestead approximately 6.5 km from the nearest blast, and hence blast impacts are predicted to be well below the amenity criteria.

Structural Damage

The blast structural damage criteria with overpressure at 120 dB(L) and ground vibration at 10 mm/sec are lower than contemporary mining operations. For example, the Mt Arthur Mine approval sets overpressure at 133 dB(L) and ground vibration at 10 mm/s for heritage structures.

The Department considers that adoption of these criteria for the project is a conservative approach and well below levels described in relevant Australian Standards (AS:2187) for blasts to have potential to cause structural damage.

Given the concerns raised and the significant capital investment in the winery and horse studs to the south of the project, the Department has recommended conditions which provide an entitlement for a baseline dilapidation or structural surveys for and ongoing surveys for blast damage (on request) for any buildings and other structures on Coolmore and Woodlands studs and Hollydene Estate, and for other land within 3 km of any approved blasting operations.

The impacts of blasting on Aboriginal archaeological sites have not been directly assessed. However, the artefacts located were predominantly mobile stone objects with no grinding grooves or features within bedrock that have a higher potential for impact due to vibration or blast overpressure. Two significant stone quarries were also located within the project boundary. While the likelihood of impacts is low, the blast management plan would need to be revised and refined based on site data to consider potential impacts on Aboriginal sites as the mine progresses.

Safety

The Department notes that all private properties are over 500 m from the active blast areas, and therefore have a low risk of being affected by flyrock (i.e. rock projectiles). The Department has recommended conditions that blasting cannot occur within 500 m of public roads unless it is demonstrated that the safety of people or livestock or damage to infrastructure is not compromised, including a requirement to revise the Blast Management Plan and have in place a written agreement with the owner of the land or infrastructure before any blasting occurs.

6.3.4 Conclusion

The Department is satisfied that Anglo has implemented a range of reasonable and feasible mitigation measures to avoid or minimise the air, noise and blasting impacts from the project. In particular, with the implementation of best practice mitigation measures, dust impacts are expected to comply with relevant amenity criterion at all privately-owned residences and the Department considers that the risks from blast fumes at receivers can be effectively managed through appropriate blast design and implementation of risk management measures, including avoiding blasting during adverse meteorological conditions, as informed by the blast fume modelling.

While marginal to moderate noise impacts are predicted at receivers to the north, there is an overall reduction in noise impacts in this area once mining operations move to Drayton South. Currently there are 17 marginally to moderately affected receivers with mitigation rights under the existing approval which reduces to 4 affected receivers due to reduced operations at the Drayton mine and noise mitigation works undertaken at the CHPP. However, existing noise mitigation rights for all 17 receivers in the Antiene area have been retained in the recommended conditions.

In addition or complementary to the commitments by Anglo, the Department has also recommended a range of conditions to ensure that the mine operates in accordance with best practice to manage air quality, noise and blasting, including requirements for Anglo to:

- comply with contemporary air, noise and blasting criteria;
- acquire residence or properties if dust or noise emissions exceed the applicable acquisition criteria, if requested by a landowner;
- implement noise mitigation measures (such as double glazing, insulation and/or air conditioning) at the 17 existing residences with mitigation rights, if requested by the landowner;
- develop comprehensive management plans, including real-time noise and dust monitoring and active management systems to identify and manage potential exceedances as they occur;
- consult with relevant agencies and stakeholders, in particular in the case of blast management Coolmore and Woodland stud operations, in the preparation of the management plans;
- notify the affected landowners and tenants of the potential health-related dust impacts associated with mine dust;
- allow tenants of affected mine-owned residences to terminate tenancy agreements without penalty;
- limit blast frequency and hours and co-ordinate blasting operations with neighbouring mines;
- keep residences notified and up to date regarding blasting operations, and facilitate feedback and complaint management;
- provide for baseline property assessments within 3 km of any blasting activity and any structural property inspections and investigations on request;
- repair any structural damage to buildings or infrastructure caused by the project;
- manage blasting operations to avoid fly-rock and blast fume related safety risks;
- independently investigate complaints and undertake applicable corrective and other management measures; and
- communicate regularly with the community, including publicly reporting all monitoring results, and effectively responding to enquiries and complaints.

With the implementation of these measures the Department is satisfied that the project's air quality, noise and blasting impacts can be minimised to an acceptable standard.

6.4 BIODIVERSITY

The EIS included a specialist ecological impact assessment undertaken by Cumberland Ecology, based on a number of surveys and studies undertaken to support the original Drayton South EA and supplemented by a range of studies for the current project. The assessment considered the potential impacts of the proposed vegetation and habitat clearing, and proposed a range of measures to mitigate and offset the impacts of the modification on flora and fauna species and communities.

The project would directly and indirectly impact a number of threatened ecological communities, threatened flora and fauna species and habitat for these species. However, the extent of clearing of native vegetation, in particular on the critically endangered Box Gum Woodland⁴ has been reduced with significant avoidance of impacts compared to the original mine plan submitted in 2012.

As outlined in Section 4 above, the Drayton South proposal was determined to be a controlled action under the EPBC Act due to the potentially significant impacts on a number of matters of environmental significance (MNES) under section 18 and 18A of the EPBC Act for listed threatened species and communities. In addition, the biodiversity assessment is being assessed under the *NSW Biodiversity Offsets Policy for Major Projects 2014* (NSW Offsets Policy) using the *Framework for*

⁴ Listed as EEC under NSW Threatened Species Conservation Act 1995 (TSC Act) as 'White Box – Yellow Box – Blakely's Red Gum (Box Gum) Woodland' and listed as Critically Endangered Ecological Community (CEEC) under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) as 'White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland', together termed in this report as 'Box Gum Woodland'

Biodiversity Assessment (FBA), which are accredited under the Assessment Bilateral Agreement between NSW and the Commonwealth.

The NSW Offsets Policy is in a transitional period prior to formal legislative reform. The intention of the transitional period is to provide some flexibility in application of the FBA rules to deal with technical issues, practical implementation and unintended outcomes that may arise.

In this instance, it is important to note that the offsets provided for the earlier 2012 application met State and Commonwealth offsetting policies at that time with the offsets package accepted by the Department following advice from OEH and DoE. Since then, further impacts on biodiversity have been avoided.

Under these circumstances, the Department considers that, in accordance with the NSW Offsets Policy a more flexible approach to the full application of the FBA is warranted in considering the adequacy of the offsets package for this project, as discussed below.

6.4.1 Biodiversity Impacts

Vegetation Communities

The project would involve the disturbance of approximately 1,447 ha of native vegetation, including 9 ha of additional disturbance within the Drayton mine area. Table 8 provides further details of the vegetation proposed to be cleared with around 270 ha conforming to the definition of one or more listed ecological communities under the TSC Act and/or EPBC Acts. The vegetation communities within the Drayton South disturbance area are shown in Figure 17.

Table 8: Native Vegetation Communities

Vegetation Community	TSC Act status¹	EPBC Act status¹	Area (ha)
Listed Ecological Communities			
Central Hunter Box-Ironbark Woodland ²	EEC		151.9
Hunter Floodplain Red Gum Woodland ³			
- Woodland	EEC	CEEC	10.9
- Derived Native Grassland (DNG)			4.3
Narrabeen Foothills Slaty Box Woodland ² (Hunter Valley Foothills Slaty Gum Woodland in the Sydney Basin Bioregion)	VEC		97
Upper Hunter White Box-Ironbark Grassy Woodland			
- Woodland	EEC	CEEC	3.8
- Derived Native Grassland (DNG)			2.7
Hunter Lowland Red Gum Forest ⁴	EEC		0.4
Total Listed Ecological Communities			270
Other Forest and Woodland			
Central Hunter Bullock Forest			25.9
Hunter Valley River Oak Forest			2.2
Acacia Revegetation ⁴			1.2
Total Other Forest and Woodland			29.3
Grassland			
Derived Native Grasslands (non-listed) ⁴			1,148
Summary			
Total Native Vegetation			1,447

Notes:

- 1: Critically endangered ecological community (CEEC); endangered ecological community (EEC); vulnerable ecological community (VEC).
- 2: These two state listed vegetation communities are identified in section 1.6.1 of the approved conservation advice for the Central Hunter Valley eucalypt forest and woodland ecological community as corresponding vegetation types. However, the Commonwealth has advised that as this listing post-dates the determination of the development proposal as a controlled action under the EPBC Act, no further consideration is required under the EPBC Act.
- 3: The Hunter Floodplain Red Gum Woodland does not conform to a Box Gum Woodland EEC under the TSC Act but forms a separate EEC. However, for the purposes of the report, this community has been included in summary tables as a Box Gum Woodland CEEC as it conforms to this listing under the EPBC Act.
- 4: Regrowth (1.6 ha) and grasslands (7.4 ha) associated with the proposed additional mining areas at the Drayton mine.

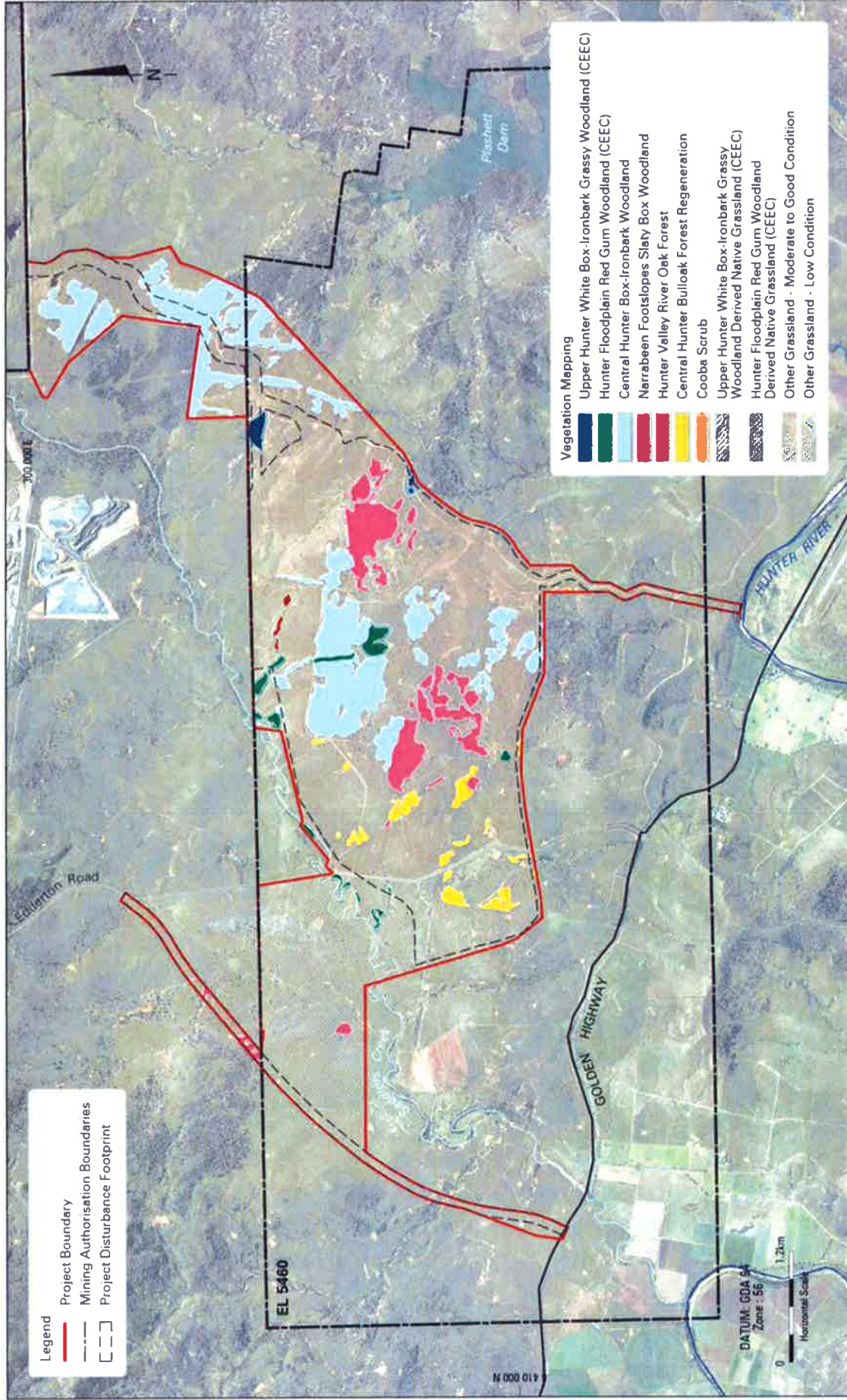


Figure 17: Vegetation Communities - Drayton South

In regards MNES, the project would impact around 22 ha of listed Box Gum Woodland made up of 15.2 ha of the Hunter Floodplain Red Gum Woodland and 6.5 ha of Upper Hunter White Box-Ironbark Woodland. As outlined above, the recently listed Central Hunter Valley Eucalyptus Forest and Woodland CEEC is not being considered as a controlled action as it was listed after the controlled action determination. Regardless, the two vegetation communities that make up this CEEC are State listed and have been assessed under the NSW Offsets Policy and FBA.

Threatened Flora

Three threatened plant species under the TSC Act have been recorded within the proposed disturbance area as summarised in Table 9. The biodiversity assessment also determined that there was low potential for a further 3 threatened flora species to occur within the disturbance boundary, including the leek-orchid and Slaty Red Gum, which were identified in the Commonwealth referral for further assessment. The Austral Toadflax was also identified as having a low likelihood of occurrence. The EPBC listed species, Rufous Pomaderris was considered unlikely to occur being outside the typical range of this species.

Table 9: Threatened Plant Species

Plant species	TSC Act Status ¹	EPBC Act Status ¹	Number
<i>Acacia pendula</i> (Weeping Myall) ²	EP (Hunter Catchment)	-	1 patch (15 individuals)
<i>Cymbidium canaliculatum</i> (Tiger Orchid)	EP (Hunter Catchment)	-	1 individual
<i>Diuris tricolor</i> (Pine Donkey Orchid)	V, EP (Muswellbrook LGA)	-	39 individuals

Notes: 1. EP- endangered population; V – Vulnerable

2. The Weeping Myall does not conform to the listing as an EEC under the EPBC Act.

Fauna Impacts

The modification has the potential to impact fauna species through the removal of habitat trees and resources associated with the grassland, woodland and forest communities identified in Table 8 above. A total of 21 threatened fauna species were recorded within the project area as summarised in Table 10 below. The EIS also noted that a further 12 species are likely to occur within the project area based on available habitat and regional site records, including surveys at the adjoining Mt Arthur Mine.

Table 10: Summary of Threatened Fauna Species recorded or likely to occur within the Project Area

Group	Species (Common Name) ¹	TSC Act ²	EPBC Act ²	Recorded
Birds 13 recorded, 10 likely to occur	Barking Owl, Blacked Chinned Honeyeater, Brown Treecreeper, Diamond Firetail, Grey Crowned Babbler, Hooded Robin, Little Eagle, Scarlet Robin, Speckled Warbler, Spotted Harrier	V	-	Yes
	Little Lorikeet, Turquoise Parrot, Flame Robin, Gang-gang Cockatoo, Glossy Black Cockatoo, Powerful Owl, Masked Owl, Varied Sitella	V	-	No
	Rainbow Bee-eater, White Throated Needletail	-	M, Ma	Yes
	Satin Flycatcher	-	M, Ma	No
	Swift Parrot	E	E, Ma	Yes
	Regent Honeyeater	CE	E	No
	Mammals 8 recorded 2 likely to occur	Eastern Cave Bat ³ , Eastern Freetail-Bat Eastern Bentwing Bat, Greater Broad-Nosed Bat, Southern Myotis³, Yellow-bellied Sheath-tail Bat	V	-
Greater Long Eared Bat, Large-eared Pied Bat		V	V	Yes
Spotted Tail Quoll		E	E	No
Squirrel Glider		V	-	No

Notes:

1. Bolded species assessed by Cumberland Ecology as having significant impact under State or Commonwealth significance assessment—refer below.

2. V = vulnerable; E = endangered; M = migratory; Ma = Marine; CE- critically endangered,

3. Inconclusive recording – however likely to be present

6.4.2 Avoidance and Mitigation

In assessing potential to avoid impacts on biodiversity, particularly EECs and habitat for threatened species, it is important to consider the changes to the mine plan since the 2012 EA. Table 11 below summarises the changes to the mine plan with respect to reduction in impacts on native vegetation.

Table 11: Avoidance of Impacts – Changes to Mine Plan 2012 to 2015

Feature (ha)	2012 EA Mine Plan	2014 Retracted Mine Plan	2015 EIS Mine Plan
Native Vegetation (Grasslands and Woodlands)	1,928	1,618	1,447
Box Gum Woodland EEC / CEEC ¹	166 /181	5 / 20	5 / 22
All EEC communities	460	295	270
Total Woodland/ Shrubland/ Forest	389	324	291

Note: EEC under the TSC Act and CEEC under the EPBC Act

When compared with the 2014 retracted mine plan, the 2015 mine plan avoids impacts on a further 171 ha of native vegetation, 32 ha of woodland and 25 ha of EEC. However, there is a minor increase (2 ha) in the clearing of Box Gum Woodland due to minor project boundary adjustments. The total area of woodland shrub-land or forest being cleared has been reduced by 25% compared to the original mine plan and 10% compared to the retracted mine plan. This reduces the impact on threatened fauna reliant on woodland habitat such as woodland birds, hollow dependent bats and mammals, while retaining surrounding woodland habitat around the disturbance footprint.

