

Mangoola Coal previously (in 2008) offered additional visual mitigation measures, such as landscaping treatments or vegetation screens, to reduce the visibility of the mine from my property. To date, no such mitigation measure has been carried out by Mangoola Coal on my property. As a result of this unfulfilled commitment, I have little trust in Mangoola Coal honouring any commitment or consent obligation placed upon them by the Department of Planning.

Xstrata Mangoola was required to plant a vegetative screen along the lower sections of Mangoola Road, from Roxburgh Rd to the Rail loop intersection. "This visual screen now forms part of the project approval and is due for completion by July 2010". Xstrata Mangoola has failed to comply with the completion of this project. In fact the planting is a disgrace and the success rate of the trees planted is well below 20%. Xstrata Mangoola has made no effort to maintain the plantings or take measures to ensure their success or to replant where necessary. Compared to other mining operations in the area who keep their visual screenings slashed, sprayed and well irrigated to enable fast progression of the growth period thus ensuring an effective vegetative screen quite rapidly, Xstrata Mangoola have shown complete contempt for this condition of Project Approval.

We have also had consultation at community meetings as to the viability of planting a vegetative screen on the southern side of the acoustic barrier. To date no follow up action or consultation has resulted. The acoustic barrier is extensive and certainly detracts from the existing environment, primarily flat alluvial river flats.

Response

Mangoola Coal is committed to the implementation of the visual impact mitigation and management measures specified in the EA. The following provides a list of mitigation and management measures and progress with respect to implementation.

1. Within the infrastructure areas use low height lighting (approximately 15-20 metre high light columns) and low brightness floodlights with the floodlight body horizontal and the floodlight reflector designed to provide sharp cut-off and restrict stray light - implemented on site; 2 complaints regarding fixed lighting have been received and investigated in accordance with the Mangoola Coal Complaints Management Procedure. Lighting issues are still being resolved; Mangoola Coal are in the process of contracting a lighting expert to assist in the resolution of this issue;
2. Clad the whole of the north, east and south sides of the workshop and Coal Preparation Plant (CPP) where practical and eliminate translucent panels from the roof, the north, south and eastern sides of the building if they are visible from rural residential areas to the north, south and east - implemented where practical with some translucent sheeting being installed on the sides of CPP to reduce outdoor lighting requirements with flood lighting; no complaints received;
3. Use wall mounted lights with horizontal bodies and low brightness design to light areas around the workshop and CPP to approximately 50 lux and adjacent portions of the hard stand area to approximately 10 lux - lux survey to be conducted following completion of site commissioning/construction (estimated mid 2011);
4. Shield all floodlights in the Open Cut Area to the maximum extent practicable and where safe to do so – implemented;
5. Face workshop doors south, south west to reduce light spill - the workshop is well lit and doors are closed at night time;

6. Where safe to do so, trucks on access roads would make use of portable visual edge markers to increase drivers' visibility of road edges when driving with dipped headlamps – the road is not visible from outside the project disturbance boundary therefore this has not been implemented;
7. Work programmes should be arranged so that work can be carried out on surfaces of the Overburden Emplacement Area (OEA) visible from outside the lease area only during daytime hours as defined by the EPA or only at lower levels of the emplacement at night – procedure implemented; and
8. Restriction of certain operations to daylight hours or only at lower levels at night on the OEA to significantly reduce potential direct lighting effects from random elements such as truck headlights and flashing beacons moving on the OEAs and haul roads at night. This would maintain the night time ambience for rural residential properties north, east and south of the OEAs – procedure implemented.

Further to this, it was recommended that Mangoola Coal implements the following additional visual and lighting mitigation measures as detailed in the Hanson Bailey report (2008):

- The major infrastructure buildings are painted with a blend of olive green and grey green to blend with the pastoral environment – recommendation implemented;
- Workshop access doors are kept closed at night where safe and practical to do so – procedure implemented;
- Interior surfaces of infrastructure that could reflect during night time hours (workshop) are finished in a colour at the bottom range of reflectance's as recommended in AS1680 – 'Interior Lighting Code' - the workshop is well lit and doors are close at night time therefore this recommendation has not been implemented; and
- Where amelioration is found to reduce predicted high to moderate lighting or visual impacts at the following residences, additional tree planting close to the residence or the installation of blackout window blinds (where rooms are orientated towards the mine), or other amelioration, as agreed between Mangoola Coal and the residence owner will be implemented:
 - 8 private residences remain within the acquisition contours: 25**, 34**, 56, 76, 81, 83, 91, and 121; and
 - 33 private residences outside the acquisition contours: 45B**, 104, 110, 111, 124, 125A, 125B, 125C, 130, 134A, 134B, 134C, 148, 162, 174A, 174B, 175, 180, 182, 183A, 183B, 183C, 191, 192, 193, 200, 227, 240, 241A, 241B, 241C, 269B and 294.

*** These residences are currently in negotiation for purchase with Mangoola Coal. If they are purchased prior to Mangoola Coal notifying residences in accordance with PA Condition 54 (see below) then the mitigation measures proposed in this report shall not apply to these residences.*

This has been requested by two residents following a mail out offering amelioration measures.

The EA also states that the following measures will be implemented to reduce the overall visual impacts of the proposed mine plan modifications, the overburden emplacement areas and the infrastructural elements from various viewpoints:

- planting of a vegetative screen along the ridge between Limb of Addy Hill and Bellevue Homestead – to be completed mid 2011.

- maintaining as much remnant vegetation as possible along the south-east edge of the plateau facing VP3, 4 and 5 - implemented; and
- shielding lighting with hoods and louvers where possible, to reduce sky glow. Further, the use of low brightness lights in the infrastructure area with horizontal floodlight bodies and sharp cut off angles could also reduce stray light - implemented.

In accordance with Condition 54 of the Mangoola Coal Mine Project Approval, Mangoola Coal will advise these residences they are entitled to the additional mitigation measures to reduce the visibility of the mine from their properties. In addition, Condition 55 states:

'Upon receiving a written request from an owner of a residence identified in this report, the Proponent shall implement additional visual impact mitigation measures (such as landscaping treatments or vegetation screens) in consultation with the landowner, and to the satisfaction of the Director- General.

These mitigation measures must be reasonable and feasible.

If within 3 months of receiving this request from the owner, the Proponent and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.

Note: The additional visual impact mitigation measures must be aimed at reducing the visibility of the mine from significantly affected residences and do not necessarily require measures to reduce visibility of the mine from other locations on the affected properties. The additional visual impact mitigation measures do not necessarily have to include measures on the affected property itself (i.e. the additional measures may consist of measures outside the affected property boundary that provide an effective reduction in visual impacts).'

Submission

There is no data available on any increased lighting needed for the rail refuelling facility. It is difficult to determine the exact visual impacts the facility will have on our residence without further consultation with Xstrata.

Response

Lighting at the refuelling facility will be managed in accordance with the requirements outlined for operational lighting at the site *Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*.

Submission

In relation to Appendix B3 – Visual Assessment – 3.14 Individual Residences, we are concerned that our residence is not listed in Table 1, especially as we are in Schedule 5 with Acquisition rights.

Response

This residence has acquisition rights in accordance with current Project Approval and this will not change as a result of the proposed modification.

Submission

In reference to Appendix C5 – 3.1. – Visual Impact Assessment. “Sensitivity levels are a measure of people’s concern for the scenic quality of an existing environment.” Due to the highly objective nature of one’s perception of visual impacts we feel that the EA has not addressed the value we put on the area impacted by this assessment, not only from our property but indeed it is changing the landscape as we know it.

Response

The variability in people’s perception of visual impacts is a difficult issue from an assessment perspective. For this reason, it is common practice for visual impact assessment to use objective ranking of scenic quality considerations. This does not mean that people’s perception of the impact may not vary from person to person, but does provide an objective basis on which DP&I can consider the visual impacts.

Submission

The increase in the height of the emplacement area for overburden is too high. The emplacement plan now shows that areas of high scenic and cultural values will now be totally lost; Anvil Hill will be totally obscured and little will be left to be seen of Wallaby Rocks. The mine plan must be changed to reduce the overburden height and fill all voids.

Increased height of overburden dump to RL240 (was 210m max) will conceal Anvil Hill permanently from view.

Response

Section 3.3 of this Response to Submissions provides a response to the issue of overburden heights and visual impacts.

Submission

Optical pollution is destroying bush scenery.

Response

The proposed modifications to the approved project disturbance are relatively minor, with the major change with respect to perceived visual impacts resulting from an increase in overburden height. There will be a minor increase in overburden height, with the final landform of the project area containing artificial landforms at a greater elevation than previously proposed, the conceptual final landform for the proposed modifications has been designed to maintain consistency with the local area and will predominantly consist of an undulating landform reflecting the dominant features of the existing environment. Although the emplacement area will limit views from some properties close to the site in the north, it will also act as a physical barrier between some residents and the mine site.

Refer to the response to the WAG submission related to impacts on visual amenity in **Section 3.3** of this Response to Submissions report.

7.3.1 Night Lighting**Submission**

Night lighting - told this would not be an issue.

Illuminated night sky - recently noticed the evening sky in the direction of Mangoola Mine glows white at night, reflection from lighting at the mine.

Response

Night lighting was acknowledged in the original EA as an impact. The impacts associated with night lighting and sky glow are impossible to completely ameliorate due to the dark background levels in the vicinity of the Mangoola Coal Mine. Mangoola Coal has committed to a number of mitigation measures to reduce the impacts associated with night lighting, as outlined in response to a previous submission (refer above), to reduce sky glow. The current operational process for limiting lighting impacts involves the training of onsite personnel and undertaking a competency based assessment. Any complaints received for lighting impacts are managed by the shift supervisor, the equipment the subject of the complaint is repositioned and the complainant is then asked to confirm if the issue has been resolved.

Some complaints have been received to date with respect to mobile lighting impacts from night time operations at Mangoola Coal Mine at both residences and from drivers on roads in the project area which are impacted by lighting. Complaints have been investigated and issues addressed through the Mangoola Coal Complaints Management Procedure. Issues have been addressed and resolved.

7.4 Final Void/Landform

Submission

The final void should be filled. There is no good reason for leaving an extremely large and deep hole to fill or not fill with water of unknown quality for future generations. If monitoring of groundwater is required it can be done from a secured well or bores. The fact that Xstrata do not plan to have a final strategy for this area until five years from mine closure and thus without public input is not satisfactory. A condition must be placed on the mine owners at this stage that all voids be filled and any final strategy for closing the mine should be open to public scrutiny, input and thorough approval process. It is the people of the area who are left with the legacy.

Response

Open cut mining methods necessitate a final void due to a shortfall of material to backfill all mined areas:

‘As open cut coal mining typically has low overburden to coal ratios, following mine closure a large void is usually left in the final landform due to the prohibitive costs of earthwork infilling operations in the preparation and approval of mine plans, efforts are made to minimise the size of the void and optimise its utility for ongoing mining-related purposes or its configuration for an alternate post-mining land use.’ (Coal Mining Potential in the Upper Hunter Valley – Strategic Assessment, Dec 2005, DoP, p74).

The feasibility of open cut mining is usually based on a strip ratio. Strip ratio is commonly defined as the cubic metres of overburden (soil and rock) that is required to be removed for every tonne of usable coal recovered. Strip ratios increase dramatically with depth of mining, as mining goes deeper the cost of mining increases exponentially until a cut-off point is reached where it is no longer economical to continue open cut mining. An alternate mining method is then required to extract the coal at depth.

Open cut coal mining methods are usually limited to a strip ratio of around 5:1 (m³ overburden/tonne of coal) which varies according to price/quality of coal and costs of mining. The low cut-off strip ratios applicable to open cut coal mining have the effect of removing a large volume of material from the area mined which creates a deficit of material to backfill all voids created by mining.

Modern open cut coal mining methods employ roll-over mining methods where material extracted from the current mining face (slot) are backfilled into the previous mined slot, so as mining advances the areas behind the mine are backfilled and rehabilitated. This has the effect of creating a final void (slot) with a shortfall of material to fill the void. The mine plan has sought to optimise the size, shape and position of the final void for integration into the post mining land use.

Final voids can have a number of beneficial post mining land uses that are determined as part of the detailed mine closure plan that is developed in consultation with regulators, local landholders and community members five years prior to scheduled mine closure in accordance with the NSW DTIRIS NSW Guidelines to the Mining, Rehabilitation and Environmental Management Process (January 2006)³⁰.

Mangoola Coal Mine Final Void Parameters

As a result of the proposed modification, the final void will be reduced to one pit located at the south-western end of the approved project disturbance area near the area associated with the Main Pit workings (refer Figure 11.10 of the EA). Consistent with the approved project, the final void will be designed to capture groundwater inflow from the Main Pit and South Pit overburden emplacement areas and allow for the evaporation of accumulated water. In order to provide an appropriately sized evaporative surface, the final void will have an area of approximately 130 hectares.

An assessment of the long term void water levels, water quality and required management, is included in Section 12.5.1 of the EA. The final void will become a self contained system that will not overflow or discharge to the surrounding environment.

The final void also has the advantage of collecting seepage/leachate from the overburden emplacement areas where the seepage will be contained and evaporated. NB: The final void design is such that it is not expected to overflow or discharge any water nor will infiltration occur to the Big Flat Creek alluvium.

With respect to developing a final strategy within five years from planned cessation of mining, this is usually stipulated as long-term monitoring may require an adjustment to the final rehabilitation design. As mining progresses and ongoing rehabilitation is undertaken as well as continuing surface and groundwater monitoring a better understanding of the environmental systems and their interaction is gained. NSW DTIRIS requires a conceptual mine closure plan to be developed prior to commencement of mining, the conceptual plan is regularly updated and reported on in the MOP updates and in the AEMR which includes a review of the mine closure securities.

Within five years prior to cessation of mining, NSW DTIRIS requests a detailed Mine Closure Plan to be developed taking into consideration accumulated monitoring results. As part of the process updated specialist studies including rehabilitation methodology, hydrology, groundwater and civil engineering designs for the various landforms are developed. The detailed mine closure plan is then presented to all stakeholders including local communities and regulators for approval. It is not prudent to expect final closure designs prior to commencement of mining. The five year time period also allows sufficient time to modify rehabilitation objectives and methodologies to accommodate an alternate land use if required.

³⁰ In addition, the 'Mine Closure and Completion' Best Practice Handbook, Commonwealth of Australia 2006, states 'The initial mine closure plan may be conceptual from project concept and be steadily developed in detail through to the last five years of the project life'; and, the Australian and New Zealand Mineral and Energy Council 2000, 'Strategic Framework for Mine Closure' indicates that the final mine decommissioning plan should be developed 2-4 years prior to closure.

Project Approval Condition 43 has specific requirements for a final void management plan, to minimise, manage and monitor potential impacts of the final void.

Submission

Unsatisfactory that Xstrata do not plan to have a final strategy until five years from mine closure, and thus without public input. Request a condition requiring final void to be filled, and that any final strategy for closing the mine be open to public scrutiny, input and a thorough approval process.

Response

The preceding response provides a response to this submission relating to final mine closure strategy. It is a misunderstanding that the detailed mine closure plan (final) is not open to public scrutiny. It is a requirement from NSW DTIRIS that all detailed mine closure plans be distributed to relevant stakeholders for comment. XC also has internal standards relating to detailed mine closure plans that state 'Following XCN and XC approval, the Mine Closure Plan will need to be submitted to the DPI-Minerals Division and other relevant stakeholders (as identified from stakeholder analysis and engagement) for approval prior to the cessation of mining operations'.

Submission

There will be a final void and it must be assumed that this will fill with very saline water, eventually overflowing into Wybong Creek.

Response

As discussed in the response above, modelling of the final void indicates that the void would not overflow and all waters will be contained. This issue is addressed in Section 12.5.1 of the EA.

Submission

In 15 years time, the coal will be gone and so will Xstrata. What will become of the site and who will maintain it? What will be the final land uses?

Response

Mangoola Coal will be responsible for the management of the project area post-mining and this will be consistent with that of the approved project. The post-mining land use will include the progressive revegetation and regeneration to self-sustaining endemic vegetation communities consisting of native and naturalised species, which aims to emulate the pre-mining environment, enhance local and regional ecological linkages and provide for a sustainable final land use option. It has been developed with consideration of the inherently low land capability of the existing land (Class VI) across the majority of the approved project disturbance area. The modification areas around the rail loop are proposed to be predominantly rehabilitated to agricultural land with a land capability consistent with that which currently exists.

At closure, a minimum of 5 years post rehabilitation monitoring and water monitoring will be required prior to mining lease relinquishment. There is the potential for the remainder rehabilitation of the remainder, following cessation of mining, which could take up to approximately three years to complete.

The Strategic Framework for Mine Closure (Australian and New Zealand Minerals and Energy Council and Minerals Council of Australia, 2000) states that for the maintenance and monitoring plan aspect of closure 'the last aspect of the Closure Plan is performance monitoring, which should be designed to demonstrate that the completion criteria have been met. This period should also plan for remedial action where monitoring demonstrates completion criteria are unlikely to be met. If progressive rehabilitation has been successful,

with stabilisation and revegetation meeting completion criteria this last phase of closure may be shortened. It is, however, unlikely to be less than five years in duration’.

Mangoola Coal will be responsible for this process.

7.5 Water Resources

7.5.1 Surface Water

Submission

The surface water assessment in the EA modification provides no detail of either the Site Water Balance or Erosion and Sediment Control Plan. Therefore, Mangoola Coal’s mine plan strategy to deal with potential adverse watercourse salt and other contamination outcome remains unclear and concerning. The ‘Erosion and Sediment Control’ and ‘Site Water Balance’ Plan should have been provided for public assessment and scrutiny.

Response

As discussed in Section 3.2 of the Surface Water Assessment completed as part of the EA (refer to Appendix C3 of the EA), the primary difference in the site water balance between the approved plan and the proposed modifications relates to the increased area of saline catchment runoff area, that is the open cut pit areas. All other assumptions and parameters used previously in the approved site water balance (refer to the approved Site Water Management Plan) are preserved for the modification. The current Site Water Management Plan and Erosion and Sediment Control Plan can be accessed on the Xstrata Mangoola website.

Submission

In relation to the following statement, “... it is proposed to use wheel lubrication on the rail loop around the Sandy Creek bend ...”, the EA does not state what the nature of the lubrication will be, fails to recognise the environmental impact of any residues that may contaminate water ways in the event of rain events, or indeed any mitigation measures that may need to be implemented to prevent contamination to nearby waterways and properties.

Response

The exact nature of the lubricant may change over time as different products become available. At this time, Caltex Grease 904 will be utilised for wheel lubrication on the rail loop; it is designed to reduce friction and wear between curved steel rails and railcar wheels. There will be less than 100 litres stored on site at any one time and it will be appropriately contained in accordance with Australian Standards to prevent potential contamination of any waterways within the vicinity of the project area.

Submission

We are concerned that the ‘minor modification’ proposed is considerable. Increasing the capacity of the raw water dam by 900ML seems excessive when it is clearly stated that the annual usage of water decreased by 450ML due to the changed mine plan. Is this modification necessary?

Response

The 450 ML per year reduction is the typical order of magnitude of the reduced water deficit of the proposed modification compared to the approved mine plan, and is largely the result of an increase in saline runoff area under the proposed modification. The increase in maximum storage volume of the Raw Water Dam is therefore intended to provide a greater storage volume required for the additional saline water, and has the added advantage of providing greater flexibility in the water supply system and therefore the potential to better manage the water requirements of the site during extended dry periods, with a reduced requirement for licensed abstractions from the Hunter River.

Submission

As stated in Appendix C3, Section 3.1.2 Open Cut Pits & Overburden Emplacement, “Saline water and water imported from the Hunter River will be stored in a series of major water storage dams. These dams are located ... upper catchment of Sandy Creek” The only dam apparent on the maps is one in the rail loop area. We would like a more detailed map of this area and the exact location of the series of dams as in a major rain event we would like to ascertain the effects on our property.

Response

Water imported from the Hunter River is to be stored in the Raw Water Dam, located within the upper sections of the Sandy Creek catchment. The location and scale of this dam is clearly evident in the figures in the EA.

Submission

We are concerned about the massive loss the report indicates due to evaporation, some 800ML / year. This seems excessive doesn't appear to be clarified in the EA.

Response

As summarised in Section 3.2.2 of Appendix C3 of the EA, the estimated loss of 800 ML per year in evaporation losses is based on consideration of available evaporation data and considering the required surface areas for the dams. Mangoola Coal agrees that reduction of such evaporation would be beneficial during drought periods, but there is no commercially feasible means of achieving this outcome, at this time.

Submission

Overflow of mine dams into Sandy Creek in times of excessive rainfall and flooding which may potentially encroach on properties downstream of Sandy Creek with subsequent environmental impact. Told this would not be an issue

Response

As illustrated in the figures included in the EA, there are two key dams proposed to be located within the catchment area of Sandy Creek. Of these dams, the Raw Water Dam will contain water pumped from the Hunter River and not mine waters and the Rail Loop Dam will capture runoff from the small area within the rail loop and associate rail loading facility. Management strategies for both these dams are outlined in the Mangoola Water Management Plan (Umwelt, 2010b).

The proposed modifications of works associated with surface water management within the Sandy Creek catchment area differ little from the works currently being carried out as part of the approved plans. As such, it is considered that there is little potential difference in the likely impacts between the approved mine plan and the proposed modifications within this area.

Submission

Massive void of poisonous water directly within the Great Eastern Ranges Initiative Regional Corridor at Wallaby Rocks

Response

The final landform will be shaped to provide a free-draining broad vegetated drainage line along the approximate current alignment of Anvil Creek and the final void has been designed to become a self contained system that will not overflow or discharge to the surrounding environment. Responses to submissions in **Section 7.4** of this Response to Submissions Report provides further detail.

Submission

The EA modification document does not make comment on the potential to increase salt loads in the Wybong, Goulburn and Hunters systems Soil, unlike the original Anvil Hill EA.

