

ASSESSMENT REPORT

BENGALLA COAL MINE Overburden Emplacement Area Modification (DA 211/93 Mod 4)

1 BACKGROUND

The Bengalla Mining Company Pty Ltd (Bengalla), managed by Coal & Allied Bengalla Pty Ltd, operates the Bengalla Coal Mine in the Upper Hunter Valley, approximately 4 kilometres (km) west of Muswellbrook (refer to **Figure 1**). The mine is located in an area dominated by coal mining and agricultural activity, including:

- the Mount Arthur mining complex located to the southeast of the mine, across Denman Road, and the approved Mount Pleasant mining project located directly north of the mine;
- intensive agriculture enterprises on either side of the Hunter River on its alluvial floodplain; and
- extensive areas of grazing land located to the west of the mine.

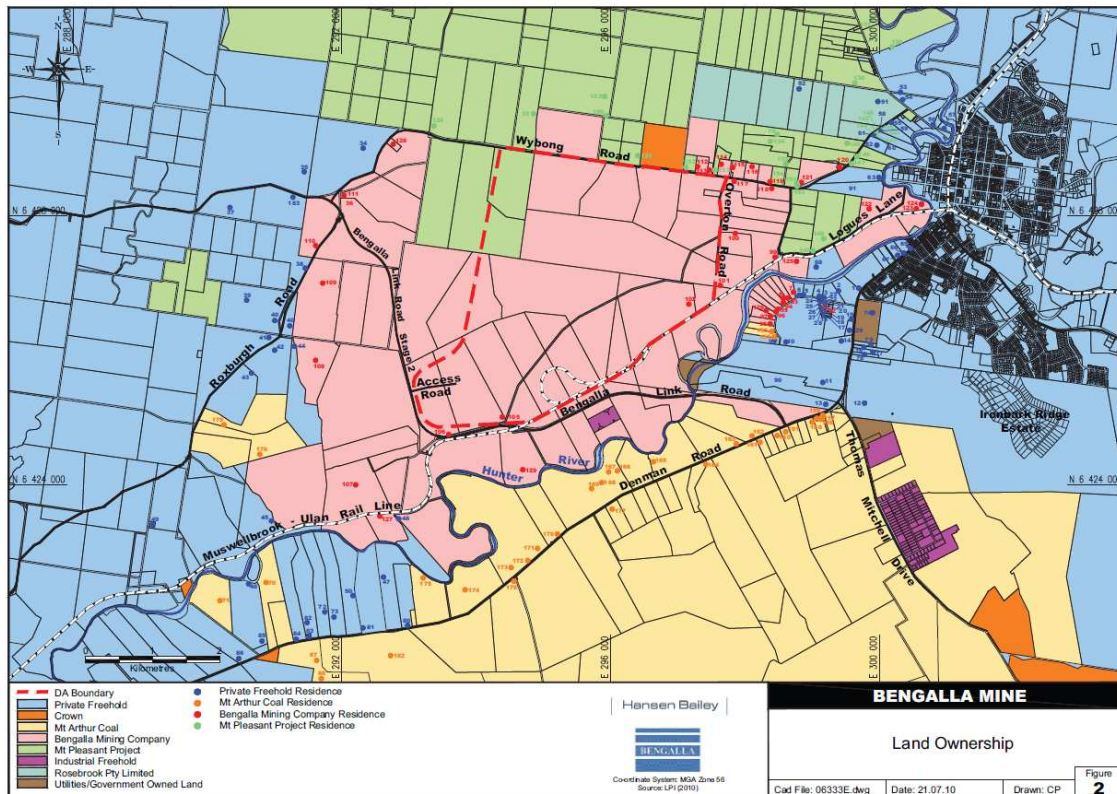


Figure 1: Land ownership

The mine was originally approved by the Minister on 7 August 1995 (DA 211/93), following a Commission of Inquiry. This consent allows for:

- the extraction of 146.3 million tonnes of run-of-mine (ROM) coal, over a period of 21 years, at a maximum extraction rate of 8.7 million tonnes per annum (Mtpa) of ROM coal;
- open pit mining, based on a series of 60 metre (m) wide dragline strips running north-south and initially starting in the east and progressing westwards;
- a large overburden area in the east with a maximum allowable height of RL 240 m; and
- a coal handling and preparation plant (CHPP) located in the southwest corner of the project, with adjacent related ROM and clean coal stockpiles.

Since approval, the Bengalla development consent has been modified 3 times (refer to **Appendix B**), which provided for:

- an increase in the maximum extraction rate to 10.7 Mtpa of ROM coal;
- an increase in the maximum height of the overburden dump to RL 270m (required due to original miscalculations in the swell factor of the mine's overburden); and
- an extension of the coal extraction footprint by 32 hectares (ha) in the south (Wantana Extension Area), with an approved production rate for mining in this area of 1.5 Mtpa of ROM coal.

The mine commenced operations in October 1998, and by the end of 2009 had fully mined 18 of a total of 31 dragline strips within the DA boundary. Mining operations in the Wantana Extension Area were originally scheduled to begin during 2008, following the relocation of the ROM Hopper. However, due to rail and port infrastructure capacity limits, Bengalla was unable to achieve its approved maximum production levels, with annual production levels reaching only between 6.5 and 7 Mtpa of ROM coal. As a consequence, the company deferred relocation of the ROM Hopper and mining operations in the Wantana Extension only commenced in 2010. Mining operations within the main pit have now progressed further west than originally planned, which has restricted overburden emplacement activities within the southern portion of the existing Overburden Emplacement Area (OEA).

To alleviate the shortage in overburden capacity, Bengalla is seeking approval to accelerate mining within the Wantana Extension, and alter the approved overburden emplacement strategy.

2 PROPOSED MODIFICATION

Bengalla is seeking to modify the development consent for the Bengalla mine (DA 211/93) under section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The modification involves two main components. Firstly, Bengalla is requesting approval to increase the rate of mining in the Wantana Extension to a maximum production rate of 2.5 Mtpa, which would realign mining activities in the Wantana Extension with mining activities in the Main Pit, and consequently liberate the approved emplacement areas. The total maximum annual extraction rate for the Bengalla Mine would remain unchanged.

Secondly, in order to alleviate the overburden capacity issues in the approved OEA, Bengalla has proposed three main changes to its approved overburden emplacement strategy. These involve:

- extending the approved OEA further south (referred to as the Southern OEA), over an additional 11 ha (refer to **Figure 2**), 9 ha of which is part of the Hunter River alluvial floodplain. The final landform in this area would have a 10 degree slope towards the northwest and would extend to the currently approved maximum height of RL 270 m;
- delaying final rehabilitation of the northern edge of the OEA from 2012 until 2016. Overburden emplacement and temporary rehabilitation would continue to occur until this time; and
- relocating the approved, temporary out-of-pit OEA on the western side of the pit (referred to as the Western OEA) further west (refer to **Figure 3**), including over an additional 15 ha outside the approved disturbance boundary.

The modification does not propose an increase to the maximum total annual ROM production rate or to the life of the mine. **Table 2** below provides a comparison of the mine as it was originally approved with the mine as it is currently approved, and as it would be modified. Bengalla considered a number of alternative options for alleviating the overburden emplacement capacity issue. **Table 3** summarises these alternatives. Further details of the proposed modification are found in the Environmental Assessment (EA, see **Appendix C**).