To further minimise impacts on fauna, Anglo proposes to implement a range of standard mitigation and management strategies to be incorporated into a Biodiversity Action Plan. These include for example: limiting clearing ahead of mining; pre-clearing and clearing protocols, salvage and reinstatement of habitat; biodiversity monitoring and implementation of trigger based adaptive management; seed collection, propagation and translocation trials; and management of weeds and feral fauna species. The Department has formalised these commitments in the draft conditions through the preparation and implementation of Biodiversity and Rehabilitation Management Plans.

The Department is satisfied that Anglo has avoided impacts on biodiversity and in particular Box Gum Woodland EEC/ CEEC as far as practicable, particularly given the location of the coal resource relative to the remnant native vegetation and known populations of threatened flora. Further, a range of best practice mitigation measures have been adopted. These avoidance and mitigation measures are consistent with Principle 1 of the NSW Biodiversity Offsets Policy:

“Principle 1: Before offsets are considered, impacts must first be avoided and unavoidable impacts minimised through mitigation measures. Only then should offsets be considered for the remaining impacts.”

The residual impacts proposed to be offset as discussed further below.

6.4.3 Significance of Impacts on Threatened Species

The Department notes that the Commonwealth referral decision in determining that the action is a controlled action was based on there being likely significant impacts on 4 threatened species, including Box Gum Woodland CEEC, Regent Honeyeater, Swift Parrot and the Spotted-tail Quoll, with further assessment of potential impacts required on a further 9 threatened flora and fauna species.

Cumberland Ecology assessed significance of impacts on State listed threatened species using the 7 part test and Commonwealth listed species using the methodology outlined in *Matters of National Environmental Significance Significant Impact Guidelines 1.1 (2013)*.

The EIS concluded that *without* appropriate mitigation, offsetting and/or supplementary compensation there would be a significant residual impact on 3 endangered ecological communities, 3 threatened flora species and 15 threatened fauna species. In particular, the clearing of 291 ha of mature woodland would impact the habitat availability for a range of woodland birds, hollow dependent bats and migratory species, including the Swift Parrot and Greater Long-eared Bat.

In regards MNES, the assessment determined that Box Gum Woodland CEEC (with the clearing of 22 ha) and 4 threatened fauna species Regent Honeyeater, Swift Parrot, Large-eared Pied Bat and the Greater Long-eared Bat (with the clearing of 291 ha of habitat) would be significantly impacted. However, the assessment concluded that there would be no significant impact on the Spotted-tail Quoll.

The Department requested further information justifying the significance assessment of the Spotted-tail Quoll and relevant conservation advice, threat abatement plans and recovery plans approved under the EPBC for these species. This additional information is provided in Appendix D. While considering the additional information provided on the Spotted-tail Quoll, the Department considers that a precautionary approach is warranted and following consultation with DoE, has accepted the Commonwealth determination that there is likely to be a significant impact on this species.

The Department has undertaken a preliminary assessment of relevant approved conservation advice, recovery plans and threat abatement plans (TAPs) for each of the six MNES likely to be significantly impacted. The Department's consideration of these matters would be finalised following completion of OEH's technical review and advice, including any recommended consent conditions, in accordance with Commonwealth requirements under the Assessment Bilateral. This would be provided in the Department's final assessment report. In the meantime, Appendix L provides further details on the Department's consideration of relevant TAPs and other statutory requirements for each of these MNES, with discussion on approved conservation advice and recovery plans provided below.

There is no approved conservation advice for Box Gum Woodland CEEC that requires consideration under the EPBC Act. However, Cumberland Ecology provided a review of the 2006 conservation/ listing advice including threat abatement actions and priority recovery actions. In particular, these include actions for protection of Box Gum Woodland through conservation agreements, management of weeds and other management measures such as exclusion of and strategic grazing, targeted restoration planting. The National Recovery Plan for Box Gum Woodland also identifies a range of objectives including achieving no net loss in extent and condition of Box Gum Woodland. While the project would clear 22 ha of the Box Gum Woodland EEC, substantive offsets are proposed (see Section 6.4.4 below) such that the action would not be inconsistent with the objectives of the Recovery Plan. Key relevant actions identified in the 2006 conservation advice would also be implemented as part of the Biodiversity Management Plan for the site and offset areas.

The Department has considered the approved conservation advice and National Recovery Plan under the EPBC Act in assessing the impacts of the project on the Regent Honeyeater and notes that the main threat and cause for decline in population is clearing, fragmentation and degradation of its habitat. The National Recovery Plan includes a number of objectives relevant to the project including maintaining and enhancing the value of Regent Honeyeater habitat and monitoring trends in Regent Honeyeater population size and dispersion. While the project would clear 291 ha of habitat for the Regent Honeyeater, substantive offsets to maintain and enhance Regent Honeyeater habitat in the medium to long term are proposed, such that the action would not be inconsistent with the objectives of the Recovery Plan. Key actions of the Recovery Plan including monitoring would also be implemented as part of the Biodiversity Management Plan for the site and offset areas.

While there is no approved conservation advice, National Recovery Plans have been approved for the Swift Parrot and Large-eared Pied Bat. Key objectives or actions for both species have been considered by Cumberland Ecology. The Department is satisfied that with the proposed avoidance and mitigation measures to be implemented as required under the Biodiversity Management Plan and the proposed biodiversity offset package, that the action would not be inconsistent with the objectives of these Recovery Plans. In particular, the proposed offsets, including the rehabilitation of the mine to biodiversity conservation objectives, would maintain and enhance habitat for both these species at the landscape scale in the medium to long term and include monitoring programs, to assess habitat condition.

There are no approved recovery plans or conservation advice for the Greater Long-eared Bat or the Spotted-tail Quoll. However, the Department has considered relevant TAPs as outlined in Appendix L.

6.4.4 Biodiversity Offsets

Existing Offsets

To inform consideration of the proposed offsets and rehabilitation areas under the current project, it is important to understand the interactions these areas have with the existing biodiversity offsets required under the current consent for the Drayton mine.

The existing offsets include establishment of the Drayton Wildlife Refuge (comprising 217 ha of actively managed biodiversity offset areas and 173 ha of passively managed 'natural zones') and the establishment of rehabilitated woodland corridors to link extant woodland communities and biodiversity offset areas surrounding the site.

The existing requirements would be consolidated into a single approval and are summarised in Table 12 below and depicted on Figure 18. It should also be noted that areas within these existing conservation areas/ offsets are proposed to be used to offset the impact on the Pine Donkey Orchid for the Drayton South area.

Table 12: Existing Biodiversity Conservation Commitments or Offsets

Conservation or Offset Area	Area (ha)	Description
Drayton Wildlife Refuge – active management area	117	Secured as a Wildlife Refuge under Section 68 of the NPW Act and located within the "Natural Zone". Commitments by Anglo to actively manage through restoration of Hunter Floodplain Red Gum Woodland, monitoring, fencing, weed and feral animal control.
Northern Offset	12	9.7 ha located with the "Natural Zone" Drayton Wildlife Refuge with an additional 2.3 ha outside the refuge. It is intended that this entire area be secured under a Conservation Agreement to replace the existing Wildlife Refuge Protection. There is currently no formal security over this additional area.
Southern Offset	88	Restoration of woodlands, including Hunter Lowland Red Gum Forest and Box Gum Woodland EEC, required on a rehabilitated area of mine site located in the 'Mining' Zone of the Wildlife Refuge. The existing approval requires further security of this offset area.
TOTAL AREA ACTIVELY MANAGED AS OFFSETS	217	
Drayton Wildlife Refuge - remaining "Natural Zone" area	173	Secured as a Wildlife Refuge under Section 68 of the NPW Act. Passive management strategy with no disturbance of woodland habitat with standard management practices such as weed and feral animal control but no active restoration of habitat. ¹
TOTAL AREA	390	

Note 1: The total area of the Drayton Wildlife Refuge "Natural Zone" was identified as 334 ha in the 2007 Drayton Mine Extension EA. 34 ha of this area is within a sub-lease area managed by Mt Arthur Mine with a further approximate 127 ha within the active management area.

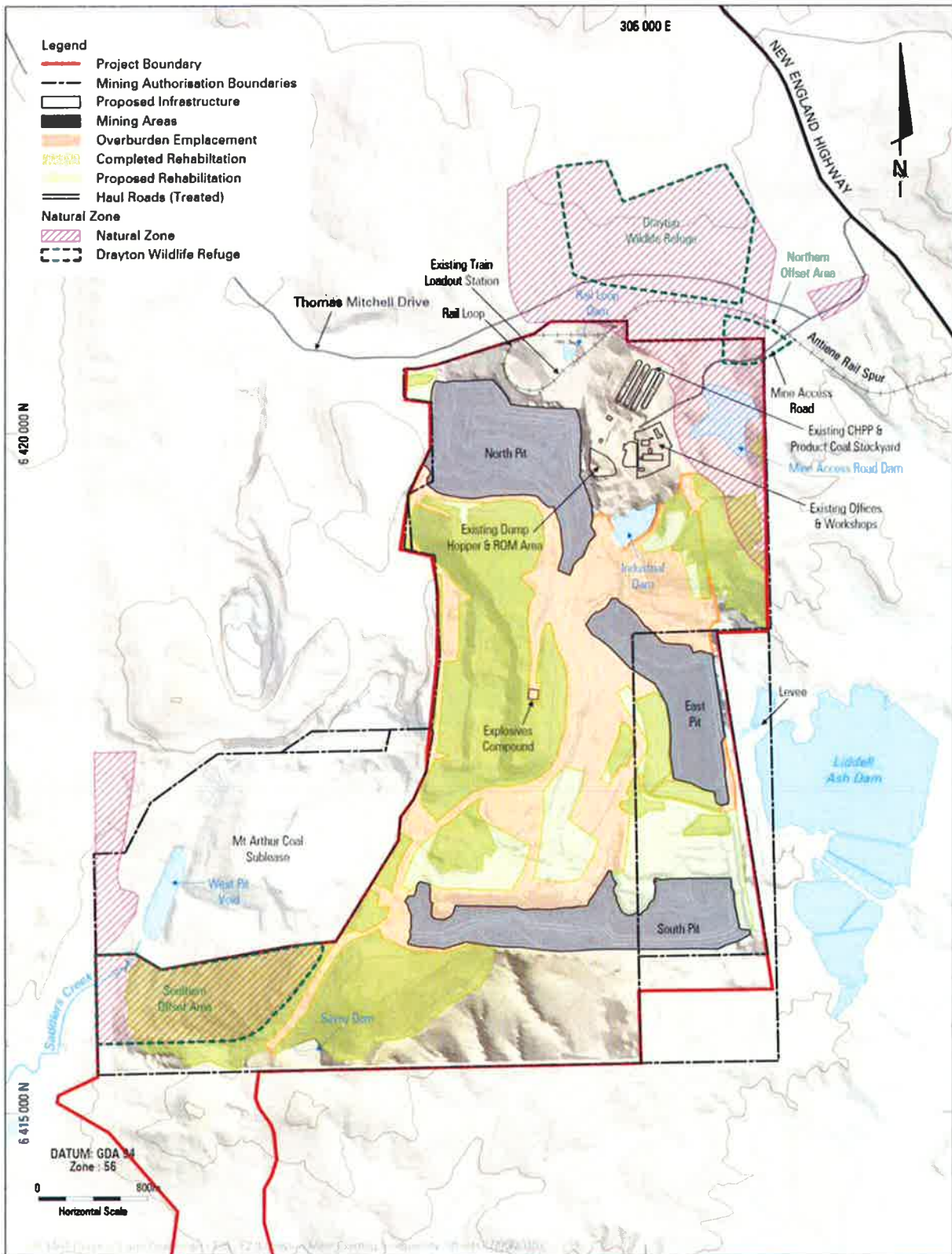


Figure 18: Existing Conservation/ Offset Areas for Drayton Mine

Biodiversity Offsets - Drayton South

In addition to the existing approved offset areas, Anglo proposes to offset the residual biodiversity impacts through:

- offset areas within and adjoining the project boundary;
- offset areas at an off-site offset area (Temi offset);
- rehabilitation of mining disturbance areas to woodland; and
- supplementary offset measures for individual threatened flora species.

Residual offset requirements have been assessed using the FBA as required under the NSW Offsets Policy, with Anglo providing additional information in its RTS in response to OEH's submission. Anglo subsequently provided additional information (refer Appendix D) with OEH's final advice on the RTS and application of the FBA provided in Appendix G.

Following review of the EIS, the Department requested that Anglo maximise the area of proposed on-site offsets, particularly to the south of the project boundary, within the excised Redbank pit area which contains Central Hunter Box-Ironbark Woodland EEC. As a result, an additional 27.2 ha of this woodland, 3.3 ha Central Hunter Bulloak Forest Regeneration and 39.2 ha native grassland has been incorporated into the on-site offset areas.

Further, Anglo has included restoration of native grassland associated with these on-site offset areas as part of the offset credit calculations under the FBA, with a commitment to undertake natural and assisted regeneration as necessary to restore woodland habitat in the medium to long term.

The final offset strategy, incorporating the additional on-site area, is summarised in Table 13 below and depicted in Figure 19 (on-site offset areas) and Figure 20 (off-site offset area).

Table 13: Summary of Biodiversity Offsets – Drayton South

Offset Component	Description
Direct offsets – onsite	<p>587 ha of native vegetation, including:</p> <p>a) <u>Saddlers Creek Restoration and Enhancement Area</u></p> <ul style="list-style-type: none"> • 252 ha of native vegetation including 20 ha Box Gum Woodland EEC/ CEEC and 62 ha DNG; and • improvement to Saddlers Creek riparian condition and function <p>b) <u>North East Conservation Area</u></p> <ul style="list-style-type: none"> • 92 ha of native vegetation including 59 ha Central Hunter Box-Ironbark Woodland EEC <p>c) <u>Ridgeline Conservation Area</u></p> <ul style="list-style-type: none"> • 243 ha of native vegetation including 77 ha Central Hunter Box-Ironbark Woodland EEC
Direct offsets – offsite (Temi)	<p>1,645 ha of native vegetation located in the Peel sub-region of the Nandewar Bio-region approximately 75 km from the project site, including:</p> <ul style="list-style-type: none"> • 519 ha Box Gum Woodland EEC/ CEEC • 773 ha Box Gum Woodland DNG
Mine Rehabilitation	<p>1,127 ha of rehabilitation including:</p> <ul style="list-style-type: none"> • 471 ha Central Hunter Box- Ironbark Woodland • 656 ha Narrabeen Foothills Slaty Box Woodland
TOTAL	
Without mine rehabilitation	2,232 ha of native vegetation, including 1,514 ha EEC
With mine rehabilitation	3,359 ha of native vegetation, including 2,641 ha EEC

In broad summary, the overall clearing of 1,447 ha of native vegetation (woodland and grassland) is proposed to be offset by conserving and improving the condition of 2,232 ha of native vegetation, with rehabilitation to woodland of a further 1,127 ha (an overall ratio of 2.3 to 1). When comparing the 291 ha of better condition habitat woodland/ shrub-land/ forest habitat for threatened fauna, this clearing is proposed to be offset with 1,069 ha of remnant woodland/ shrub-land/ forest (a ratio of 3.6 to 1).