Response

Section 12.5.1.3 of the EA discusses the potential impacts and management measures associated with surface water resources in relation to the project modifications. Wybong Creek has been identified in the HCRCMA CAP as being a major salt contributor to the Goulburn and Hunter River systems. Soil testing undertaken as part of the original project approval indicated that the soils within the proposed disturbance area are suitable to be used for topsoil on reshaped landforms. In addition, soils are typically non-saline and are unlikely to generate saline runoff or contribute significantly to existing salt loads in the Big Flat Creek system. As a result, it was considered that the approved Anvil Hill Project was unlikely to increase total salt loads in the Big Flat Creek system. The proposed mine plan modifications are not expected to alter this finding.

Submission

Failure to disclose how runoff from Anvil Creek will be managed to avoid increasing salinity in Wybong Creek and Goulburn and Hunter Rivers.

Response

The proposed water management system includes separate clean and dirty water systems which are intended to minimise the discharging of dirty water into the downstream receiving waters. Water captured within the active mining areas is to be treated as saline, and therefore only used for dust suppression, with no discharges of saline water from the site.

The proposed modification is estimated to capture at most 1.1 per cent of the total Wybong Creek catchment area, and 0.4 per cent of the total Sandy Creek catchment area. It is therefore, as discussed in the EA, considered that the potential for noticeable cumulative impacts with respect to salinity levels within the Wybong Creek and Sandy Creek catchments is minimal, especially when considering the surface water management system proposed.

Submission

Disruption to water tables – spring fed dams that rely on water tables

Response

As stated by Mackie Environmental Research Pty. Ltd. in the groundwater assessment completed as part of the EA (refer Appendix C4 of the EA), the proposed modifications are not expected to change the previously approved regional groundwater impacts. Consequently, it is not expected that any spring fed dams will be impacted any more than would be the case under the approved plans.

However, Mangoola Coal is committed to installing groundwater monitoring piezometers as part of the site's monitoring program.

Submission

No details of site water balance, erosion and sed control plan.

Response

Details of the predictive water balance was included within the Surface Water Assessment for the EA (refer Section 3.2 of Appendix C3 of the EA). This water balance compared the likely water balance estimated for the approved mine plans to the proposed mine plan modifications.

Similarly, Section 3.1.4 of Appendix C3 of the EA refers to the control measures outlined in the existing Erosion and Sediment Control Plan (approved as part of the Surface Water Management Plan). Erosion and sediment controls to be implemented will be in accordance with the guidelines provided by:

- *Managing Urban Stormwater Soils and Construction* (the Blue Book) *Volume 1* (Landcom, 2004) and *Volume 2E Mines and Quarries* (DECC, 2008); and
- *Draft Guidelines for the Design of Stable Drainage Lines on Rehabilitated Minesites in the Hunter Coalfields* (DIPNR, undated).

7.5.2 Groundwater

Submission

The Ground Water evaluation in the EA modification provides no reference to concerns raised in the original EA Submission and there is no reference to groundwater impacts within the Castlerock / Spring Creek area.

Although my property is located approximately 3 to 4 km to the north-east of the proposed northern pit, I have requested on a number of occasions that my irrigation well be monitored, so that a benchmark as to supply and quality could be documented. It was only after this EA was released and a further approach was made to Centennial, that my well is now being inspected on a regular basis. I appreciate that the company has limited funds to cover all bases, however, it must be noted that water is the essence of viable farming. Therefore, every effort must be made to establish the water base line, especially if resident requests it and every effort must be made to mitigate any potential impact.

The single page statement in the EA modification from Mackie Environmental Research Pty Ltd delivers no reference to my concerns raised in my original EA submission. There is no reference to the Castlerock area groundwater impact, however Dr C. Mackie makes a short statement concerning the Wybong Creek at pt 4: *"In particular we would not expect any significant change to predicted strata pore pressures or groundwater levels in the shallow alluvial systems associated with Wybong Creek."*

Response

Whilst the report prepared by Mackie Environmental Research Pty Ltd (refer Appendix C5 of the EA) makes no specific mention of the potential impacts of the proposed modification to the groundwater systems within the Castle Rock/Spring Creek area, it does state:

Since the revised pit shell closely approximates the 2006 shell in perimeter and area, we would expect the regional groundwater impacts to be similar to the assessed impacts in 2006.

That is, the similar shape and scale of the modified pit shell compared to the approved mine plan is unlikely to change the previously predicted groundwater impacts for the wider area identified in the groundwater report previously prepared by Mackie Environmental Research Pty Ltd (as part of the Anvill Hill Project EA (Umwelt, 2006)).

Submission

Groundwater may be affected by the mining process and as a landholder adjoining the mine we have concerns because we need water for cattle and some minimal crop growing.

Response

As stated by Mackie Environmental Research Pty. Ltd. (refer Appendix C5 of the EA), the proposed modifications are not expected to change the previously approved regional groundwater impacts. Consequently, it is not expected that any spring fed dams will be impacted any more than would be the case under the approved plans.

However, Mangoola Coal is committed to installing groundwater monitoring piezometers as part of the site's monitoring program.

7.6 Property Devaluation/Acquisition

Submission

The failure of the document [Mangoola Coal modification EA] to mention the Socio-Economic impacts of property devaluations, loss of community heritage and spirit and the future uncertainty of a potential undesirable and unliveable area are most concerning.

The EA modification document does not make comment on the Socio-Economic Impacts, unlike the original Anvil Hill EA, Section 7.1.1 Property value and acquisition. The impact on property value and a resident's ability to sell their properties remains a critical issue for those residents not purchased by Xstrata, but remain close to the project area and suffer adversity with no avenue to sell their property for its true market value. Centennial's EA's offer to landholders within the Assessment Lease Area for purchase at market value and an offer to landholders whose property may be impacted upon beyond relevant noise and dust criteria does not continue under Xstrata Pty Ltd ownership of the mine project.

Market values within the surrounding project area continue to be adversely affected by this proposed project. My bank continues to demand the Title Deeds of an unmortgaged property, due to the collapsed equity in my Castlerock properties.

Since the start of the early works for Mangoola Coal, I have struggled to lease my rental property on Castlerock Road over the last 18 months. I advertised my rental property on 2 occasions on the Mangoola Coal notice board; however this did not trigger a single enquiry from the huge work force at Mangoola. Even though I have renovated my property residence to a fully air-conditioned 4 bedroom house, it appears that no one wants to live anywhere near a large coal mine, including the workers of the mine.

Before the Mangoola Project began its construction phase I could demand rents at or better than the upper end of the market (Housing NSW Official Rent Statistics), however now, I have been forced to lease my property at rents equal to $\frac{3}{4}$ the median weekly rent (Sep 2010) for Rural Local Government Areas.

We have already been visited by Xstrata Mangoola P/L in relation to the ETL project and have been told we are currently outside the buffer zone to be considered for property purchase. They [Xstrata] discussed possibility of providing triple glazing, air conditioning and insulation as compensation for this project. This is in adequate recompense when considering we work outside of the house for the majority of the day and this will do little to address our property's diminished value. We are not interested in becoming prisoners in our home of 22 years, unable to use our acre of garden, bush land and sheds. Gone is our peace and quiet and quality of life. They [Xstrata] cannot reduce the environmental problems they have created so the best they can offer is to lock us inside. Surely the foregoing description of the problems and the fact Xstrata Mangoola P/L's offer, prove to any reasonable person that the approved buffer zone is totally inadequate, particularly on our side of the mine. If our claims are questioned, we challenge Xstrata Mangoola P/L to obtain a before and after valuation of our property. We request an onsite inspection of our property to be carried out as soon as possible.

We live in Yarraman Road and Xstrata have ruled that we are "300 metres too far away" from their mining activity to be affected enough to be included in the list of acquisition properties.

Risk acknowledged by property valuers and is real in the minds of the community (Appx B4 EA). Focus seems to be on protection of flora, fauna including bats and indigenous sites whilst property values are ignored.

The current consent conditions also set an assumption that is carried through to the EPA licence conditions, compliance activities by DoP officers and in any complaints made to the EPA or other government authorities and that as landholders we will take up the acquisition offer. DoP needs to acknowledge that due to the rapid expansion of coal mining in the Muswellbrook Shire, existing and proposed, there has become a critical shortage of like properties to relocate to. Most acreage in this shire is under an existing Exploration Licence or waiting for one to be taken up. This means, for us and the many others who will be expected to relocate, any relocation will mean leaving the shire and competing in property markets that far exceed the market value of our property in Wybong in any attempt to replace like for like. Relocation will also require changes of school, possible changes of employment, loss of community and place, loss of ability to represent the local community as an elected Councillor on the Muswellbrook Shire and the loss of the projects we have put into this place in the 14 years we have lived here. We are older and no longer of an age to be able to put the effort into another property; we have exhausted all our forward plans on this location. Relocation will also change the timeframes we have planned on that rely on us reaching our retirement age after 20 years of ownership of a property of a small acreage (22 hectares). This will impact significantly on our ability to be eligible for any government assistance in our retirement years as any property we purchase now we would not have continued ownership and residency for 20 years prior to retiring.

Response

It is important to note that the mine plan modifications are located entirely on Mangoola Coal³¹ owned or leased land therefore no additional property acquisitions are required.

³¹ Xstrata Mangoola Pty Limited.

With respect to the value of properties within the area, Mangoola Coal has undertaken to monitor non-mining related property sales for a five year period from 2006 to 2011 (time period was chosen to coincide with the granting of the Mangoola Project Approval in 2006). The area monitored is within a 5 kilometre radius of the Mangoola Coal land acquisition zone (Sales Area) and those in the general Denman/Muswellbrook area outside of the Sales Area. Results indicate that since 2006, there has been a continuity of rural and rural-residential property sales in the Sales Area that are not directly related to the Mangoola Coal Mine, or other mining projects. Records indicate that approximately 50 non-mining related sales have occurred in the Sales Area since 2006, including 15 sales in the past two years.

In relation to valuation of the property in the acquisition process, Mangoola Coal is bound by any Government requirement should consent be granted. Current government policy, as expressed in the Project Approval, requires the acquisition and compensation process to be undertaken in accordance with the following:

Schedule 4, Procedure 10

Within 3 months of receiving a written request from the landowner with acquisition rights, the Proponent shall make a binding written offer to the landowner based on:

- a) the current market value of the landowner's interest in the property at the date of this written request, as if the property was unaffected by the project the subject of the project application, having regard to the:
 - existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and
 - presence of improvements on the property and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of the 'additional noise mitigation measures' in Condition 8 of Schedule 3;
- b) the reasonable costs associated with:
 - relocating within the Muswellbrook local government area, or to any other local government area determined by the Director-General;
 - obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is required; and
- c) reasonable compensation for any disturbance caused by the land acquisition process.

However, if at the end of this period, the Proponent and landowner cannot agree on the acquisition price of the land, and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Director-General for resolution.

Upon receiving such a request, the Director-General shall request the President of the NSW Division of the Australian Property Institute to appoint a qualified independent valuer to:

- a) consider submissions from both parties;
- b) determine a fair and reasonable acquisition price for the land, and/or terms upon which the land is to be acquired, having regard to the matters referred to in paragraphs (a)-(c) above;
- c) prepare a detailed report setting out the reasons for any determination; and

d) provide a copy of the report to both parties.

Within 14 days of receiving the independent valuer's report, the Proponent shall make a binding written offer to the landowner to purchase the land at a price not less than the independent valuer's determination.

However, if either party disputes the independent valuer's determination, then within 14 days of receiving the independent valuer's report, they may refer the matter to the Director-General for review. Any request for a review must be accompanied by a detailed report setting out the reasons why the party disputes the independent valuer's determination. Following consultation with the independent valuer and both parties, the Director-General shall determine a fair and reasonable acquisition price for the land, having regard to the matters referred to in paragraphs (a)-(c) above, the independent valuer's report and the detailed report of the party that disputes the independent valuer's determination.

Within 14 days of the Director-General's determination, the Proponent shall make a binding written offer to the landowner to purchase the land at a price not less than the Director-General's determination.

If the landowner refuses to accept the Proponent's binding written offer under this condition within 6 months of the offer being made, then the Proponent's obligations to acquire the land shall cease, unless the Director-General determines otherwise.

Schedule 4, Procedure 11

The Proponent shall pay all reasonable costs associated with the land acquisition process described in condition 10 above.

Schedule 4, Procedure 12

If the Proponent and landowner agree that only part of the land shall be acquired, then the Proponent shall pay all reasonable costs associated with obtaining Council approval for any plan of subdivision (where permissible), and registration of the plan at the Office of the Registrar-General.

To date, Mangoola Coal has approached landholders in good faith with the expectation that any agreement should satisfactorily reflect a land purchase condition of approval similar to that quoted above. Individual landholders' situations have been a specific consideration in purchase and option agreement negotiations.

With respect to rental of properties, Mangoola Coal owns several properties within the vicinity of the Mangoola Coal Mine all of which are currently rented at market value. Unable to comment with respect to the rental of individually owned properties.

Submission

I am very concerned that the Mangoola Coal modification document states that no new properties move into the acquisition zone as my personal circumstances have become increasingly distressing. I am 77 years of age and live on my own. I have a number of life concerning conditions, which have been complicated and made worse as a direct result of the Mangoola Coal Mine Project. Many of these health complaints (including diabetes, high blood pressure, acute sinus which has become increasingly worse due to surrounding mine development), irritable bowel and diverticulitis, insomnia (which has been made considerably worse since the Wybong Road upgrade has started – the increase in traffic has started and the Mangoola Coal 'early works'

has commenced) have developed because I feel trapped in my current living arrangements, with few options for improvement. This feeling is made worse when I see my neighbours, who are in better health and financially secure, escape this area when Mangoola Coal purchased their properties. The decision of Mangoola Coal not to include my property within the land acquisition zone is unjust, unethical, unfair and wrong. I have no current options to improve my quality of life and have an incessant feeling of despair.

Response

This submission was made anonymously; therefore it is unknown what rights the landholder has with respect to management or acquisition.

Where relevant, properties within acquisition and management zones are dealt with in accordance with legislative requirements. Every effort has been made with landholders to ensure that these requirements are being met. With respect to property valuation, refer to the previous response.

7.7 Accommodation

Submission

The proposed changes will lead to an increase in the demand for short term accommodation during the construction phase, then an increase in the long term workforce of a further 60 personnel. The rental/hotel/motel accommodation situation in Denman is under constant strain, we are concerned that the proposed modification will exacerbate the problem. Visitors to the area find it impossible to find short term accommodation currently, often finding alternative destinations.

Response

With an increase in mining accommodation availability does become an issue. It drives increases in property values and rent. The demand for rental accommodation from the construction workforce associated with the Mangoola Coal Mine is reduced from the numbers estimated in the EA as the project is substantially complete.

The major population impact associated with the construction phase is therefore expected to be demand for short term accommodation. Based on the occupancy rates of existing facilities, there is expected to be sufficient short term accommodation available to house the construction workforce.

Given the extent of fluctuation of the cumulative workforce in the Muswellbrook LGA and surrounding areas, it is anticipated that the proposed increase of an average of approximately 60 operational employees associated with the mine plan modifications can be catered for within the existing capacity. It is also estimated that the operational workforce will increase by a further 60 personnel to an estimated average of 300 personnel. Despite an increase in operational staff, the large reduction in construction staff numbers, outlined above, will reduce any residual stress on accommodation supply.

7.8 Cost of Living

Submission

Increase to cost of living (agree with Wybong Action Group) – do not want the mine to make everything in town too expensive to afford including rent, food and entertainment.

Expensive housing – Muswellbrook and Singleton housing is already very expensive, these expansions are not sustainable and not in the community's interest.

Mining benefits a small number of people in the area who are able to obtain jobs in the industry. The remainder of us are forced to pay inflated prices for housing, goods and services as there is a presumption that all people in the area earn miners wages. Muswellbrook and Singleton housing is already very expensive and the development will exacerbate this problem.

There is no mitigation offered for the impact of more people on Muswellbrook's already very expensive housing.

Response

Mangoola Coal, and XCN at a corporate level, recognise that those who are directly employed by the mining industry, and those employed in closely related industries, are better able to deal with increased cost of living as a result of mining in the region. Based on this understanding, and other socio-economic factors which result from the influence of the mining industry, XCN/XC have developed a CSI Program where each year XCN/XC finds and fund partner organisations and initiatives throughout New South Wales and Queensland. XCN/XC's CSI provide the ideas, foundations and support necessary to affect positive change across the areas of health, education and enterprise, communities, environment and the arts and culture. This program supports the whole community. The response to MSC submission 7(c)(ii) provides further details the contributions made by both Mangoola Coal and XCN/XC in relation to community support and the amelioration of impacts on the cost of living.

7.9 Health Services

Submission

There is no offered mitigation of the impact of more people on our already overloaded health services (Muswellbrook has the highest number of deaths from preventable diseases).

No mitigation offered for the impact of more people on already overloaded health services. I have read that Muswellbrook has the highest number of deaths from preventable diseases, and this will increase on the already stretched health services.

The proposal will lead to a further increase in illness of the local population thereby increasing the impact on our already overloaded health services (Muswellbrook has the highest number of deaths from preventable diseases).

No mitigation offered for the impact of more people on Muswellbrook's already overloaded health services, with the highest number of deaths from preventable diseases in the state.

I object to the latest modification to the Anvil Hill site because of the lack of offer for more health services in Muswellbrook, in particular which has the highest incidence of preventable disease in the Hunter Valley and possibly NSW.

Concern for the health and welfare of residents of Muswellbrook and the surrounding district.

No mitigation offered for the impact of more people on already overloaded health services (Muswellbrook has the highest number of deaths from preventable diseases).

The local community is already overloaded and effects on local services (e.g. health) have not been considered.

No mitigation is offered for the impact of more people on the already overloaded health services in Muswellbrook.

The increased number of people working in the area will not contribute to the economy of Muswellbrook as many involved in the construction will work and live outside of the area and travel each day.

Response

The issue of impacts on health services on the local community and wider region has been addressed in response to submission 7(c)(ii) from MSC.

7.10 Community Displacement and Relocation

Submission

Muswellbrook as it once was is lost forever. Do not destroy even further what is left of the area.

Loss of community is a major impact. Most of our friends' properties have been purchased by Xstrata leaving a changeable neighbourhood. This means you do not have confidence to approach people in times of need because by the time you become acquainted they have moved on.

A strong sense of community exists in the Wybong area and concerns were raised as to how this would be affected by the proposed mine development. Centennial's response was that they will document the history of the area and give a community contribution to the value of \$500,000 directed towards the Denman and Wybong communities.

Under the original EA, my concern was that many residents will ultimately leave this area either by pressure from the company or by choice due to the unliveable impacts caused by this development and such, the entire aesthetics of the area will be lost forever. Because there will be fewer residents to participate in community activities, the funding provides little recompense.

My concern now is that the local community spirit has been lost and the remaining residents feel trapped, dislocated and ignored by both Mangoola Coal and Muswellbrook Shire Council.

Response

Mangoola Coal has an active residential acquisition program which has the potential to alter the dynamic of the local community. It is acknowledged that some residents may have relocated due to unacceptable mining impacts. Mangoola Coal as a priority is committed to avoiding and minimising impacts where practicable, with the purchasing of property as a final option. This approach may enable more people to remain in the local area.

Ultimately relocation from the area is a personal decision which may vary between individuals due to personal circumstances.

The history of the area has been documented and titled 'Wybong Oral Heritage Report' and is available on the Xstrata Mangoola website. Community Contributions have been made in the form of a Planning Agreement, for the original Planning Approval, which was entered into by Mangoola Coal, XCN and MSC in accordance with section 93F of the EP&A Act and

specifically in relation to the Mangoola Coal Project. **Section 5.4.2** of this Response to Submissions report provides further details on this agreement, in addition to contributions made by XCN/XC on a regional basis.

7.11 Impacts on Other Industries

Submission

Impacts on agricultural and equine industries.

Response

This is not a 'greenfield project'; the Mangoola Coal Mine has been approved and has commenced operation. There are no substantial horse breeding businesses in the area significantly affected by the Project. The nearest horse stud is located approximately 3.5 kilometres south-east of the Mangoola Coal Mine. Impacts on agricultural land from the mine modifications are negligible as there is only an additional 11.7 hectares of land impacted by the proposed mine plan modifications (and 14.9 hectares by the ETL relocation).

7.12 Soils/Water Resources

Submission

The original EA acknowledged the area's prominent problematic high dispersion topsoils and sub-soils, but the modification document does not mention any issue regarding the land resource assessment or contamination that might or has occurred.

The EA modification document does not make comment on the Soil Survey & Land Resource Assessment, unlike the original Anvil Hill EA, Section 5.0 Soil Survey & Land Resource Assessment Conclusion. I do not believe that Mangoola Coal has incorporated an appropriate Land Resource Management Plan to prevent potential surface or ground water contamination.

Centennial's response in relation to this is that generally, the subsurface of soils of the yellow solodics and the brown clay soil units were observed to consist of medium clays with moderate to high alkalinity and moderate to high dispersion potential. This indicates that these soils have high potential for erosion and hard setting surfaces if less exposed and, therefore, should not be used as surface cover in the rehabilitated post-mining landscape.

Concerns raised under the original EA were that high dispersion potential material is not desirable for dam walls or linings, therefore, how is the company going to construct the tailings pits and water storage dams to a confident and secure standard, when the location presents difficult and largely unsuitable earth material, which is suggestive of potential leakage and dam failure? During the 1970's the Wybong Creek and Goulburn River were ear-marked for potential dam storage locations, however, after extensive soil testing, these projects were abandoned because of potential dam failure and reservoir leakage. Does the company plan to import any or all of the dam construction material? Or, does the company plan to gamble on using site location material? The critical issue of questionable soil types leads to reservations of how:

- Surface water is going to be contained?
- Contaminated water is going to be contained?
- Ground water is not going to be contaminated?