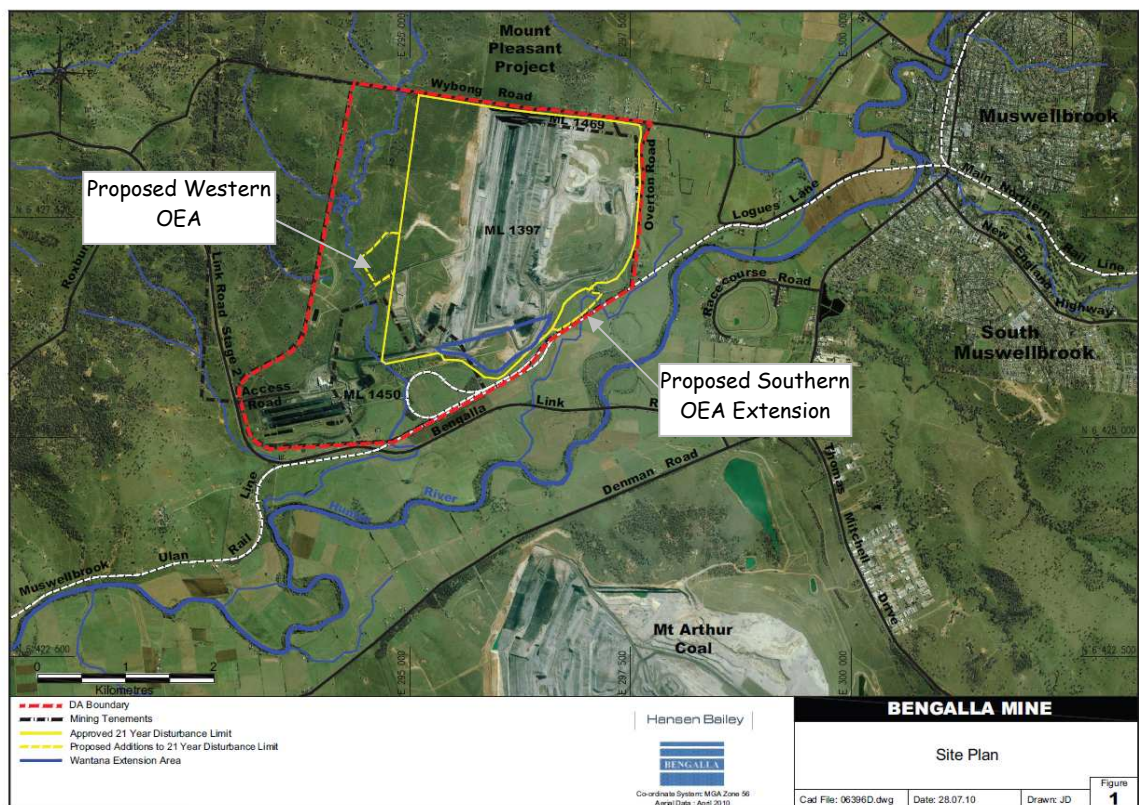


Figure 2: Project Area

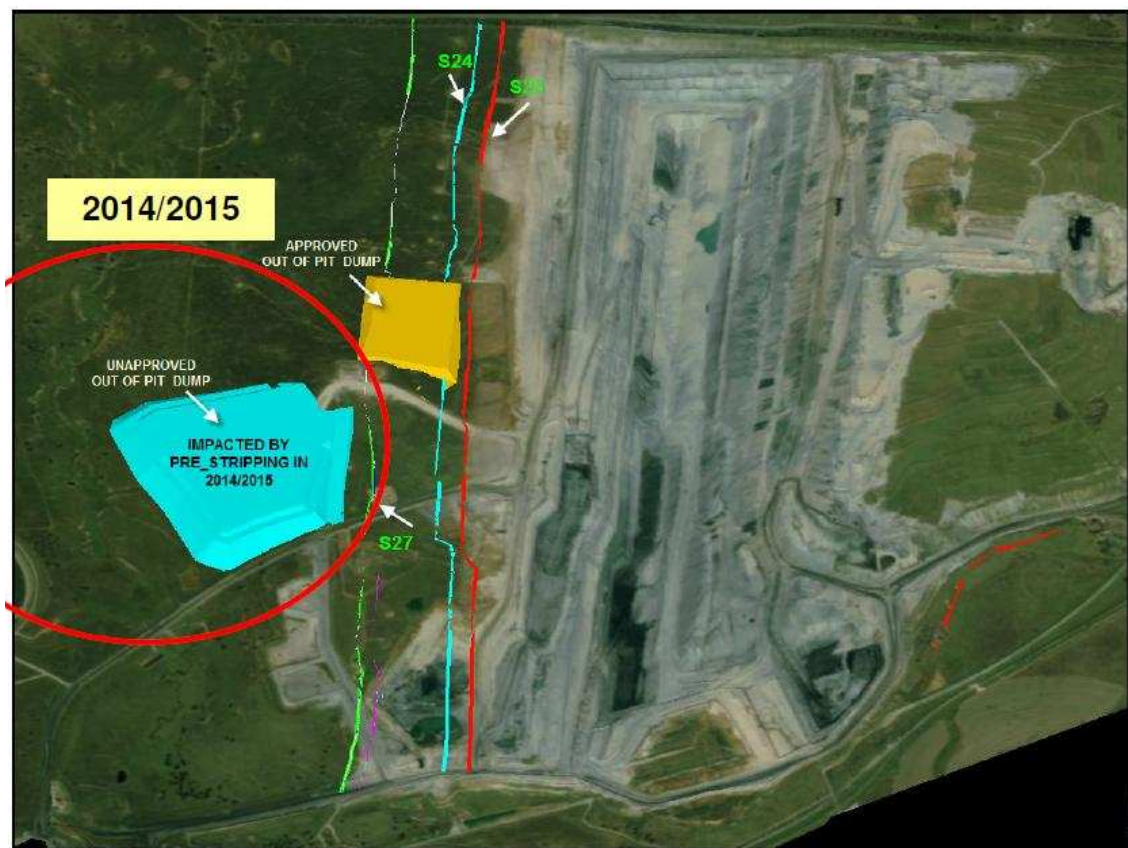


Figure 3: Relocated temporary Western OEA

Table 2: Comparison of original, approved and proposed Bengalla Coal Mine

| Development Component | Original Development | Approved Development (as modified) | Proposed Development |
|--|---|--|---|
| <i>Mining Method</i> | Open-cut strip mining from east to west | No change | No change |
| <i>Reserves</i> | 147 Mt | 154.5 Mt | No change |
| <i>21 Year Mine Disturbance Area</i> | 565 ha | 597 ha | 623 ha |
| <i>Annual Extraction Rate</i> | 8.7 Mt | Total: 10.7 Mt per year (21 years) Wantana: 1.5 Mt per year (5 years) | Total: 10.7 Mt per year Wantana: 2.5 Mt per year |
| <i>Product Coal Trains</i> | Train loading would take 2 hours per train. Train capacity is 8,645 t (91 carriages with 95 t capacity each) Train scheduling would be dependent on State Rail scheduling | No change | No more than 16 laden trains to leave the Bengalla load point each day with coal from either Bengalla or Mount Pleasant |
| <i>Infrastructure</i> | Includes: <ul style="list-style-type: none"> • CHPP and associated facilities • Administration and bathhouse • Rail loop and loading facilities | <ul style="list-style-type: none"> • New ROM hopper and associated product coal stockpile • Modify CHPP to facilitate two stage washing • 2 permanent tailings drying areas • Extensions to administration, bathhouse and workshop buildings • Construction of a laydown area and associated facilities | No change |
| <i>Operating Hours</i> | Mine Operations: 24/7 CHPP: 24/7 Rail Loading: 24/7 (as required) | No change | No change |
| <i>Consent Life</i> | 2017 | No change | No change |
| <i>Maximum Overburden Emplacement Height</i> | RL 240 m | RL 270 m for the eastern OEA | No change |
| <i>Workforce</i> | 300 full-time operational employees | 400 full-time employees | No change |

Table 3: Comparison of options considered

| Considered Options | Conclusion | Pros | Cons |
|--|--|--|---|
| <i>Southern OEA Extension</i> | Preferred and part of current modification application | <ul style="list-style-type: none"> • Provides an additional 9.8 Million LCM; • No increase to approved maximum height. | <ul style="list-style-type: none"> • Extends into 9 ha of Hunter River alluvial sediments |
| <i>Relocation of temporary Western OEA</i> | Preferred and part of current modification application | <ul style="list-style-type: none"> • No increase in capacity | <ul style="list-style-type: none"> • Increases period of use before rehandling would occur |
| <i>Increase the approved height of the existing OEA to RL 300m</i> | Rejected | <ul style="list-style-type: none"> • Provides an additional 10 Million LCM capacity • No additional disturbance areas | <ul style="list-style-type: none"> • Increased visual impact • Increased dust levels • Less harmonious integration with the currently approved final landform • Community concerns raised regarding the perceived extent and duration |
| <i>Steepening of the outer slopes of the existing OEA from 10° to 14°</i> | Less favourable | <ul style="list-style-type: none"> • No additional disturbance areas | <ul style="list-style-type: none"> • Increased stability and erosion risk • Potential surface water impacts for neighbouring properties |
| <i>Limiting mining to the Wynn Seam and not the approved Lower Edderton Seam</i> | Rejected | <ul style="list-style-type: none"> • No additional environmental impacts | <ul style="list-style-type: none"> • Would sterilise approximately 1.8 Mt of ROM Coal resources |

| Considered Options | Conclusion | Pros | Cons |
|--|-------------------|---|--|
| <i>Constructing an additional larger temporary OEA west of current mining operations</i> | Rejected | | <ul style="list-style-type: none"> • Involves significant increase in double handling of overburden; • Increased cost, energy, dust, noise |
| <i>Do nothing</i> | Rejected | <ul style="list-style-type: none"> • No additional environmental impacts | <ul style="list-style-type: none"> • Would result in a maximum 14 million LCM deficit in emplacement capacity by 2013 -14 |

3 STATUTORY CONTEXT

3.1. Approval Authority

The Minister was the consent authority for the original development consent, and is consequently the approval authority for the modification application. However, the Deputy Director-General, Development Assessment and Systems Performance, may determine the application under the Minister's delegation of 14 September 2011, since Bengalla declared that it had made no reportable political donations, Council did not object and the low number of objections received from the public.