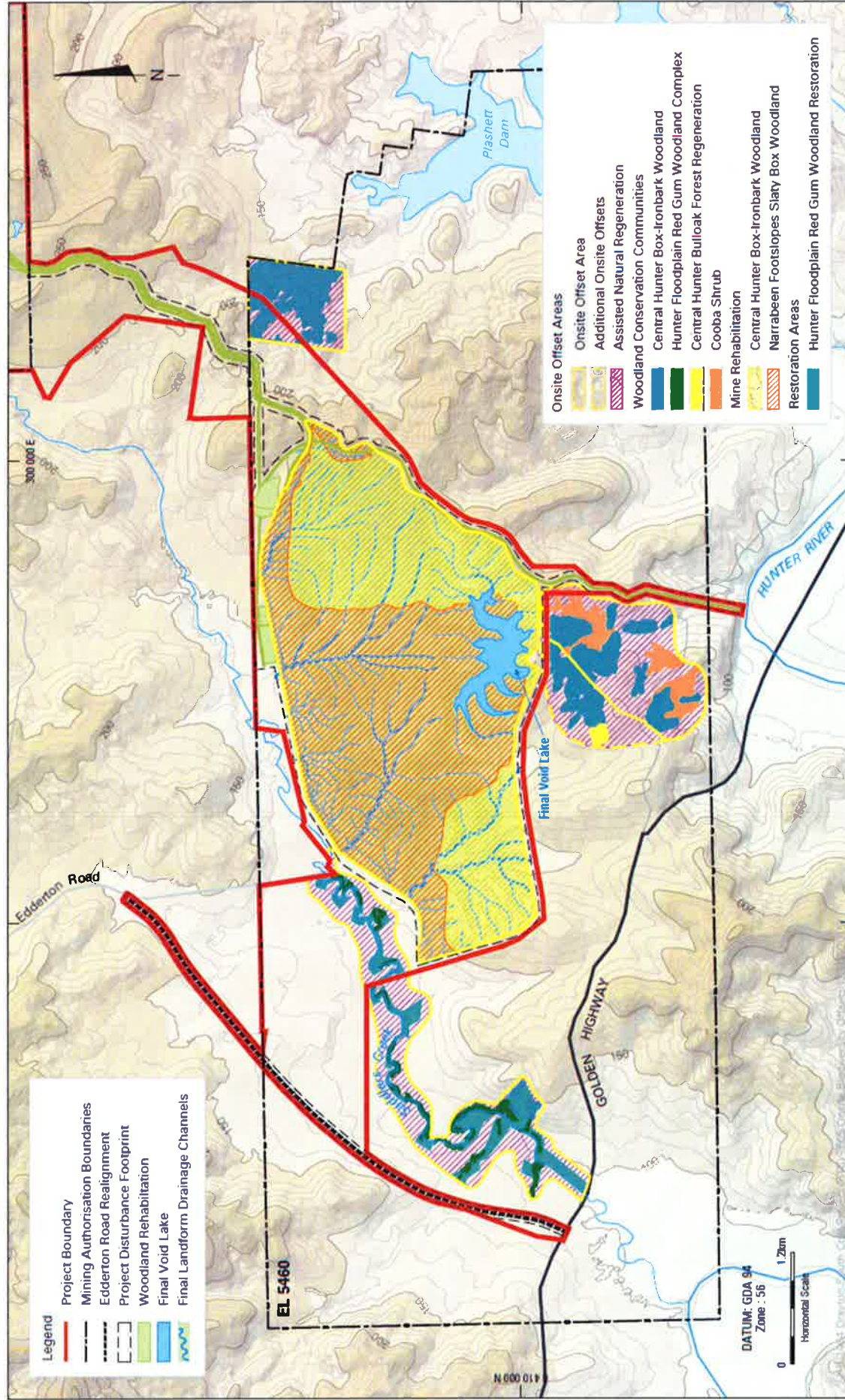


Figure 19: On-site Offset Areas

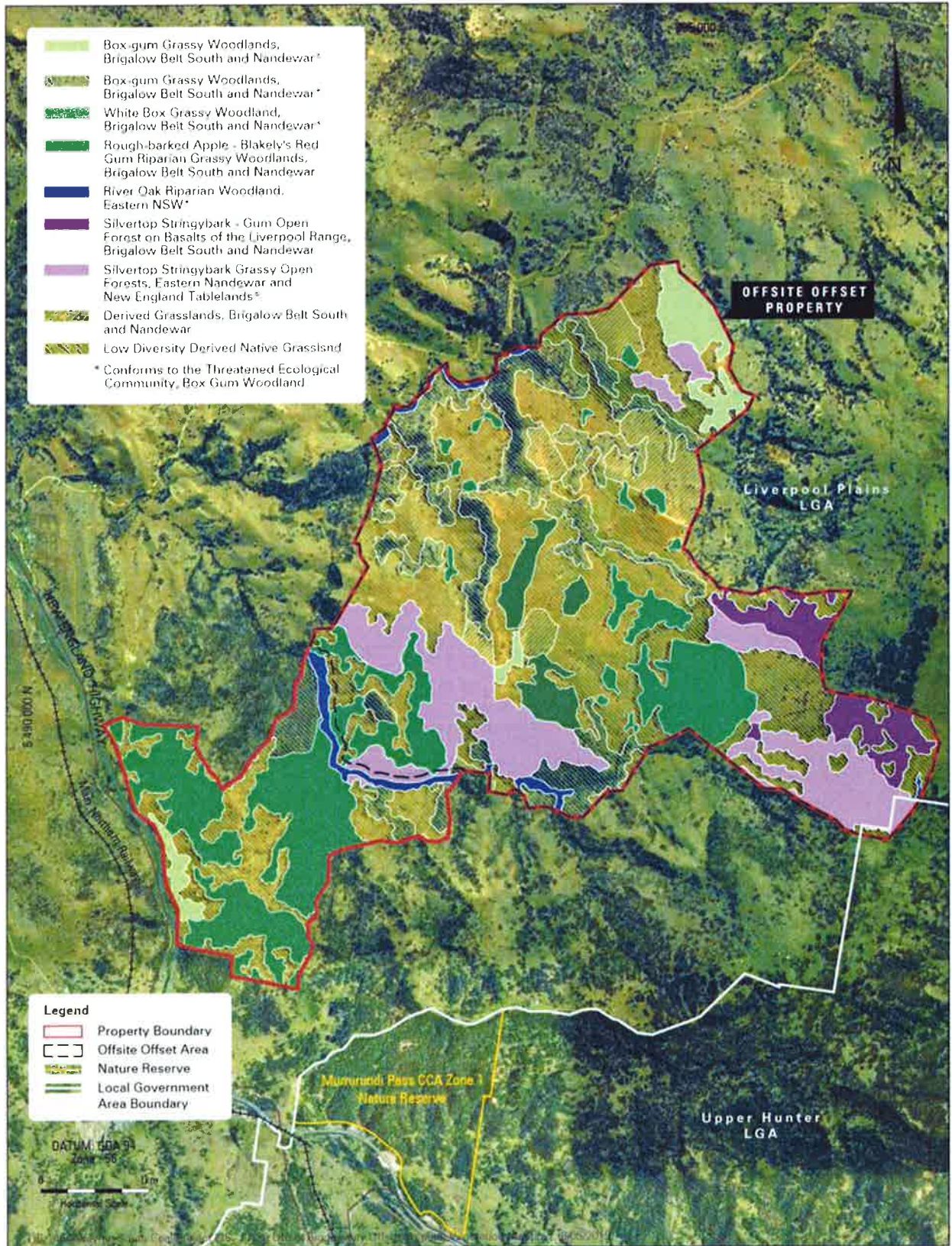


Figure 20: Temi Offset Area

Ecosystem Credits

Table 14 below identifies the impact 'ecosystem' credits⁵ and offset credits calculated by Cumberland Ecology using the FBA, with OEH's preliminary calculations in brackets.

Table 14: Ecosystem Credit Calculations

On-site vegetation community	Impact (Credits)	On-site Offset (Credits)	Offsite Offset (Credits Used)	Mine Rehab Area (ha) (Credits Used)	Credits Required CE (OEH)₁
Upper Hunter White Box-Ironbark Grassy Woodland	254	-	254	-	0 (254)
Upper Hunter White Box-Ironbark Grassy Woodland DNG	69	-	69	-	0 (69)
Hunter Floodplain Red Gum Woodland	602	315	287	-	0
Hunter Floodplain Red Gum Woodland DNG	103	103	-	-	0
Central Hunter Box Ironbark Woodland	7,961	6,071	479	1,411	0 (3,342)
Narrabeen Foot-slopes Slaty Box Woodland	5,323	-	-	2,513	2,810 (2,051)
Central Hunter Bulloak Forest Regeneration	950	41	909	-	0 (909)
Hunter Valley River Oak Forest	71	-	71	-	0
TOTAL	15,333	6,530	2,069	3,924	TOTAL applied 12,523 (8,708)
Additional Unallocated Credits		622	15,932	-	TOTAL unallocated 16,554
TOTAL CREDITS - OFFSETS		7,152	18,001	3,924	TOTAL available 29,077

Note 1: CE – Cumberland Ecology and OEH application of FBA credit matching rules.

The combined credits available from all offsets (including rehabilitation) is 29,077 credits of which 12,523 credits have been allocated for offsets with substantive excess offset credits from the Temi offset area. This is a result of the Temi offset property being acquired to target Box Gum Woodland communities for the original 2012 application, which at that stage included the clearing of 181 ha of Box Gum Woodland, now reduced to 22 ha for the current project.

As summarised in Table 14, OEH in its assessment determined that only 8,708 (rather than 12,523) of the available credits could be used in strict application of the FBA rules, due to differences in vegetation formation and comparison of percentage cleared across the Plant Community Types (PCTs). However, OEH also acknowledged the transitional period in applying the FBA and identified options for matching the outstanding ecosystem credits within the Temi offsite offset area, which could be used to meet residual credit requirements.

The Department notes that under Commonwealth offsetting rules (based on the application of the EPBC offsets policy and calculator), the Temi offset area would also be acceptable.

In particular, the proposed offsets exceed the minimum 90% of direct offset against impacts required under the policy for Box Gum Woodland with 605% provided for woodland and 1,038% for derived native grassland. For MNES threatened fauna species (Swift Parrot, Regent Honeyeater, Large-eared Pied Bat, Greater Long Eared Bat and the Spotted-tail Quoll) the offsets provided ranged from 124% to 143% of the requirement under the policy. The Department notes that the application of the

⁵ Ecosystem credits for Plant Community Types (PCT) under the FBA assume the presence of a range of threatened flora and fauna species. Individual species credits are not required where the PCT is a surrogate for these species.

Commonwealth calculator is still under review, with preliminary advice from DoE indicating that these percentages may be lower depending on assumptions used, although they would still comfortably meet the minimum requirements for offsetting.

The Department notes that it is not necessary to strictly apply the FBA to the project during the transitional period of implementation of the NSW Offsets Policy, and that both the Department and OEH were satisfied with the previous offset package that was based on a land-based approach.

At this stage, the Department considers that it is appropriate to adopt a similar approach to the previous application. Accordingly, the conditions recommended by the Department specifically nominate the land that must be secured for biodiversity offsets, rather than incorporating the FBA credits in the conditions. This approach provides greater certainty for both Anglo and regulators about how the impacts of the project on vegetation communities would be compensated for.

Threatened Species Credits

As described above, the project would directly impact 3 threatened flora species. Anglo has proposed a combination of direct and indirect or supplementary offsets for these flora species as summarised in Table 15 below, which also identifies species credits determined using the FBA.

Table 15: Offsets for Threatened Flora Species

<i>Plant species</i>	<i>Species Credits Required / Provided</i>	<i>Offset Type</i>	<i>Offset Strategy</i>
<i>Acacia pendula</i> (Weeping Myall)	1,155/ 71	Direct & Supplementary	<ul style="list-style-type: none"> One patch containing two conserved individuals to be incorporated into the Saddlers Creek restoration area. Propagation trials from individuals located within the disturbance area.
<i>Cymbidium canaliculatum</i> (Tiger Orchid)	10/ -	Supplementary	<ul style="list-style-type: none"> Translocation of the individual recorded plant to a suitable location within the on-site offsets. Potential for propagation trials following consultation with Glencore (which has undertaken successful propagation of the species) and appropriate experts.
<i>Diuris tricolor</i> (Pine Donkey Orchid)	507/ not determined ¹	Direct & Supplementary	<ul style="list-style-type: none"> Increased protection and management of known sub-population of Pine Donkey orchids located within the existing Drayton Wildlife Refuge. Protect and enhance habitat for the species within the Saddlers Creek restoration area. Seed and tissue propagation trials of the impacted population. Translocation trials of impacted population to the Drayton Wildlife Refuge. Investigate options for increasing the security of the Drayton Wildlife Refuge (e.g. via conservation agreement under the NPW Act).

Other supplementary species offset measures provided:

- Protection of the Tiger Orchid (*Cymbidium canaliculatum*) located in the Temi offset area.
- Protection of one individual threatened species *Eucalyptus camaldulensis* (River Red Gum) located with the Saddlers Creek restoration area (7 species credits under the FBA)
- Protection of at least 5 individuals of *Tylophora linearis* listed as vulnerable under the TSC Act and Endangered under the EPBC Act, located within the Temi offset area (36 species credits under the FBA)
- Protection of 37 ha of foraging habitat for the Large-eared Pied Bat (*Chalinolobus dwyeri*) detected on the Temi offset area (262 species credits under the FBA)

Note 1: It is proposed to undertake targeted surveys in September/ October 2015 to determine the extent of the population and the species credits that would be generated.

In regards threatened flora species, OEH has recommended that Anglo:

- offset the impacts of these 3 species in accordance with the FBA within 12 months of any consent being granted;
- assess the current population of Pine Donkey orchid within the Drayton Wildlife Refuge in accordance with the FBA, and secure the area using an appropriate conservation mechanism;
- provide for alternative offsets or supplementary measures, pending the success of translocation trials.

The Department has recommended conditions as part of the Biodiversity Management Plan for the implementation of measures for the propagation and/or translocation of these 3 threatened species and ensure that the offset and rehabilitation strategies focus on re-establishment of habitat for these species.

The Department has also recommended a condition as a requirement within the Biodiversity Management Plan to provide a contingency for alternative direct or supplementary offsets for threatened flora where the proposed propagation and/or translocation programs do not meet performance and completion criteria.

6.4.5 Conclusion

The Department acknowledges that the project would result in the clearing of a large area of native vegetation, including 291 ha of woodland/ forest or shrub-land communities, mainly comprising endangered ecological communities and habitat for threatened fauna species. Furthermore, there are direct impacts on 3 threatened flora species.

However, the Department is satisfied that the project has been designed to avoid, mitigate, manage and/or offset the residual impacts of the project in accordance with the NSW Offsets Policy, so that biodiversity values would be enhanced or maintained over the medium to long term.

To ensure this occurs, the Department has recommended conditions requiring Anglo to:

- implement the proposed biodiversity offset strategy and rehabilitation strategy, focusing on the re-establishment of EECs and habitat for threatened flora and fauna;
- secure the offsets in perpetuity, including strengthening the security of areas contained within the existing Drayton Wildlife Refuge;
- prepare and implement a comprehensive Biodiversity Management Plan and Rehabilitation Management Plan for the site and offset areas;
- prepare and implement a propagation and / or translocation procedures for the 3 threatened flora species directly impacted by the project;
- implement measures to manage and minimise risks identified in relevant threat abatement plans for threatened species; and
- lodge a substantial conservation and biodiversity bond to ensure that the offset areas are established and maintained to the satisfaction of the Secretary.

6.5 WATER RESOURCES

The Drayton Complex is located within the Hunter River catchment and is traversed by a number of creeks and headwater tributaries, including:

- four unnamed gullies at Drayton mine, which drain north to the Ramrod Creek catchment and subsequently the Hunter River;
- Bayswater Creek, which drains east from Drayton mine to Lake Liddell and Headwater Dam;
- Saltwater Creek, which drains southeast from the Drayton South area into Plashett Dam and subsequently the Hunter River;
- Saddlers Creek which drains southwest through the Drayton Complex to the Hunter River; and
- several unnamed first, second and third order creeks within the Saddlers Creek catchment.

The existing Drayton mine and historical open cut mining at the Mt Arthur mine has substantially altered significant portions of the original catchment and headwaters of these creeks, resulting in modified overland drainage patterns, recharge zones and volumes of surface water leaving the Drayton mine site. However, the surface water environment at Drayton South is less disturbed and

can be broadly defined by the dominant northeast to southwest trending ridgeline that separates the Saddlers Creek and Saltwater Creek catchments.

There are three key aquifer systems in the area surrounding the Drayton South project, including the:

- Permian hard rock aquifer associated with the Wittingham Coal Measures;
- alluvial aquifers associated with the Hunter River and Saddlers Creek; and
- aquifers of the weathered bedrock (regolith).

The Hunter River alluvial aquifer is a key groundwater resource within the Hunter Valley and comprises a mixture of relatively porous silts, clays and sands, overlaying a porous basal layer of sandy gravels. This alluvium has significant storage capacities and varies in extent along the length of the Hunter River, ranging between 11 m and 18 m thick and between 500 m and 1.5 km wide in the areas closest to the proposed Drayton South disturbance area.

The Saddlers Creek alluvial aquifer comprises a thin layer of clay-dominated silts, interspersed with sandy lenses which range in size up to a few metres thick. The groundwater assessment notes that the dominance of finer sediments and low permeability clays within this aquifer, combination with the limited storage capacity and low connectivity of the thin sandy lenses, means that this alluvial aquifer has significantly less storage capacity and permeability than the nearby Hunter River alluvium.

The project has the potential to affect these water resources through:

- the minor extensions at the Drayton mine;
- the development of the new open cut mining areas at the Drayton South site;
- ongoing tailings and reject disposal at the existing Drayton mine voids; and
- design of the final integrated landform across the existing and proposed mining areas.

The EIS included a number of specialist technical assessments of the incremental and cumulative effects of the project on water resources throughout the Drayton Complex, including:

- a surface water assessment prepared by WRM Water & Environment Pty Ltd (WRM);
- a groundwater assessment prepared by Australasian Groundwater and Environmental Consultants Pty Ltd (AGE), including a peer review by Dr Noel Merrick; and
- a stygofauna assessment prepared by Eco Logical Australia Pty Ltd.

Some submitters were critical of the surface water and groundwater modelling and considered that the modelling was inadequate. However, the Department notes that:

- a groundwater peer review was commissioned by Anglo which was undertaken by Dr Noel Merrick, a highly experienced and credentialed groundwater expert;
- DPI Water advised that the model was fit for purpose in accordance with the National Water Commission's *Australian Groundwater Modelling Guidelines 2012* and has raised no concerns over the adequacy of the modelling; and
- the IESC noted that the revised groundwater modelling for the project included transient calibration, as previously recommended, increasing model complexity and confidence in predictions and aligns with best modelling practice guidelines.

Consequently, the Department considers the modelling adequate for the purposes of the assessment.

Impacts on water resources have also been identified as a controlling provision under the EPBC Act. Accordingly, a joint referral by the Department and DoE to the IESC was made. Advice from the IESC on the project has been provided (see Appendix K). The IESC identified a number of areas where it considered that the assessment would benefit from additional information and made a number of recommendations, including enhancements to proposed monitoring programs. Anglo has provided a detailed response to the matters raised by the IESC (see Appendix K). The Department has considered the IESC's advice and Anglo's response in the assessment below.