- **Ground water pressure within aquifers will be maintained?**
- **The project will store and preserve precious pumped Hunter River water?**
- **The project will be self-sufficient, given the soil type constraints?**

Concerns now under the current EA is in relation to the 'Big Flat Creek' surface water contamination event, of which details have been largely suppressed, upholds my concerns documented in my original EA submission. Mangoola Coal's non-comment on this topic raises significant concern and I question the 'reportable event process' and the relevant Government authority's commitment to police licence breaches and the 'naming and shaming' of a mine company when environmental contamination is caused by their conduct.

Response

Mangoola Coal is aware of the challenges associated with the construction of water control infrastructure, including storage dams, as a result of the in situ soil types. Mangoola Coal is committed to providing structures that are safe and stable. To this end, all major water storage structures, such as the Raw Water Dam, require detailed design that will include assessments of the suitability of local material for dam construction and a dam design that meets the requirements for stability, safety and storage based on the available and imported materials recommended.

With regard to concerns regarding surface water management, three separate water management systems will be implemented, are isolated from one and other to reduce the likelihood of impacting the downstream environment:

1. A clean water diversion system will be installed to divert the clean runoff water from upslope areas around the disturbed areas of the site, returning the flows to the existing downstream system and minimising the amount of clean runoff water captured within the mining area;
2. Runoff from emplacements areas which are undergoing rehabilitation will be managed via a dirty water system. This system will incorporate a series of catch drains and sediment basins, allowing for the intercepted water to be treated to a suitable condition (as per the *Blue Book* requirements) prior to controlled discharges off site; and
3. Water captured within the active mining area will be considered saline, and therefore stored either in-pit or pumped into the mine water dam for re-use on site for dust control. Saline water will not be discharged off site.

The increased capacity of the Raw Water Dam, coupled with the reduced water deficit predicted for the mine plan modification, result in a net reduction in the anticipated abstractions of water from the Hunter River. Any water pumped from the Hunter River will be under the conditions of the Licenses currently held by Mangoola Coal.

As stated in the Groundwater Assessment (Appendix C4 of the EA), the proposed modification is unlikely to significantly alter the impacts to the local groundwater conditions from those previously anticipated by the approved Mangoola Coal Mine.

The EA for the approved project provided much detail regarding the soil capabilities for the project site and as potential soil and land capability impacts associated with the projects will be minimal due to the areas to be impacted being relatively small when compared to the approved project disturbance area, they have not been detailed.

7.13 Ecology

Submission

Xstrata has failed to refer the matter to the Federal Minister for determination if it is a controlled action Xstrata has used the information from the 2006 EA which is largely out of date in terms of scheduled species under both state and Federal legislation. The referral made for the 2007 consent does not contain the actions of the modification or the relocation of the ETL that will impact on *Commersonia rosea* (Endangered EPBC) and *Prasophyllum sp.* Wybong (C. Phelps ORG 5269) (a leek orchid) Critically Endangered.

Response

Refer to response to submission 53c from MSC in **Section 5.4** of this Response to Submissions report for a response to this submission.

Submission

No Offset Strategy can be found to exist let alone have been reviewed prior to the commencement of mining operations in September 2010. I have had conversation with Graham Clarke from DECC who informs me that while DECC have seen some documents floating around he is unable to locate a document titled Offset Strategy or Reviewed Offset Strategy or anyone in DECC who has.

Response

A detailed Biodiversity Offset Strategy was proposed as part of the Ecological Assessment for the Anvil Hill Project (Umwelt 2006a), and was documented as part of the Project Approval from DP&I initially dated 2007. This Biodiversity Offset Strategy was further developed and documented in the ROMP for Mangoola Coal Mine (Umwelt, 2011c).

A separate, but clearly integrated Additional Biodiversity Offset Strategy has been provided for the proposed mine plan modification. These are provided in the Ecological Assessment – Proposed Relocation of 500 kV Electricity Transmission Line, Mangoola Coal (refer Appendix B1 of the EA) and Ecological Assessment – Proposed Mine Plan Modification, Mangoola Coal (refer Appendix C1 of the EA).

If approved, this Additional Biodiversity Offset Strategy will be included within an Amended ROMP, to ensure the integration of the additional offset areas into the overall management for the Mangoola Coal Mine.

All of the aforementioned documents have been submitted to the required governmental agencies for the adequacy and public exhibition phases (for the EAs), and for a review and comment phase for the ROMP. All comments and revisions posed by these agencies have then been attended to, prior to finalisation.

Umwelt cannot comment further on Council's inability to locate these documents, nor for the comments from the nominated OEH officer.

Submission

Concern for health and welfare of flora and fauna in the district.

Response

As required by State and Commonwealth legislation, the potential impacts of the proposed mine plan modifications on threatened species, endangered populations, TECs (and their habitats) have been considered as part of the Ecological Assessments completed for the proposed ETL relocation, and for the proposed mine plan modifications). These impacts were also considered in great detail within the Ecological Assessment completed for the proposed Anvil Hill Project completed by Umwelt in 2006. The ecological impact and mitigation assessment completed in 2006 lead to the development of a substantial Biodiversity Offset Strategy, including (but not limited to):

- provision of Biodiversity Offset Areas to allow for the protection and management of 1904 hectares of land surrounding the disturbance area for the Mangoola Coal Mine;
- provision of 1164 hectares of Corridors to provide for the protection and augmentation of existing vegetation within two defined corridors, to improve existing corridor function between the Mangoola Coal Mine and nearby secure areas;
- a detailed augmentation strategy to increase habitat quality within the Biodiversity Offset Areas, including revegetation works, nest boxes, orchid translocations and other habitat augmentation strategies; and
- detailed annual ecological monitoring to assess the efficacy of these strategies.

This same offsetting approach has been adopted as part of the current project, whereby impacts unable to be mitigated have been offset by provision of an Additional Biodiversity Offset Area. The Mangoola Coal Mine ROMP (Umwelt, 2011c) provides further details on the management of biodiversity values within the Mangoola Coal Mine. This ROMP will be amended to include the Additional Biodiversity Offset Area, if the proposed modifications are approved.

All of the above biodiversity offsets, corridor conservation, habitat augmentation and monitoring measures provide for the management, protection and conservation of flora and fauna species within the vicinity of the Mangoola Coal Mine.

Submission

The following submissions are related to the potential impacts on the Great Eastern Ranges Initiative and habitat/wildlife corridors within the proposed project area and surrounds, and the removal of woodland.

Destruction of important native woodland and proposed wildlife corridor for species migration.

Threaten integrity of the Great Eastern Ranges Initiative

The Wybong Uplands were identified as important remnant vegetation well before the original proposal. This expansion will further impact on the environment by threatening the integrity of the Great Eastern Ranges corridor.

Objection to the latest modification to the Anvil Hill site because of the narrower proposed wildlife corridor.

Opposed to the destruction of woodland from a proposed wildlife corridor.

There has already been too much natural vegetation and habitat loss so far in the mine preparation with more to come once mining is in full swing. There should be no expansion or clearing of the site whatsoever.

The proposed wildlife corridor must be kept intact with no human infrastructure impeding upon species migration. Migratory species are 'encoded' with their route and any changes due to infrastructure could cause a great number of deaths leading to an overall reduction in species numbers.

I object to the proposal on the grounds that both the ETL realignment and the expansion of the Mangoola Coal Mine would result in the destruction of more precious threatened woodland habitat.

Response

Removal of Woodland/Natural Vegetation

It is acknowledged that the proposed mine modification areas will require the removal of some areas of native vegetation. The following three vegetation communities have been recorded within the Proposed Modification Areas:

- Ironbark Woodland Complex (1.2 hectares);
- Slaty Box Woodland (5.4 hectares); and
- Disturbed Grassland (5.1 hectares).

Of the 11.7 hectares of vegetation to be removed as part of the Proposed Modification Areas, 44 per cent comprises Disturbed Grassland, where substantial clearing and existing disturbances have already reduced the biodiversity value of this community. The remaining 56 per cent of vegetation to be removed comprises two communities of higher quality woodland vegetation, each of which has legislative significance.

Given the general lack of canopy and understorey strata, the Disturbed Grassland community is unlikely to be substantially disturbed by the project. While this community is known to contain habitat for a number of threatened species (such as *Diuris tricolor*), it is not likely to be of high conservation significance in its own right. The project is not likely to result in a significant reduction in the amount or quality of Disturbed Grassland in a local or regional context.

Approximately 1.2 hectares of Ironbark Woodland Complex and 5.4 hectares of Slaty Box Woodland will be removed as a result of the proposed modification. Both of these communities are of conservation significance, as they are both consistent with listed TECs.

Biodiversity Offset Strategy

In order to address residual impacts of the project on threatened species, endangered populations, TECs and their habitats, a Biodiversity Offset Strategy has been developed.

This Strategy focuses on the provision of a formal offset area within the former 'Nipol' property (referred to as the Additional Biodiversity Offset Area), which lies to the south of and adjoins the existing Mangoola Coal Mine Biodiversity Offset Area. The Biodiversity Offset Strategy provides for the protection of this Additional Biodiversity Offset Area, as well as ongoing management actions to ensure its ecological integrity in the long term.

The Additional Biodiversity Offset Area covers 30 hectares, which run along the western boundary of the former 'Nipol' property, thus providing a valuable corridor function within a generally fragmented landscape. The Additional Biodiversity Offset Area is primarily vegetated, and its protection will ensure existing vegetated connectivity from the heavily

vegetated existing Conservation Offset Area in the north to the vegetated habitats of the Myambat Military Area. This will provide additional security to the existing corridor function of this area, which will assist in preserving movement corridors for flora and fauna in the local area. This improved security will in turn assist in securing this connectivity on a regional basis.

Cumulative Impacts with Mangoola Coal Mine

It should also be noted that the Mangoola Coal Mine was approved on the basis of impacts to 2238 hectares of vegetation, comprising 1304 hectares of treed vegetation and 934 hectares of grassland. From this disturbance, came the requirement to provide an offset covering a total of 2800 hectares (comprising of 1924 hectares of proposed Biodiversity Offset Areas as well as an additional area of 1046 hectares). The proposed Biodiversity Offset Areas have been formalised, and the additional 1046 hectares have been included within the corridors which have now been finalised. These areas cover a total of 1164 hectares, comprising one northern corridor (942 hectares in size) and one western corridor (222 hectares in size).

Great Eastern Ranges Initiative/Corridors

The Great Eastern Ranges Initiative (the Initiative) is a concept developed by the OEH to maintain and improve long-term connectivity conservation of mountain ecosystems running the length of eastern Australia. There is currently no legislative requirement to assess a project against the concept area relating to this initiative.

The approved Mangoola Coal Mine lies within the Initiative corridor boundary (with the exception of approximately 32 hectares), and impacts on approximately 2251 hectares of the nominal boundary for this conceptual corridor. The proposed mine plan modifications and proposed ETL relocation impacts on an additional 26.6 hectares of vegetation within the corridor (ETL 14.9 hectares, 11.7 hectares mine plan modifications). The primary goal of the Initiative is 'A connected NSW conservation corridor contributing to healthy ecosystems and healthy people'. The Biodiversity Offset Strategy proposed for the currently proposed and existing approved Mangoola Coal Mine has provided for the offsetting of a total of 3132 hectares³² in response to impacting a total of approximately 2265 hectares³³. The offset areas surround the vast majority of the impacted areas, and also provide for the immediate protection and pending revegetation of substantial corridors from the Mangoola Coal Mine to conserved areas to the north and west.

Corridor Value

The Additional Biodiversity Offset Area proposed as part of the EA for the mine plan modifications and ETL realignment provides valuable corridor function within a generally fragmented landscape. The Additional Biodiversity Offset Area is primarily vegetated, and its protection will ensure existing vegetated connectivity from the heavily vegetated existing Conservation Offset Area in the north to the vegetated habitats of the Myambat Military Area. This will provide additional security to the existing corridor function of this area, which will assist in preserving movement corridors for flora and fauna in the local area. This improved security will, in turn assist in securing this connectivity on a regional basis and add to the long term value of the Great Eastern Ranges Initiative, meeting goal number one.

³² Includes 1904 hectares offsets, 64 hectares mine plan modifications offsets, 222 hectares Western Corridor Offsets, 942 hectares Northern Corridor.

³³ Impacts from ETL 14.9 hectares, 11.7 hectares mine plan modifications, 2238 hectares approved mine.

On a larger scale, the Additional Biodiversity Offset Area will integrate with the existing Biodiversity Offset Area by way of adding to the existing corridor value of these offsets. The Project Approval for the Mangoola Coal Mine requires that two external corridors (one to the north and one to the west of the EA Study Area), be established as part of the Biodiversity Offset Strategy. In order to address this requirement, a number of corridor options were investigated, and issues such as location, strategic connectivity, existing vegetation, land ownership and corridor width were considered in identifying the preferred options.

These corridors are to form part of the Biodiversity Offset Areas for the Mangoola Coal Mine, by way of providing vegetated egress from the approved project disturbance area in front of the advancing mine, as well as to provide a recolonisation pathway following rehabilitation of the post-mining landscape. To this end, the two external corridors will connect the project area with nearby secure habitats within either the conservation or Crown lands systems.

The locations of these external corridors are currently proposed as part of the ROMP, and they will be subject to revegetation works (where necessary) to provide a continuous vegetated connectivity throughout the local area in the long term. The location of the proposed Additional Biodiversity Offset Area will complement this corridor package in the local area, by way of securing existing vegetated cover in a southern direction from the bottom of the existing Biodiversity Offset Areas into the Myambat Military Area. This will add to the security of flora and fauna passage throughout the local area in the long term.

In addition, at the completion of mining, those areas impacted will be rehabilitated, therefore in the long term contributing to the corridor of protected and managed land, flora and fauna.

The alternative to this proposed corridor is land which remains privately owned with no conditions associated with its management.

Submission

The habitat loss resulting from this proposal could not be offset or rehabilitated.

Response

Offsetting is standard practice required by DP&I, DSEWPC and OEH for addressing residual impacts from a proposal that cannot be avoided or mitigated.

The ROMP contains a detailed rehabilitation plan, which has been designed specifically for this site. Mangoola Coal Mine has engaged suitably qualified and experienced rehabilitation experts who are continually refining rehabilitation planning, practices and techniques, to ensure that the post-mining rehabilitation and revegetation/regeneration within the Biodiversity Offset Areas and Corridors are of the highest industry standard.

The primary objective of the post-mining rehabilitation will be to create a stable final landform with acceptable post-mining land use capability. Revegetation and regeneration of the overburden emplacement areas and backfilled pits will be conducted progressively over the life of the mine, as an integral component of mining operations. All revegetation and regeneration works will be scheduled to commence as soon as practicable after mining disturbance. This approach will minimise the disturbed area at any point in time and hence reduce the ecological impact of the Mangoola Coal Mine.

The majority of the approved project disturbance area, including the open cut mining areas and overburden emplacement areas, will be progressively revegetated and regenerated to self-sustaining indigenous vegetation communities. This will aim to emulate the pre-mining environment and will enhance local and regional ecological linkages across the Mangoola Coal Mine, into the Biodiversity Offset Areas and Corridors and into proximate areas. Revegetation works will use local provenance species.

Submission

The impact of the current approval did not address (by the then proposed Biodiversity Offset Strategy) the loss of local populations of at least 15 threatened species. Note Condition 38 of the approval. Unaware of compliance with neither this condition nor 39, and neither with, most significantly, Condition 40. Similarly conditions 41 to 45 remain outstanding.

Response

Condition 38 – Offset Strategy – Mangoola Coal is in full compliance with this condition and these issues have been addressed within the ROMP.

Condition 39 – Offset Strategy - Mangoola Coal is in full compliance with this condition and these issues have been addressed within the ROMP.

Condition 40 – Long term security of offsets - the mechanism for securing these areas in the long-term continues to be investigated, and discussions with DP&I and OEH in relation to the preferred mechanism are ongoing.

Condition 41 – Landscape Management Plan - Mangoola Coal is in full compliance with this condition. A Landscape Management Plan (including the ROMP) was submitted to DP&I and (the then) DPI for approval prior to starting mining operations on site. These documents have since been revised and resubmitted, based on a number of rounds of comments from the above authorities, including OEH. The final drafts of these documents are with DP&I for final approval.

Condition 42 – ROMP - Mangoola Coal is in full compliance with this condition and these issues have been addressed within the ROMP.

Condition 43 – Final Void Management – Mangoola Coal is in full compliance with this condition (the Final Void Management has been completed as required as part of the Landscape Management Plan).

Condition 44 – Mine Closure Plan - Mangoola Coal is in full compliance with this condition (the Mine Closure Plan has been completed as required as part of the Landscape Management Plan).

Condition 45 – Conservation and Biodiversity Bond – Within 3 months of the approval of the Landscape Management Plan, the Proponent shall lodge a conservation and biodiversity bond with DP&I to ensure that the Offset Strategy is implemented in accordance with the performance and completion criteria of the Landscape Management Plan.

Submission

Manobolai Nature Reserve should not be compromised.

Response

The Manobalai Nature Reserve and vacant Crown land (VCL) lie approximately 10 kilometres to the north-west and 2 kilometres to the west of the Mangoola Coal Mine boundary respectively, and approximately 6 kilometres from the northern extent of the proposed ETL relocation. There will be no impact to the Nature Reserve or VCL as a result of the proposed mine plan modifications proposed at the Mangoola Coal Mine.

Submission

Failure to offset in perpetuity and indicate future application to mine the NE offset.

Response

The Additional Biodiversity Offset Area will be secured for long-term conservation as will the Biodiversity Offset Areas and Corridors, in accordance with Project Approval Condition 40.

Submission

Failure to offset the loss of internal corridors.

Response

The Mangoola Coal Mine has approval to impact all vegetation within the approved project disturbance area. The proposed modifications represent a minor addition to this disturbance area (being an additional 11.7 hectares), 44 per cent of which is existing disturbed grassland. These proposed additions to the disturbance area will not impact on internal corridors, as these all lie on the edge of the approved disturbance area for the Mangoola Coal Mine.

A detailed Biodiversity Offset Strategy (including two large regional corridors) has been provided for the loss of internal connectivity, in the short to medium term, as a result of the Mangoola Coal Mine.

Submission

Listing of Kangaroos as pests on the Mangoola site

Response

The OEH is responsible for the management of kangaroo populations within the State (striking a balance between conserving native species and landholder interests), as per its Kangaroo Management Program. As a private landholder, Mangoola Coal complies with all requirements of this program; however, there is currently no requirement (from a project approval or recommended ecological requirement) for kangaroo control on this site.

Ongoing fauna and flora monitoring of the Mangoola Coal Mine includes surveys for the presence of significant numbers of feral (and possibly pest) fauna species. Records of significant populations of such species may trigger appropriate control strategies to control numbers or reduce impact.

The effectiveness of the feral animal control program (as defined within the ROMP) will be reported in the AEMR. This will include details of feral animal sightings, control actions and the effectiveness of control strategies.

7.14 GHG/Climate Change

The following submissions are in relation to greenhouse gas emissions and the potential impacts on climate change.

Submission

There is a strong correlation of increasing the rate of coal export with increased greenhouse gas emissions – these will not be mitigated.

The correlation of increasing the rate of coal export with increased greenhouse gas emissions will not be mitigated but further increased.

The proposal to increase production rate directly correlates with an increase in greenhouse gas production. While we wait to see if cyclones, floods, bushfires, heatwaves and droughts continue to increase in frequency and intensity as a consequence of human induced global warming as predicted by the IPCC, it makes no sense to accelerate the release of those gases.

Increased coal burning impacting on climate change

Impacts from coal burning on climate change – the environmental disasters that have recently struck Queensland and Victoria are predicted to increase in frequency and intensity. Failing to link this to the expansion of coal burning is mind boggling.

No mitigation for the correlation of increasing the rate of coal export with increased greenhouse gas emissions.

The correlation of increased rate of coal export with increased greenhouse gas emissions will not be mitigated.

Strongly oppose to any increase in mining production and coal exports due to the negative effects this has on global carbon emissions and climate change. Surely this is something that needs to be taken very seriously. The negative effects of climate change are only too apparent locally at the moment with extreme weather experienced here, around the country, and the world.

The Mangoola Coal Project is grossly unsustainable due to both its direct impacts and downstream impacts on global climate through the combustion of the mined coal.

There is no mitigation of increased carbon emissions and increased global warming.

Response

Section 3.2.2 of this response to submissions report addresses matters related to greenhouse gas emissions. It also responds to mitigation, monitoring and management of greenhouse gas emissions at the Mangoola Coal Mine.

With respect to climate change, the Mangoola Coal Mine is an approved mine and the proposed modifications do not include an increase in the amount of ROM coal to be mined or product coal to be produced; therefore no additional greenhouse gas emissions are predicted nor would there be any change to the potential for impacts on climate related to greenhouse gas emissions.

7.15 Traffic and Roads

7.15.1 Traffic Increase

Submission

Traffic flow on Wybong Rd has increased dramatically.

Response

The DGRs for the proposed mine plan modifications required accurate predictions of the road and rail traffic likely to be generated by the revised mine plan and a detailed assessment of the impact of this traffic on the capacity, efficiency and safety of the road and rail networks.

The traffic assessment as part of the EA for the project concluded that the traffic associated with the mine plan modifications, when combined with the ETL relocation construction traffic numbers, does not result in changes to the level of service on roads surrounding Mangoola Coal Mine. Impacts to traffic associated with the proposed modifications are expected to be minimal.

Section 6.8.1 of the EA provides an overview of the existing road network and traffic demands and further details on the potential impacts relating to the projects are summarised in Sections 8.14 and 12.14. A copy of the traffic impact assessment report is provided as Appendix A5.

Based on the content of the traffic related submissions received from MSC, Interest Groups and the Community for the proposed modifications, Mangoola Coal has commissioned additional traffic assessment for the project area. Further details of the assessment are included in response to MSC submission 7(c)(i).

Submission

Increased highway traffic – the highway and road traffic is already bumper to bumper, these expansions are not sustainable and not in the community's interest.

The road and highway traffic is already hazardous. Muswellbrook Shire Council has noted there is a significant difference between Mangoola's predicted and actual traffic generation and this expansion can be expected to exacerbate that situation.