3.2. Modification

Under clause 8J(8)(a) of the *Environmental Planning and Assessment Regulation 2000*, section 75W of the EP&A Act applies to any modification of a development consent granted by the Minister under section 101 of the EP&A Act. The Bengalla Open Cut Coal Mine development consent was granted under section 101 and must therefore be modified under section 75W of the EP&A Act.

The Department notes that:

- the proposed modification would not change the essential function of the mine for which consent was originally granted, namely an open cut coal mine with associated surface infrastructure;
- the proposal would not change the mining, processing and transport methods, operating hours, maximum annual production limit or life of the development consent; and
- the proposed additional disturbance necessary for the proposal is relatively minor in scale.

Consequently, the Department is satisfied that the proposal can appropriately be characterised as a modification to the originally approved mine, rather than a new project in its own right, and that it may be determined under Section 75W.

3.3. Applicability of sections 75U and 75V of the EP&A Act

A development consent issued under Part 4 of the EP&A Act and modified by the Minister under Section 75W is not, for the purposes of Sections 75U and 75V, considered an approved project under Part 3A of the Act. Consequently, any approvals required under other legislation as part of the modification must be sought in accordance with the relevant instruments.

4 EXHIBITION AND NOTIFICATION

Under section 75W of the EP&A Act, the Department is not required to notify modification applications. However, after accepting the EA for the modification, the Department:

- made it publically available from 8 December 2010 until 21 January 2011:
 - on the Department's website;
 - at the Department's Information Centre and Muswellbrook Shire Council;
 - at Coal and Allied's Muswellbrook Shopfront; and
 - at the offices of the Nature Conservation Council;
- notified relevant state government authorities and Muswellbrook Shire Council by letter; and
- advertised the exhibition in the Hunter Valley News on 8 and 22 December 2010 and in the Muswellbrook Chronicle on 10 and 24 December 2010.

During the exhibition period, the Department received 14 submissions on the proposed modification, including:

- 6 from public authorities;
- 2 from special interest groups (including the Construction Forestry Mining Energy Union, or CFMEU); and
- 5 from the general public.

None of the agencies objected to the proposal. However:

- **Office of Environment and Heritage** (OEH) recommended several conditions in relation to management of Aboriginal Heritage;
- **Division of Resources and Energy** within the Department of Trade & Investment, Regional Infrastructure and Services (DRE) recommended conditions of consent in relation to rehabilitation and revision of the Mining Operations Plan required under the mining lease;
- **Department of Primary Industries** (DPI) raised concerns with the location of the proposed overburden dump extension on prime agricultural land;
- **NSW Office of Water** (NOW) noted that the development may have an increased risk to water quality as a result of activities on the alluvial floodplain, but acknowledged overriding factors in respect of the suitability of alternative locations. NOW recommended several conditions of approval in relation to minimising the water quality risks to the alluvial aquifer and Hunter River. It also noted that the development would require an Aquifer Interference Approval under a new policy due to come into effect in July 2011;
- **OEH's Heritage Branch** accepted the relevant heritage mitigation and management commitments outlined in the EA;
- **Hunter-Central Rivers CMA** (CMA) raised concerns regarding activities on the alluvial floodplain and details of the native vegetation assessment; and
- **Muswellbrook Shire Council** (Council) raised concern regarding the proposal's activities on the alluvial lands. Council also recommended conditions of approval relating to flood impact and section 94 contributions for the upgrade of Thomas Mitchell Drive.

Of the 7 submissions from special interest groups and the general community, only the CFMEU supported the proposal. This support was based primarily on the improved air quality through the reduction of overburden re-handling and a reduction in the visual and noise impacts on receivers to the east of the mine through the screening effects of the proposed landform.

The remaining submissions objected to the potential dust, visual, noise and water impacts of the proposal. Many were also concerned with the expansion of activities on the Hunter River alluvial floodplain, and the impact this may have on water resources and prime agriculture land.

A full copy of the submissions is attached in **Appendix D**. These issues have been considered in Section 5 below. Bengalla provided a formal response to the issues raised in submissions in February 2011 (see **Appendix E**).

5 ASSESSMENT

The Department has carried out a detailed assessment of the merits of the proposal. During this assessment it has considered the:

- EA, submissions, response to submissions and an additional agricultural assessment provided in May 2011 (see **Appendix G**);
- existing development consent for the open cut mining operations at Bengalla, as modified;
- relevant sections of the development's original environmental impact statement and statements of environmental effects and EAs for subsequent modifications of the consent;
- relevant environmental planning instruments, policies and guidelines; and
- relevant provisions of the EP&A Act, including the objects of the Act.

The Department considers the key issues for assessment are land use conflicts, air quality, noise and water resources. The assessment of these and other issues associated with the proposal is summarised below.

5.1. *Agricultural Productivity*

The proposal would impact agricultural productivity of land in two areas: 23 ha of land to the west of the existing disturbance boundary (Western OEA) and 20 ha in the southeast (Southern Extension OEA) (refer to **Figure 2**).

The EA included a soil and land capability assessment, undertaken by GSS Environmental, which assessed the current agricultural suitability of land to be impacted by the proposal. The land in the area covered by the Western OEA was assessed as Class 3 agricultural land, defined as moderately productive land (see **Figure 4**). The Western OEA would be temporary and only utilised as a last resort in order to reduce the area of disturbance and the associated costs of rehandling overburden waste. Overburden emplaced in the Western OEA would be used for future rehabilitation at Bengalla, while the footprint would be topsoiled and rehabilitated consistent with other rehabilitation objectives at Bengalla.

The agricultural suitability assessment of the land in the area of the Southern OEA included 9.6 ha of Class 1 agricultural land, defined as highly productive land (refer to **Figure 4** and **Table 4**). However, DPI's agricultural suitability classification is based solely on soil and topography, and does not account for other factors relevant to potential agricultural productivity of an area. The 9.6 ha of Class 1 land in the Southern OEA is isolated from other agricultural areas by currently approved mining operations to the north, east and west. The area is also dissected by 1.1 ha of Class 4 land. The closest associated Class 1 land is to the south of the Muswellbrook to Ulan Rail Line, which also acts as a physical barrier (refer to **Figure 5**).