6.5.1 Water Management

A comprehensive water balance over the Drayton Complex was undertaken for the project to assess water management over a range of wet and dry weather scenarios. This assessment identified the key risks in managing both excess water on-site and make-up water demand from off-site sources during dry periods.

Additional water management infrastructure would be constructed progressively at the Drayton South mining area, including a turkey's nest transfer dam that would store and transfer water from the mining pits, sediment dams and additional raw water supply if needed from the Hunter River. The existing 'South void' located at the Drayton mine is proposed to be used as the main storage for excess water. Concerns were raised in submissions that the use of the South void through the life of the mine was subject to ongoing commercial arrangements between Anglo and AGL Macquarie with current arrangements allowing use of this void until 2023. Ongoing use of the void would be subject to new commercial arrangements after that time.

If the South void was not available for water storage from 2023, this would increase the risk of in-pit water inundation that may then impact mining operations. Anglo in the RTS advised that in the eventuality that this storage was unavailable from 2023, it would utilise capacity in the East (North) void, North void or the Blakefield void (prior to rehabilitation). The Department notes that this issue is also linked to tailings and reject management and final rehabilitation landform options as the East (North) void and North void are also proposed to be used for tailings and/or reject disposal. This is discussed further below in Section 6.7.

The Department is satisfied that there is sufficient flexibility in the proposed water management system to manage excess water on site without discharge of mine water to the Hunter River if AGL Macquarie were to utilise the South void. However, this may also mean short term water storage within operating pits that may affect production. Nevertheless, the Department has recommended a condition that there be no discharge of mine water from the site.

The water balance modelling also showed that the operational water demands, mainly for make-up water in the CHPP and for dust suppression, could largely be met from catchment runoff and groundwater captured in the mine voids. In only very dry years the model predicted that off-site water may be required to be pumped from the Hunter River or alternative sources. If this were to eventuate, Anglo has retained the option for construction of a water pipeline and pump station from the Hunter River to the Transfer Dam.

Submitters raised concerns over the potential take of water from the Hunter River for use on site. The Department is satisfied that Anglo has demonstrated that with on-site water capture, there is a low risk for additional raw water make-up demand. Anglo has committed to holding required Water Access Licences (WAL) for any additional water take and already holds a number of general security. In addition, Anglo has committed to implementing water efficiency measures, options for sourcing water from other operations and acquiring additional WAL units as needed.

The Department has recommended conditions requiring Anglo to adjust the scale of operations on site to match its available water supply. In addition, Anglo would be required to hold all necessary water licences for the project.

6.5.2 Surface Water

Submitters were concerned over the potential loss of surface water to downstream riparian ecosystems and water users, including for agricultural purposes. In particular, access to low salinity clean water for irrigation and watering horses is clearly an important aspect of the stud operations, as well as for viticulture enterprises along the Hunter River.

The Department notes that the minor extensions at the existing Drayton mine represent a 3% increase in the approved disturbance footprint. Given the limited changes to the mining footprint and the requirement to progressively rehabilitate the site, the Department is satisfied that proposed extensions would not materially increase the surface water or groundwater captured by the existing operations at the Drayton mine and can be effectively managed through the proposed water management changes outlined in the EIS.

For Drayton South, the mine plan effectively confines all surface water impacts to the Saddlers Creek catchment, which is an ephemeral creek that only flows after rain. Consequently, any material impacts on surface water flows in the Hunter River would only occur as a result of changes to flows in Saddlers Creek.

During operations, the project would remove up to 520 ha (5%) of the Saddlers Creek catchment, which would reduce flows by the same proportion. As there would be a smaller final void retained in the mining area, the post-mining reduction in flows would be in the order of 3% in the Saddlers Creek catchment. The current mine design substantially reduces these surface water losses when compared to the 2012 mine plan and 2014 retracted mine plan. Based on the surface water modelling completed for the project, this catchment loss equates to a maximum surface water take of 114 ML/year during operations.

On a regional scale, the project is predicted to reduce total water catchments feeding into the broader Hunter River catchment upstream of Jerrys Plains by less than 0.1% during mining. This would reduce significantly as the mine is rehabilitated and returned to the catchment.

A key change in the overall management of surface water is that the project would not require controlled discharge of mine water to the Hunter River through the Hunter River Salinity Trading Scheme (HRSTS), as was previously required for the 2012 application. This is largely due to less groundwater seepage into the mining areas as a result of a smaller mine footprint and shallower mining depths.

To mitigate the long term impacts associated with the removal of this catchment area, the surface water assessment identifies that the final landform would be designed to re-establish three of the four major gullies that would be removed by the project. The Department is satisfied that the establishment of these gullies as part of a free-draining final landform would help to mitigate the long term impacts of the project on this surface water catchment, but notes that the creation of these gullies would alter the characteristics and flow dynamics of the original tributaries and their interactions with Saddlers Creek. Accordingly, the Department has recommended conditions requiring Anglo to design these re-established gullies in consultation with DPI Water and in consideration of potential impacts these gullies may have on the flow regimes of Saddlers Creek.

With respect to cumulative impacts, the Department notes that while the project would increase the area of cumulative disturbance within the Saddlers Creek catchment, the maximum impacts associated with each source of disturbance are unlikely to coincide. In this regard, the Department notes that under the recent modification approval for the Mt Arthur mine, HVEC has committed to fill its previously approved Saddlers pit void and the former Drayton West pit void, situated within the Mt Arthur sublease area. Following rehabilitation of these areas, surface water runoff from these former voids would be progressively returned to the broader Saddlers Creek catchment.

Accordingly, the Department is satisfied that the project would not have a significant impact on the Hunter River catchment. Notwithstanding, DPI Water and the Department believe that Anglo should be required to comprehensively monitor stream flows, and provide compensatory water supplies to any downstream surface water user that experiences loss of surface water flows as a result of the project.

The EPA also raised concerns over potential impacts of discharges from sediment dams from the site, particularly any discharges that may have high turbidity due to fine/ colloidal clay particles. The EPA advised that, based on the information provided, it would not be in a position to licence discharges from sediment dams but would require Anglo to ensure it did not pollute waters and manage sediment dams in accordance with the document *'Managing Urban Stormwater Soils and Construction Volume 2E – Mines and Quarries.'* The Department has recommended conditions requiring Anglo to comply with EPA's recommendations.

The IESC also raised concerns over potential water quality impacts from uncontrolled spills from sediment dams on Saddlers Creek. The Department is satisfied that discharges from sediment dams can be effectively managed in accordance with EPA requirements under an EPL and an approved Water Management Plan. Monitoring would be undertaken to demonstrate that there is no cross-contamination of mine water with dirty water runoff from disturbed areas to sediment dams or that potential seepage of other pollutants, such as salts, from waste emplacements is not compromising the water quality in these sediment dams.

6.5.3 Groundwater

The project has the potential to impact groundwater resources, including groundwater dependent ecosystems (GDE) during the mine life and post closure through:

- reduction in baseflow to Saddlers Creek and the Hunter River;
- net loss of groundwater flow into Saddlers Creek and Hunter River alluvium;
- groundwater drawdown or depressurisation, with potential loss of water supply to groundwater users; and
- changes in water quality, for example through salt migration/ seepage.

Stream Base Flow and Alluvium – Saddlers Creek

The groundwater modelling predicted that there would be a peak flow reduction of 134 ML/year from the Saddlers Creek alluvium around 30 years after mining. This is a result of both a reduction in inflow from the Permian coal measures (103 ML/year) and induced flow from the alluvium into the coal measures (31 ML/year). This would recover in the very long term to a net 5 ML/ year loss from the Saddlers Creek alluvium. During mining the predicted maximum take of water ranges from 39-94 ML/year. There is also peak reduction in baseflow of 130 ML/year in Saddlers Creek around 50 years after mining. This would recover in the very long term to a 5 ML/year loss of baseflow.

The peak groundwater take of 134 ML/year can be compared to the total licensed water entitlement of 10,278 ML/year within the Jerrys Management Zone of the Water Sharing Plan of the Hunter Unregulated and Alluvial Water Sources. The required entitlement ranges from 0.38% to 1% of the total share component. Currently, Anglo does not hold access shares to account for this water take and would be required to ensure that appropriate WALs are held for all stages of the development, including for predicted post mining peak take of water.

Stream Base Flow and Alluvium – Hunter River

The groundwater modelling predicted that there would be a peak flow reduction of 8 ML/year from the Hunter River alluvium around 245 years after mining due to a reduction in inflow from the Permian coal measures. This would recover in the very long term to a net 2 ML/ year loss from the Hunter River alluvium. During mining there is no take of water from the Hunter River alluvium. The Hunter River alluvium water source in this area is also within the Jerry Management Zone and the additional peak 8 ML/year post mining would also need to be accounted, with a total peak of 142 ML/year required post mining to be acquired from this water source.

There is also peak reduction in base flow of 10 ML/year in the Hunter River around 50 years after mining. This would recover in the very long term to a 3 ML/year loss of base flow. This is negligible when compared to the average yearly river flow (85,775 ML) and the total licensed water entitlement of 75,035 units (general security) available in the Water Sharing Plan for the Hunter Regulated River Water Source. Anglo currently holds 198 ML of general security WALs under this Water Sharing Plan.

The Department notes that concerns were raised in submissions on the potential impact from the take of water as a result of the project on agricultural activities, including horse stud operations and viticulture.

Overall, the Department is satisfied that there would be negligible impact from the project due to the take of water from these water sources on other users. There is considerable depth in the licensed water market compared to the predicted take of water.

Further, the assessment against the minimal impact considerations of the AIP demonstrated that the project would meet the level 1 minimal impact requirements. In its submission, DPI Water advised that this impact is considered acceptable.

Drayton South Final Void

The final landform at Drayton South would include one final void within the proposed Whynot mining area. The Blakefield open cut pit area would be backfilled and shaped to drain water to the Saddlers Creek catchment. The Whynot final void is predicted to develop a pit lake in the long term

(approximately 245 years after mining) with the level stabilising 17 m below the pit void spill point. This means there would be no direct discharge of final void water to surrounding rehabilitated watercourses.

However, both the backfilled Blakefield and the Whynot final void would act in some capacity post mining as through-flow systems, with spoil water from the pit shell migrating into surrounding aquifers. The groundwater assessment looked at potential salt migration from the spoil in the pit shells into the surrounding Saddlers Creek and Hunter River alluvium.

The assessment concluded that for the Saddlers Creek alluvium, the migration of water from the Blakefield spoil would not lower the existing beneficial use of this groundwater water source. In particular, the Saddlers Creek alluvium has existing high total dissolved solid (TDS) concentrations with an average concentration of 6,000 mg/L, compared to the predicted long term concentration of spoil water from the Blakefield mining area of 2,182 mg/L.

In the case of the Hunter River alluvium and the Hunter River, the potential salt migration from the Whynot void is predicted to not lower the beneficial use category for the alluvium with an increase of salt load/ TDS to the Hunter River in the very long term (>500 years) of 0.04% - that is significantly lower than the <1% minimal impact consideration under the AIP.

The Department and DPI Water are satisfied that the minimal impact requirements of the AIP have been met and that there is negligible risk due to impacts on water quality to water users taking water from Hunter alluvium or Hunter River as a result of the project.

The IESC in its advice to the Department considered additional information was required including:

- travel times, volume of seepage and salt loads migrating to the Hunter River and Saddlers Creek;
- assessment of impacts of shallow seepage on GDEs within the seepage flow path; and
- impacts of salt, metals and polycyclic aromatic hydrocarbons on the alluvium, Saddlers Creek and GDEs.

The Department is generally satisfied with Anglo's response, and considers that the predictions in the EIS remain valid.

Groundwater Drawdown

The groundwater assessment included a prediction of groundwater drawdown in the alluvium and Permian rock aquifers during the mine life and post mining. Figure 22 below shows the groundwater draw down in the alluvium/ regolith and Permian rock aquifers at the end of mining.

The 1 m drawdown of the alluvial aquifer does not extend into the Hunter alluvium or affect non-project related bores and meets the Level 1 AIP minimal impact considerations. However, an approximate 4 km reach of the Saddlers Creek alluvium would have drawdown of between 1 to 2 m. While no high priority GDEs are listed in the relevant WSP, an assessment of potential impacts on GDEs was undertaken by Cumberland Ecology, with additional assessment of stygofauna by Eco Logical Australia.

The GDE assessment determined that two vegetation communities along Saddlers Creek, the Hunter Floodplain Red Gum Woodland EEC and Hunter Valley River Oak Forest were likely to have a partial or opportunistic dependency on groundwater, with reliance principally on soil water and surface water flows. The Department also notes that the offset strategy includes restoration of these GDE terrestrial communities within the Saddlers Creek Restoration Area, part of which is within the 1 to 2 m predicted drawdown zone of the alluvium.

The IESC in its advice to the Department considered that the reduction in base flow is highly likely to adversely affect GDE vegetation and in providing refuge pools for aquatic fauna during dry periods. The IESC considered that the degree of groundwater dependency and the impacts of cumulative groundwater drawdown on the Saddlers Creek riparian vegetation have not been adequately assessed, particularly the role of groundwater in maintaining base flow during dry periods.

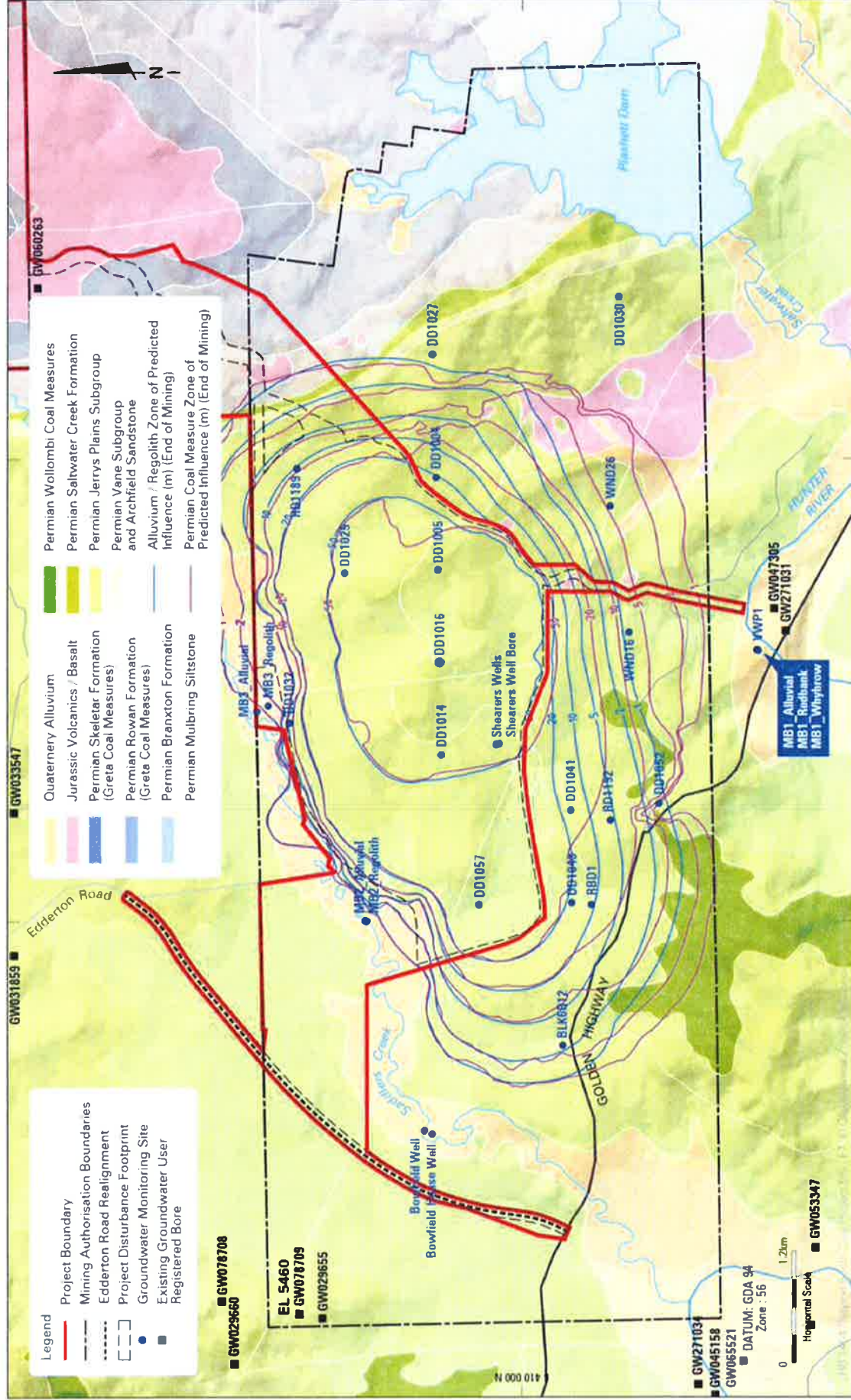


Figure 22: Groundwater Drawdown

The IESC considered that the assessment could be better informed with additional baseline data on the magnitude and variability of surface flows (including contribution of base flow) to assess likely impacts on in-stream fauna and the riparian Hunter Floodplain Red Gum CEEC woodland.

Anglo has responded by pointing out that the contribution of base flow to surface flows is very small (i.e. only 4%), and hence any reduction in base flows would be very unlikely to have any material impact on GDEs along Saddlers Creek. Further, Anglo note that the riparian and aquatic ecology along the creek is relatively degraded and that the proposed Saddlers Creek restoration program, including exclusion of livestock, restoration and weed and feral animal control, would provide a net improvement to the Saddlers Creek riparian zone and surrounding area.