I object to the latest modification to the Anvil Hill site because of the traffic already bulging on the New England Highway.

There is no mitigation offered for the impact of more people on Muswellbrook's highway traffic which is already bumper to bumper.

Response

A further traffic assessment was commissioned as part of this Response to Submissions report, the result of which reflect similar findings to that of the assessment completed as part of the Anvil Hill Project EA (Umwelt, 2006). Future traffic demand on the road network servicing the Mangoola Coal Mine, including the proposed modifications, will be minor and will not result in noticeable impacts on current traffic loads. The LoS for Wybong Road, Wybong Post Office Road and Bengalla Link Road will remain at LoS A.

Submission

The traffic has increased considerably along Wybong Rd which has increased noise. – This increased traffic consists of light vehicles, vehicles up to 6 tonne with escorts and over-sized/wide loads. When the wide loads come through the road goes into 'shut down' mode, which results in having to wait between 20 and 30 minutes to use the public road. This inconvenience has forced us to be late for employment and other appointments like doctors. Unfortunately this inconvenience is expected to continue as the mine will always need to replace machinery parts, tyres and equipment.

Response

As noted above, the existing traffic assessment results indicate that for the proposed modification no significant impact from traffic is expected.

With respect to road closures, some temporary short-term closures will impact on traffic along Wybong Road and Wybong Post Office Road during decommissioning of the existing ETL and construction of the ETL relocation. These closures are required to allow for the stringing and removal of the ETL cables across both these roads. The closures are expected to last for up to 20 minutes per cable run over a period of four days per road crossing (there are 26 cables on the ETL in total, 24 large 2 small). Hurdles of timber uprights/crossbeam configuration are intended to be utilised to ensure 6-8 metre clearance over roads for the stringing of cables, with traffic control and authority to stop traffic if required and reduced speeds. This also applies for dismantling, although hurdles are less effective when lowering conductors and each phase will be cut and removed from the road hurdle each time a phase is lowered so as much risk as possible is mitigated. Expected road closure during decommissioning of the existing ETL is for 15-20 minutes each time this occurs.

In addition to the movement of oversize/overmass vehicles used for deliveries (tower materials transport) and equipment being transported for clearing and earthmoving and tower construction.

The impact of these closures should be minimal with less than 10 vehicles being made to wait up to 20 minutes. The impact will be managed by:

- closing the road during off peak periods only;
- informing drivers in advance of closure; and
- minimising the number of closures.

As previously noted, in an attempt to ameliorate the inconvenience of road closures, Mangoola Coal advertises road closures or disruptions and distributes notifications, e.g. flyers, to the local community. Advertisements and notifications include dates and times, proposed works and what traffic controls will be in place during the disruption period.

Submission

Increased traffic increases risk of accidents due to fatigue, lack of patience and unstable road surface.

Response

As part of the traffic assessment completed for the ETL relocation EA an assessment was completed against Australian road safety standards. Based on the predicted increases in traffic, increase in traffic volumes is unlikely to cause any change to the road network's performance or affect road safety.

Submission

Proposed train refuelling facility installed at the rail loop is fine, however not impressed that there will be 2 road tankers travelling our local road every day.

During a community meeting with mine personnel, we were notified that the mine would be refuelling their trains on site. If this occurs, there will be another hazard on the road when fuel tankers travel between Newcastle, local properties and the mine site.

Response

The transportation of the fuel associated with the rail re-fuelling facility by road is a consequential activity of the re-fuelling facility assessed as part of the EA. The proposed rail re-fuelling facility will be located where existing rail track provides for easily obtained access for re-fuelling reducing the risk of fuel spillage.

The re-fuelling initiative is aimed at improving efficiency by enabling trains to be refuelled as part of loading operations. It is proposed that two additional fuel tankers per day would travel to and from the Mangoola Coal Mine, using the route from the New England Highway, via Thomas Mitchell Drive, Bengalla Link Road and Wybong Road to the Mine.

The road geometry and the layouts of the key intersections along the route are such that they can accommodate the additional two heavy vehicles/fuel tankers and their turning paths without any operational or safety concerns. There is nothing to indicate that an accident involving a fuel tanker is more likely to occur than accidents involving other vehicles (Parsons Brinkerhoff, 2011).

7.15.2 Wybong Road Upgrade**Submission**

The Wybong Road upgrade has been poorly executed; therefore, a consent condition for this modification should require Mangoola Coal to fix the access roads to RTA standards before being allowed to commence coal sales.

After considerable road works over the past 12 months causing substantial travel delays, cracked windscreens and constant inappropriate driver behaviour, we now have a Wybong Road which is a little wider in places, however it is littered with potholes, broken edges and a large amount of loose gravel. It is concerning to note that the 'new' Wybong Road is only months old and is in an extremely poor state. I question the use of water carts spraying water on a 'sealed' road in an attempt to keep the heat out, so that the road doesn't fall apart further. A consent condition for this modification should be that Mangoola Coal not be permitted to commence coal sales until the mine access (Wybong and Bengalla Link) Roads meet RTA standards and are safe for the volume and nature of traffic, which is intended for these roads.

Response

Mangoola Coal is currently in negotiations with MSC with respect to the amelioration of the condition of Wybong Road. Refer to response to MSC submissions 16-20.

Submission

The surface of the road is of concern because when the temperature is over 30°C the Mangoola Mine provides a water cart to water the surface down to prevent the tar melting and sticking to vehicles. For safety reasons the speed level is dropped to 60km/hr. This can be seen as doing the right thing for road users but it is also a major inconvenience as the road is not yet 12 months old and the surface is unstable. Vehicles are being damaged by loose stones and tar being flicked up.

Response

Mangoola Coal is currently in negotiations with MSC with respect to the amelioration of the condition of Wybong Road. Refer to response to MSC submissions 16-20.

7.15.3 Road Closure

Submission

Assumption that Yarraman and Wybong PO roads will act as detours for all traffic when Xstrata choose and no consultation with Wybong Community and road users on these matters or the capacity of Wybong Rd to handle the increased traffic.

Response

No detours are proposed as part of the mine plan modifications or associated ETL relocation. Temporary, short-term closures will occur (refer previous response in this section of the Response to Submissions Report) which details road closures. The traffic assessment as part of the EA for the mine plan modifications concluded that the traffic associated with the modified project, when combined with the ETL relocation construction traffic numbers, does not result in changes to the level of service on roads surrounding Mangoola Coal Mine. Impacts to traffic are expected to be minimal.

Section 6.8.1 of the EA provides an overview of the existing road network and traffic demands and further details on the potential impacts relating to the projects are summarised in Sections 8.14 and 12.14. With respect to road closures, the Mangoola Coal Project Construction Traffic Management Plan³⁴ states 'Local communities will be kept informed about the proposed construction works and in particular the moving work zone on Wybong Road East and the proposed mine access route via the Xstrata Mangoola website'.

In addition, Mangoola Coal advertises road closures or disruptions and distributes notifications, e.g. flyers, to the local community. Advertisements and notifications include dates and times, proposed works and what traffic controls will be in place during the disruption period.

7.16 Transport - Rail

Submission

Locally increased production results in increased disturbance to all those people who live near the railway, those people of lower incomes who need somewhere to live.

Response

These issues are discussed in **Section 5.4.13** of this Response to Submissions, in response to MSC submissions 57-66.

Submission

We are concerned that there is insufficient data available to reflect the increase in Rail Traffic from 4 trains per day to 10 per day. This is a significant increase and the location of our property is directly opposite where the rail spur adjoins the main line. We would like some additional data to ensure we are not subject to increased disturbance from the huge increase in the number of trains. The report in Appendix C7 does not address any specific residence/s. The only reference is in 12.8.1.4 - Rail Impacts "The proposed night time freight movements result in one additional residence having noise levels that exceed the relevant criteria." The EA does not specify the number of that residence.

³⁴ The Community Consultative Committee was consulted on the Construction Traffic Management Plan and MSC informed of the outcome. The plan is available on the Xstrata Mangoola website.

Response

Rail noise impacts are from train movements associated with the transportation of coal on the Muswellbrook to Ulan line. Rail noise impacts from trains on the Mangoola Coal rail loop have been assessed as part of the operational noise impact for the EA.

The noise impact was assessed for the proposed average ten train trips per day, averaging five during the daytime period and five during the night time period on the Muswellbrook to Ulan Railway. The rail noise was reassessed in relation to these revised train movements based on a review of train movements associated with other developments using the Ulan to Muswellbrook line and taking into account certain parameters such as train lengths.

The maximum increase in distance from the track to meet the ARTC criteria as a result of proposed Mangoola Coal freight movements on any part of the Muswellbrook to Ulan line is 5 metres for daytime peak operations and 20 metres for peak operations at night. For each section of track under consideration, the noise footprint for daytime $L_{Aeq15hr}$ and maximum passby noise for proposed operations are wholly contained within the existing night time noise footprint. As such the only relevant time period for assessment of future additional exceedances is the night time period. The proposed night time freight movements result in one additional residence having noise levels that exceed the relevant criteria.

As prescribed in the statement of commitments for the project, a 4 metre high acoustic barrier has been constructed near the rail loop. Noise modelling to confirm the impacts of noise following more detailed design of the rail loop has optimised the design and location of this acoustic barrier. The purpose of the acoustic barrier is to minimise the off-site impact of wheel squeak around Sandy Creek Bend – the part of the rail loop where the track changes direction from an approximate north-south direction to an approximate east-west direction. Wheel squeak will be further minimised through the use of track lubrication. During the design process the need for a second acoustic barrier, as required for the Anvil Hill Project, was considered. However, noise modelling has shown that mitigation of impacts can be effectively achieved through use of track lubrication and that this second acoustic barrier is not required.

An acoustic barrier has been designed to mitigate noise impacts from the rail loop. Modelling undertaken during the design phase of the acoustic barrier suggests that there are substantial benefits of constructing an acoustic barrier in the vicinity of the rail loop. These benefits include:

- a reduction of seven properties being in the acquisition zone due to rail noise impacts; and
- a reduction of thirteen properties moving out of the management zone for noise due to noise impacts from the rail loop.

The construction of the acoustic barrier will be completed prior to any rail movements commencing on the Mangoola rail loop.

7.17 Ecologically Sustainable Development

Submission

Concern regarding the way in which mining companies treat the land and local community with such contempt.

Concern over the future of the country and what we are leaving for our grandchildren and great grandchildren.

Response

ESD issues are addressed in response to the North East Forest Alliance submissions in **Section 6.2.4** of this Response to Submissions Report.

7.18 Socio-Economics

Submission

I have visited the district and am appalled at the scale of mining impact. Please reconsider the value relative to the social and environmental costs of this latest modification.

Overburdened resources will suffer extended aggravation without any clear indication that the community will be further recompensed.

Response

Refer to response to submission 7(c)(ii) from MSC .

7.19 Consultation

Submission

Mangoola Coal have made a number of alterations made to their lease application to date; how many more do there need to be before commencing full production? Each change or alteration has an impact on our lifestyle. We ask that the planning committee look at the current proposal put forward and consider the needs of the few local landholders as well when making a decision about the alterations.

Response

The proposed mine plan modifications are generally aimed at more efficient mine operations, shortening the mine life and/or avoiding or significantly avoiding or minimising potential impacts, through the process of optimisation. The process of taking a project from design to detailed design results in better function and better function often results in changes to the original plan.

DP&I will consider all submissions in making a recommendation to the Minister for Planning in relation to determination of the proposed modification.

Submission

Sham community consultation.

Response

Throughout the development of the EA, there have been numerous opportunities for community input and questions throughout the consultation process. As part of the environmental assessment process for the project, extensive consultation with the local community and government agencies has been undertaken. A range of consultative and assessment mechanisms were used to engage the community including:

- CCC – the Projects were initially raised with the Mangoola Coal CCC in 2008 and consultation has been ongoing with the CCC throughout the Project;
- Project Specific CIS – two project specific CIS were held in April 2009;

- Mangoola Coal Consultation – in addition to the specific CIS held for the Project, one further Mangoola Coal CIS, held on 22 July 2010, and two community newsletters developed by Mangoola Coal, which addressed various aspects of the Mangoola Coal Project, have also provided the community with updates on the proposed Projects;
- Individual Meetings – In addition to the consultation mechanisms outlined above, Mangoola Coal has commenced face-to-face consultation with specific residents affected or potentially affected by the proposed Projects; and
- Aboriginal Stakeholder Consultation – consultation with 33 Aboriginal stakeholder groups has also been undertaken during the Aboriginal Heritage Assessments for the Projects.

(Further details on the consultation undertaken are provided in Section 4 of the EA).

In addition to consultation outlined above, the general public have the opportunity to contact DP&I at any time; and project information flyers, advertisements and company website provide contact numbers and names of Mangoola Coal representatives who can be contacted to discuss the project throughout the assessment process.

Submission

We approached a spokesperson from the mine regarding an incident where the Wybong Creek was filled with pollution that had a greenish sludge appearance and as of 30.1.2011 we are still awaiting a response. This is only one incident we know about. How many others are left undisclosed that will gain affect the adjoining landholders water?

Response

Mangoola Coal Mine Environment and Community staff has contacted the individual responsible for this submission and their concerns regarding the issue have now been alleviated. Resolution of this issue has been recorded in accordance in the Mangoola Coal Stakeholder Communication Register.

Submission

In relation to construction noise, the EA states "...consultation with the affected residents will be undertaken to seek to establish alternative arrangements for mitigating these impacts..." The EA fails to indicate what the alternative arrangements may be.

Response

Alternative arrangements will be presented to, and negotiated and agreed with affected residents prior to commencement of construction. Should the mitigation measures be required, and agreed with affected residents, then they will be implemented.

Submission

In relation to noise control measures, as we are one of three affected residents we believe it would have been prudent for Xstrata Mangoola to provide detailed information to us however there has been no consultation to date regarding this specific issue. There are multiple references to this throughout the EA however it seems unclear as to the nature of these barriers and little or no modelling on the noise reduction they may provide.

Past negotiations with Xstrata Mangoola in direct regard to construction noise mitigation arrangements resulted in a very unsatisfactory outcome for ourselves and our tenants. We were left substantially out of pocket financially due to loss of production and time spent trying to reach an agreement and endured a significant amount of emotional duress.

Xstrata Mangoola proved extremely frustrating in trying to reach an agreement, changing guidelines mid-way through drawing up contracts and at one stage used threatening tactics.

Response

Consultation will be undertaken with residents with respect to noise management measures, including noise barriers, prior to works being undertaken. Information regarding noise mitigation measures is circulated where relevant and all records of requests and responses are maintained on site, with negotiations continuing until resolution is reached. In addition, in the case of the landholder who provided this submission, a specific noise assessment was conducted and explanation of results provided. It should be noted that the noise impact assessment undertaken as part of the EA has taken into consideration, not only predicted noise impacts, but modelling which includes noise management measures to determine the best management outcomes to avoid or minimise noise or other measures acceptable to and agreed by affected residents.

With respect to noise from rail activities, the current noise management measure for the approved project, directly associated with rail is with respect to the location of the rail loop. The loop has been located to use natural topography for shielding as much as possible. In addition, a 4 metre high noise barrier has been constructed on parts of the track that are exposed to nearby residences. Modelling has been conducted which includes this barrier, indicating that noise guidelines can be met.

7.20 Environmental Assessment

Submission

Opposed to the Xstrata plan to increase production rate without mitigating the impact of that expansion.

We have been grossly misled already by Centennial Coal, the previous mine proponent, and the DoP in terms of the impact the Mangoola Coal Mine would have on our property value and quality of life. Since then, Xstrata Mangoola P/L has done nothing to allay concerns. We once lived in a quiet peaceful rural area with the closest neighbour two kilometres away and with little passing traffic. The noise which we reported to both the EPA and Xstrata Mangoola P/L during the mine construction and operation phases has been very significant. Passing traffic noise, congestion and road closures have become major problems. The initial Environmental Assessment and subsequent monitoring is inadequate and we have grave concerns that the deficiencies in the original statement have not been addressed without introducing new modifications.

Response

'The modification does not seek to increase the production rate as a result of the alterations to the mine plan or to alter the original consent period of 21 years' (refer Section 11.1 of the EA). The approved limit of extraction is 10.5 Mtpa. As a result of the modifications to the mine plans a more efficient mining sequence can be implemented at the site resulting in a shorter overall life of mine, despite no change in the maximum approved extraction rate. This is achieved through a quicker ramping up of operations to the maximum annual production rate.

The EA for the proposed mine plan modifications was a complete EA prepared in accordance with DGRs taking into account all potentially impacted aspects.

Submission

The EA is extremely detailed and complex, yet there is scant information on what will be the final outcome. The EA states there has to be a ROMP completed prior to mining on site, however mining has already commenced.

Response

The Draft ROMP was submitted to DP&I for review and comment prior to mining on 17 August 2010. Following provision of comments from the relevant authorities, the ROMP was revised and re-issued as a Final on 21 December 2010. An additional revision was submitted on 7 April 2011. Further planning and refinement of forward actions to achieve critical commitments from the ROMP (Umwelt, 2011c) (such as revegetation and regeneration works within the Biodiversity Offset Areas and Corridors) are ongoing, in consultation with the relevant authorities, as required.

Submission

Who can possibly digest and understand all the information that goes into the presentation of the EA, as required by law?

Response

The EA is written in a style which aims to be understood by the general public, but it is appreciated that it contains a lot of information.

Throughout the development of the EA, there are numerous opportunities for community input through the consultation process. As part of the approvals process for the project, there is a requirement to consult with the community but no specific requirements on how this is to be completed. As part of the environmental assessment process for the project, extensive consultation with the local community and government agencies has been undertaken. A range of consultative and assessment mechanisms were used to engage the community including:

- CCC – the Projects were initially raised with the Mangoola Coal CCC in 2008 and consultation has been ongoing with the CCC throughout the Project;
- Project Specific CIS – two project specific CIS were held in April 2009;
- Mangoola Coal Consultation – in addition to the specific CIS held for the Project, one further Mangoola Coal CIS, held on 22 July 2010, and two community newsletters developed by Mangoola Coal, which addressed various aspects of the Mangoola Coal Project, have also provided the community with updates on the proposed Projects;
- Individual Meetings – In addition to the consultation mechanisms outlined above, Mangoola Coal has commenced face-to-face consultation with specific residents affected or potentially affected by the proposed Projects; and
- Aboriginal Stakeholder Consultation – consultation with 33 Aboriginal stakeholder groups has also been undertaken during the Aboriginal Heritage Assessments for the Projects.

(Further details on the consultation undertaken are provided in Section 4 of the EA).

In addition to consultation outlined above, we note project information flyers, advertisements and company website provide contact numbers and names which can be contacted to discuss the EA at any time.

Submission

Do the representative government departments with the power to make a difference digest it is it just a process of ticking the box to acknowledge that the EA has addressed this issue?

Response

The NSW environmental assessment is a legislative based process ensuring that relevant aspects and impacts are assessed on a project specific basis.

In summary, the EA for the proposed mine plan modifications was developed to meet the DGRs following which it was subject to adequacy review where all government agencies had the opportunity to assessment the document against the DGRs, legislation, guidelines, policies etc. Relevant guidelines, policies etc are also highlighted in the DGRs. In addition to this process, the DP&I also completes their own assessment and produces a Director-General's Report which would accompany any potential instrument of approval or project refusal. The process allows for a thorough assessment of issues on a project by project basis.

The capability of the DP&I and other regulators is not for us to question, nor is it our place to comment.

Submission

The expense involved in the computer modelling to determine unequivocally that dust and noise will stop at an imaginary line on the valley floor (what imaginary line?). There is no machine that has been invented for measuring all of the affecting parameters like the human sensory system.

Response

The EA for the mine plan modifications was completed as required by legislation in accordance with the DGRs and the relevant legislation, guidelines, policies. Modelling techniques applied are those which are accepted by government regulators.

7.21 Legislative Considerations and Approvals

Submission

The NSW Government needs to:

- **Implement a moratorium on approval of any new or expanded coal mines in NSW, including the Mangoola Mine.**
- **Immediately commission a study into the cumulative global effects of the NSW coal mining and export industry, including climate change impacts.**
- **Implement a 'Just Transition Levy' on coal exported from NSW, of at least \$5 per tonne of shipped coal. This money should be used to seed sustainable alternative industries in coal-affected regions, and to offer voluntary redundancy to workers in the coal industry.**
- **Begin to phase out the NSW coal industry, which is this state's single biggest contribution to climate change, with the aim of completely phasing out this state's coal industry by the year 2030.**

Response

These issues are broader than the scope required to be assessed for the proposed modifications. We note, however, that the Department of Planning has recently released a scope for a Coal and Gas Strategy for NSW, for public comment.

Submission

Both Xstrata proposals (Mangoola Mine Modification and TransGrid 500kV ETL Relation) should be the subject of a re-convened public enquiry or public PAC hearing and no activity in pursuit of either proposal should occur unless and until that process is approved.

Response

The referral of the EA to the Planning and Assessment Commission is a matter for the Minister of Planning to determine.

Submission

Incomplete plans such as Landscape Management Plan, required by the initial consent prior to any site work, construction and/or commencement of mining but still absent despite work underway.

Response

The Landscape Management Plan was submitted to NSW DTIRIS and the Director-General of DP&I, with final approval required by the Director-General. In accordance with the Project Approval, the Landscape Management Plan was submitted prior to the commencement of mining.

Submission

There is no evidence of responsible management in current or past operations; they should not be allowed to expand or avoid compliance with conditions, as already we have seen:

- a) failure to work below the crest of the overburden dump at night;
- b) the use of unshielded lights all directed to the North;
- c) failure to secure, rent or demolish unoccupied and disintegrating dwellings; and
- d) unexplained and constant 'watering' of Wybong Rd for in excess of 2 months in a failed attempt to rectify melting seal.