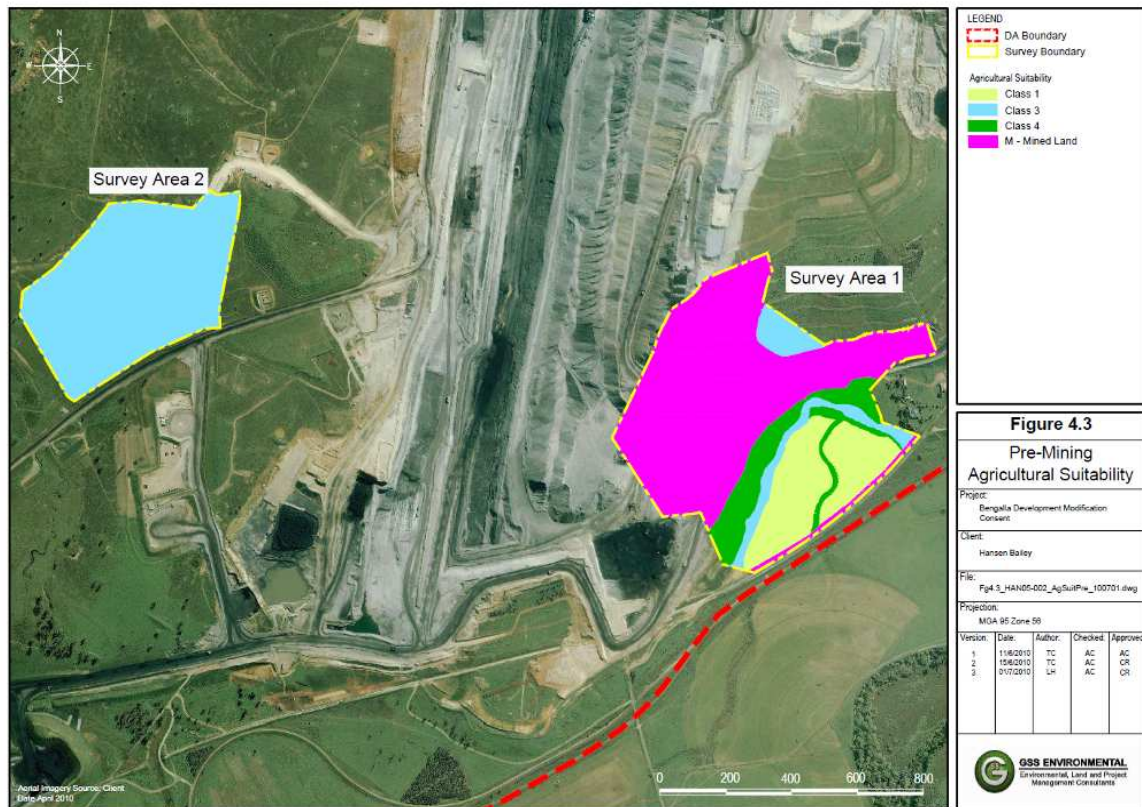


Figure 4: Pre-mining land suitability

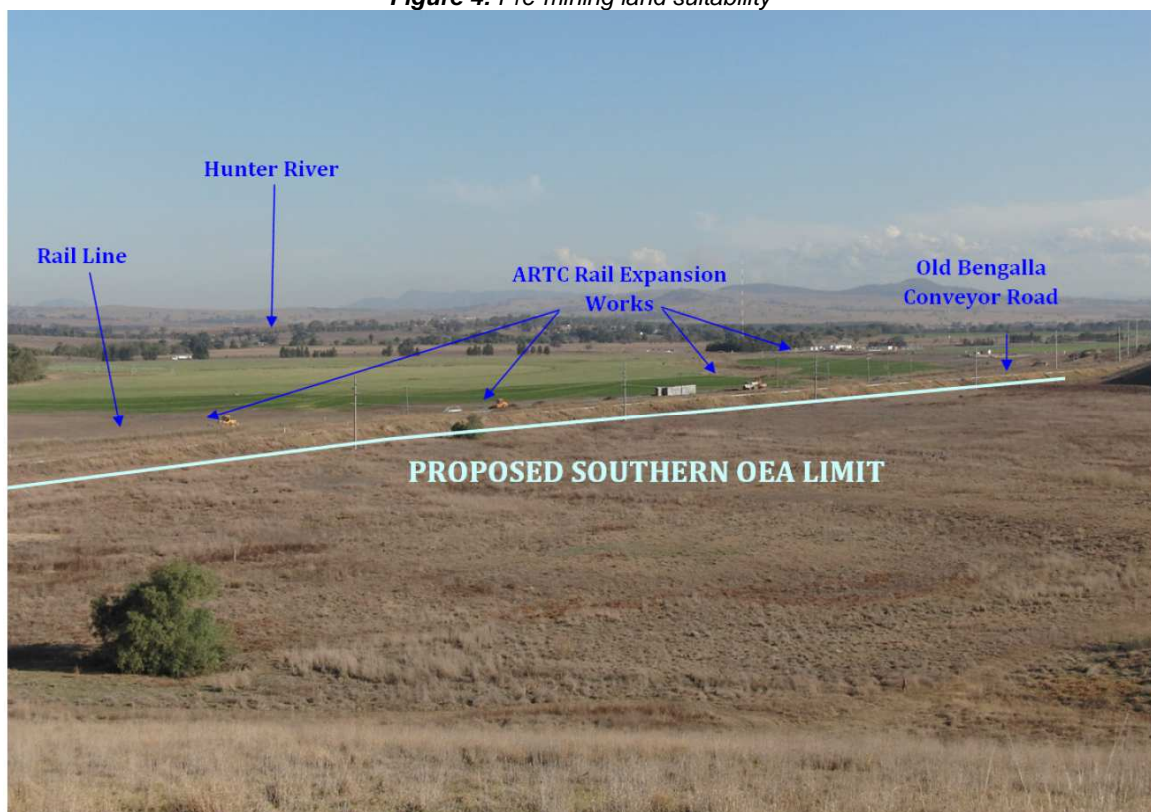


Figure 5: Photo of the Class 1 agricultural land to be impacted by the proposal

The impact of the modification on land suitability class is shown in **Figure 6** and **Table 4**. The assessment indicates that the Southern OEA could be rehabilitated to Class 3 agricultural land, which would be consistent with the proposed future land use of the surrounding areas once rehabilitated.

Table 4: Land suitability assessment – results for the Southern OEA

| Land Suitability Class | Pre-mining Composition | | Proposed Post-mining Composition | | |
|------------------------|------------------------|-------------|----------------------------------|------------|-------------|
| | % | Ha | Associated Landform | % | Ha |
| 1 | 18.4 | 9.6 | - | Nil | Nil |
| 2 | Nil | Nil | Flat gently inclined | 12.8 | 6.7 |
| 3 | 8.2 | 4.3 | Slopes of 10-18% | 85.5 | 44.7 |
| 4 | 12 | 6.3 | - | Nil | Nil |
| 5 | Nil | Nil | - | Nil | Nil |
| Mined Land | 61.4 | 32.1 | Existing roadway | 1.7 | 0.9 |
| Total | 100 | 52.3 | | 100 | 52.3 |