Nonetheless, the Department considers the development of an ongoing monitoring program and trigger levels (for the both preventative and remedial action) to be an appropriate mechanism to manage the potential impacts of the project on these GDEs, and has included this as a recommended condition of consent.

Cumulative Impacts

Cumulative groundwater impacts were considered in the assessment based on modelling undertaken by AGE in 2009. Most importantly, this assessment considered the impacts associated with the Mt Arthur North and Saddlers Creek open cut pits and approved underground workings at the neighbouring Mt Arthur mine, which are predicted to result in groundwater drawdown from a similar area of the Saddlers Creek alluvium and regolith as the Drayton South project.

AGE identified that depressurisation of the Permian bedrock aquifer associated with the existing Mt Arthur mine is predicted to reduce leakage into the Saddlers Creek alluvium by 69 ML/year and reduce the pre-mining leakage from 103 ML/year to 34 ML/year following the cessation of mining. When considered alongside the 76 ML/year reduction under the project, the cumulative reduction leakage would temporarily reverse the hydrological gradient between the Permian bedrock and Saddlers Creek alluvium, and reduce the base flow from the alluvium to Saddlers Creek from about 245 ML/year pre-mining to around 115 ML/year around 75 years. This reduction in base flows to the alluvium would be expected to return to pre-project levels after about 150 years and would continue to recovery towards pre-mining levels and stabilise at a net long term reduction of 5 ML/year.

The IESC in its advice to the Department concluded that there was insufficient information in the EIS to inform a sound assessment of potential cumulative impacts. In particular, that the cumulative assessment should be informed by the development of a sub-regional groundwater model, incorporating all mines and major water users in the vicinity. The IESC was concerned that the cumulative impacts were assessed by adding results from modelling undertaken separately for the two mines, limiting confidence in estimates of these impacts.

Anglo has stated that its assessment included cumulative impacts by incorporating actual monitoring data from nearby mines in its groundwater model. Anglo argues this is a more robust approach than preparing a sub-regional model based on simplified representations and assumptions about mines in the region.

Both the Department and DPI Water are satisfied with Anglo's groundwater model, and note that it would not be reasonable for Anglo to be required to prepare a sub-regional model for a specific project.

Nonetheless, the Department has recommended that Anglo be required to validate its model every 3 years by comparing it against monitoring results as the mine progresses. Anglo would then be required to take action to respond to any exceedances of groundwater assessment criteria, in accordance with its Water Management Plan.

Finally, the Department notes that the Commonwealth is currently undertaking a Bioregional Assessment program which would deliver a regional groundwater model for the Hunter sub-region.

6.5.4 Tailings and Reject Management – Drayton Mine

At the end of mining at the existing Drayton mine three voids would remain – North, East (separated into the East-North and East-South compartments) and the South void. It is proposed to use capacity in the North and East voids to minimise final void area and volume with emplacement of tailings and rejects from the CHPP.

As described above, the option of using the East-South void is subject to commercial arrangements with AGL Macquarie who may wish to use this void for future disposal of ash, with AGL having the option of taking this void back in 2023. To provide flexibility pending finalising these commercial arrangements, Anglo investigated three options in the EIS for disposal and management of tailings and rejects. DRE in its submission raised concerns that the three options did not satisfactorily identify options for maximising the elimination of final voids across the Drayton Complex. In the RTS, Anglo provided a fourth (preferred) option which would eliminate the North void and have a free draining landform. This preferred option assumes that the East (South) void is taken back by AGL Macquarie in 2023.

A key concern under all scenarios is the potential for leachate generated from the disposed tailings and reject to migrate to surrounding aquifers / streams. The 2012 EA identified a risk for potential migration of leachate from the rehabilitated North void toward Ramrod Creek to the northwest as the rehabilitated void would not act as a groundwater sink. The current project groundwater assessment concludes that a shallow hydraulic gradient towards the East void may result in leachate from the North void migrating towards this groundwater sink and that therefore leachate migration towards Ramrod creek is not likely to occur. However, AGE recommended that groundwater monitoring be undertaken to confirm this.

The IESC in its advice to the Department considered that additional information be provided on potential seepage from the proposed tailings emplacement in the existing Drayton mine North void towards Ramrod Creek. The IESC recommended that groundwater quality and levels be monitored near tailings and reject emplacement areas to determine if leachate migration occurs. In its response, Anglo has agreed to install a number of additional groundwater monitoring bores in accordance with the IESC's recommendation.

The Department also notes that under scenario 4, the North void would be used for reject emplacement only, with tailing emplacement confined to the East (North) void with both emplacement areas to be capped with inert materials. The Department is therefore satisfied that, regardless of the commercial arrangements with AGL Macquarie, there is sufficient flexibility to avoid emplacement of tailings in the North void, reducing risks associated with potential leachate migration generated from tailings towards Ramrod Creek. The Department has recommended a condition that restricts emplacement of tailings in the North void.

While the Department is satisfied that there is sufficient capacity for the rejects and tailings generated by the project, it believes that Anglo should be required to prepare a detailed Tailings Management Strategy as part of the Rehabilitation Management Plan for the mine, including detailed leachate management measures including the proposed groundwater monitoring program.

6.5.5 Flooding

While a comprehensive flood assessment was completed for the project, OEH raised concerns that the assessment did not consider potential flood impacts from the Edderton Road re-alignment. In the RTS, Anglo committed to undertaking consultation on the design of the proposed realignment with relevant regulators and ensure there would be no flood impacts from these works on private property. In addition, the Department notes that the road realignment does not cross the main channel of Saddlers Creek, being located further to the west.

Muswellbrook Shire Council is the appropriate roads authority for the realignment. The Department has recommended conditions that Edderton Road be realigned to the satisfaction of the relevant road authority. The design and construction would need to consider relevant standards for flood flows and impacts on private properties. The Department has also recommended that the Water Management Plan include details on the design and construction of the Edderton Road re-alignment.

6.5.6 Conclusion

Following its assessment, the Department is satisfied that the project could be managed to avoid significant impacts on water resources. Furthermore, the Department notes that DPI Water has identified that it is satisfied that Anglo could apply to obtain any additional licences required to account for the predicted maximum water take from all relevant water sources. It has also advised that the project would meet the Level 1 impact assessment criteria under the AIP and is unlikely to result a distinguishable change to the water quality within Saddlers Creek and Hunter River alluvium aquifers.

However, in recognition of the importance of ensuring appropriate protection of water resources, particularly for downstream users and the environment, the Department has recommended a broad suite of conditions that require Anglo to:

- ensure that sufficient water licences are held to account for the maximum take from relevant water sources for all stages of the project, and if necessary adjust the scale of the operations to match available water supply;
- provide compensatory water supply to any private landowner where the water supply has been directly impacted by the project;
- only discharge water from the site in accordance with an EPA Environment Protection Licence;
- comply with a range of best practice water management performance measures;
- prepare and implement a comprehensive Water Management Plan that includes appropriate controls and measures to monitor, mitigate and manage any water quality impacts and ensure compliance with the water management performance measures;
- prepare a Tailings Management Strategy, including contingency measures for managing any leachate migration from open cut pits; and
- avoid emplacing tailings in the North pit.

6.6 HERITAGE

The EIS includes cultural heritage impact assessments (CHIA) for Aboriginal and historic heritage prepared by AECOM Australia Pty Ltd. These assessments were based on desktop research, assessment of relevant Aboriginal and historic heritage inventories and field studies.

OEH advised that the Aboriginal cultural heritage assessment had been conducted in line with relevant consultation and assessment requirements and noted Anglo's commitment to update the existing CHMP for the Drayton mine.

6.6.1 Aboriginal Heritage

AECOM undertook an extensive consultation program in accordance with the OEH's *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation 2005*, the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* with 25 individuals or groups expressing an interest in the project as Registered Aboriginal Parties (RAPs). The Department also notes that consultation with the Aboriginal community is a key requirement when considering impacts on MNES under the EPBC Act.

While no Heritage Places are identified as a controlling provision for the Drayton South project, resources in the landscape, such as biodiversity features, traditionally used by Aboriginal persons would be impacted by the project. In this regard, consultation with the RAPs identified regional landscape/ landmarks – such as Mt Arthur and Saddlers Creek as having cultural significance. The CHIA identifies Mount Arthur as a regional significant topographic feature and Saddlers Creek as a significant focal point of past Aboriginal activity including a source of aquatic resources.

In addition, all Aboriginal objects contained within the landscape were identified as a significant link to Aboriginal heritage and past occupation within the project area. There were a range of views from RAPs that there should be no further destruction of Aboriginal sites due to the cultural significance to requests for involvement in subsequent surface collection, salvage and artefact conservation programs.

The CHIA identified 194 sites within the study area, including consolidated groupings of sites previously registered with OEH on the Aboriginal Heritage Information Management System site database where these sites were closer than 100 m to each other. A summary of the sites that would be fully or partially impacted is provided in Table 16 with the locations shown in Figure 23. In addition to these sites there are a further 62 sites, in close proximity to the study area identified in the CHIA.

Table 16: Aboriginal Sites

Site Type	Sites Impacted	Sites conserved	Total
Artefact Scatter	107	29	136
Artefact Scatter and PAD ¹	0	1	1
Stone Quarry	2 ²	-	2
Isolated Find	47	8	55
Total	156	38	194
High Significance	3	-	3
Moderate Significance	13	3	16

Notes:

1: Potential Archaeological Deposit

2. One quarry site 37-2-1955 identified in 2000 surveys could not be relocated during the 2011 survey

A total of 4,519 artefacts were identified during surface investigations including artefacts from existing sites. The largest site complex (DS-C8), a consolidation of 10 existing registered sites, contained 981 artefacts and was assessed as having high scientific significance due to the large number of artefacts, presence of rare artefacts and high likelihood of sub-surface archaeological deposits.

The quarry sites were also considered high scientific significance as they are rare in the region and have high research value. A further 16 sites were identified as having moderate scientific significance based on sites containing potential archaeological deposits, rare artefacts such as axe heads and hammer-stones, or where more than 100 artefacts were recorded.

The project would directly impact all or parts of 156 sites/ complexes including three highly significant sites – site complex DS-C8 and the two smaller quarry sites, noting again that one of the sites has not been relocated. A further 13 moderately significant sites would also be impacted. However, it is noted impact on 19 sites would be avoided when comparing the current mine plan to the retracted mine plan in the previous project application.

Furthermore, some identified artefact sites, including a highly significant quarry site (DS-QR1-11 – located outside the study area) along Saddlers Creek are within on-site biodiversity offset areas which would be conserved and protected in-perpetuity, further strengthening the protection of Aboriginal heritage in these areas. However, any active restoration works in these areas, along with the off-site offset area, would need to include management measures to avoid impacts on residual Aboriginal cultural heritage. The Department has included a requirement that requires Anglo considers this when preparing the Biodiversity Management Plan for the project.

The Department notes that Anglo has identified that sub-surface testing and salvage excavations would be undertaken at three locations, the highly significant site complex DS-C8 and quarry sites SC-QS-2 and SC-QS-1.

The Department acknowledges that the project would disturb a large number of sites, including at least 3 sites of high significance. However, the Department is satisfied that, given the location of the open cut coal reserves, there is limited opportunity to avoid these sites.

Overall, both the Department and OEH are satisfied with the measures proposed by Anglo to salvage, protect, and build on the existing cultural knowledge of the Aboriginal heritage sites identified on the site.

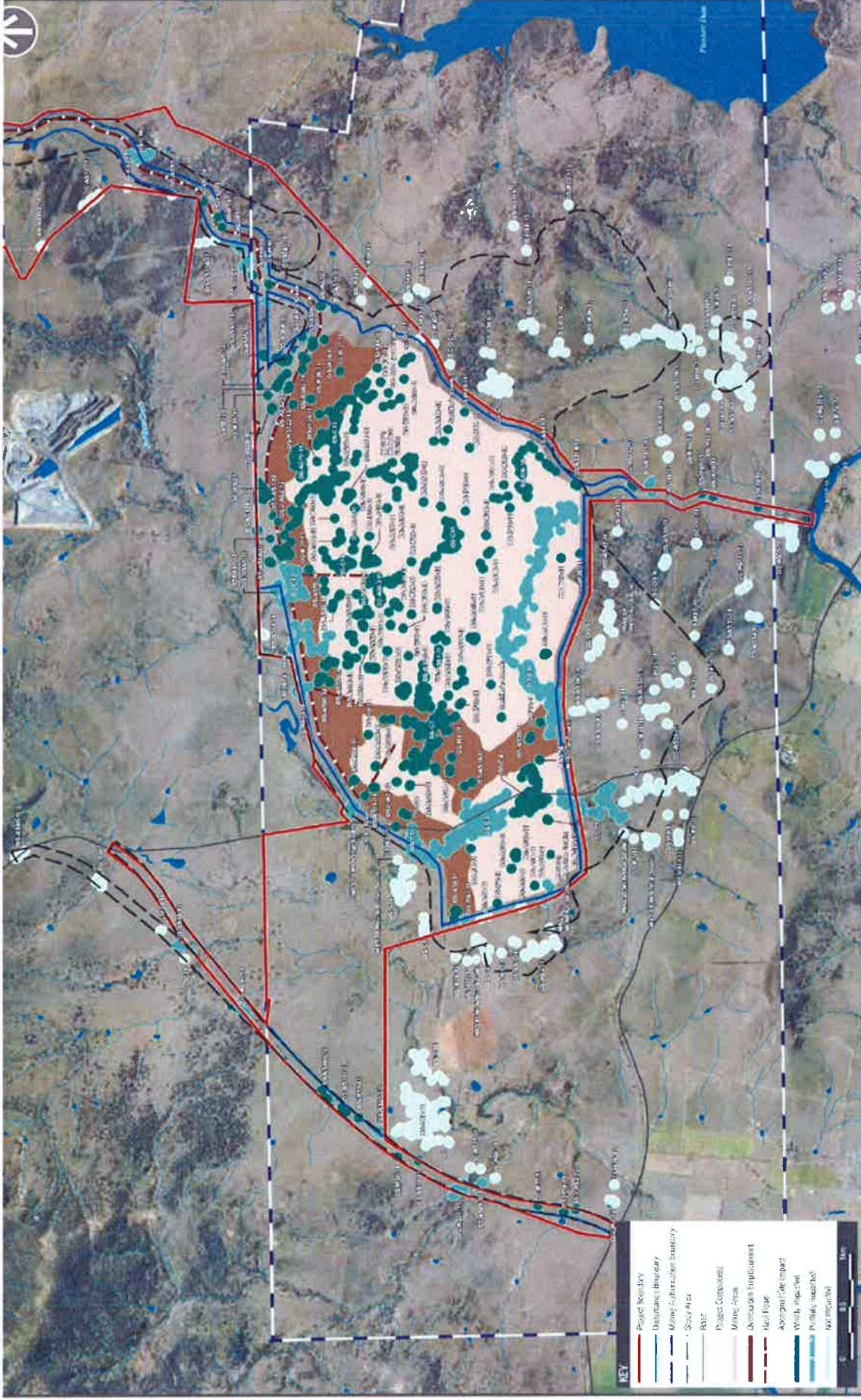


Figure 23: Location of Impacted Aboriginal Sites

To ensure that Aboriginal heritage sites and cultural values are appropriately managed across the mine complex consistent with the EIS and the existing Drayton mine approval, the Department has recommended conditions that require Anglo to prepare an updated and comprehensive Aboriginal Cultural Heritage Management Plan for the mine complex. The plan would require:

- ongoing consultation with RAPs and OEH;
- a description of measures to be implemented for:
 - management of sites not impacted by the project;
 - surface collection and salvage of sites prior to disturbance;
 - test and salvage excavation, including high significance sites and representative sites to inform archaeological research;
 - reasonable access to heritage sites, including offset areas, for the Aboriginal community;
 - managing the discovery of human remains or new sites;
 - adequate training and induction of personnel; and
 - the storage, management and conservation of salvaged artefacts.

6.6.2 Historic Heritage

Two aspects of historic heritage were assessed by AECOM for the project, heritage structures and heritage landscapes.

Heritage Structures

The field surveys identified 10 heritage items within the project boundary or surrounding area that had potential for direct or indirect impacts as summarised in Table 17 below.

Table 17: Historic Heritage Sites

<i>Heritage Item</i>	<i>Heritage Significance</i>	<i>Potential Impact Type</i>	<i>Proposed Management</i>
Fence ¹	Local	Direct	Archival recording and scaled drawings
Nissan Hut with Stockyard ¹	Local	Direct	Archival recording and scaled drawings
Stockyard ¹	Local	Nil	Nil
Plashett Homestead ¹	State ³	Indirect - Blasting	Dilapidation surveys, blast structural damage criteria
Edderton Homestead ²	Local ³	Indirect - Visual, Blasting	Dilapidation surveys, blast structural damage criteria
Bowfield Homestead ¹	Local	Indirect - Visual, Blasting	Dilapidation surveys blast structural damage criteria
Strowan Homestead	National ³	Indirect - Blasting	Dilapidation surveys, blast structural damage criteria
Arrowfield Cottage	Local ³	Indirect - Blasting	Dilapidation surveys, blast structural damage criteria
Woodlands Homestead	State ³	Nil	Dilapidation surveys, blast structural damage criteria
Randwick Homestead	Not determined	Nil	Dilapidation surveys, blast structural damage criteria

Notes:

1: On property owned by Anglo.