Response

a) The operational working locations for the Mangoola Coal Mine are addressed in the noise and blasting assessment completed as part of the EA and noise management conditions listed in the Project Approval for the Mangoola Coal Mine. Complaints related to issues from a failure to adhere to operational controls are addressed through the Mangoola Coal Complaints Management Procedure.

b) The current operational process for limiting lighting impacts involves the training of onsite personnel and undertaking a competency based assessment. Any complaints received for lighting impacts are managed by the shift supervisor, the equipment subject of the complaint is repositioned and the complainant is then asked to confirm if the issue has been resolved.

A number of complaints have been received to date with respect to lighting impacts from night time operations at Mangoola Coal Mine at both residences and from drivers on roads in the project area which are impacted by lighting. Complaints have been investigated and issues addressed through the Mangoola Coal Complaints Management Procedure.

c) A dilapidation assessment has been completed with respect to the condition of XCN owned dwellings. Subsequently, approval has been granted by MSC to remove certain dwellings. This is an ongoing process.

- d) Mangoola Coal is currently in negotiations with MSC with respect to the amelioration of the condition of Wybong Road. Refer to response to MSC submissions 16-20.

Submission

We have not ever and continue to not give anyone any consent to approve or permit to conduct or conduct activities in relation to this development that will impact over our property. We seek the Minister protects our legal rights. We seek that the Minister takes this opportunity in determining this modification application to ensure an appropriate mitigation program that protects our property, maintains our existing use rights and allows us continued full use and enjoyment of our property and does not rely on us selling.

Response

The EA for the proposed mine plan modifications was a complete EA completed as required by legislation and prepared in accordance with the DGRs and the relevant legislation, guidelines, policies.

The Minister will consider the content of the EA, submissions in relation to the proposed project and EA content, and this Response to Submissions report prior to determination of approval or project refusal.

As far as is practicable, Mangoola Coal respects residents' and landowners' property and rights including their use and enjoyment of their property. Mangoola Coal works with nearby affected landowners and residents to understand issues, concerns and impacts, to consider potential impact mitigation options, and where feasible, to arrive at mutually agreeable solutions.

7.22 Land Use

Submission

Land Use. The map clearly indicates a substantial area located on the Hunter River alluvial flats owned by Xstrata Mangoola, managed by Colinta Pastoral, is classified as intensive agriculture. The map is dated 2007 however on visual inspection it is clear since acquisition of these properties that the majority have ceased to be intensively farmed and the maps should be updated to show current land use.

Response

Land owned by Mangoola Coal and managed by Colinta Pastoral is mixed agricultural use.

The bulk of the land managed and used by Colinta comprises marginal dryland grazing areas supporting a breeding herd of cattle, i.e. non intensive agriculture; with some areas of irrigation/cropping along the Hunter River; i.e. intensive agriculture. Land use is similar to that prior to management by Colinta. Changes in land ownership and management have resulted from the land no longer being under separate ownership, and in turn resulting in larger scale management of the land.

In the Mangoola/Denman area Colinta have a resident fixed breeder herd of 1200 cattle. Male and female progeny from Colinta's breeding herd are weaned onto irrigated pasture/oats at Mangoola Coal Mine or sent to Colinta's Bobadeen farming operation near Mudgee to fatten. Depending on market and seasonal conditions, these calves are sold to a number of different markets.

Colinta continue to irrigate/crop the better quality alluvial agricultural lands along the Hunter River under an improved pasture/forage regime. Some of these areas were previously used for lucerne hay production. However, Colinta's focus has been on irrigated pastures/oats to fatten progeny in preparation for sales into target cattle markets.

Land use since Colinta established themselves at Mangoola in late 2007/early 2008 has remained relatively consistent. However, cattle numbers have increased as more land has become available and there has been some change in the specific use of the better quality alluvial flats.

7.23 Historic Heritage

Submission

Site of a former windmill - the relevance of this 'historical site' is unbelievable. One only has to drive through any rural area to see similar sites. Perhaps EA's need to have broader guidelines as to what to include.

Response

The EA was completed in accordance with legislative requirements. As part of NSW heritage assessment procedures it is essential to have a full understanding of a site or item based on its historical and physical context. The historical context of an area and its broader locality provides an understanding of the significance of any heritage sites potentially located within an area.

8.0 Abbreviations

3D	Three dimensional
ACHOA	Aboriginal Cultural Heritage Offset Area
ACHMP	Aboriginal Cultural Heritage Management Plan
AEMR	Annual Environmental Management Report
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AQMP	Air Quality Monitoring Program
ARTC	Australian Rail Track Corporation Ltd
ASIR	Aboriginal Site Impact Recording
AUR	Auxiliary Right Turn
Blue Book	Managing Urban Stormwater Soils and Construction
CAP	Catchment Action Plan
CEMP	Construction Environmental Management Plan
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
CHR	Channelised Right Turn
CHR(S)	Channelised Right Turn (Short Lane)
CIS	Community Information Sessions
CFMEU	Construction, Forestry, Mining and Energy Union
CPP	Coal Preparation Plant
CSI	Corporate Social Involvement
CTMP	Construction Traffic Management Plan
CVA	Conservation Volunteers Australia
dB	Decibel
dB(A)	A-weighted decibel
DECCW	Department of Environment, Climate Change and Water now referred to as OEH

DEFRA	Department for Environment, Food and Rural Affairs (United Kingdom)
DG	Director General
DGRs	Director General's Requirements
DIDSS	Dads in Distress Support Services
DoP	Department of Planning now known as DP&I (NSW)
DPI	Department of Primary Industries now part of DTIRIS (NSW)
DP&I	Department of Planning and Infrastructure (NSW)
DSEWPC	Department of Sustainability, Environment, Water, Population and Communities
DTIRIS	Department of Trade and Investment, Regional Infrastructure and Services (NSW)
DWE	Department of Water and Energy now within DTIRIS (NSW)
DVD	Digital Versatile Disc
EA	Environmental Assessment
E&C	Environment & Community
EDO	Environmental Defenders Office
EEC	Endangered Ecological Community
e.g.	"exempli gratia" meaning 'for the sake of example'
EIS	Environmental Impact Statement
EL	Exploration Licence
ELF	Extremely Low Frequency
EMDS	Ecosystem Management Decision Support
EMF	Electromagnetic Field
EMP	Environmental Management Plan
ENM	Environmental Noise Model
EPA	Environmental Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EPBC	Environment Protection and Biodiversity Conservation

EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth)
EPL	Environmental Protection Licence
ESD	Ecologically Sustainable Development
ETL	Electricity Transmission Line
GHG	Greenhouse Gas
ha	Hectares
HCRCMA	Hunter Central Rivers Catchment Management Authority
HMRI	Hunter Medical Research Institute
HVMP	Hunter Valley Men's Program
HVTC	Hunter Valley Training Company
Hz	Hertz
IARC	International Agency for Research on Cancer
i.e.	"id est" meaning 'that is'
I&I NSW	Department of Industry and Investment (NSW) now known as DTIRIS
IHAP	Independent Hearing Assessment Panel
Initiative	The Great Eastern Ranges Initiative
Infrastructure SEPP	State Environmental Planning Policy (Infrastructure) 2007
INP	Industrial Noise Policy
IPCC	Intergovernmental Panel on Climate Change
kHz	Kilohertz
kL	Kiloliter
km	Kilometres
kV	Kilovolt (1000 volts)
LA _{eq}	Equivalent continuous A-weighted sound pressure level
LEP	Local Environmental Plan
LGA	Local Government Area
LoS	Level of Service
M	Million

m	metres
Mangoola Coal	Xstrata Mangoola Pty Ltd
mG	Milligauss
MIA	Mining Infrastructure Area
Mining SEPP	State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
mins	Minutes
ML	Megalitres
MLEP	Muswellbrook Local Environmental Plan 2009
MOD	Modification
MOP	Mining Operations Plan
MSC	Muswellbrook Shire Council
Mtpa	Million tonnes per annum
NB	“nota bene” meaning ‘note well’
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NGA	National Greenhouse Accounts
NIA	Noise Impact Assessment
NPW Act	<i>National Parks and Wildlife Act 1974</i> (NSW)
NOW	NSW Office of Water (NSW)
NSW	New South Wales
NVMP	Noise and Vibration Management Plan
NYS	Newcastle Youth Service
OEA	Overburden Emplacement Area
OEH	Office of Environment and Heritage
PAC	Planning Assessment Commission
PAD	Potential Archaeological Deposit
PC	Practical Completion
PM ₁	Particle Matter less than 1 micron

PM _{2.5}	Particle Matter less than 2.5 microns
PM ₁₀	Particle Matter less than 10 microns
PO&E Act	<i>Protection of the Environment Operations Act 1997 (NSW)</i>
RAP	Reconciliation Action Plan
RBL	Rating Background Level
Rd	Road
RL	Relative Level (m AHD)
ROM	Run of Mine
ROMP	Rehabilitation and Offset Management Plan
RTA	Roads and Traffic Authority (NSW)
SEPP	State Environmental Planning Policy
SPCC	State Pollution Control Commission
TAFE	Technical and Further Education Commission
TEC	Threatened Ecological Communities
TEOM	Tapered Element Oscillating Microbalance
TSC Act	<i>Threatened Species Conservation Act 1995 (NSW)</i>
TSP	Total Suspended Particulate Matter
Umwelt	Umwelt (Australia) Pty Limited
WAG	Wybong Action Group
WAL	Water Access Licences
VCL	Vacant Crown Land
VEC	Vulnerable Ecological Community
VP	Viewpoints
XC	Xstrata Coal
XCN	Xstrata Coal NSW
Yr	Year
YHMOI	Youth Harm Minimisation Outreach Initiative
µT	Microtesla

9.0 References

- Department of Environment and Conservation (DEC), 2005, *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*.
- Eastcoast Flora Survey, 2010, *A strategy for the translocation of threatened terrestrial orchids at Mangoola Coal, Upper Hunter Valley*, Prepared for Mangoola Coal.
- Environment Protection Authority (EPA), 2000, *Industrial Noise Policy (INP)*, NSW Government.
- Gillespie Economics, 2009, *Cadia East Project Socio-Economic Assessment*.
- McClelland and Macdonald, 1998, *The Social Consequences of Unemployment*, Prepared for the Business Council of Australia.
- NSW Health – Hunter New England, 2007, *A New Direction for Hunter New England - Health Service Strategic Plan*.
- Parsons Brinkerhoff, 2011, *Modifications to Mangoola Coal Mine Plans and Relocation of 500kV Electricity Transmission Line – Additional Traffic Impact Assessment*, Report prepared for Xstrata Mangoola Pty Limited.
- State Pollution Control Commission (SPCC), 1986, *Particle size distributions in dust from open cut coal mines in the Hunter Valley, Report Number 10636-002-71*, Report prepared for the State Pollution Control Commission of NSW (now DECCW) by Dames and Moore, 41 McLaren Street, North Sydney, NSW 2060.
- Umwelt (Australia) Pty Limited (Umwelt), 2006, *Anvil Hill Project Environmental Assessment*, Report prepared for Centennial Hunter Pty Limited.
- Umwelt (Australia) Pty Limited (Umwelt), 2008, *Aboriginal Cultural Heritage Management Plan*, Report prepared for Xstrata Mangoola Pty Limited.
- Umwelt (Australia) Pty Limited (Umwelt), 2010a, *Groundwater Monitoring Plan (Appendix 2 Mangoola Water Management Plan)*, Prepared for Xstrata Mangoola Pty Limited.
- Umwelt (Australia) Pty Limited (Umwelt), 2010b, *Mangoola Water Management Plan*, Prepared for Xstrata Mangoola Pty Limited.
- Umwelt (Australia) Pty Limited (Umwelt), 2011, *Air Quality Monitoring Program*, Prepared on behalf of Xstrata Mangoola Pty Limited.
- Umwelt (Australia) Pty Limited (Umwelt), 2011b, *Noise Monitoring Program*, Prepared on behalf of Xstrata Mangoola Pty Limited.
- Umwelt (Australia) Pty Limited (Umwelt), 2011c, *Rehabilitation and Offsets Management Plan (ROMP) for Mangoola Mine*, Prepared on behalf of Xstrata Mangoola Pty Limited.

APPENDIX 1

Revised Statement of Commitments - ETL Relocation

Revised Statement of Commitments – ETL Relocation

The DGRs for the Project required that the EA includes a Statement of Commitments for the ETL Relocation which details the measures proposed for environmental mitigation, management and monitoring.

If approval is granted under Part 3A of the EP&A Act for the proposed Relocation Project, Mangoola Coal will commit to the following controls.

9.2.1 Compliance with the EA

- 9.2.1.1 To carry out the Project generally in accordance with the Project Application and this EA report.

9.2.2 Construction Environmental Management Plan

- 9.2.2.1 A Construction Environmental Management Plan will be prepared for the ETL relocation project in accordance with both TransGrid's Environmental Management System and Xstrata Mangoola's Sustainable Development Management System. The *ETL Construction Environmental Management Plan (CEMP)* will address a number of issues including:

- ecology;
- Aboriginal heritage;
- historic heritage;
- erosion and sediment controls;
- construction noise;
- construction traffic;
- bushfire management;
- waste management;
- biosecurity risks; and
- coordination of mining activities and ETL construction on site including blasting impacts.

9.2.3 Ecology

ETL Route Design

- 9.2.3.1 Relocate the tower and alter the stringing process for the wires to avoid the need for heavy machinery to impact EEC listed riparian vegetation where the relocated ETL spans Big Flat Creek.
- 9.2.3.2 Maintain the easement in sensitive areas by selectively removing or lopping trees with a mature height of over 4 metres that are deemed to pose a safety risk by growing too close to the ETL, wherever possible.

- 9.2.3.3 Design access tracks within and off the easement to avoid hollow-bearing trees wherever possible.

Vegetation Management

- 9.2.3.4 Ensure that the impacts of tree felling or loss of hollows are minimised in the pre-clearing and tree felling process (currently an existing commitment of Mangoola Coal).
- 9.2.3.5 Vegetation removal/lopping for maintenance and access purposes will avoid the shrub and ground layers in sensitive areas, as much as possible.
- 9.2.3.6 Retain hollow-bearing trees within the easement as a priority. Where possible, access tracks within the easement, and off-easement areas, will be located around such trees.
- 9.2.3.7 Any trees or vegetative matter that is cleared will be stockpiled and managed as per Mangoola Coal's Rehabilitation and Offset Management Plan (ROMP).
- 9.2.3.8 Lopping of hollow-bearing trees will be prioritised over felling. Any hollow-bearing trees found will be managed in accordance with Mangoola Coal's hollow-bearing tree management procedure.
- 9.2.3.9 Vehicle access within and around the easement will be restricted to existing tracks as much as possible, in order to minimise disturbance to threatened grassland species such as *Diuris tricolor* and *Bothriochloa biloba*.
- 9.2.3.10 All tiger orchid (*Cymbidium canaliculatum*) plants falling within areas to be cleared will be included in the translocation program for the Mangoola Coal Project, as per the Rehabilitation and Offset Management Plan (ROMP) (Umwelt, in prep.).
- 9.2.3.11 Investigate the use of 'glider friendly' safety barriers on the towers as an alternative to the use of barbed wire.
- 9.2.3.12 Establish the additional Biodiversity Offset Area as outlined in **Section 8.1.6** to address residual ecological impacts and maintain or improve the biodiversity values of the local area.
- 9.2.3.13 Where the ETL easement passes through Biodiversity Offset Areas groundcover will be retained, and any trees with a mature height of over 4 metres that are deemed to pose a safety risk for the ETL will be selectively removed or lopped.
- 9.2.3.14 Ensure that the impacts of tree felling or loss of hollows are minimised in the pre-clearing and tree felling process, consistent with the clearing procedure in the approved Mangoola Coal ROMP.
- 9.2.3.15 Where tree hollows are lost by felling hollow-bearing trees (including stags), hollow fallen timber will be replaced by nest boxes set in appropriate locations at appropriate heights for the target fauna species. This will be managed in accordance with procedures in Mangoola Coal's ROMP.

9.2.3.1 Prior to any vegetation clearing in any of the route for the ETL relocation, a pre-clearance survey for *Acacia pendula* plants will be completed. In the unlikely event that any plants are found these will be marked and relevant procedures managed in accordance with Mangoola Coal's ROMP.

9.2.4 Aboriginal Heritage

- 9.2.4.1 Sites SC55, SC56, SC57 and BFC69 to BFC73 will be clearly designated by a qualified archaeologist and at least two Aboriginal stakeholder representatives prior to any ground disturbance. Following the completion of the ETL relocation, these sites will be managed in a manner generally in accordance with the Mangoola ACHMP.
- 9.2.4.2 Prior to the establishment of the designated access tracks, surface artefacts within sites SC60 to SC65 will be subject to surface collection and analysis in accordance with the methodology approved by the relevant Aboriginal stakeholders and DECCW as part of the Mangoola Coal ACHMP (Umwelt 2008a). Following the completion of analysis, the proposed repository for salvaged artefacts will be the subject of further consultation with the relevant Aboriginal stakeholders, DECCW and the Department of Planning. Dependent on the nature of the final artefact repository, a Care and Control permit for artefacts may be sought from DECCW.
- 9.2.4.3 To minimise clearance and surface impacts associated with vehicle movements between T27 and T28 (within the Big Flat Creek Aboriginal Cultural Heritage Offset Area) hand-stringing of conductors using a light-weight draw-wire will be undertaken. Where conductors may contact surface artefacts during the hand-stringing process, any potential impacts to the artefacts will be mitigated by recording the MGA grid coordinates of potentially affected artefacts prior to collection and subsequent return of artefacts to the recorded location following the cessation of works associated with relocation of the ETL.
- 9.2.4.4 Vehicle access and construction activities within the Big Flat Creek ACHOA and the SC10 Management Zone will be undertaken to minimise impacts. Where impacts cannot be avoided, these areas will be inspected by at least two representatives of the Aboriginal stakeholders (in compliance with the ACHMP) and any surface artefacts located within the area flagged. Their MGA grid coordinates will be recorded and each artefact will be collected and returned to their recorded location following the cessation of works associated with the relocation of the ETL. In addition, no tracks will be established in the Big Flat Creek ACHOA along the easement for construction and future maintenance activities.
- 9.2.4.5 Sites BFC74 to BFC88, located within the Habitat Enhancement Area, will be managed in accordance with the Mangoola Coal ACHMP (Umwelt 2008) which will be reviewed to reference these sites and other sites identified in association with the relocation of the ETL.
- 9.2.4.6 A suitable culturally appropriate offset will be determined following additional consultation with the relevant Aboriginal stakeholders within two years of Project Approval, in consultation with DECCW and to the satisfaction of DoP.

Ongoing Management

9.2.4.7 Ongoing management of Aboriginal heritage items within the ETL relocation easement area will be in accordance with TransGrid's maintenance policies and procedures. TransGrid policies and procedures will be provided to OEH as part of the management plan.

Aboriginal Cultural Heritage Management

9.2.4.8 The ETL CEMP will address Aboriginal heritage sites located within the area affected by the ETL relocation and will also reference and adopt relevant management requirements outlined in the ACHMP for the Mangoola Coal Mine.

9.2.4.9 Mangoola Coal will continue to operate in accordance with the approved Aboriginal Cultural Heritage Management Plan (ACHMP) for the ongoing management of the Aboriginal heritage items within the approved project disturbance boundary. The ACHMP will continue to be implemented in consultation with the registered local Aboriginal stakeholders and will be revised within the next 12 months. The revision will include:

- additional information on all newly identified sites on land owned or managed by Mangoola Coal, including sites identified within the areas affected by the ETL relocation;
- a requirement to ensure that if Aboriginal objects are salvaged or uncovered due to development activities, any custodial arrangements will comply with the provision of Section 85 of the NPW Act and that every opportunity will be afforded to Registered Aboriginal Parties to provide input into decisions regarding short and long-term and/or final custodial arrangements for salvaged artefacts;
- addressing any relevant amendments to the NPW Act; and
- details of further consultation with the Aboriginal community.

The requirement for submission of Aboriginal Site Impact Recording (ASIR) cards following salvage will also be incorporated into these documents.

9.2.4.10 In the event that surface disturbance identifies a new Aboriginal site, the site will be managed in accordance with the procedures in the Mangoola Coal ACHMP for previously unrecorded sites. This procedure will be updated during the revision of the ACHMP, consistent with the requirements of OEH. These requirements will also be addressed in TransGrid's ETL CEMP.

9.2.4.11 In the event that human remains are located following any surface disturbance, these will be managed in accordance with relevant procedures in the Mangoola Coal's ACHMP, which will be referenced in the TransGrid ETL CEMP.

9.2.4.13 The Aboriginal Cultural Education Program developed for the Mangoola Coal Mine will continue to be implemented as part of the induction process for full time employees and contractors. This program will be available for induction processes for the ETL relocation.

9.2.4.14 Mangoola Coal will continue to consult with and involve all relevant registered local Aboriginal representatives for the project, in the ongoing management of the Aboriginal cultural heritage values. Evidence of this consultation will be collated and provided to the consent authority upon request.

9.2.5 Historic Heritage

- 9.2.5.1 The location of site/items 20 and 21 will be included in the ETL CEMP.
- 9.2.5.2 In the unlikely event that significant historical archaeological remains not identified as part of this study are discovered at the site, all works in the immediate area will cease and the Heritage Branch, Department of Planning will be notified, in accordance with Section 146 of the *Heritage Act 1977* (NSW).

9.2.6 Erosion and Sediment Control

- 9.2.6.1 Erosion and sediment control measures will be established prior to the commencement of any substantial construction works, as required.
- 9.2.6.2 The erosion and sediment control measures described in **Section 8.5** of the EA will be included in the ETL CEMP.
- 9.2.6.3 Erosion and sediment control measures will be regularly inspected and maintained as required to ensure controls are performing adequately.
- 9.2.6.4 Construction plans will detail the specific inspection, maintenance and revegetation requirements for the relocated ETL based on the construction program schedule.

9.2.7 Visual Amenity

- 9.2.7.1 The towers adjacent to Mangoola Road and Wybong Road will be painted green to slightly reduce the visual impacts.