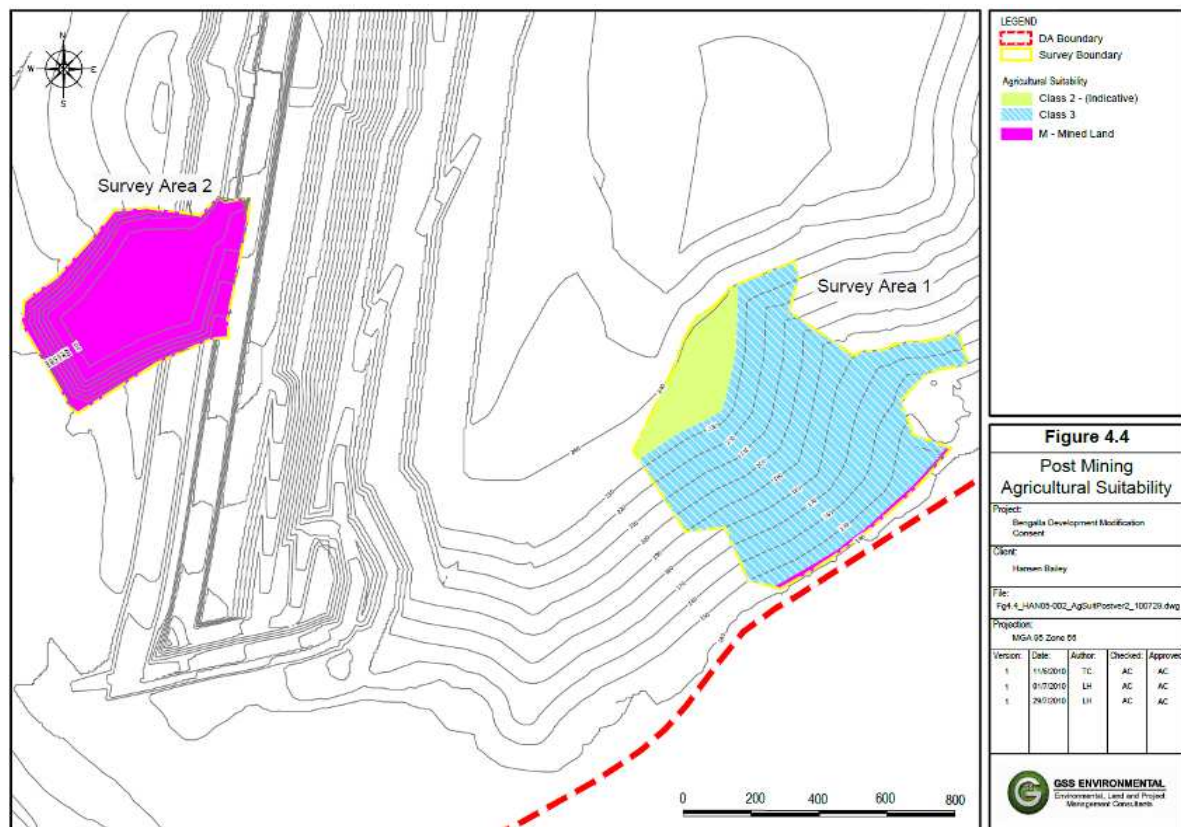


Figure 6: Post-mining land suitability

In the EA, Bengalla proposed to rehabilitate an area of land at the top of the Southern OEA to Class 2 agricultural land following the completion of mining operations. However, in submission the DPI raised concerns with this proposal on the basis that land in this location would potentially experience higher plant moisture stress due to increased exposure, increased sub surface soil drainage, greater rainfall run off and lack of irrigation options.

In response to concerns over the proposed loss of Class 1 agricultural land, Bengalla engaged Scott Barnett & Associates to undertake an agricultural productivity assessment (APA) of the land (see **Appendix G**). The APA assessed the agricultural production value of the land under three existing and proposed land use options (refer to **Table 5**). The assessment concluded that the rate of return for high value production (such as vegetable farming), over a 21 year period, was not enough to warrant the capital investment required for the establishment of irrigation infrastructure and securing water entitlements. It also noted that no other similar enterprises occurred within the immediate vicinity for the operation to leverage reduced transport and marketing costs.

Table 5: Summary of Agricultural Productivity Assessment

| Scenario | Land Use | Capital Cost | Gross Production Value | Margin after Costs | Real Cash position at 21 yrs |
|--|--|--------------|------------------------|--------------------|------------------------------|
| Class 1 land not disturbed | Vegetable farming on Class 1, beef grazing on other land | \$1 093 910 | \$510 142 per year | \$72 669 | \$432,139 |
| | Irrigated grazing and fodder cops on Class 1, beef grazing on other land | \$557 468 | \$57 233 per year | \$13 862 | -\$66,363 |
| Class 1 land is disturbed and rehabilitated to Class 3 | Extensive beef grazing | \$0 | \$61 634 per year | \$14 967 | \$314,307 |

Bengalla also engaged Gillespie Economics to assess the economic trade-off between the cost of double-handling overburden (as an alternative to the proposed modification) against the loss of prime agricultural land (**Appendix H**). The assessment calculated that the cost of a contractor to rehandle the overburden in 2013 would be \$40 million. In comparison, the loss in production value resulting from downgrading the land's suitability from Class 1 (high production farming) to Class 3 (beef grazing) would be \$68 000 per year. The assessment therefore concluded that the economic benefit of using the prime agricultural land for overburden dumping is more economically efficient than protecting the land for future cropping.

In order to mitigate the impact to the agricultural capacity of the land, Bengalla has committed to develop procedures in consultation with DPI to undertake selective soil stripping, including separate storage of high value Black Vertosol Soils and to ensure that stripped topsoils would be beneficially used in rehabilitation activities. In addition, Bengalla has proposed to commit \$1 million over four years to engage consultants (HHM Project) to undertake a research program, in particular to improve agricultural outcomes on mining lands and adjoining agricultural lands (**Appendix I**), the outcomes of which would aim to benefit the local agricultural industry.

Given the difficulties associated with the existing Class 1 land in the area of the proposed Southern OEA extension being used for high production farming in the foreseeable future, and the financial and environmental benefits of avoiding double handling of the overburden, the Department is satisfied that impacts to agricultural productivity in the region would not be significant and could be adequately mitigated.

In this regard, the Department has recommended conditions requiring Bengalla to:

- prepare and implement a research program, in consultation with DPI, OEH, CMA and NOW, directed at improving agricultural productivity of land within the local region;
- rehabilitate the mine in consultation with Council and to the satisfaction of DRE. The Department has recommended that rehabilitation must comply with several rehabilitation objectives including the establishment of extensive areas of Class 3 agricultural land; and
- prepare and implement a revised Rehabilitation Management Plan, which would include detail on various measures to be implemented over the next three years such as progressive rehabilitation and conserving and reuse of topsoils.

5.2. Noise

The modification would not result in an increase in noise sources nor change the basic operations or equipment used at Bengalla. However it would affect noise emissions from the mine through changes in the operational locations of particular mobile equipment.

Noise levels from Bengalla experienced in occupied areas east of the mine are expected to decrease due to mining operations moving further to the west, in addition to the increase in the size of the existing OEA which would provide more effective acoustic shielding. The modification would however, result in a relative concentration of dumping activity towards the southern end of the existing OEA, resulting in higher levels of noise at properties located to the southeast of the mine.

The EA included a noise impact assessment (NIA) undertaken by Bridges Acoustics in accordance with the *NSW Industrial Noise Policy (INP)*. The results found that 15 receivers would experience exceedances of the INP's intrusive noise criteria as a result of operations at Bengalla and also those of surrounding operations. Of those 15 receivers, only two were also predicted to experience exceedances to the existing consent criteria (see **Table 6**). Some receivers around Racecourse Road were predicted to experience noise levels above the existing consent criteria, however these levels were still below the INP intrusive criteria (refer to **Figure 7**).

Table 6: NIA modelling results

| Residence/Property | INP Project Specific Intrusive (D/E/N) | Existing Consent Criteria (D/E/N) | Modeling Results | | Exceedance of INP Criteria | |
|------------------------|--|-----------------------------------|------------------|-----------|----------------------------|----------|
| | | | Day/Evening | Night | Day/Evening | Night |
| 3 Almond | 38 / 37 / 36 | 35/35/37 | 36 | 36 | | |
| 4 Englebrecht | | 35/35/37 | 36 | 36 | | |
| 5 Barnett | | 35/35/38 | 37 | 36 | | |
| 6 McGoldrick | | 35/35/38 | 37 | 36 | | |
| 9 Englebrecht | | 35/35/39 | 38 | 38 | Minor | Minor |
| 11 Drake (residence) | | 35/35/37 | 33 | 37 | | Minor |
| 13 Scriven (residence) | | 35/35/37 | 32 | 37 | | Minor |
| 22 Sweeney | | 35/35/37 | 36 | 36 | | |
| 23 Dobie | | 35/35/37 | 36 | 36 | | |
| 24 Robinson | | 35/35/37 | 36 | 36 | | |
| 25 Smith | | 35/35/37 | 36 | 36 | | |
| 26 Barby | | 35/35/37 | 36 | 36 | | |
| 68 Jabetin | | 35/35/37 | 37 | 36 | | |
| 90 Webber (25% area) | | 35/35/35 | 38 | 40 | Minor | Moderate |
| 38 Hamilton | 35/35/35 | 38/38/37 | 36 | 35 | Minor | |
| 40 Ellis | | 38/38/37 | 37 | 36 | Minor | Minor |
| 44 Lane | | 38/38/38 | 36 | 36 | Minor | Minor |
| 45 Roots | | 35/35/37 | <30 | 36 | | Minor |
| 47 Rankin | | 35/35/40 | <30 | 39 | | Moderate |
| 50 Zahra | | 35/35/38 | <30 | 38 | | Moderate |
| 69 Latham | | 35/35/37 | <30 | 36 | | Minor |
| 72 Halloran | | 35/35/36 | <30 | 36 | | Minor |
| 73 Zahra | | 35/35/36 | <30 | 36 | | Minor |
| 80 Rankin | | 35/35/38 | <30 | 38 | | Moderate |
| 81 Rankin | | 35/35/37 | <30 | 37 | | Minor |

Note:

- Modelling results in **bold** represent an exceedance of the existing consent criteria
- Receivers marked in **red** represent exceedances of both the existing consent criteria and the INP Intrusive Criteria.