2: On property owned by HVEC – Mt Arthur mine.

3: These cottages/ homesteads are also listed as heritage items in the Muswellbrook or Singleton Local Environment Plans (LEPs) with Woodlands Homestead also listed on the Hunter Regional Environmental Plan (REP). Strowan homestead is also listed on the now defunct archival Register of the National Estate (RNE) – but is not formally listed on the current statutory national registers that replaced the RNE.

Two non-statutorily listed heritage items, the fence and Nissan hut with stockyard, occur within the footprint of the project disturbance area and would be destroyed as the project progresses. These items are of local historical significance as they show the progress of rural development and land uses in the area. The NSW Heritage Council has previously recommended that photographic archival recordings of the heritage items and scaled drawings of the Nissan hut be completed in accordance with the relevant standards which have been committed to be undertaken by Anglo.

The remaining eight heritage items occur outside the project disturbance footprint, with three of these located on Anglo properties. There is, however, potential for indirect impacts from blasting and on visual amenity.

As discussed in Section 6.9 below, with the proposed mine plan there are no direct visual impact predicted from viewpoints from the heritage cottages/ homesteads located to the south of the Drayton South mining operations. However, significant visual impacts would occur for an extensive period from viewing locations at Bowfield and Edderton Homesteads, noting that these are owned by Anglo and HVEC respectively. These impacts would be reduced over time with the rehabilitation of the disturbance area such that only low visual impacts would be experienced in the later years of the mine life.

There is potential for indirect impacts on the structural integrity of heritage items due to ground vibration and over-pressure from blasting. As outlined in Section 6.3 above, the blast impact assessment undertaken by Bridges Acoustics predicted that the suggested blast structural criteria for the 7 heritage cottages/ homesteads would be met under all blast MIC ranges proposed to be used by Anglo. For the 4 non-project related homesteads, a lower blast amenity criteria (5 mm/s ground vibration) was adopted providing a conservative basis for assessing potential impacts on these heritage structures.

However, Bridges Acoustic also recommended that a structural assessment be undertaken of the privately owned heritage homesteads potentially impacted by the project with current condition recorded and blast and overpressure limits reviewed and updated as necessary in the Blast Management Plan. Furthermore, AECOM recommended, that pre-blasting dilapidation survey of heritage items be undertaken followed by ongoing inspections on a risk-based frequency to monitor condition over time. Anglo has committed to undertaking dilapidation surveys at all 7 historic cottages/ homesteads identified in the EIS. The Department notes that this would be subject to landowner access arrangements being negotiated.

The Department is satisfied that blasting related to the project can be suitably managed to avoid impacts on the heritage items potentially indirectly impacted and has recommended conditions to this effect. The CHIA recommends that a Historic Heritage Management Plan for the Drayton Complex be developed and implemented prior to project commencement. This plan would assist in the development of a specific statement of significance for each heritage item and allow for the proactive management and mitigation of any adverse effects of the project on these items and any additional items discovered as the project progresses.

To ensure historic heritage sites within and surrounding the project area are appropriately managed, the Department has recommended that Anglo prepare and implement a comprehensive Historic Heritage Management Plan for the project. The plan would require:

- consultation with the Heritage Branch of OEH, Muswellbrook Shire Council, local historical organisations and relevant landowners;
- a description of measures to be implemented for:
 - ensuring personnel receive suitable inductions in regards Historic heritage;
 - photographic and archival recording of the two directly impacted heritage items using relevant Heritage Branch guidelines;
 - ongoing monitoring and assessment of the structural integrity of heritage items throughout the project life, including pre-blast and ongoing risk-based dilapidation surveys at the 7 identified heritage cottages/ homesteads; and
 - where relevant implementation of mitigation and remediation actions to ensure the Project does not adversely impact these items.

Heritage Landscapes

The heritage assessment included an assessment of the Drayton South cultural landscape focusing on direct and visual impacts from the development, with specific consideration of:

- the *Muswellbrook-Jerrys Plains Landscape Conservation Area (MJPLCA)* – listed with the non-statutory National Trust of Australia; and
- Drayton South Cultural Landscape – incorporating the Thoroughbred Cultural Landscape associated with the Coolmore and Woodlands studs to the south of the project.

The MJPLCA focuses on protecting the scenic values of the flat alluvial flood plain associated with the Hunter and Goulburn Rivers, and incorporates the edge of the Wollemi National Park to the south and the slopes on the northern side of Jerrys Plains (see Figure 24).

The listing on the register recommends that:

"The high scenic and cultural values of the listed areas should be protected through appropriate Environment Protection zonings under a Local Environmental Plan. Open cut mining of the alluvial river flats should not be permitted. Should it be necessary for open cut mining of the non-alluvial lands, the aesthetic and social values of the classified area should be recognised in the mining operation and rehabilitation programme."

The Department notes that the majority of the project is located outside the listed area, and would not be visible from the majority of locations within the listed area, with the mine area only within approximately 0.5% of this area. In addition, the listing specifically refers to the Jerrys Plains ridge with the mine plan behind this ridgeline. The mine plan as compared to the retracted mine plan from the previous application has further reduced the project disturbance directly within the MJPLCA, with the full removal of the Redbank mining area to the south.

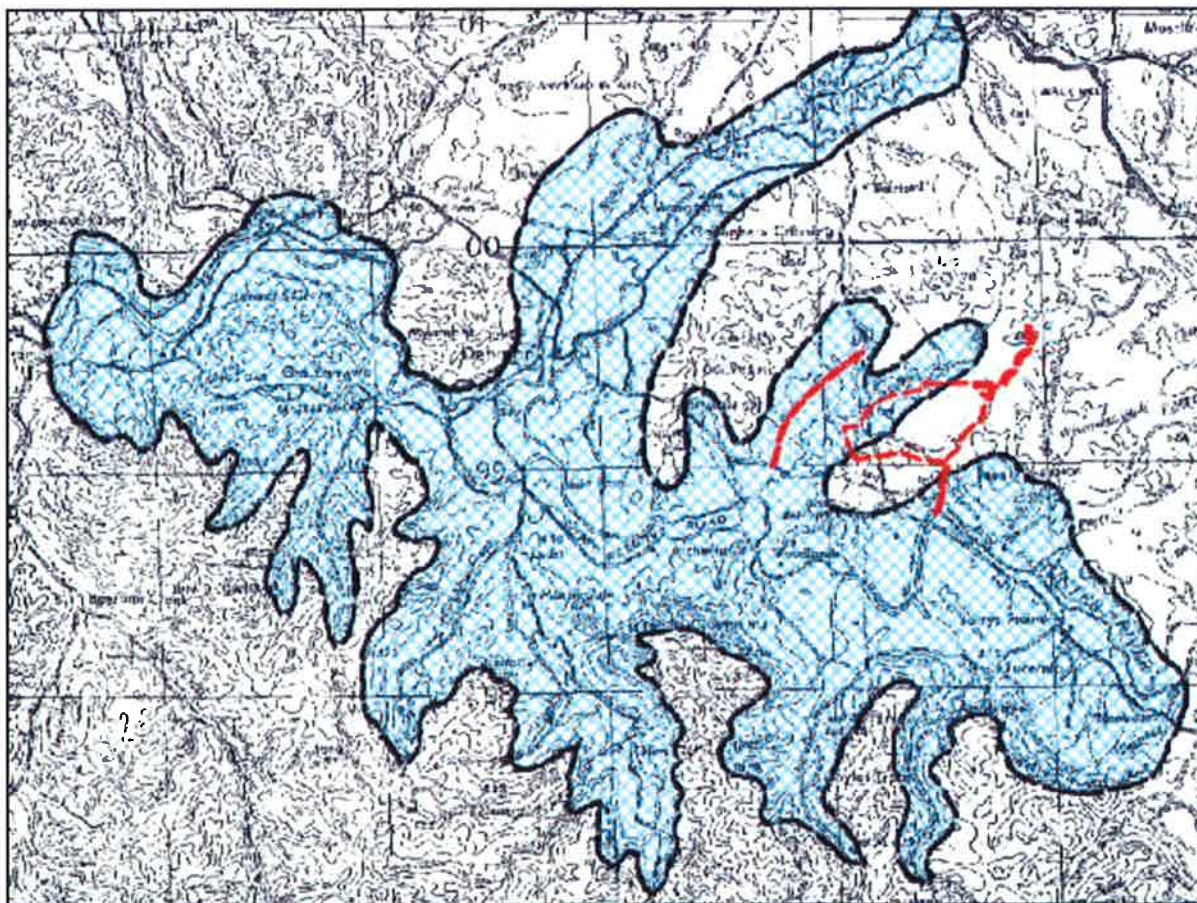


Figure 24: Boundary of Landscape Conservation Area & Project Disturbance Boundary (Red)

Nonetheless, the Department acknowledges that mining would be visible from higher parts of the listed area, and from sections of the Golden Highway and Edderton Road, particularly when travelling from the west. However, Anglo has committed to and would be required to progressively rehabilitate the site, ensure out of pit emplacements areas are developed and shaped to remain shielded behind ridgelines and provide tree screening (already commenced) from vantage points along the Golden Highway and re-aligned Edderton Road.

The Department notes that there is no formal protection for the areas covered by the National Trust conservation area. The listing focuses on the protection of the alluvial flats, and contemplates mining in non-alluvial areas provided appropriate measures are put in place to protect the scenic values of the area in the long term.

It is also important to note that the listing covers a very large area, and there are a variety of land uses that currently co-exist within the conservation area and surrounds, particularly to the immediate west of Muswellbrook where mining, viticulture, and horse breeding activities occur in close proximity to the conservation area.

Overall, the Department considers that this issue is linked to ensuring an appropriate level of protection for the scenic and landscape values associated with the studs. As discussed in detail above, the Department is satisfied that the nature and extent of impacts on these values are acceptable. Accordingly, the Department does not believe that the project is incompatible with maintaining the landscape values for which the conservation area was listed, either in the short or longer term.

In regards mitigation and management of impacts on heritage landscapes, the Department has recommended conditions to:

- progressively rehabilitate the site to woodland;
- establish and maintain a significant vegetation buffer north of the Golden Highway prior to commencing mining operations; and
- implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the project, including compliance with relevant Australian Standards for controlling the obtrusive effects of outdoor lighting.

6.6.3 Conclusion

The Department is satisfied that Anglo has identified and incorporated reasonable and feasible avoidance and mitigation measures to minimise impacts of the project on Aboriginal and historic heritage values. Furthermore, with the preparation and implementation of the proposed Aboriginal and Historic Heritage Management Plans, the Department is satisfied that any indirect impacts from the project on heritage items, including landscape values, can be monitored and remediation measures applied where necessary.

6.7 FINAL LANDFORM AND REHABILITATION

6.7.1 Drayton North

To facilitate the transition of mining operations to Drayton South and the continued operation of the Drayton CHPP, Anglo is proposing a number of changes to the post-mining landform at the existing Drayton mine. In response to several issues raised in DRE's submission, Anglo's RTS provided a further optimised final landform at Drayton mine. This 'Scenario 4' mine plan would:

- reduce the number of final voids at the existing Drayton mine by utilising the additional coarse rejects and select overburden material generated by the project to completely backfill the North pit void and rehabilitate this area to integrate with the surrounding land surfaces;
- minimise the size and extent of the East (North) pit void as far as practicable, by preferentially emplacing tailings within this void following the completion of mining in this area;
- continue to provide flexible tailings emplacement options, without relying on the continued use of the East (South) pit void beyond the currently approved level of RL 106 m AHD or impacting commercial agreements with AGL Macquarie;
- consolidate all residual void capacity at the Drayton mine towards the southeast of the site, adjacent to the Liddell Ash Dam, thereby optimising the potential for future use of these voids post-mining (e.g. for fly-ash emplacement);
- minimise the likelihood of spontaneous combustion events by covering and capping higher risk coal rejects and tailings from the Greta Coal Measures with a range of inert materials;
- reduce the surface water catchments draining to the final voids and increase the proportion of free-draining rehabilitated land allowed to returned to natural catchments; and
- minimise steep topographic profiles to provide a stable, undulating final landform that would integrate smoothly with the neighbouring Mt Arthur mine and surrounding natural landscape.

Importantly, unless AGL Macquarie elects to take back the East (South) void for its future use, Anglo would remain responsible for the rehabilitation of this area. In this way, regardless of the outcomes of commercial arrangements with AGL Macquarie, the Department is confident the Drayton site could be rehabilitated to meet current best practice outcomes for the mining industry in NSW.

Overall, the Department is of the view that the proposed changes to the final landform at the Drayton mine represent a significant improvement to the current mine closure strategy and would create a more natural and functional final landform, with improved final land use opportunities.

6.7.2 Drayton South

With respect to the Drayton South site, Anglo has undertaken detailed engineering and Geofluv modelling to design an undulating landform that would be sympathetic to the surrounding natural landscapes. This landform would include extensive micro-relief and variable dump heights that would complement the natural ridgelines on site and allow for a more harmonious final landform.

With the reduced footprint and amended sequencing of mining activities, the proposed final landform would completely backfill the Blakefield pit and, through benching and backfilling of the Whynot pit, would substantially reduce the size and volume of the final void lake relative to the previous proposal. In addition, the final landform would incorporate reinstated catchment areas and water courses that would return a significant proportion of pre-mining surface water catchments to Saddlers Creek.

While the proposed final landform clearly displays a number of beneficial outcomes, the creation of a smaller final void would result in some long term migration of groundwater through the backfilled spoil to the nearby Saddlers Creek alluvium. The Department has considered the implications of this seepage on the volumes and water quality of surrounding aquifers in Section 6.5, and is satisfied that it would comply with the minimal impact requirements of the *NSW Aquifer Interference Policy*.

6.7.3 Rehabilitation

The rehabilitation of the proposed final landform focuses on maximising biodiversity outcomes, through the re-establishment of suitable native woodland species, including 471 ha of Central Hunter Box-Ironbark Woodland and 656 ha of Narrabeen Foothills Slaty Gum Woodland. To supplement this woodland rehabilitation strategy and minimise the potential degradation of surrounding land, Anglo has committed to the restoration and reinstatement of riparian vegetation along Saddlers Creek and the management and active improvement of about 2,700 ha of pastoral land within an Agricultural Land Reserve surrounding the mine.

In considering the composition of this proposed rehabilitation strategy, the Department notes that Muswellbrook Shire Council's *Coal Mining Land Use Strategy* includes a number of objectives related to the rehabilitation and final landforms of mines in the LGA. In particular, it emphasises the need to:

- to create a stable, free-draining and natural looking final landform;
- minimise the size and number of final voids; and
- rehabilitate at least 70% of disturbed areas to "high density tree planting".

The Department believes that the proposed final landforms and rehabilitation measures generally comply with the intent of these objectives and incorporate a number of significant improvements to the existing Drayton mine that would improve the safety and potential long term uses of this land.

To achieve the proposed rehabilitation outcomes, Anglo has committed to develop a Rehabilitation Management Plan for the Drayton Complex, which would incorporate a range of the management and completion criteria currently in place at Drayton mine. These criteria include the need to create stable landforms, establish erosion and sediment controls, manage spontaneous combustion, establish suitable land capabilities, establish revegetated woodland and grass species and implement weed and pest controls.

While these measures provide a sound basis for the management of rehabilitation across the site, the Department believes there is an opportunity to improve the rehabilitation outcomes at the Drayton mine, for instance by increasing woodland rehabilitation on steeper sloping areas that would provide limited future agricultural use, to strengthen the habitat corridors that link the Drayton Wildlife Refuge with offset areas at the adjacent Mt Arthur mine and the rehabilitated Drayton South site.

To this end, the Department has recommended that Anglo prepare and implement a Rehabilitation Strategy for the Drayton Complex in consultation with DRE, and investigate opportunities for improving the potential final land use of the Drayton mine. It would also provide detailed information about the stages of the proposed rehabilitation, the timing of these stages across the Drayton Complex and the specific measures proposed to manage spontaneous combustion at the Drayton mine.

The Department has also recommended a range of rehabilitation objectives for the project (see Table 18), which aim to update the existing rehabilitation requirements at the Drayton mine and provide a consolidated set of rehabilitation objectives that can be applied across the Drayton Complex. Importantly, as these contemporary objectives would apply to the whole site, they would also assist in addressing several outstanding issues with the closure planning for the existing Drayton mine.