9.2.8 Electric and Magnetic Fields

- 9.2.8.1 No specific environmental controls are proposed for EMF as the levels of electric and magnetic fields associated with the relocated ETL are below relevant guideline limits. The principles of prudent avoidance outlined in **Section 8.7** have been incorporated into the design and operation of the relocated ETL.

9.2.9 Construction Noise

- 9.2.9.1 Construction noise associated with the Project and the potential impacts to the residents at either end of the relocated ETL will be managed by scheduling work in these areas, where practicable, within the recommended standard hours. Where this is not practical, consultation with the affected residents will be undertaken to seek to establish alternative arrangements for mitigating these impacts.
- 9.2.9.2 In relation to potential significant impacts at Residences 81 and 132, noise generation associated with the construction of the relocated ETL will be managed by installing an appropriate temporary noise barrier during construction activities, if required.
- 9.2.9.3 Construction activities associated with the relocation of the ETL will only be undertaken between the hours of 7.00 am and 6.00 pm, seven days a week.

9.2.9.4 Provision of temporary accommodation will be considered by Mangoola Coal as a potential construction noise management measure for the ETL relocation for those residents affected within the ETL noise management zone.

9.2.10 Blasting

9.2.10.1 In order to comply with the relevant blast limit to protect the ETL:

1. No mining will occur within the easement area or the area 50 metres from the centreline of the ETL;
2. In relation to blasting within 250 metres from the centreline of the ETL, monitoring is required to determine if this is practicable due to constraints imposed by compliance with the relevant vibration limit;
3. All blasts within the zone between 250 metres and 300 metres from the centreline of the ETL will be specifically designed to meet the relevant vibration limit at the ETL.

9.2.11 Waste Management

9.2.11.1 Waste management will be addressed as part of the CEMP to be developed for the ETL relocation project, and will incorporate the following:

- Excavated material from the tower footings will be re-used on site in accordance with Mangoola Coal's Rehabilitation and Offset Management Plan (ROMP).
- Any trees or vegetative matter that is cleared will be stockpiled and managed as per Mangoola Coal's ROMP.
- Concrete footings of towers outside the approved project disturbance boundary will be removed at approximately 0.5 metre below the ground surface and will remain *in situ*.
- Disposal of the existing ETL will be undertaken in accordance with TransGrid's Waste Management Policy (GD EN G3 023).
- Records will be kept of all waste transported off site and its destination.

9.2.12 Traffic

9.2.12.1 A specific risk assessment for the management of any oversized/overmass vehicles associated with the construction and decommissioning of the ETL proposing to use Wybong Road west will be undertaken as part of an ETL Construction Traffic Management Plan, prior to commencement of construction of the ETL.

9.2.12.2 Traffic delays during temporary road closures will be minimised by:

1. restricting road closures to off peak hours;
2. minimising the number of road closures required; and
3. informing drivers using various methods (e.g. print advertisements, radio etc) of the details of road closures and potential delays in advance.

9.2.12.3 A specific Construction Traffic Management Plan (CTMP) will be prepared and submitted to Council for approval prior to any ETL construction proceeding on site. The CTMP will address:

- the safety of the school bus service including the following:
 - o reminders of school bus operating times (i.e. from 6.30 am to 8.45 am, and from 3.00 pm to 5.00 pm) during 'Toolbox Talks' for all personnel involved in the ETL relocation project;
 - o installation of a variable message sign at the Bengalla Road/Denman Road intersection that activates during school bus operational hours to inform drivers and to make them aware that children may be crossing the road; and
 - o excluding construction heavy vehicles deliveries to site during school bus service hours.

9.2.12.4 All heavy vehicles associated with the construction of the ETL relocation will access the site via the intersection of Denman Road and Bengalla Link Road. Light vehicles will use the intersections of either Denman Road and Bengalla Link Road or the Golden Highway and Wybong Road.

9.2.13 Socio-economic

9.2.13.1 Where a portion of an existing 11 kV line, owned by EnergyAustralia, may conflict with the safe operation of the relocated 500 kV ETL, this section of the 11 kV line will be buried to become an underground power supply.

To minimise inconvenience and interruption to the power supply and minimise any impacts, alternate power supply methods such as a diesel generator will be offered to any affected landowner for the relevant time period. This arrangement will be developed in negotiation with EnergyAustralia.

APPENDIX 2

Revised Statement of Commitments - Mine Plan Modifications

Revised Statement of Commitments – Mine Plan Modifications

* Commitment	Future Commitment
6.2 Community Enhancement Program	
6.2.2 Mangoola Coal will work with the local Council to facilitate local employment opportunities within the Muswellbrook Shire.	Remains current
6.4 Noise	
Noise Mitigation Measures The following noise control measures will be employed throughout the life of the Project unless otherwise agreed by the DP&I: 6.4.3 The CHPP, coal stockpiles and associated infrastructure will be located near the eastern boundary of the Proposed Disturbance Area to take advantage of natural topographic shielding which will reduce noise impacts on surrounding areas	Remains current
6.4.4 The CHPP and crushers will have noise enclosures, and shielding will be installed for conveyors.	Remains current
6.4.5 The rail loop will be located to use natural topography for shielding as much as possible. In addition, a 4 metre high noise barrier will be constructed on parts of the track to meet the noise modelling in the EA.	Remains current
6.4.6 At night, trucks will be restricted to operate below the maximum elevation of the overburden emplacement areas.	Remains current
6.4.9 If there are more than 20 privately-owned properties in the acquisition zone that have not entered into a negotiated agreement, Mangoola Coal will either: (a) carry out no night time mining operations; or (b) prepare and implement a noise management plan, in consultation with the OEH, and to the satisfaction of the Director-General to reduce the noise impact of mining operations on the properties in the acquisition zone.	Remains current
<u>Noise Management Zone</u> <u>6.4.10 Mangoola Coal confirms that those residences identified as having rights for noise mitigation and management in accordance with the original Project Approval No 06-0014, will still have those rights available to them, irrespective of whether the modification results in their property no longer being predicted to receive the level of noise impacts above the relevant trigger level specified in the current Project Approval</u>	<u>New Commitment</u>
6.5 Blasting and Vibration	
Blast Controls 6.5.6 Mangoola Coal will design and undertake blasts to ensure the relevant vibration and blast overpressure criteria are met at the 500 kV transmission line.	Remains current

* Commitment	Future Commitment
6.5.7 Mangoola Coal will refine and manage its blasting practices or undertake ameliorative measures so as not to significantly increase the risk of instability or affect the structural integrity of the rock shelter sites that are considered to be of significant Aboriginal cultural value in the Wallaby Rocks, Western Rocks and Limb of Addy Hill plateaus. This will include an ongoing monitoring program and review of blast design parameters.	Remains current
6.5.8 Techniques to minimise blast impacts will be employed as necessary to ensure compliance with relevant criteria. This may include blast initiation using electronic detonation techniques, limiting blast MIC, consideration of wind speed and direction prior to blasting, use of adequate stemming, implementing a delay detonation system, and careful drilling and hole loading to ensure that the required blast design is implemented.	Remains current
6.5.9 The Mine Manager or delegate will undertake a pre-blasting review of weather conditions to identify any conditions which may significantly increase blasting impact or dust impacts. When weather conditions are suitable or if safety requirements dictate at other times, the Mine Manager or delegate will issue a blast clearance prior to each blast proceeding.	Remains current
6.5.10 Wybong Road will be temporarily closed during blast events within 500 metres of the road.	Remains current
6.5.12 All relevant personnel will be trained on environmental obligations in relation to blasting controls.	Remains current
6.5.13 The date, location of blast holes and quantity of explosive detonated each day will be documented.	Remains current
6.5.14 Monitoring will be undertaken at locations representative of surrounding nearest private residences and other sensitive locations to verify compliance with relevant vibration and blast overpressure criteria, and identify appropriate further blast refinement or management.	Remains current
6.5.15 Blast management procedures will be periodically reviewed to evaluate performance and identify corrective action, if required.	Remains current
6.5.16 Blast monitoring results will be reported in the AEMR.	Remains current
6.6 Air Quality	
Air Quality Controls	Remains current
6.6.2 Water sprays will be used at coal handling transfer points and on stockpile areas that are capable of generating dust.	Remains current
6.6.3 All active roads will be clearly defined and the development of minor roads will be limited. Minor roads used regularly for access will be constructed so as to minimise dust generation (for example, by using well-compacted select material) and will be watered as required.	Remains current
6.6.4 Speed limits will apply and be enforced on all roads on the mine site.	Remains current
6.6.5 Water carts will be used on active haul roads and unsealed working areas. Surface moisture levels on all haul roads will be maintained at suitably elevated levels and/or chemical treatments will be applied to achieve 90 per cent dust suppression.	Remains current
6.6.6 Only the minimum area necessary for mining operations will be disturbed at any time.	Remains current

* Commitment	Future Commitment
6.6.7 Reshaping and rehabilitation of mining and overburden emplacement areas, and obsolete roads, will be undertaken as soon as practicable.	Remains current
6.6.8 Drills will be fitted with dust suppressant measures.	Remains current
6.6.9 Blasting design and operation will be managed to achieve optimum material breakage and movement to facilitate efficient mining while minimising the explosives used to achieve this outcome. This includes consideration of material and explosives characteristics, excavating equipment specifications, hole spacing and stemming material specification, accurate placement and drilling of holes, accurate explosives loading and well-managed stemming of blast holes. These measures will assist with minimising dust generation in the blasting process.	Remains current
6.6.10 Cover crops will be established on any topsoil and subsoil stockpiles that are not planned to be used in less than six months.	Remains current
6.6.11 Meteorological conditions will be monitored and weather data will be considered in the timing of blasts to assist with minimising the impacts of blast generated dust.	Remains current
6.6.12 Dust control measures to be employed during construction will include use of water carts, defining of trafficked areas, imposition of vehicle speed limits and constraints on work under extreme unfavourable weather conditions.	Remains current
6.6.13 A spontaneous combustion management strategy will be developed for the Project and will include coal stockpile and reject emplacement management measures, monitoring potential causes of spontaneous combustion events, and actions that can be implemented in the event of spontaneous combustion occurring.	Remains current
6.6.14 Mine personnel will be provided with training in dust controls during induction for mine operations.	Remains current
6.6.15 Mangoola Coal will install first flush systems on residential rain water tanks, at the request of landowners located within 4 kilometres of the Project Disturbance boundary.	Remains current
6.7 Water Management	
6.7.1 Conceptual surface water controls have been designed to ensure that clean runoff is separated from runoff within disturbed mining and infrastructure areas. Conceptual sediment and erosion controls have been designed to ensure any runoff from disturbed areas is appropriately treated.	Remains current
6.7.2 The drainage lines to be constructed as part of the final landform generally along the alignment of Anvil Creek as it existed prior to approval will be designed and constructed to provide a stable vegetated channel with a natural appearance that blends in with any adjoining riparian areas. Native trees and shrubs will be planted along the drainage alignment to enhance the long term stability of the drainage system and to provide suitable habitat for native fauna.	Remains current
6.7.3 A comprehensive water quality monitoring program will continue throughout the life of the Project to monitor the surrounding surface water quality.	Remains current
6.7.3a <u>Mangoola Coal will submit to the NSW Office of Water, plans for isolation of the mining excavation from the Big Flat Creek at least 6 months prior to operations extending to within 150 metres of Big Flat Creek.</u>	
Groundwater	

* Commitment	Future Commitment
6.7.4 The existing groundwater monitoring bore locations will be maintained and a number of additional bores will be constructed at new locations beyond the mine pit areas, and in spoils following reshaping. Locations for these piezometers will be subject to consultation with DWE. These bores will be monitored every two months for a range of parameters including water table level, pH, and EC and further analyses every six months for total dissolved solids (TDS), major ions, and heavy metals. Daily monitoring of water levels by automatic data loggers at existing piezometers and in selected new piezometers will continue. Analyses of this data will include comparison against model predictions, establishment of triggers for remedial action, expert review as required, and reporting to regulatory agencies at appropriate intervals.	Remains current
6.7.5 As discussed in Section 5.3.2.3, it is possible (but unlikely) that two existing groundwater wells not owned by Mangoola Coal may be affected by the Project. If the data obtained from the groundwater monitoring program indicates that the Project is having an adverse affect on these groundwater bores (that is, reduced groundwater yield from existing wells), then an alternative water supply will be provided by Mangoola Coal.	Remains current
6.7.6 If monitoring indicates it is required, a barrier cut off wall within the alluvium associated with Big Flat Creek will be constructed to limit groundwater seepage into the mine.	Remains current
6.7.7 Final voids have been designed to intercept leachate from overburden emplacement areas and minimise discharge of saline groundwater. Final void design will be reviewed at least three years prior to anticipated mine closure.	Remains current
6.7.8 Analyses of the monitoring data will include comparison against model predictions, establishment of triggers for remedial action, expert review as required, and reporting to regulatory agencies at appropriate intervals. The monitoring results and the analyses will be reported in the AEMR.	Remains current
<u>6.7.9 Mangoola Coal will install piezometers in accordance with the Xstrata Mangoola Groundwater Monitoring Program by the end of 2011. Monitoring of piezometers will become part of the site's monitoring schedule for the ongoing collection of data and reported in accordance with current Mangoola Coal Mine Project Approval. In addition, based on further groundwater advice, additional piezometers will be installed.</u>	
6.8 Ecological Management and Site Rehabilitation	
6.8.2 Mangoola Coal is committed to long term protection of the Proposed Offset Areas and will finalise the appropriate tenure/conservation mechanism to achieve this, in consultation with DP&I, OEH and DPI.	Remains current
6.8.3 Mangoola Coal will seek to acquire all proposed components of the Proposed Offset Areas within one year of the date of project approval. If one or more proposed components of the Proposed Offset Areas have not been acquired within this time frame, Mangoola Coal will consult with OEH and DP&I to identify alternatives.	Remains current
6.8.4 The land to be included in the conceptual corridors will include one external corridor to the north and one external corridor to the west, with the final location to be determined in consultation with OEH and DP&I.	Remains current
6.8.5 Mangoola Coal will take all reasonable steps to acquire all proposed component(s) of the conceptual corridors within one year of the date of granting of project approval. If proposed component(s) of the conceptual corridors have not been acquired within this time frame, Mangoola Coal will consult with OEH and DP&I to identify alternatives.	Remains current

* Commitment	Future Commitment
Vegetation Management	
6.8.6 Where tree hollows are lost by felling hollow-bearing trees (including stags), hollow fallen timber will be replaced by nest boxes set in appropriate locations at appropriate heights for the target fauna species. This will be managed in accordance with procedures in Mangoola Coal's ROMP.	
6.8.7 The ongoing health of <i>Diuris tricolor</i> will be monitored in the Habitat Enhancement Area adjacent to Modification Area 1, and at least 2 reference populations elsewhere in the Habitat Enhancement Area for at least five years. This will be included in the revised Mangoola Coal ROMP with baseline with baseline monitoring established prior to mining in the modifications areas and annual monitoring for at least 5 years following mining in the modifications areas.	
6.8.8 If there is significant and sustained decline in vigour of the Pine Donkey Orchids immediately adjacent to the open pit in Modification Area 1 then Mangoola Coal, over a three (3) year period, will engage a suitably qualified ecologist to recommend actions in relation to achieving the long-term survival of this population. This will be included in the revised ROMP.	
6.8.9 Prior to any vegetation clearing in any of the modifications areas, a pre-clearance survey for <i>Acacia pendula</i> plants will be done. In the event that any plants are found they are to be marked and managed in accordance with Mangoola Coal's ROMP.	
6.8.10 Translocation of <i>Diuris tricolor</i> from the approved disturbance area into suitable known habitats within the Biodiversity Offset Areas will continue to occur, as per the Project Approval for the Mangoola Coal Mine, and defined further in the ROMP. This will be extended to include any records of this species identified (during seasonal surveys) in the proposed modification areas.	Ongoing
6.9 Aboriginal Cultural Management	
* Site Management in Proposed Disturbance Area 6.9.1 Surface collection and grader scrapes will be undertaken for sites identified in the EA, prior to works commencing in these areas. Manual excavation will be undertaken in areas where the grader scrapes reveal features such as hearths, heat treatment pits, knapping floors or significant artefact concentrations.	Completed
* 6.9.2 Site AC13 will be subject to a detailed geomorphic investigation, a sub-surface test pitting program, large area manual excavation and grader scrapes.	Completed
6.9.3 Site SC10 will be managed for use by the Aboriginal and wider communities for teaching and educational purposes.	Remains current
6.9.4 Surface artefacts within sites SC58 and SC59 will be subject to surface collection and analysis in accordance with the methodology approved under the Mangoola Coal ACHMP.	New Commitment

* Commitment	Future Commitment
<u>Conservation Management</u> <u>6.9.6</u> The Proposed Offset Areas shown on Figure 5.8 provide for conservation of archaeological terrain units evaluated as having equal or greater overall significance than in the Proposed Disturbance Area. Mangoola Coal is committed to conserving all 98 identified sites and the landscapes in which they occur, within the Proposed Offset Areas. The Proposed Offset Areas will conserve all the rockshelter sites within Wallaby Rocks, Limb of Addy Hill, Western Rocks and Anvil Hill. Anvil Hill rockshelter sites (four sites), however, may be affected by the indirect impacts of blasting. This impact will be mitigated and management strategies for the rockshelters on Anvil Hill are discussed in Appendix 13.	Remains current
<u>6.9.7</u> Mangoola Coal will continue to operate in accordance with the approved Mangoola Coal Aboriginal Cultural Heritage Management Plan (ACHMP) for the ongoing management of the Aboriginal heritage items within the approved project disturbance boundary. The ACHMP will continue to be implemented in consultation with the registered local Aboriginal stakeholders and will be revised within the next 12 months. The revision will include: • <u>additional information on all newly identified sites on land owned or managed by Mangoola Coal, including sites identified within the areas affected by the modifications;</u> • <u>a requirement to ensure that if Aboriginal objects are salvaged or uncovered due to development activities, any custodial arrangements will comply with the provision of Section 85 of the NPW Act and that every opportunity will be afforded to Registered Aboriginal Parties to provide input into decisions regarding short and long-term and/or final custodial arrangements for salvaged artefacts;</u> • <u>amendments to the NPW Act; and</u> • <u>details of further consultation with the Aboriginal community.</u>	New Commitment
<u>6.9.8</u> In the event that surface disturbance identifies a new Aboriginal site, the site will be managed in accordance with the procedures in the existing ACHMP for previously unrecorded sites. This procedure will be updated during the revision of the ACHMP, consistent with the requirements of OEH.	
<u>6.9.9</u> In the event that human remains are located following any surface disturbance, these will be managed in accordance with relevant procedures in the Mangoola Coal's ACHMP.	
<u>6.9.10</u> All reasonable efforts will be made to avoid impacts to Aboriginal cultural heritage at all stages of the development works. Where impacts are unavoidable possible management options for unavoidable impacts and detailed management recommendations and methodologies have been developed in consultation with the Registered Aboriginal Parties. The requirement for submission of Aboriginal Site Impact Recording (ASIR) cards following salvage will also be incorporated into these documents.	
<u>6.9.11</u> The Aboriginal Cultural Education Program developed for the Mangoola Coal Mine will continue to be implemented as part of the induction process for all employees and contractors.	
<u>6.9.12</u> An additional suitable culturally appropriate offset will be determined following additional consultation with the relevant Aboriginal stakeholders, in consultation with OEH and to the satisfaction of DP&I.	