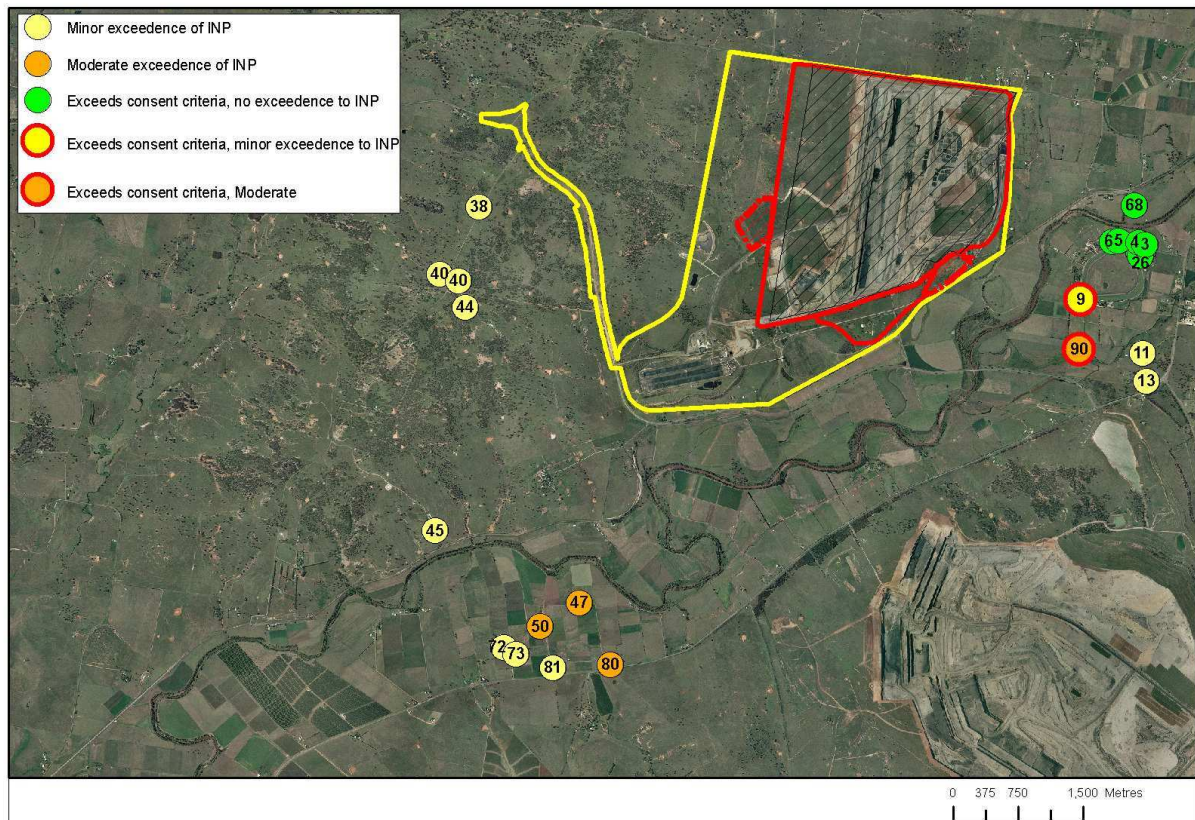


Figure 7: Results of the Noise Impact Assessment

The Department received one submission from a resident to the west of the mine concerned about potential increases to noise as a result of the modification. While the residence was predicted to experience a minor (1 dB) exceedance of the INP intrusive criteria, the noise levels predicted remain below permitted in the existing consent. An exceedance of INP intrusive criteria by 1 or 2 decibels is considered minor as such a small increase in noise levels is not able to be differentiated by most people.

Given that the proposed modification would only potentially affect noise levels for up to two years, and would not result in significant noise impacts on any property not already impacted under the existing consent, the Department is satisfied that noise impacts as a result of the modification could be managed under contemporary noise mitigation measures. Consequently, the Department has reviewed the noise management conditions in the consent to ensure they are in line with current best practice. In addition, the Department has recommended a condition of approval ensuring that those residences where noise levels are predicted to exceed the intrusive criteria by 3 or more decibels would be entitled to additional noise mitigation measures, at the request of the landowner.

5.3. Air Quality

The EA includes a specialist air quality impact assessment undertaken by PAE Holmes Pty Ltd. With regard to dust, the assessment includes consideration of project-specific increases caused by the modified development, and the total cumulative emissions generated by Bengalla, neighbouring mines and other existing background sources. The assessment includes consideration of total suspended particulates (TSP), fine particulate matter (PM₁₀) and dust deposition, with reference to relevant 24-hour, monthly and annual air quality goals.

The air quality assessment is also based on the adoption of a number of mitigation measures by Bengalla, including:

- watering of haul roads;
- automated mist sprays on coal stockpiles;
- the use of dust curtains and sprays on drills; and
- enclosure of the processing facility.

The modification would result in two changes to the air quality environment at Bengalla. The first would occur from Years 1 to 6, during which time overburden emplacement activities would occur in both proposed OEAs. During this time, dust emissions would increase due to longer haul distances and an increase in exposed areas, with Year 1 having the largest impact. The second change would occur in later years (modelled as Year 7) when only the proposed Western OEA would be in use. Dust emissions would be reduced due to a reduction in haul distances.

While the results show that no exceedance of the Department's air quality acquisition criteria would occur as a result of the proposed development alone, conservative estimates predict some minor and infrequent (<5 times a year) exceedances of the 24 hour PM₁₀ criteria would occur at 4 privately-owned properties directly southeast of the mine, around Racecourse Road (refer to **Table 7** and **Figure 8**). Three of these receivers are currently eligible for acquisition rights under the Mount Arthur Coal approval. Nevertheless, given the contribution that Bengalla will have on air quality at these residences, the Department has recommended a condition of consent requiring Bengalla to implement reasonable dust mitigation measures (such as a first flush roof system, internal or external air filters, and/or air conditioning) at the request of these landowners, given they have not received any mitigation measures under the existing Mount Arthur Coal project approval.

Table 7: Summary of Air Quality Impacts as a Result of the Modified Development Only

| Receiver No. | Receiver | Modelling Year | PM ₁₀ | | | TSP |
|--------------|-------------|----------------|--|---|-------------------|--|
| | | | Annual ($\mu\text{g}/\text{m}^3$) | 24 hour ($\mu\text{g}/\text{m}^3$) | Times per year | Annual ($\mu\text{g}/\text{m}^3$) |
| | | | NA | 50 | 5 | 2 |
| 5* | Barnett | Year 1 | 11 | 53 | 1 | 1.5 |
| 6* | McGoldrick | Year 1 | 11 | 54 | 1 | 1.6 |
| 9* | Englebrecht | Year 1 | 13 | 55 | 2 | 2.1 |
| 68 | Jabetin | Year 1 | 9 | 51 | 1 | 1.3 |

*Residences with existing acquisition rights under the existing Mount Arthur Coal mining approval.

The air quality assessment included a cumulative assessment of dust generated by the proposed development in addition to contributions from other existing mining projects (Mount Arthur, Drayton, Mangoola and Muswellbrook), the future Mount Pleasant Mine and other small local sources. Estimates of dust emissions from the Mount Pleasant project were estimated using the 1997 EIS. Mining operations at Mount Pleasant are not expected to commence until 2014, and therefore its predicted emissions were only considered for Bengalla Year 7 scenario, when dust emissions are

expected to be reduced as a consequence of the modification. A summary of the dust impacts as a result of the proposal, together with all other sources, is presented in **Table 8**.

The air quality assessment indicated that exceedances of the annual average cumulative PM₁₀ air quality criteria as a result of the proposal and other sources (such as the recently approved Mount Arthur Coal project), would occur at 6 privately-owned residences (refer to **Table 8** and **Figure 8**). These exceedances are primarily the cause of dust emissions generated by the Mount Arthur Coal project, and all affected properties have existing acquisition rights under that approval (MP 09_0062). The Department is satisfied that Bengalla's contribution to these exceedances is small, and that impacts can be effectively managed under the Mount Arthur Coal project approval.

Consequently, the Department is satisfied that the Air Quality Impacts as a result of the modification would be minimal, and can be satisfactorily managed under the revised conditions of consent.