Table 18: Rehabilitation Objectives

Feature	Objective
Mine site (as a whole)	<ul style="list-style-type: none"> • Safe, stable and non-polluting • Final landforms designed to incorporate micro-relief and integrate with surrounding natural landforms • Constructed landforms maximise surface water drainage to the natural environment (excluding final void catchments) • Minimise long term groundwater seepage zones • Minimise visual impact of final landforms as far as is reasonable and feasible
Final voids	<ul style="list-style-type: none"> • Minimise to the greatest extent practicable: <ul style="list-style-type: none"> ○ the size and depth of final voids ○ the drainage catchment of final voids ○ any high wall instability risk ○ risk of flood interaction for all flood events up to and including the Probable Maximum Flood.
Agricultural land	<ul style="list-style-type: none"> • Restore, maintain or improve land capability generally as described in the EIS and RTS, including within the Agricultural Land Reserve and Rehabilitation Areas • Restore the 3 ha area of BSAL near the Hunter River that would be disturbed by the water pipeline (if constructed) • Rehabilitate areas at the existing Drayton mine identified for agricultural use in the rehabilitation plan to sufficient agricultural capability to support grazing
Rehabilitation areas and other vegetated land	<ul style="list-style-type: none"> • Restore ecosystem function as described in the EIS and RTS, including maintaining or establishing self-sustaining ecosystems that comprise at least: <ul style="list-style-type: none"> ○ 471 ha of Central Hunter Box-Ironbark Woodland; ○ 656 ha of Narrabeen Foothills Slaty Gum Woodland; and ○ 252 ha of woodland and grassland within the Saddlers Creek Restoration and Enhancement Area. • Establish areas of self-sustaining: <ul style="list-style-type: none"> ○ aquatic habitat, within the diverted and/or re-established creek lines and retained water features; ○ habitat for threatened flora and fauna species; and ○ wildlife corridors, as far as is reasonable and feasible and as generally shown in the EIS.
Saddlers Creek restoration works	<ul style="list-style-type: none"> • Flows to mimic pre-development flows for all flood events up to and including the 1 in 100 year ARI • Incorporate erosion control measures based on vegetation and engineering revetments • Incorporate structures for aquatic habitat • Revegetate with suitable native species
Surface infrastructure	<ul style="list-style-type: none"> • To be decommissioned and removed, unless DRE agrees otherwise
Community	<ul style="list-style-type: none"> • Ensure public safety • Minimise the adverse socio-economic effects associated with mine closure.

While there remains some uncertainty regarding the post-closure use of the final voids at Drayton mine, the Department and DRE are satisfied that sufficient information has been provided regarding the intended land uses and associated rehabilitation strategies to determine the application. The Department is satisfied that the rehabilitation completion criteria and post-mining land use goals for these voids can be managed to the satisfaction of DRE under a Mine Operations Plan for the complex.

To support this process, the Department has supported DRE’s recommendation that Anglo be required to undertake a review of the rehabilitation options for the Drayton Complex every 3 years. The Department considers this periodic review would assist in refining and strengthening rehabilitation completion criteria required under the Mine Operations Plan and guide operational activities to deliver optimal land use outcomes, prior to the commencement of final mine closure planning for the complex.

6.7.4 Conclusion

Overall, the Department accepts that the proposed final landforms have been designed to integrate with the surrounding topography, accommodate periods of increased surface water runoff, address relevant safety considerations (e.g. the stability of highwall batters), provide an appropriate balance between future land uses (including conservation and agriculture), and minimise the number and extent of final voids to the greatest degree practicable.

Importantly, the Department believes the optimized 'Scenario 4' mine plan and final landform for the Drayton mine would achieve superior outcomes to the alternatively proposed scenarios, and has only recommended the inclusion of this scenario in the recommended conditions of consent.

Finally, the Department has recommended conditions requiring Anglo to meet contemporary best practice rehabilitation objectives across the Drayton Complex, and prepare and implement a detailed Rehabilitation Management Plan that describes how these objectives would be achieved.

6.8 TRAFFIC AND TRANSPORT

The EIS included a road traffic assessment prepared by DC Traffic Engineering Pty Ltd, which considered the traffic impacts of the proposal on the local and classified road network. In addition, the EIS included an assessment of potential rail impacts associated with an average of 4 train movements (entries/exits) per day along the Antiene rail spur to the Main Northern Railway and on to the Port of Newcastle for export. These transport impacts are considered further below.

6.8.1 Roads

Existing Situation

Drayton mine is located on Thomas Mitchell Drive and accessed via a dedicated mine access road (see Figure 25). This road provides site access for both deliveries and around 500 existing employees and contractors.

Employees travelling to the existing Drayton mine predominately reside in Muswellbrook and travel south along either Denman Road or the New England Highway, before entering Thomas Mitchell Drive to reach the mine access road. The majority of remaining employees reside in the Singleton area and travel north along the New England Highway to enter Thomas Mitchell Drive from the southeast.

A limited number of light vehicles also access the Drayton South site via an access track off Edderton Road. Unlike the formal access road off Thomas Mitchell Drive, the Edderton Road entrance is only utilised intermittently for specific operational and environmental activities.

The road authorities for the key roads in the area are as follows:

- RMS – Denman Road, the New England Highway and the Golden Highway; and
- Council – Thomas Mitchell Drive and Edderton Road.

A number of additional coal mining operations, including the Mt Arthur, Bengalla and Mangoola mines operate to the west of Muswellbrook. These mines all generate traffic on the local road network and have been considered in the assessment of the Drayton South project.

Traffic Impacts

The traffic assessment found that the project would not significantly increase traffic impacts relative to the existing operations, given the project would continue to utilise the existing Drayton workforce and access the site via the existing Drayton Mine Access Road off Thomas Mitchell Drive. This assessment also noted that following completion of various roadworks and intersection upgrades being undertaken by Council and other nearby mines, the predicted traffic generation associated with the Drayton South project would comply with acceptable levels of performance for all local roads.

While the Department is generally satisfied with the overarching conclusions of this traffic assessment, there are a number of matters that warrant further consideration. In particular:

- the need for Anglo to contribute towards the current Thomas Mitchell Drive upgrade works, which were commenced by Council in 2013 to ensure the safety and serviceability of this road;
- consideration of Anglo's contribution towards the need for an accelerated upgrade of the Thomas Mitchell Drive/Denman Road intersection; and
- specific requirements of Council and the RMS, as the relevant roads authorities, concerning the proposed realignment of Edderton Road and its intersection with the Golden Highway.

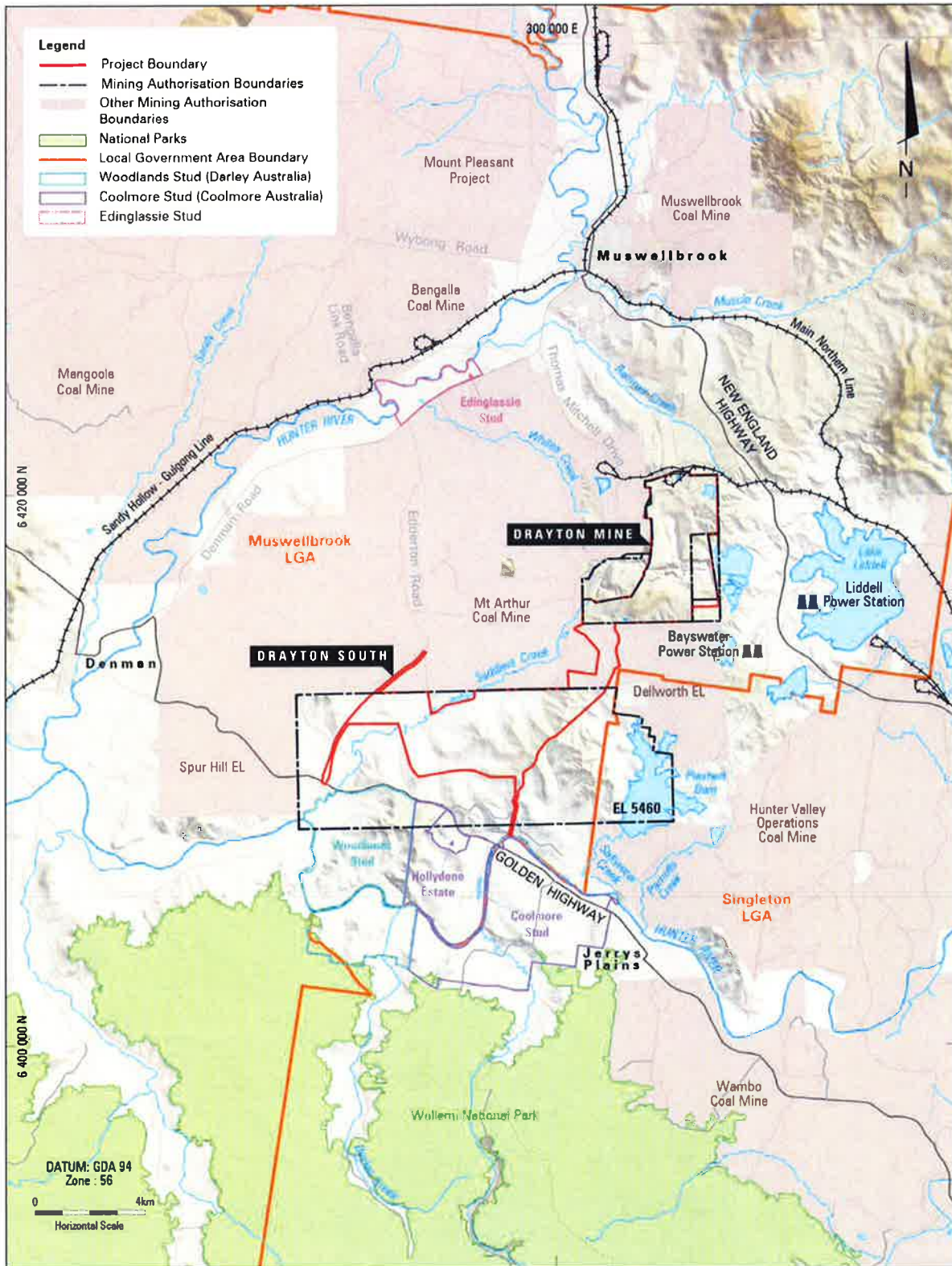


Figure 25: Road Network

Road Upgrade and Maintenance

The Department is aware that Anglo has offered to enter into a Voluntary Planning Agreement (VPA) with Muswellbrook Shire Council, which includes funding for maintenance of the local road network. Specifically, the VPA offer includes a \$50,000 per annum (CPI adjusted) contribution towards road maintenance in the Muswellbrook LGA, to be paid each year over the life of the mine, with the first payment to be made 30 days after the commencement of the project.

The Department notes that this road maintenance contribution is significantly lower than the proportional funding provided by the nearby Mt Arthur, Bengalla and Mangoola mines, even when considering the relative size of these operations. Furthermore, unlike the nearby mines which are all responsible for contributing towards the upgrade and maintenance of specific local roads utilised by their operations, Anglo's existing Drayton mine consent does not require any contributions in excess of the existing VPA for the upgrade or maintenance of local roads utilised by its operations.

It is important to recognise that while these existing obligations and contributions provide a contextual framework for consideration, they are not necessarily the key matters for consideration in the assessment of the project. Rather, it is whether any further upgrades or maintenance contributions should be required to reflect the traffic generation over the life of the Drayton South mine.

Thomas Mitchell Drive

In late 2013, Muswellbrook Shire Council commenced a major upgrade of Thomas Mitchell Drive. This upgrade is forecast to cost around \$18 million and is being implemented in four stages. In recognition of the strategic importance of the road in supporting the mining industry, the NSW Government has agreed to contribute \$4.6 million towards the upgrade of the road under the 'Resources for Regions' initiative. This State funding would assist Council to fund its share of the upgrade costs for the road.

However, there remains a significant shortfall in the funding arrangements for these upgrade works and both the Department and Council believe it is appropriate that a significant proportion of the current upgrade (and ongoing maintenance) of Thomas Mitchell Drive be funded by the various mining companies that use the road for their operations (i.e. Mt Arthur, Drayton, Bengalla and Mangoola).

To provide a sound technical basis for the apportionment of funding responsibilities for the current Thomas Mitchell Drive upgrade, the Department commissioned GHD to undertake an independent Contributions Study. GHD developed a framework for the allocation of funding between the respective road users, including Council as the local roads authority and the four mining companies that currently utilise this road. In addition to establishing a framework for funding the capital upgrade and ongoing maintenance of the road over its 30 year design life, this study also included an assessment of each mine's proportionate traffic generation at the Thomas Mitchell Drive/Denman Road intersection.

The Contributions Study indicates that the Drayton mine contributes around 12% of mine-related traffic on Thomas Mitchell Drive and accounts for around 3.9% of mining traffic utilising the intersection with Denman Road. Given the proposed Drayton South project is forecast to maintain Anglo's road traffic impacts in line with those of its existing operations, GHD recommended that Anglo be required to contribute \$930,000 in upfront capital towards the current upgrade works, and a further \$460,000 towards ongoing heavy maintenance throughout the life of the road pavement.

In considering GHD's recommendations, it is important to note that the Department would take into consideration any VPA obligations when determining the final outstanding contributions payable by Anglo under this study. Furthermore, as the forecast cost of upgrading the road cannot be verified until the works have been completed and the costs verified by Council, the recommended upgrade and maintenance contributions may change to reflect Anglo's proportionate contribution under the study. This validation process is captured in the recommended the payment schedule contained within the GHD study and reflected in the recommended conditions of consent.

In regard to the Thomas Mitchell Drive/Denman Road intersection, recent traffic studies for nearby mining developments indicate that cumulative traffic impacts at this intersection would cause it to fail appropriate levels of service by 2017. To address this matter and ensure the safety and efficiency of this intersection for road users, the Department accelerated Mt Arthur's existing obligation to upgrade this intersection under a recent modification to the Mt Arthur Mine.

However, given the accelerated decline in performance of this intersection has arisen from cumulative impacts, the Department believes that (while Mt Arthur would remain primarily responsible for the upgrade works) each of the mines that generate traffic at this intersection should be required to contribute towards the costs of the accelerated upgrade works. This requirement has been reflected in recent modifications and project approvals for the Mt Arthur, Mangoola and Bengalla mines.

Consistent with this approach, the Department has recommended a condition requiring Anglo to contribute towards the accelerated upgrade of the Thomas Mitchell Drive/Denman Road intersection, in accordance with its proportionate use of the intersection as identified in the GHD study.

Edderton Road

To facilitate access to coal resources in the Blakefield pit, the project is proposing to relocate a section of Edderton Road and its intersection with the Golden Highway. This proposed realignment would be completed in the first four years of the project, with the realigned section of road being completed and commissioned before the existing section of the road is closed to public vehicles.

The Department acknowledges that a number of submitters, including Muswellbrook Shire Council, raised concerns with the impacts of the realignment on traffic efficiency and travel times. In addition, Council has contended that the proposed alignment of the new section of road would not achieve the improvements to road safety purported in the EIS or offset the efficiency losses to the road network.

Anglo has identified that the existing road pavement is in sub-optimal condition and requires significant repairs, as reflected by Council imposing load limits on the southern section of road. Consequently, Anglo has maintained that delaying the need for capitally intensive maintenance works and providing a new road capable of performing at a higher level of service would help to mitigate the slight increase in travel time and distance generated by the proposed realignment.

Having considered the merits of the proposed realignment, the Department considers that the predicted increase in travel time of around 3 to 4 minutes is relatively minor and would be partially mitigated by the new section of road being designed and built to facilitate increased speed and load limits.

With respect to Edderton Road, the Department believes it is important to recognize that the proposed realignment under this project would join the existing road alignment around 3.5 km south of a separate northern realignment approved under the 2010 Mt Arthur Mine Consolidation Project. The construction of these realigned sections of Edderton Road would be funded by the respective mining companies and designed and constructed to the satisfaction of Council and the RMS.

Given these two mining companies would be funding pavement upgrades along 80% of the length of Edderton Road as part of these realignments, the Department believes that should Council wish to upgrade the remaining 3.5 km section of road to a similar standard, it should be responsible for these works as the relevant road authority under *the Roads Act 1993*.

Nonetheless, the Department acknowledges that mining traffic contributes to the need for ongoing road maintenance and therefore believes that Anglo should be required to contribute funding to Council towards the maintenance of the local road network (including Edderton Road). To this end, the Department notes that Anglo is proposing to contribute \$50,000 a year to Council's road maintenance under its VPA offer to Council. Given this commitment and the substantial contribution for Thomas Mitchell Drive, the Department considers there is limited justification to impose additional contributions for the local road network.

Having regard to the above, the Department has recommended a requirement that any upgrade or realignment of roads affected by the project be designed to meet contemporary road standards and undertaken to the satisfaction of the relevant roads authorities.

6.8.2 Rail

Existing Situation

The Antiene rail spur is a private rail line, co-owned by the Mt Arthur and Drayton mines through the Antiene Joint Venture. The rail spur joins the Main Northern Railway to the north of Lake Liddell and currently operates under two separate approvals - MP 09_0062 for the Mt Arthur mine and DA 106-04-2000 for the Drayton mine. The Drayton mine consent allows for up to 12 train movements per day on the Antiene rail spur, to transport of up to 7 Mt of product coal to the Port of Newcastle each year until 2025. In addition, this consent includes provisions for the neighbouring Mt Arthur mine to access spare capacity on the rail spur not utilised by Anglo for its Drayton operations.

Importantly, while the neighbouring Mt Arthur mine was recently approved to increase its peak train movements on the Antiene rail spur from 24 to 30 movements per day, these additional daily movements were subject to availability on the rail network and conditional on Mt Arthur not unduly impacting Anglo's ability to use the rail spur to accommodate its approved rail movements.

Traffic Generation

The traffic impact assessment includes a forecast of the maximum rail traffic generation associated with the project based on scheduled extraction rates, processing efficiencies and train capacity. Having regard to the detailed production schedules provided in the RTS, the Department notes that proposed maximum extraction rate of 6.4 Mtpa would produce slightly under 5 Mtpa of product coal. To transport this coal to the port of Newcastle, Anglo is seeking an average of 4 train movements (entries/exits) per day from its Drayton rail loading facilities to the Port of Newcastle.

The Department acknowledges that these predicted rail movements are well within the 7 Mtpa product coal and 12 train movements per day limits of Anglo's existing Antiene rail spur consent. However, the project would extend the duration of these impacts for a further 6 years (i.e. beyond 2025 which is when the current consent expires) to accommodate the life of mining operations at Drayton South. The ARTC has advised that it has no objections to these continued rail movements, subject to consideration of potential noise impacts (see Section 6.3) and adequate modelling of any impacts on the operation of the Hunter Valley rail network.