* Commitment	Future Commitment
<u>Consultation</u> <u>6.9.13 Mangoola Coal will continue to consult with and involve all relevant registered local Aboriginal representatives for the project, in the ongoing management of the Aboriginal cultural heritage values. Evidence of this consultation will be collated and provided to the consent authority upon request.</u>	
6.10 Heritage	
6.10.2 Archival recording will be undertaken for all heritage items identified within the Proposed Disturbance Area, prior to disturbance of such sites, to the standards of local heritage significance as specified by the guidelines of the NSW Heritage Office.	Remains current
* 6.10.3 The surface collection and salvage of Ham House 1 and Ham House 2 and associated dairies, creamery and structures will be undertaken.	Completed
6.10.4 Mangoola Coal will complete a detailed archival recording of the Castle Hill homestead to the standard of local heritage significance.	Remains current
6.10.5 Potential further sites of local heritage value located within the area at which the relevant vibration criteria are predicted to be exceeded will be inspected, subject to landowner permission for access, and appropriately recorded prior to blasting. This will include assessing the structural status and identifying appropriate ameliorative measures, where relevant.	Remains current
<u>6.10.6 In the unlikely event that significant historical archaeological remains not identified as part of this study are discovered at the site, all works in the immediate area will cease and the Heritage Branch, Department of Planning and Infrastructure will be notified, in accordance with Section 146 of the Heritage Act 1977 (NSW).</u>	<u>New Commitment</u>
<u>6.10.7 The location of site/items 20 and 21 will be included in a revision of the Heritage Management Plan.</u>	<u>New Commitment</u>
6.11 Traffic and Transport	
6.11.2 Wybong Road will be upgraded in association with Council, from the intersection with Bengalla Link Road to the proposed mine access road. This includes an upgrade to a sealed carriageway minimum 6.5 metres wide, road marked centreline to relevant standards, enhancement of safety and advisory signage, and upgrade of sections to ensure safe operation of school bus zones and stops. All works will be undertaken in consultation with Council and to the standards recommended in the detailed traffic assessment in Appendix 16 .	Substantially completed
* 6.11.3 The intersection of Wybong Road and the mine access road will be a Type B rural layout with a left turn auxiliary lane from Wybong Road into the proposed access road.	Completed
6.12 Greenhouse Gas	

* Commitment	Future Commitment
6.12.1 Mangoola Coal will implement the following approaches to improving energy efficiency and reducing greenhouse emissions from the Project: ▪ use of minimum 5 per cent bio-diesel or similar in the mining fleet, where environmental benefit is demonstrated; ▪ implementation of an energy management system within two years of the commencement of mining; ▪ conduct of an energy efficiency audit each three years after the commencement of mining; and ▪ installation of gas boosted solar hot water system. Mangoola Coal will continue to assess and implement energy and greenhouse management initiatives during the Project design, operation and decommissioning.	Remains current
6.12.2 In addition to these initiatives, Mangoola Coal will review various emission trading schemes and abatement initiatives available and assess the suitability of these for the Project (for example, the NSW Greenhouse Gas Abatement Scheme). The objective of these measures is to seek further opportunities to reduce or offset GHG emissions from the Project.	Refer to Section 12.9 of this EA
<u>6.12.3 Mangoola Coal will continue to monitor and seek to improve its energy and greenhouse gas performance against performance targets.</u>	<u>New Commitment</u>
<u>6.12.4 Mangoola Coal will report its greenhouse gas and energy performance via legislative reporting requirements.</u>	<u>New Commitment</u>
6.13 Visual Controls	
Vegetative Screenings	Remains current
6.13.1 Where access allows, vegetative screens will be planted along the lower sections of Mangoola Road from Roxburgh Road to the new rail loop intersection and along the ridge extending west from Limb of Addy Hill.	
6.13.2 Final revegetation of disturbed areas will consider the reduction of visual impacts.	Remains current
Infrastructure	
6.13.4 The link road from the CHPP to the Tailings Dam will be relocated to avoid the knoll 500 metres east of the product stockpile. This will ensure existing vegetation on the knoll shields views of the CHPP and stockpile from VP2.	Superseded, as design of infrastructure layout has been modified (MOD3)
6.13.5 The colour of building roofs and walls will be selected to differentiate elements and reduce visual mass.	Remains current
* 6.13.6 The spur on the north-east edge of Anvil Hill at RL 220 will be recreated as part of the overburden emplacement areas to assist screening of the CHPP from Years 10 to 20 when viewed from the north around VP10.	New final landform has been devised which does address this concern

*	Commitment	Future Commitment
	6.13.7 The north, east and south sides of the workshop and CHPP will be clad to meet the noise modelling in the EA.	Workshop and CHPP will be clad, direction of workshop has changed as per MOD3.
	6.13.8 All floodlights in the open cut area will be shielded to the maximum extent practicable.	Remains current
	6.13.9 Workshop doors will be orientated south or south-west, where possible, to reduce light spill.	Remains current
	6.13.10 Where safe to do so, trucks on access roads will make use of portable visual edge markers to increase drivers' visibility of road edges when driving with dipped headlamps.	Remains current
	Operational Measures 6.13.11 At night, work will be restricted to lower levels on the overburden emplacement areas to reduce noise impacts which will also reduce potential direct lighting effects from random elements such as truck headlights and flashing beacons.	Remains current

APPENDIX 3

Additional Traffic Impact Assessment

Modifications to Mangoola Coal Mine Plans and Relocation of 500kV Electricity Transmission Line

- Additional Traffic Impact Assessment

September 2011

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Contents

	Page number
Glossary	v
Executive summary	vii
1. Introduction	1
1.1 Background	3
1.2 The ETL Relocation and Modifications to Mine Plans	3
1.2.1 ETL relocation	3
1.2.2 Modifications to Mine Plans	6
1.3 Study scope	7
1.4 Summary of work previously completed	8
1.4.1 Previous Traffic Impact Assessments	8
2. Existing roads and traffic demand	9
2.1 Existing road network	9
2.2 School bus operation	24
2.3 Cycling and pedestrian access	24
2.4 Heavy vehicles route	24
2.5 Recent road upgrades	25
2.6 2011 Existing traffic volumes	26
2.6.1 Existing intersection traffic performance	28
2.6.2 2011 current situation – performance of the key intersections	29
2.7 Road safety	31
2.7.1 Road safety deficiencies	31
2.7.2 Road safety audit – Wybong Road	43
3. Future traffic demand and assessment of demand impacts	45
3.1 Predicted background traffic volumes for 2012	45
3.2 ETL Relocation traffic demands	46
3.2.1 Construction	46
3.2.3 Operation	48
3.3 Mine plan modifications traffic demands	48
3.3.1 Construction	48
3.3.2 Operation	48
3.3.3 Heavy vehicles/Oversize vehicles	49
3.3.4 Additional trips and their distribution in the peak hours	49
3.4 Traffic impacts	50
3.4.1 Construction	50

3.4.2	Operations	51
3.5	Comparison of traffic loads – approved mine plan vs approved mine plan plus modifications and ETL relocation	52
3.6	Cumulative traffic – approved mine, mine plan modifications and ETL relocation	52
3.7	Mid-block traffic performance	53
3.8	Intersection performance	54
3.8.1	Road closures	58
3.8.2	School bus operation	59
3.8.3	Walking, cycling and public transport	59
4.	Mitigation and management measures	61
4.1	Minimising traffic delays from road closure	61
4.2	Managing the safety of the school bus service	61
4.3	Address deficiencies listed in the road safety audit	61
4.4	Heavy and oversize/overmass vehicles	62

List of tables

	Page number
Table 2.1	RTA levels of service 29
Table 2.2	Modelled existing intersections performance 30
Table 3.1	RTA mid-block level of service 53
Table 3.2	2012 do-nothing intersections performance – estimated background traffic volumes 56
Table 3.3	2012 intersections performance – estimated background traffic volumes plus combined construction and operational traffic (ETL relocation and mine plan modification) 57

List of figures

	Page number
Figure 1.1	Location map 2
Figure 1.2	500 kV ETL relocation and construction access 4
Figure 1.3	Worksite 2 and ETL relocation easement location, Wybong Road and Wybong Post Office Road 5
Figure 2.1	Surrounding road network 9
Figure 2.2	Wybong Road, looking westbound 10
Figure 2.3	Wybong Post Office Road, looking westbound 11
Figure 2.4	Mangoola Coal Mine Northern Access Road 12
Figure 2.5	Bengalla Link Road, looking westbound 13
Figure 2.6	Thomas Mitchell Drive, looking westbound 14
Figure 2.7	Denman Road, looking southbound 15
Figure 2.9	Thomas Mitchell Drive, on approach to its intersection with New England Highway 17
Figure 2.10	Denman Road/Thomas Mitchell Drive intersection 18
Figure 2.11	Denman Road, on approach to its intersection with Thomas Mitchell Drive 19

Figure 2.12	Denman Road/Bengalla Link Road intersection	20
Figure 2.13	Bengalla Link Road/Wybong Road intersection	21
Figure 2.15	Bengalla Link Road/Wybong Road intersection	22
Figure 2.16	New England Highway/Sydney Street intersection	23
Figure 2.16	Heavy vehicle mine access route	25
Figure 2.17	Recent road upgrades	26
Figure 2.18	Location of traffic surveys and traffic count data stations	27
Figure 2.19	Existing intersections AM peak traffic volumes (6.00 am to 7.00 am)	27
Figure 2.20	Existing intersections PM peak traffic volumes (4.45 pm to 5.45 pm)	28
Figure 2.21	Locations of the key intersections	30
Figure 2.22	Edge line covered with chipseal aggregate - Wybong Road, looking eastbound toward its intersection with Bengalla Link Road	32
Figure 2.23	No sufficient contrast between the road markings and the pavement - Wybong Road/Bengalla Link Road intersection	32

Contents (Continued)

	Page number
Figure 2.24	Potholes, uneven road surface and other pavement deficiencies – Thomas Mitchell Drive, looking eastbound from its intersection with Denman Road 33
Figure 2.25	Potholes, uneven road surface and other pavement deficiencies - Thomas Mitchell Drive, looking toward its intersection with Denman Road 34
Figure 2.26	Potholes -Thomas Mitchell Drive/Denman Road intersection 34
Figure 2.27	No edge line painted - Thomas Mitchell Drive, looking eastbound 35
Figure 2.28	No edge line painted - Thomas Mitchell Drive, looking eastbound 35
Figure 2.29	Substandard curve with no sufficient delineation provided - Thomas Mitchell Drive, looking eastbound 36
Figure 2.30	Substandard curve with no sufficient delineation provided - Thomas Mitchell Drive, looking eastbound 36
Figure 2.31	Substandard curve with no sufficient delineation provided - Thomas Mitchell Drive, looking eastbound 37
Figure 2.32	Substandard curve with no sufficient delineation provided - Thomas Mitchell Drive, looking eastbound 37
Figure 2.33	Substandard curve with no sufficient delineation provided - Thomas Mitchell Drive, looking eastbound 38
Figure 2.34	Pavement arrows covered by tyre marks - Thomas Mitchell Drive, looking westbound, on approach to its intersection with the New England Highway 39
Figure 2.35	Median island overgrowth by vegetation and partly covered by soil and gravel - Thomas Mitchell Drive, on approach to the intersection with the New England Highway 40
Figure 2.36	KEEP LEFT sign is missing - Thomas Mitchell Drive, looking westbound from its intersection with the New England Highway 40
Figure 2.37	Chipseal covering dedicated cycling lane - Denman Road, looking northbound on approach to its intersection with Bengalla Link Road with 41
Figure 2.38	Poor pavement condition - Bengalla Link Road, looking eastbound toward its intersection with Denman Road 42
Figure 2.39	Unidirectional Hazard Marker is missing on the safety barrier - Denman road, looking westbound 43
Figure 3.1	Average daily construction traffic by construction week 46
Figure 3.2	Number of heavy vehicles' trips generated per day per week over the construction period 48
Figure 3.3	Additional trips in AM peak hour 49
Figure 3.4	Additional trips in PM peak hour 50
Figure 3.6	2012 intersection PM peak volumes (4.45 pm to 5.45 pm) – estimated background traffic volumes 55
Figure 3.7	2012 intersection AM peak volumes (6.00 am to 7.00 am) – estimated background traffic volumes plus combines operational and construction traffic (ETL relocation and mine plan modifications) 55
Figure 3.8	2012 intersection PM peak volumes (4.45 pm to 5.45 pm) – combined operational and construction traffic (ETL relocation and mine plan modification) 56

Appendices

Appendix A
SIDRA modelling results

Glossary

SIDRA	Intersection performance analysis software
AADT	Annual Average Daily Traffic
LoS	Level of Service
DOS	Degree of Saturation
LV	Light Vehicles; includes cars, vans and motorbikes
Mtpa	Million tons per annum
ROM	Run of mine
HV	Heavy Vehicles; includes rigid trucks, trucks and trailers, buses and semitrailers
RTA	Road and Traffic Authority NSW
MSC	Muswellbrook Shire Council
kV	Kilo Volt (1,000 Volts)
km	Kilometres
m	Metres
veh/day	Vehicles per day
veh/hr	Vehicles per hour
ETL	Electricity Transmission Line
EP&A Act	Environmental Planning and Assessment Act 1979
EA	Environmental Assessment
TIA	Traffic Impact Assessment
TransGrid	Company that is the owner, operator and manager of the high-voltage electricity transmission system in New South Wales

Executive summary

Umwelt (Australia) Pty Limited (Umwelt), on behalf of Xstrata Mangoola Pty Limited (Mangoola Coal) engaged Parsons Brinckerhoff (PB) to undertake an additional traffic impact assessment, including cumulative impacts, as part of the Mangoola Coal Response to Submissions for the Environmental Assessment (EA) to the Modifications to Mangoola Coal Mine Plans and Relocation of 500 kV Electricity Transmission Line.

The Mangoola Coal Mine is located approximately 20 kilometres west of Muswellbrook near to Wybong within the Muswellbrook Local Government Area. Mangoola Coal is seeking to modify their mine plans approved under the current Project Approval (06_0014). Following detailed feasibility investigations, Mangoola Coal has resolved that the improved operational efficiency warrants the relocation of a section of the Bayswater to Mount Piper 500 kilovolt (kV) electricity transmission line (ETL) that currently bisects the site. Modifications to the mine plans, approved in PA 06_0014, is proposed to take into account the ETL relocation. Modifications to the mine plans includes changes to mine staging, site water management and minor increases to the approved project disturbance boundary.

Mangoola Coal is the proponent for the modifications to the mine plans, and is applying to modify the existing Project Approval PA 06_0014 pursuant to section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The ETL relocation requires project approval in accordance with Part 3A of the EP&A Act. TransGrid is the proponent for the proposed relocation of the existing 500 kV ETL.

The proposed modifications and ETL relocation will result in a change in employee numbers during the construction and operational phases of the mine as follows:

- construction at the mine is substantially complete with no additional construction staff required (previously estimated to increase from 200 to 350)
- operational mine employees will increase from an approved 240 to 300
- construction phase for the ETL relocation will require up to 50 employees on the site at any time
- no employees are required during the operation of the ETL (with the exception of occasional staff employed by TransGrid to conduct inspections of the ETL and associated easement and conduct maintenance as required).

Electricity Transmission Line

The relocation of the 500 kV ETL will involve the following:

- Construction of an 11.1 kilometre section of 500 kV ETL comprising 32 new towers, which will in part traverse through the western extent of the approved project disturbance area, replacing an existing 9 kilometre section that currently bisects the site. Of the ETL alignment to be relocated, approximately:
 - ▶ 5.8 km is within the Mangoola Coal Mine approved project disturbance boundary
 - ▶ 3.4 km is located outside the approved project disturbance boundary to the south
 - ▶ 1.9 km is located outside the approved project disturbance boundary to the south.

- Following completion of the new line, 24 towers comprising the existing ETL will be decommissioned, dismantled and removed. Upon completion of the line, the easement for the existing ETL will be relinquished and a new easement will be created over the route of the relocated ETL. The new easement will have a width of 70 m along its length.

Each phase of the construction of the ETL relocation will require bringing equipment and heavy vehicles to site. There will also be light vehicle movements throughout the eleven month construction period for the ETL relocation. Access for ETL relocation works traffic will initially be via Bengalla Link Road and Wybong Road east of the Mangoola Coal Mine Northern Access Road with the majority of traffic then turning into the mine and access the ETL relocation easement from within the approved project disturbance area. Access to the specific sections of the ETL relocation will be as follows:

- 5.8 km is within the Mangoola Coal Mine approved project disturbance boundary – accessed through the Project Site via the Mangoola Coal Mine Northern Access Road, then designated access tracks within the project site
- 1.9 km is located outside the approved disturbance boundary to the north – accessed directly from Wybong Road or Wybong Post Office Road
- 3.4 km is located outside the approved project disturbance boundary to the south – access via Wybong Road, Wybong Road and Bengalla Link Road.

Approximately 20% of ETL relocation construction traffic will continue to access worksites off Wybong Post Office Road.

The stringing of the ETL cables between towers 27 and 28 and between towers 30 and 31 is likely to require temporary closures of Wybong Road and Wybong Post Office Road.

When running drawwire/conductor with a helicopter, minor stoppages would be expected lasting 2-5 minutes over a period of 3-4 days for each pull section with road crossings. There are 26 cables in total on the ETL, 24 large and 2 small, which based on a maximum of 5 minutes per cable (assuming one cable strung at a time) would result in total road closure time for stringing of approximately 2 hours 10 minutes over a period of 3–4 days.

Closures are expected to last between 15 to 20 minutes per cable run, pre road crossing over a period of four days. During each of these closures between 20 and 24 vehicles may subsequently incur a delay. Similarly the decommissioning of the existing ETL is likely to require road closures during removal of cables on Wybong Road and Wybong Post Office Road.

Road closures of up to 30 to 40 minutes are likely to be required for the movement of oversize vehicles (i.e. vehicles >4.5m in width) used for the delivery of tower materials and equipment being transported for clearing, earthmoving and tower construction. It is estimated that approximately 12 closures for oversize vehicles would be required for the life of the ETL relocation. These road closures will be undertaken during off peak hours. During each of these closures between 40 and 48 vehicles may subsequently incur a delay.

During these road closures traffic would not be detoured onto an alternative route.

Mangoola Coal Mine traffic will generally not use the affected sections of Wybong Road and Wybong Post Office Road as these road sections are west of the Mangoola Project Northern Access Road. Delays or increased journey times are likely to affect existing traffic only, i.e. non-mine related traffic. Based on the traffic count data for Wybong Road/Wybong Post Office Road intersection, closures during off peak periods for ETL stringing and decommissioning and for oversized vehicles, may impact on up to approximately 30 vehicles per hour.

This impact could be managed by:

- closing the road during off peak periods only
- informing drivers in advance of closure
- minimising the number of closures.

The ETL relocation work is unlikely to impact on the operation of the school bus service as:

- the school bus operates outside the peak hours for construction traffic
- the increase in traffic volumes is unlikely to cause a change in road network performance or road safety.

A specific Construction Traffic Management Plan (CTMP) will be prepared and submitted to Muswellbrook Shire Council for approval prior to any ETL construction proceeding on the site. The CTMP will address the safety of the school bus service including the following:

- reminders of school bus operating times (i.e. from 6.30 am to 8.45 am and from 3.00 pm to 5.00 pm) during 'Toolbox Talks' for all personnel involved in the ETL relocation project
- installation of a variable message sign at the Bengalla Road/Denman Road intersection that activates during school bus operational hours to inform drivers and to make them aware that children may be crossing the road.
- excluding the movement of heavy vehicles to and from site during school bus service hours

Modifications to Mangoola Coal Mine Plans

Key features of the modifications to the mine plans for the Mangoola Coal Mine include changes to mine staging, site water management and minor increases to the approved project disturbance boundary.

Some occasional road closures will be required for the movement of oversized vehicles making deliveries to the operational site. These ongoing oversized vehicle movements will be much less frequent than has occurred during the construction period and less than originally predicted as a result of the majority of much heavy machinery etc. being serviced/repaired on site.

Impact assessment

The ETL relocation will occur during the operational phase of the Mangoola Coal Mine (overburden mining commenced on 1 September 2010). The employee numbers during the operational phase of the mine has been assessed and analysed in a cumulative context with the ETL relocation construction traffic.

The assessment for the modifications compares the approved project with the proposed project, taking into account traffic impact arising from increased employee numbers on the site.

Cumulative impacts

The assessment of cumulative impacts have not identified any significant traffic impact that would result from the cumulative projected increase in traffic that would result from construction and operational activities at the Mangoola Coal Mine site and the ETL relocation.

During the ETL relocation the cumulative operational traffic for the Mangoola Coal Mine is estimated to be up to 600 vehicle trips per day, the construction traffic for the ETL relocation could add a further 360 vehicles trips per day.

With the traffic generated by the Mangoola Coal Mine operations and the construction traffic for the ETL relocation during the peak weeks of construction, Wybong Road is estimated to have approximately 241 and 234 vehicles per hour in the AM and PM peak hours respectively, operating at a Level of Service (LoS) A. This peak hour traffic volume will not change the current LoS A (where traffic is free flowing and traffic conditions are good) and the impact on traffic will be minimal.

1. Introduction

Umwelt (Australia) Pty Ltd on behalf of Xstrata Mangoola Pty Limited (Mangoola Coal) engaged Parsons Brinckerhoff (PB) to undertake an additional traffic impact assessment (including cumulative impacts) as part of Mangoola Coal Response to Submissions for the Environmental Assessment (EA) for the Modifications to Mangoola Coal Mine Plans and Relocation of 500 kV Electricity Transmission Line (ETL).

Mangoola Coal is the applicant for the modifications to the mine plans, and is seeking to modify the existing Project Approval PA 06_0014 pursuant to section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The ETL relocation requires project approval in accordance with Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). TransGrid is the proponent for the proposed relocation of the existing 500 kV ETL.

An Environmental Assessment (EA) was developed for the proposed modifications and ETL relocation during the public exhibition of the EA; a number of submissions were made regarding concerns about traffic impacts on the regional road network and intersections as a result of the proposed modifications. This additional traffic impact assessment (including cumulative impacts) has been completed as part of the response to these submissions.

The location of the Mangoola Coal Mine site, proposed mine plan modifications, existing ETL and ETL relocation are shown on Figure 1.1.

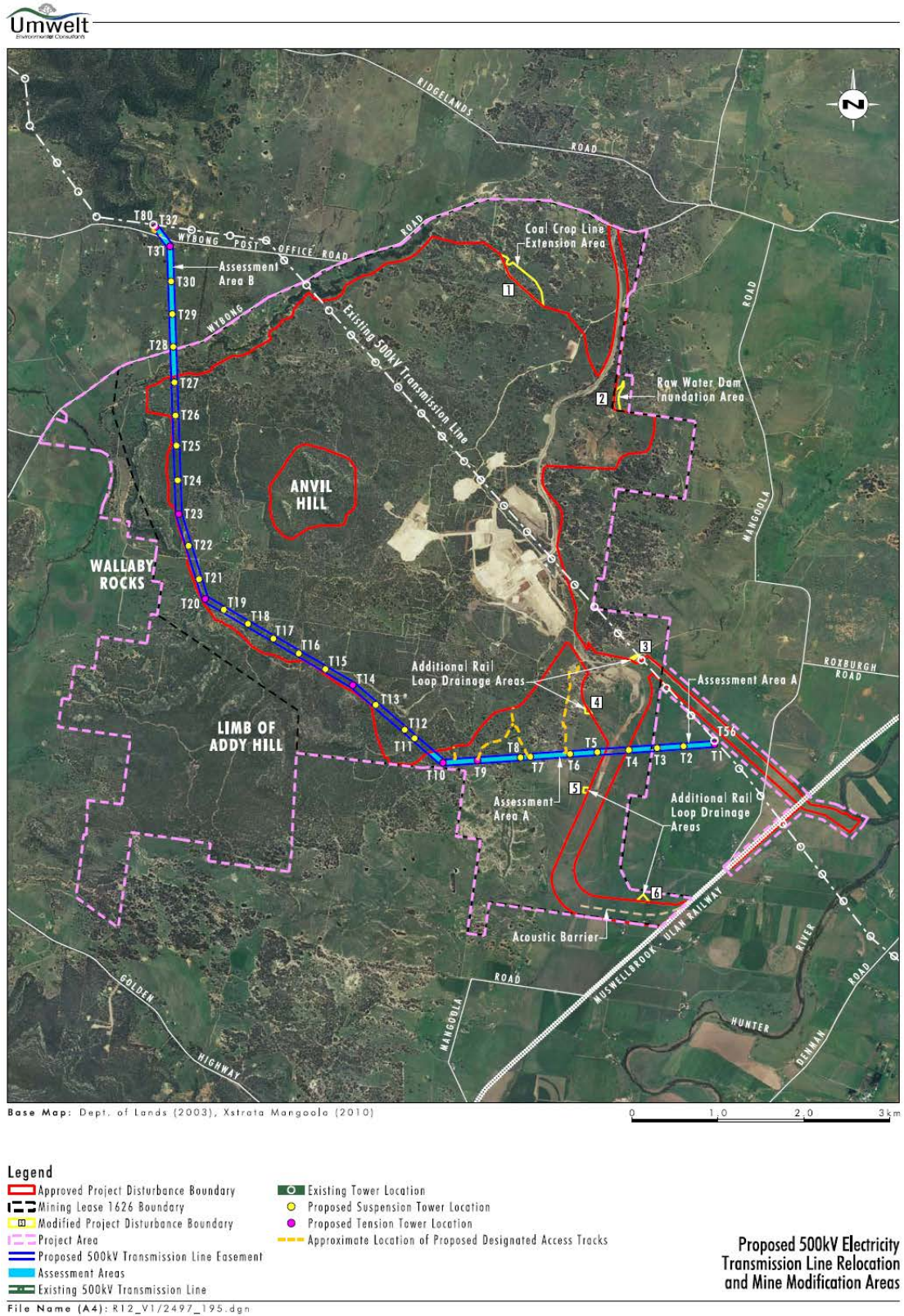


Figure 1.1 Location map

1.1 Background

Planning approval for the Mangoola Coal Mine, previously referred to as the Anvil Hill Project, was granted in June 2007 (Project Approval 06-0014). This approval was for an open cut coal mine near Wybong, approximately 20 km west of Muswellbrook close to the village of Wybong within the Muswellbrook Local Government Area. Approval was granted for the mine to extract 10.5 million tonnes per annum (Mtpa) of run of mine (ROM) coal for 21 years.