Table 8: Summary of Cumulative Air Quality Impacts (exceedances only)

| Receiver No. | Receiver | Modelling Year | PM ₁₀ |
|--------------|-------------|----------------|-------------------------------|
| | | | Annual (µg/ m ³) |
| | | | 30 |
| 9* | Englebrecht | 2011 | 32 |
| 47* | Rankin | 2017 | 35 |
| 50* | Zahra | 2017 | 32 |
| 73* | Zahra | 2017 | 31 |
| 80* | Rankin | 2017 | 34 |
| 81* | Rankin | 2017 | 32 |

*Residences with existing acquisition rights under the existing Mount Arthur Coal mining approval.

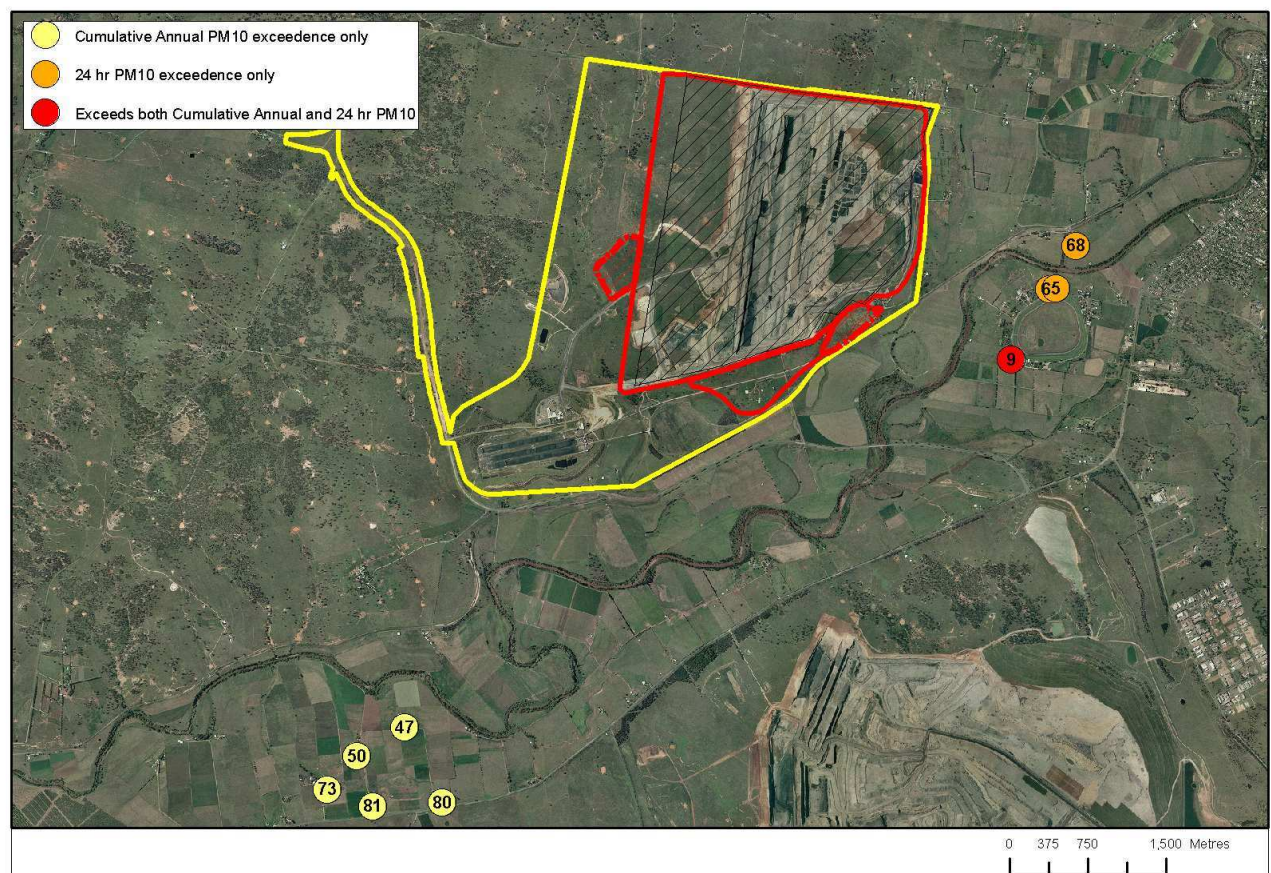


Figure 8: Results of the Air Quality Impact Assessment

5.4. Other Issues

The Department's assessment of other environmental impacts and issues is summarised in Table 9 below.

Table 9: Other Issues

| Issue | Assessment | Recommendation |
|-----------------|--|---|
| Surface Water | <ul style="list-style-type: none"> The disturbed catchment area would increase by 48 ha but the annual water deficit would be reduced by 75ML in an average rainfall year. Increased stormwater runoff from the OEAs would be captured in sediment control dams, then transferred to the Mine's Water Management System or released off-site (depending on water quality). Loss of floodplain storage resulting from the extension of the Southern OEA would be 8 ML. Over the 1.2 km reach of the Hunter River adjacent to the OEA, this would equate to a 0.3% loss. Floodwaters only enter the area through the road and rail embankment culverts aligned perpendicular to the direction of the Hunter River flow, resulting in backwater storage only. These existing embankments are a much greater restriction to flood flow than the OEA extension. To limit future drainage and potential floodwaters entering the area of the proposed Southern OEA, an existing floodway on the floodplain would be diverted by constructing a diversion channel south of the existing development boundary (refer to Figure 9). The design would be developed in consultation with NOW, and would: <ul style="list-style-type: none"> consider ARTC works and assets and existing agricultural activities; match channel capacity to current flows; and ensure flows are at a non-erosive velocity; In its submission, Council recommended that a flood impact study be undertaken for the Rosebrook Creek Catchment. Bengalla has confirmed that Rosebrook Creek flows into the Hunter River approximately 1.5 km upstream from the project. Given that the modification would have no measurable impact on floodwater storage or flows, the Department considers that a flood impact study is not warranted. | <ul style="list-style-type: none"> Ensure that any water released from the site is done in accordance with EPL limits and relevant provisions of the POEO Act and the Hunter River Salinity Trading Scheme. Ensure that detailed plans are submitted to the Department and to NOW prior to commissioning works for the modified drainage channel. |
| Groundwater | <ul style="list-style-type: none"> Recharge of the alluvial aquifer is more dependent on the Hunter River than on rainfall. Leachate migration to the alluvial aquifer generated by rainfall seepage through the spoil is predicted to be 6.2 ML/year. The chemistry of the leachate would be pH neutral to moderately alkaline, contain low levels of sodium, chloride and sulphate, and contain low salinity, all of which would decrease over time. The seepage of leachate through the spoil would result in two potential impacts: <ul style="list-style-type: none"> groundwater would pool above the alluvial clay and below the spoil, causing a reversal of the existing groundwater flow gradient (towards the pit) back towards the Hunter River, as existed prior to mining activities; and an improvement in groundwater quality given the high natural salinity of the alluvial aquifer as opposed to the leachate. In response to concerns raised by NOW on the potential of the Southern OEA to cause aquifer compaction, resulting in sterilisation of the alluvial water for productive use, Bengalla engaged Golders & Associates Pty Ltd, to conduct a hydrological assessment (refer to Appendix E). The report determined that the reduction in permeability would be 15-20%, which would still ensure highly permeable material suitable for use as a water supply aquifer. To reduce seepage, Bengalla has committed to seal the alluvial clays prior to laying spoil. Two additional groundwater monitoring bores in the vicinity of the Southern OEA would be incorporated into the groundwater monitoring program. | <ul style="list-style-type: none"> Ensure that the alluvial aquifer is protected through sealing of the natural surface; diversion and capture of runoff and lateral seepage; progressive rehabilitation; and monitoring of salinity levels and implementing appropriate response mechanisms. |
| Flora and Fauna | <ul style="list-style-type: none"> 22 ha of modified, low-diversity derived native grassland in the Western OEA, and 9 ha of exotic pasture dominated grassland in the Southern OEA, would be cleared. No Endangered Ecological Community (EEC) or threatened flora species listed on either the <i>Threatened Species Act 1995</i> (TSC Act) or the <i>Environmental Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) have been | <ul style="list-style-type: none"> No further action required. |