Rail Capacity and Performance

With regard rail capacity, the Department notes that Anglo has an existing Access Holder Agreement with the ARTC for up to 501 path usages (i.e. return rail movements) per annum for the Drayton mine until the end of 2024. Notwithstanding, the Department understands that these access arrangements would be subject to both capacity on the day and network exit capability at the time.

While Anglo would need to negotiate renewed rail access agreements beyond 2024, the ARTC has confirmed that the production schedule for the Drayton South proposal aligns with the current and forecast carrying capacity of the Main Northern Railway over the life of the operation.

In considering the impacts of these ongoing rail movements, the Department understands there is the potential for trains on the Antiene rail spur to periodically block a level crossing on Antiene Railway Station Road, near the intersection of the spur and the Main Northern Railway. The Department is satisfied that the project is unlikely to increase the frequency of blockages on this lightly trafficked road and is not expected to materially increase inconvenience for road users.

Nevertheless, to provide consistency with the conditions imposed on the neighbouring Mt Arthur mine, the Department has recommended a condition requiring Anglo to liaise with relevant stakeholders (including the ARTC, Council, other rail users and impacted residents) and implement all reasonable and feasible measures to minimise project-related blockages of the level crossing.

With these management measures in place and considering that the project would generate fewer average rail movements than the existing Drayton operations, the Department is satisfied that sufficient capacity would exist on the Antiene rail spur and broader rail network to accommodate the continued export of product coal from the Drayton Complex to the Port of Newcastle for export.

6.9 OTHER ISSUES

The Department has considered the potential impacts of the project on the environment and the amenity of the local community. However, it is important to put this assessment into context.

Operations at the existing Drayton mine are currently winding down in line with the exhaustion of approved recoverable coal reserves in 2015 and expiration of the current project approval in 2017. While the project would involve some minor areas of additional mining adjacent to the existing pits at the Drayton mine, Anglo American is primarily seeking approval for the continued use of existing Drayton mine coal processing and transport infrastructure to support mining at Drayton South.

Based on its assessment, the Department is generally satisfied that the nature and extent of the impacts associated with continued operations at the Drayton mine would be essentially the same as, or less than, the current operations over the remaining mine life. Consequently, the focus of the Department's assessment has been on the potential impacts of the new mining area at Drayton South.

Table 19: Assessment of Other Issues

Issue	Potential Impacts	Consideration
Land and Soil Resources	<ul style="list-style-type: none"> ▪ The project would disturb 1,618 ha of land at Drayton South, historically used for grazing and agistment on unimproved rain-fed pasture. ▪ Site verification undertaken for the project confirmed the presence of 78.8 ha of BSAL within the project disturbance boundary. ▪ OAS&FS raised initial concerns with the agricultural impacts of the project, including the mapping of potential BSAL on site. Following the provision of additional information, OAS&FS has confirmed that it is satisfied that the project would only disturb 78.8 ha of BSAL within the mining areas. ▪ It is also worth noting that the project could disturb a further 3 ha of BSAL for the development of a pipeline from the Hunter River. This 3 ha of BSAL would be temporarily disturbed to bury the pipeline and promptly reinstated to ensure this productive BSAL is not lost. ▪ With regards to other CICs, as defined in the Upper Hunter SRLUP, the EIS notes that the project would not disturb any mapped Viticulture or Equine CIC land. ▪ However, the Department notes that both Equine and Viticulture CIC operations occur within 1 to 1.5 km of the proposed mining area. The potential impacts on the Equine CIC are discussed in detail in Section 6.2. ▪ Hollydene Estate is located about 1.5 km from the Drayton South mining area and forms part of the Upper Hunter Viticulture CIC. The estate contains vineyards, a winery, accommodation and function facilities. ▪ Having reviewed the predicted impacts on this property (including air quality, noise, blasting and visual impacts), the Department does not believe that the project would significantly impair the ability this agricultural enterprise to operate as part of the Viticulture CIC; inhibit access to support services, infrastructure or transport routes; or cause the loss of scenic and landscape values. ▪ Notwithstanding the above, to mitigate the predicted impacts associated with the proposed clearing and loss of 1,618 ha of agricultural grazing land, Anglo has also committed to establish a 2,700 ha Agricultural Land Reserve, which would be managed to maintain and improve pastoral lands surrounding Drayton South. ▪ In addition OAS&FS identified that the project should provide further details and commitments regarding soil balances, the use of topsoils in rehabilitation, potential measures to mitigate potential impacts on agriculture and further consideration of the economic impacts of on the local community and agricultural industry. ▪ The Department and OAS&FS have both reviewed the additional information provided by Anglo to address the recommendations of the Gateway Certificate (see Appendix J), and are satisfied that this information clarifies the extent of BSAL to be disturbed by the project and Anglo's proposed rehabilitation measures. ▪ Importantly, the Department notes that the project only proposes to restore 3 ha of BSAL near the Hunter River that would be disturbed to develop a water pipeline. ▪ Accordingly, the information provided with respect to rehabilitation and restoration efforts considered on the optimised use of soil resources and measures that could be used to improve land uses post-mining. ▪ To this end, the Department is satisfied that the information provided is sufficient to determine this project and that further detailed information and prescriptive management measures can be developed under relevant management plans for the project. 	<ul style="list-style-type: none"> ▪ The Department is satisfied that Anglo has undertaken reasonable efforts to address the requirements of the Gateway Certificate (see Appendix J) and accepts this information as a sound basis for the assessment of the project. ▪ In accordance with relevant criteria under the Mining SEPP, the Department is satisfied that the project is unlikely to have a significant impact on CIC land resulting from surface disturbance, reduced access to support services, infrastructure and transport routes, or cause the loss of scenic and landscape values. ▪ Further, the Department is satisfied that the potential amenity impacts of the project are unlikely to materially affect the operation of the established agricultural enterprises situated on nearby CIC land (see also Section 6.3) or the ability of this land to continue to be used for thoroughbred breeding and viticulture purposes into the future. ▪ The Department is also satisfied that the proposed rehabilitation plans represent appropriate final land uses (see Section 6.9) and that the residual impacts associated with the removal of agricultural land could be mitigated through appropriate management of the Agricultural Land Reserve. ▪ To this end, the Department supports OAS&FS's recommendation that Anglo be required to develop protocols to manage and improve the agricultural capabilities and productivities in the Agricultural Land Reserve, and has recommended conditions to this effect. ▪ In addition, the Department has recommended conditions requiring Anglo to compensate for impacts on water access rights for downstream agricultural users and develop detailed performance and completion criteria for the management of agricultural land as part of the Rehabilitation Management Plan for the complex.

<i>Visual</i>	<ul style="list-style-type: none"> ▪ As with most large mining projects, the proposal would generate a range of visual impacts from various viewpoints surrounding the site. ▪ The EIS visual impact assessment included an assessment of these potential impacts at several of the more sensitive receiver locations surrounding the site, including highly sensitive CIC receivers to the south, and along Edderton Road and the Golden Highway. ▪ The Department has considered the potential visual impacts on horse studs in detail in Section 6.2. ▪ The Department notes that those receivers to the north of Drayton mine are unlikely to experience any material change in views relative to the existing operations and that all land to the east of the Drayton Complex is owned by either mining or electricity generation companies. ▪ Consequently, the following focuses on the visual impacts and mitigation measures for public road users and residences to the west of Drayton South. ▪ These 'western receivers' would experience direct views of the overburden emplacement areas at Drayton South from the commencement of the operations. ▪ To minimise these impacts, Anglo has committed to use a range of micro-relief and proactive rehabilitation to create more naturalistic final landforms that would be sympathetic to the visual landscape in these areas. ▪ Given the use of representative receiver locations and the variable topography to the northwest of the project, the Department notes there is some uncertainty as to the extent of impacts at these private residences. ▪ Further, the Department recognises that some receivers to the north and west may experience views associated with the construction of the Edderton Road realignment. ▪ In considering the visual landscape along Edderton Road, it is important to recognise that these road users would already be exposed to views of mining operations at the neighbouring Mt Arthur and Bengalla mines. ▪ To mitigate any further impacts on these road users, Anglo has committed to establish dense tree screens and/or landscaping measures along Edderton Road, aimed at interrupting direct views of Drayton South. 	<ul style="list-style-type: none"> ▪ The Department is satisfied that the proposed tree screening and/or landscaping measures along public roads would provide reasonable and appropriate mitigation for the likely visual impacts on road users. ▪ Notwithstanding, the Department has recommended conditions that require Anglo to establish and monitor the performance of these tree screens and landscaping measures, and develop remedial action triggers to ensure they are maintained to the standards outlined in the EIS. ▪ The Department is generally satisfied that Anglo has proposed reasonable measures to reduce the visual impact of the project on surrounding private landholders and public receivers. ▪ The Department notes that Anglo has committed to implement further site specific mitigation measures on a case by case basis, for any private receiver that experiences significant visual impacts from the project. ▪ The Department is satisfied that these additional mitigation measures could be management under the Visual Impact Management Plan for the mine. ▪ Given the short duration of visual impacts associated with construction of the Edderton Road realignment, the Department is satisfied that these impacts could be managed and minimised as far as reasonable, under the Visual Impact Management Plan for the Drayton Complex.
<i>Hazards</i>	<ul style="list-style-type: none"> ▪ The project is seeking to use the existing explosive storage facilities at Drayton mine for the project. ▪ Anglo would continue to manage this explosives storage facility in accordance with relevant standards (including AS 2187.1:1998 Explosives: Storage, Transport and Use) and transport explosive materials to the Drayton South site using internal access roads. ▪ To manage the storage of fuels and other hazardous materials (i.e. oil, grease, coolant, chemicals, etc) at the Drayton South site, Anglo has committed to update its existing hazardous material management system to encompass the entire Drayton Complex. ▪ In addition, any hazardous material stores on the site would need to be constructed to comply with relevant Australian Standards, and include bunding to prevent spills and measures to manage emergency situations. 	<ul style="list-style-type: none"> ▪ The Department notes that the project would not increase the likelihood of offsite hazards and would not materially affect the existing explosives delivery and storage, operational procedures or management measures, relative to the existing Drayton mine. ▪ The Department is therefore satisfied that the project would be able to be operated to manage explosive and hazardous material risks through the implementation of an amended hazardous material management system for the Drayton Complex.

<i>Transmission Lines</i>	<ul style="list-style-type: none"> ▪ The transport corridor connecting the Drayton mine with the Drayton South site has been designed to provide ensure there are no disruptions to the regional electricity transmission network. This includes through the provision of appropriate clearance for overlying 500kV (Transgrid) and 132 kV (Ausgrid) transmission lines, which traverse the proposed haul road alignment. ▪ In addition, the project would involve the realignment of some 11 kV and 66 kV Ausgrid transmission lines and the establishment of a new transmission lines, to connection Drayton South with the electricity network. ▪ Anglo has indicated that it has commenced discussions with HVEC and Ausgrid regarding the potential routes for the relocation of these transmission lines. Importantly, any final realignment routes would need to be formalised with Ausgrid as part of a separate application. ▪ The Department previously consulted Ausgrid and Transgrid about the potential impacts of the original Drayton South proposal on their infrastructure networks. At that time, both infrastructure owners indicated they were satisfied that the recommended conditions of approval would provide appropriate protection for their respective electricity transmission assets. 	<ul style="list-style-type: none"> ▪ In accordance with the requirements of <i>SEPP (Infrastructure) 2007</i>, the Department has sought input from Ausgrid and Transgrid regarding the revised project. ▪ The Department is satisfied that the recommended conditions provide appropriate protection for public infrastructure and include provisions requiring Anglo to repair or pay for any impacts on these assets caused by the project. However, the Department will continue to seek Ausgrid and Transgrid endorsement of these conditions, prior to finalising its assessment of the project. ▪ The Department is satisfied that any potential interactions with these infrastructure assets can be managed under a Mine Operations Plan for the Drayton Complex.
<i>Voluntary Planning Agreement</i>	<ul style="list-style-type: none"> ▪ Anglo has made an offer to enter into a VPA with Muswellbrook Shire Council for the project. ▪ The offer includes following contributions to Council: <ul style="list-style-type: none"> ○ \$50,000 a year for road maintenance; ○ \$290,000 a year, to be paid into a Community Fund and spent on projects "related to the promotion of economic and social health (health and education) or environmental benefit in the LGA"; and ○ \$15,000 a year to help Council monitor the impacts of the project. ▪ In addition, Anglo has committed to use its best endeavours to engage 3 apprentices each year from within the Muswellbrook Shire, Aberdeen and Jerrys Plains areas, for the life of the project. ▪ Anglo argues that this offer is reasonable, as the project represents a continuation of existing mining operations and would create little additional demand on Council for the provision of local infrastructure and services. ▪ It is important to recognise that this offer is voluntary, and the Department has no express power to require Anglo to increase these contributions. Nevertheless, the Department understands that Council is generally satisfied with the terms of the offer. ▪ Further, the Department notes that it is only able to levy additional developer contributions for the provision of local infrastructure with a direct nexus to the project. 	<ul style="list-style-type: none"> ▪ The Department is generally satisfied that Anglo's VPA offer is reasonable given the likely impact of the project and demand on local services and infrastructure. ▪ With respect to developer contributions, the Department has recommended that Anglo be required to contribute an additional \$1.4 million for the upgrade and maintenance of Thomas Mitchell Drive, which is the primary access road for the mine. ▪ The quantum of this contribution has been calculated in accordance with a Contributions Study for Thomas Mitchell Drive which was completed for the Department by GHD in May 2015. The findings of this study are discussed further in Section 6.8.

7. RECOMMENDED CONDITIONS

The Department has prepared recommended conditions of approval for the project (see Appendix A). These conditions are required to:

- prevent, minimise, and/or offset adverse impacts of the project;
- ensure standards and performance measures for acceptable environmental performance;
- ensure regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

The Department notes that the majority of the conditions are typical of what would normally be recommended for the regulation of a coal mine in NSW. The Department believes these conditions reflect best practice and provide a sound basis for managing the various potential impacts of the project. The conditions also incorporate the recommendations of relevant government authorities where applicable.

However, the Department notes that the conditions also include a range of measures to address the potential impacts on the horse studs. In particular, the conditions require Anglo to:

- meet appropriate criteria for noise, dust and blasting at all the receivers at the studs;
- minimise the visible off-site air pollution generated by the project (including dust and blast fumes);
- prepare and implement a tree screening strategy along the Golden Highway and Edderton Road to minimise the visual and lighting impacts of the project;
- implement all reasonable and feasible measures to minimise off-site lighting impacts of the project, including compliance with applicable Australian Standards;
- consult with the studs in the preparation of the Blast Management Plan, and use all reasonable endeavours to co-ordinate the timing of blasting on the site to minimise disturbance to the horse studs;
- provide compensatory water supply if the project results in adverse impacts on the groundwater wells at the studs; and
- progressively rehabilitate the site and minimise the area of disturbance on the site.

Furthermore, the conditions allow the owner of any privately-owned land that considers that the project is not complying with the relevant criteria in the approval to request an independent review. If the review finds that the project is not complying with the criteria, Anglo would be required to modify its operations to ensure it complies.

8. CONCLUSION

The Department has assessed the project application, and the various documents submitted to support the application throughout the assessment process. The Department has also considered the Commission's previous review and the various submissions on the project.

Based on this assessment, the Department is satisfied that the proposed mine plan strikes a reasonable balance between maximising resource recovery of a recognised coal resource of significance and minimising the potential impacts on the Coolmore and Woodlands studs and the environment as far as practicable. This has been achieved primarily through adhering to the Commission's recommendation to keep mining behind the second ridgeline on the site.

Having said this, the Department notes that regardless of the setbacks imposed on the mining operations there would still be some indirect and dynamic impacts as a result of the project.

The Department does not consider these impacts to be significant enough to warrant making further changes to the mine plan, as this would jeopardise the viability of the project as a whole.

It also does not consider these impacts to be significant enough to cause the thoroughbred operations to leave the Hunter Valley.

The Department has recommended a comprehensive and precautionary suite of conditions to ensure the project complies with relevant criteria and standards, and to ensure that the predicted residual impacts are effectively minimised, mitigated and/or compensated for. The Department believes that the conditions reflect current best practice for the regulation of mining projects in NSW, and provide a high level of protection to the nearby horse studs.

The conditions also require Anglo to prepare a number of management plans for the project in consultation with relevant agencies and the owners of both Coolmore and Woodlands, and monitor the impacts of its project closely, and implement appropriate mitigation measures in the unlikely event that the impacts of the project are greater than predicted.

The Department also recognises that the project would provide major economic and social benefits for the region, including:

- direct capital investment of \$131 million;
- direct employment of around 500 workers for another 15 years;
- \$355,000 (present value) each year to Council for the provision of local infrastructure and community services; and
- \$233 million (present value) in direct revenue for the State Government from coal royalties.

Overall, the Department is satisfied that the benefits of the project would outweigh its costs, and believes that the proposed mine plan strikes an appropriate balance between protecting the interests of the horse studs and realising the significant economic benefits that would flow to the region and the State if the project is allowed to proceed.

Consequently, the Department considers the project to be in the public interest, and recommends that it be approved subject to strict conditions.


Mike Young
Director

Resource Assessments

21.8.15.


Marcus Ray
Deputy Secretary
Planning Services