Mangoola Coal has completed enabling works for the project site along with some upgrades to the mine access routes and surrounding road network. Overburden mining operations at the site commenced on 1 September 2010.

Mangoola Coal is seeking to modify the mine plans approved under the current Project Approval (06_0014). Following detailed feasibility investigation, Mangoola Coal has resolved that the improved operational efficiency warrants the relocation of a section of the Bayswater to Mount Piper 500 kV ETL that currently bisects the site. Modifications to the mine plans are proposed to take into account the ETL relocation. Modifications to the mine plans include changes to mine staging, site water management and minor increases to the approved project disturbance boundary.

1.2 The ETL Relocation and Modifications to Mine Plans

1.2.1 ETL relocation

TransGrid is the proponent for the proposal to relocate a nine kilometre section of the Bayswater to Mount Piper 500 kV ETL that currently bi-sects the Mangoola Coal Mine site. The ETL relocation will be 11.1 km in length.

It is proposed that the ETL relocation is primarily within the approved Mangoola Coal Mine disturbance area (5.8 km), with a portion outside the approved disturbance area to the north (1.9 km) and a section outside the disturbance area to the south (3.4 km). The relocated ETL section will reconnect with the existing alignment at Tower 80 to the north of Wybong Post Office Road and Tower 56 to the south (refer to Figure 1.1).

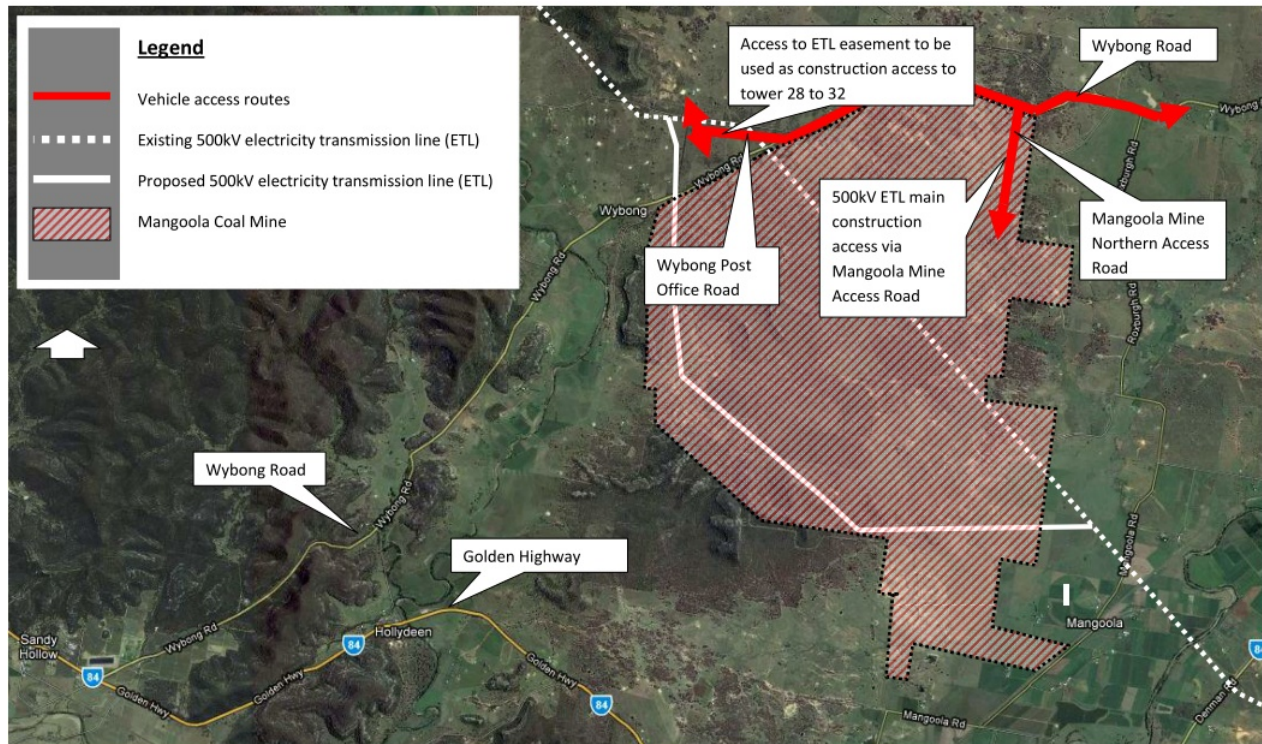


Figure 1.2 500 kV ETL relocation construction access

Two main worksites for the ETL relocation have been defined based on access, Worksite 1 and Worksite 2, as follows:

Worksite 1 which constitutes 9.2 km of the 11.1 km of the ETL relocation covering towers T1 and T27. It comprises the area of the easement within and to the south of the approved project disturbance area. This area will be accessed via existing tracks within the approved project disturbance area, along the easement itself or via designated access tracks. It is proposed that construction traffic will access Worksite 1 via the Mangoola Coal Mine Northern Access Road, Wybong Road and the Bengalla Link Road.

Worksite 2 which comprises the 1.9 km of the ETL relocated to the north of Wybong Road outside the approved project disturbance boundary (shown in Figure 1.3). This section of the ETL relocation crosses both Wybong Road and Wybong Post Office Road before reconnecting with the existing ETL at Tower 80, and consists of towers T28 to T32. Worksite 2 will be accessed from Wybong Road and Wybong Post Office Road directly. The access route to these worksites will be via Wybong Post Office Road, Wybong Road and Bengalla Link Road.

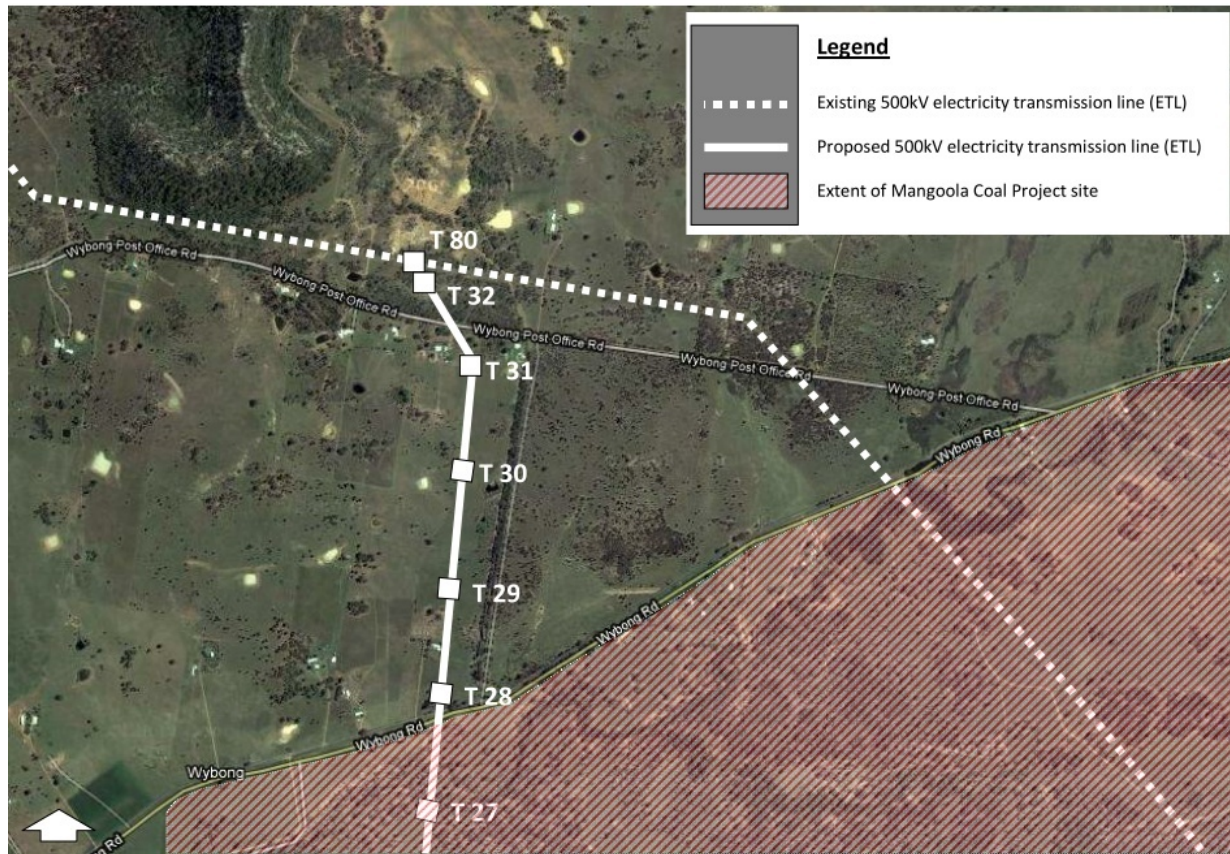


Figure 1.3 Worksite 2 and ETL relocation easement location, Wybong Road and Wybong Post Office Road

1.2.1.1 Proposed works

The ETL relocation will involve the following works:

- clearance of a 70 m wide easement¹ along the alignment of the ETL relocation
- casting in situ-concrete foundations for new towers
- installation of 32 new towers (including eight tension towers and 24 suspension towers)
- removal of 24 existing towers (including foundations to a depth of 0.5 m)
- stringing cables between towers and reconnection with existing towers at each end.

The disconnection of the existing ETL and the connection of the ETL relocation will need to be undertaken in spring or autumn when power needs are reduced.

1.2.1.2 Working hours

The construction activities with the relocation of the ETL are planned to be undertaken seven days a week between the hours 7.00 am and 6.00 pm.

The construction phase is only approximately two weeks in duration at each tower location. The total construction timeframe for the entire ETL relocation project is approximately 11 months.

1.2.1.3 Project staffing

The construction phase of the ETL relocation requires 50 employees on site at any one time and no regular employees during the operation of the ETL as maintenance inspections will be conducted aerially and involve a ground inspection once every three years. Maintenance will be conducted as required.

1.2.2 Modifications to Mine Plans

1.2.2.1 Proposed works

Key features of the modifications to mine plans include:

- a re-design of the mine plan, including certain aspects of site water management, following the ETL relocation
- six small extensions to the approved project disturbance boundary totalling approximately 11.7 hectares
- a temporary ROM stockpile for coal from the box pit (developed for initial tailing storage)
- operating the Raw Water Dam at its full supply level
- an increase in the workforce employee numbers

¹ It should be noted that rather than clearing all of the vegetation within the easement for safety reasons, this project has adopted an approach for sensitive areas that will selectively remove or lop trees with a mature heights of over 4 metres that are deemed to pose a safety risk for the ETL. This will ensure that vegetation removal for this purpose is as minimal as possible, whilst not compromising the safety and reliability of the ETL.

- an increase in train movements; and
- incorporating a rail re-fuelling in to the approved rail loop.

In addition, two fuel tankers per day will travel to and from the Mangoola Coal Mine site to service the rail-fuelling facility. It is proposed that these two additional fuel tankers per day would travel to and from the Mangoola Coal Mine, using the route from the New England Highway, via Thomas Mitchell Drive, Bengalla Link Road and Wybong Road to the Mangoola Coal Mine.

1.2.2.2 Working hours

The current hours of operation at the Mangoola Coal Mine will not be affected by the proposed mine plan modifications.

1.2.2.3 Project staffing

Construction is substantially complete at the mine (in accordance with the existing approval) and no additional construction staff are required (previously estimated to increase from 200 to 350).

Operational mine employees will increase from an approved 240 to 300 as part of the proposed modifications.

1.3 Study scope

The scope of this study was to provide additional information in relation to investigation of the likely traffic impacts, including cumulative impacts associated with the ETL relocation and proposed mine plan modifications by:

- reviewing the current traffic and transport environment, including: school bus service, traffic volumes, traffic speeds and the recent improvements to the road network
- identifying the key access routes to the ETL relocation construction worksites, including routes suited to use by heavy vehicles
- estimating construction traffic volumes associated with the relocation of the ETL relocation
- investigating the impacts on the road network of an additional 60 mine employees during the operational phase of the Mangoola Coal Mine
- estimating the cumulative traffic volumes from construction works for the ETL relocation and the operational traffic for the Mangoola Coal Mine
- estimating the peak hourly traffic volumes on Wybong Road
- assessing the traffic performance on Wybong Road and Wybong Post Office Road
- comparing the proposed mine modifications project with the approved project
- identifying potential traffic impacts and recommending measures to control impacts

- hazard, safety and road impact consideration of the addition of two fuel tankers travelling to and from the Mangoola Coal Mine on a daily basis.

1.4 Summary of work previously completed

As part of the works required by the original Project Approval (06-0014), Mangoola Coal has funded and undertaken substantial road upgrades over the last 3 years at a cost of \$11.8 million. Wybong Road East has also been upgraded as has the intersection of the Golden Highway/Wybong Road intersection in Sandy Hollow.

The following safety works have been undertaken by Mangoola Coal to upgrade Wybong Road:

- enhanced signing, particularly on substandard bends
- installation of safety barriers
- localised road widening to provide a minimum of 6.5 m sealed pavement width
- improved facilities for the school buses
- upgrade of the Golden Highway/Wybong Road intersection in Sandy Hollow.

In addition to the above works, the following intersections have been upgraded:

- Bengalla Road/Denman Road intersection
- Wybong Road/Bengalla Road intersection.
- Wybong Road/Mangoola Coal Mine Northern Access Road intersection

1.4.1 Previous Traffic Impact Assessments

The following traffic impact assessment studies have been undertaken for developments in close proximity to the study area. Information contained within these reports has been considered as part of this study:

- Transport Study for Anvil Hill Project, undertaken by TPK & Associates Pty Ltd, July 2006.

This study was part of the EA for the Anvil Hill Project. It determined that the traffic generated by the mine would not have an adverse impact on the adjacent road network and made a number of road improvement recommendations to improve the safety of the local road network.

- Mangoola Coal Project 500kV Electricity Transmission Line Relocation Traffic Assessment, Parsons Brinckerhoff, March 2010.

This study was part of the EA for the ETL relocation. It concluded that no significant impact on the road network would occur as a result of the likely increase in traffic volumes associated with additional staff and construction traffic related to the ETL relocation.

2. Existing roads and traffic demand

2.1 Existing road network

Figure 2.1 shows the surrounding road network, in the vicinity of the Mangoola Coal Mine, which consist of Wybong Road, Wybong Post Office Road, Yarraman Road, the Mangoola Coal Mine Northern Access Road, Bengalla Link Road, Thomas Mitchell Drive and Denman Road.



Figure 2.1 Surrounding road network

Wybong Road to the east of Mangoola Coal Mine Northern Access Road (refer to Figure 2.2) is a collector road that connects the mine to Muswellbrook and the New England Highway. It will be used by traffic resulting from construction and operational activities at the Mangoola Coal Mine site and the ETL relocation. This recently upgraded section of Wybong Road is generally a two-lane two-way 7 m wide road with at least 1.0 m wide sealed shoulders provided on its both sides. The road has a posted speed limit of 100 km/h. The road traverses moderately undulating country and has some low radius curves having sign posted advisory speeds as low as 55 km/h. The surrounding land use is predominately rural, with a number of vineyards and other mine sites adjacent to but not directly accessed off the road.



Figure 2.2 Wybong Road, looking westbound

Wybong Post Office Road (refer to Figures 2.3) is a rural two-way two-lane road that connect approximately 10 properties with Wybong Road. The road has a paved width ranging approximately between 3.8 m and 4.0 m, with the unpaved shoulder on both sides of the roads. The road has no posted speed limit which means that the speed limit is 100 km/h by default. This is the quietest road, compared with the other roads in the study area, with traffic volumes estimated to be less than 100 vehicles per day.



Figure 2.3 Wybong Post Office Road, looking southbound

The Mangoola Coal Mine Northern Access Road (refer to Figure 2.4) is a private road providing access to Mangoola Coal Mine from Wybong Road with a posted speed limit of 80 km/h. The intersection of this road with Wybong Road had been assessed but as it is a private road, a safety assessment has not been undertaken.



Figure 2.4 Mangoola Coal Mine Northern Access Road

Bengalla Link Road (refer to Figure 2.5) is a two lane 7 m wide sealed road connecting Wybong Road with Denman Road. There are at least 1.0 m wide sealed shoulders provided on both sides of the road. The annual average daily traffic is approximately 2,000 vehicles per day. Bengalla Link Road is the main access route to Mangoola Coal Mine and Bengalla Mine with a posted speed limit of 100 km/hr.



Figure 2.5 Bengalla Link Road, looking westbound

Thomas Mitchell Drive (refer to Figure 2.6) is a two lane 7 m wide sealed rural road connecting New England Highway and Denman Road. There are quite narrow sealed shoulders provided on both sides of the road. The annual average daily traffic is over 1,000 vehicles per day. The road provides an access route to some of the traffic associated with the Mangoola Coal Mine and Bengalla Mine and enables vehicles travelling between Denman Road and the New England Highway to bypass the township of Muswellbrook. The posted speed limits on Thomas Mitchell Drive are 80 km/h through the industrial area and 100 km/h thereafter.



Figure 2.6 **Thomas Mitchell Drive, looking westbound**

Denman Road (refer to Figure 2.7) is a two lane 7 m wide sealed State road connecting the New England Highway at Muswellbrook with the township of Denman to the south-east. There is 1.0 m wide sealed shoulders provided on its both sides. The speed limit on Denman Road is 100 km/h. The road is a part of an access route to some of the traffic associated with the Mangoola Coal Mine and Bengalla Mine and enable vehicles travelling between Thomas Mitchell Drive and Bengalla Link Road to bypass the township of Muswellbrook.



Figure 2.7 Denman Road, looking southbound

New England Highway/Thomas Mitchell Drive intersection (refer to Figures 2.8 and 2.9) is a GIVE WAY priority controlled intersection which has a T-junction configuration with adequate sight distance looking from each approach in all directions and with the following features:

- a designated deceleration lane on the New England Highway for vehicles turning left into Thomas Mitchell Drive
- a designated right turn waiting lane on the New England Highway for vehicles turning into Thomas Mitchell Drive
- separate left and right turning lanes on Thomas Mitchell Drive for vehicles waiting to turn onto the New England Highway (northbound and southbound).



Figure 2.8 **New England Highway, looking eastbound toward its intersection with Thomas Mitchell Drive**



Figure 2.9 **Thomas Mitchell Drive, on approach to its intersection with New England Highway**

Denman Road/Thomas Mitchell Drive (refer to Figures 2.10 and 2.11) is a GIVE WAY priority controlled intersection which intersection which has a T-junction configuration with adequate sight distance looking from each approach in all directions and with the following features:

- a designated deceleration lane on the Denman Road for vehicles decelerating to turn left from Denman Road onto Thomas Mitchell Drive
- a designated right turn waiting lane on the Denman Road for vehicles turning into Thomas Mitchell Drive.



Figure 2.10 Denman Road/Thomas Mitchell Drive intersection



Figure 2.11 Denman Road, on approach to its intersection with Thomas Mitchell Drive

Denman Road/Bengalla Link Road intersection (refer to Figure 2.12) is a GIVE WAY priority control intersection which has a T junction configuration, with adequate sight distance looking from each approach in all directions and with the following features:

- a designated deceleration lane on the Denman Road for vehicles decelerating to turn left from Denman Road onto Bengalla Link Road
- a designated acceleration lane for vehicles turning left from Bengalla Link Road onto Denman Road
- a designated right turn waiting lane for vehicles turning right from Denman Road onto Bengalla Link Road
- There is a dedicated cycling lane on the paved shoulder along Denman Road.



Figure 2.12 Denman Road/Bengalla Link Road intersection

Wybong Road/Bengalla Link Road intersection (refer to Figure 2.13) is a GIVE WAY priority controlled intersection which has a T junction configuration, with adequate sight distance looking from each approach in all directions and with the following features:

- a designated deceleration lane on the Wybong Road (west) for vehicles turning left from Wybong Road (west) onto Wybong Road (north)
- a designated right turn waiting lane for vehicles turning right from Bengalla Link Road onto Wybong Road (north).



Figure 2.13 Bengalla Link Road/Wybong Road intersection