| | | |
|-------------------------|--|---|
| | <p>recorded in the modification area.</p> <ul style="list-style-type: none"> • Due to the lack of nearby wooded areas, it is highly unlikely that the grassland habitat would be used for foraging by any fauna species listed under the TSC Act. • In their submissions, OEH and the CMA raised concerns regarding difficulty in identifying particular species at the time of year when flora surveys were completed. Bengalla undertook additional targeted field surveys in October 2010, which also recorded no evidence of these species. • The CMA also raised concerns regarding the potential occurrence of a derived grassland under the EPBC Act. In response, Bengalla confirmed that a native groundcover assessment was undertaken as part of the ecological impact assessment, with results indicating less than 50% native vegetation with no additional habitat features such as log hollows. In addition, the area was considered to contain a highly modified soil profile, and as a result contained low species diversity with only very hardy native grasses and few herbs. The assessment concluded that EPBC criteria for a derived grassland was not met due to a lack of native herbs. | |
| Aboriginal Heritage | <ul style="list-style-type: none"> • The EA reviewed the 1992 Aboriginal Heritage Assessment (AHA) completed as part of the original Environmental Impact Assessment for the Bengalla mine. No Aboriginal heritage items were identified within the proposed 21 year disturbance boundary extensions areas. • In its initial submission, OEH raised concerns regarding the currency of this assessment. In response, Bengalla supplied further cultural heritage documentation relating to the assessment. In its final submission, OEH raised no further concerns and recommended conditions of approval relating to management of Aboriginal heritage. | <ul style="list-style-type: none"> • Update existing conditions to reflect contemporary criteria. |
| Non-Indigenous Heritage | <ul style="list-style-type: none"> • Two heritage buildings are located in the near vicinity of Bengalla Mine - Bengalla Homestead and Overdene Homestead. Edinglassie homestead is at a greater distance. • The Southern OEA would extend to a distance of 50 m from the Bengalla Homestead fence line. Existing impacts to the visual integrity of the homestead would not be significantly increased by the modification, given the level of impact associated with existing approved mining operations and the Muswellbrook to Ulan Rail Line. Bengalla has committed to planting a row of screening trees, complementary to existing gardens, between the Homestead and the Southern OEA. • Minor dust and vibration impacts at the Homestead may result from increased traffic. However, these impacts would be adequately managed under the existing Bengalla <i>European Heritage Management Plan</i>, which includes ongoing monitoring of dust build up and structural integrity. • Bengalla has committed to designing and implementing water management structures to divert runoff away from the Homestead and manage any potential risk of flooding via runoff resulting from the increased catchment area and steep slopes of the Southern OEA. • In its submission, the Heritage Branch considered that the potential impacts could be adequately managed through the EA's Statement of Commitments and recommended that no additional mitigation was required. | <ul style="list-style-type: none"> • Update existing conditions to reflect contemporary criteria. |
| Visual & Lighting | <ul style="list-style-type: none"> • Visual impacts as a result of the modification would be low due to relatively minor changes in terms of scale and bulk, in addition to the similar nature of the Southern OEA extension to approved activities. The impacts from the Western OEA are also limited due to the lack of external viewing locations. • Lighting impacts resulting from the modification would be similar to the existing environment. • Bengalla has committed to expeditious completion and rehabilitation of the Southern OEA extension, with priority given to the outer faces, to mitigate the impact of the modification to potentially sensitive receivers in the South. | <ul style="list-style-type: none"> • No change to existing conditions. |
| Community Enhancement | <ul style="list-style-type: none"> • A voluntary planning agreement with Council under sections 93F of the EP&A Act would replace existing contributions under section 94 and provide funding for road maintenance. | <ul style="list-style-type: none"> • Ensure that a voluntary planning agreement with Council is completed. |

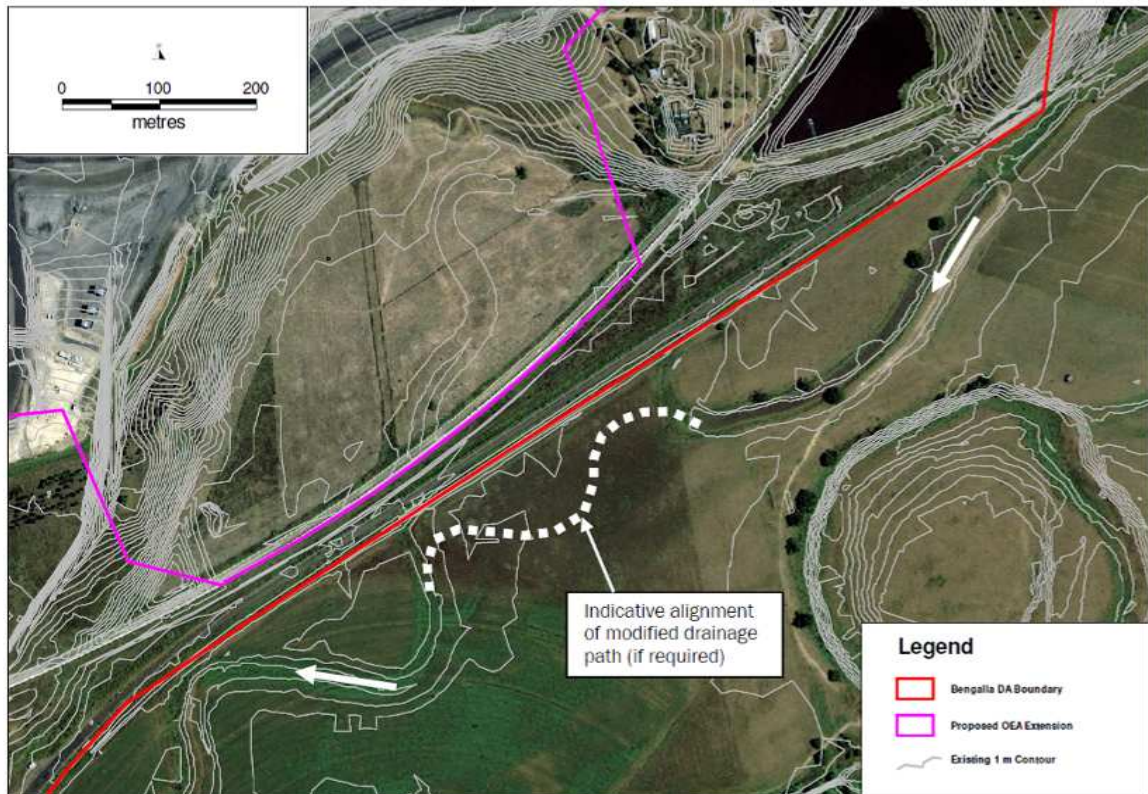


Figure 9: Indicative alignment of the modified drainage path

6 RECOMMENDED CONDITIONS

The Department has prepared recommended conditions of approval for the proposed modifications (see Appendix A). These conditions are required to:

- prevent, minimise, and/or offset adverse impacts of the development;
- set standards and performance measures for acceptable environmental performance;
- ensure regular monitoring and reporting; and
- provide for the ongoing environmental management of the development.

The proposed conditions replace all existing conditions for the Bengalla Coal Mine, in order to fully update the regulatory framework for the mine. The Department believes the conditions reflect current best practice for the regulation of open cut coal mines in NSW.

Bengalla has reviewed and accepted the recommended conditions.

Following a review of the recommended conditions of consent, including the proposed planning agreement (**Appendix F**) and land use objectives, Council is satisfied that its concerns have been adequately addressed.

7 CONCLUSION

The Department has assessed the modification application in accordance with the relevant requirements of the EP&A Act. Based on this assessment, the Department is satisfied that:


- the proposal is consistent with the provisions of the relevant planning instruments;
- the potential environmental impacts are not significant and can be adequately minimised, mitigated and/or managed;
- the site is suitable for the development; and
- the proposed modification can be carried out in a manner that is consistent with the objects of the EP&A Act, including the principles of ecologically sustainable development.

The Department therefore believes that the proposed modifications are in the public interest and should be approved, subject to conditions.

8 RECOMMENDATION

It is RECOMMENDED that the Deputy Director-General, Development Assessment and Systems Performance:

- **consider** the findings and recommendations of this report;
- **determine** that the proposed modification is within the scope of section 75W of the EP&A Act;
- **approve** the proposed modifications under section 75W of the EP&A Act; and
- **sign** the attached notice of modification.


Howard Reed
Manager
Mining Projects

30.9.11


Chris Wilson
Executive Director
Major Project Assessment

6.10.11


David Kitto
Director
Mining & Industry Projects


~~Richard Pearson~~
A/ **Deputy Director-General**
Development Assessment and
Systems Performance

07/10/11
Marcus Ray