EMGA Mitchell McLennan

# Mount Pleasant Project
# Landscape Management Plan

## Final

Prepared for Coal & Allied Pty Limited | 20 July 2012

Planning + Environment + Acoustics

# Mount Pleasant Project

# Landscape Management Plan

Final

Prepared for Coal & Allied Operations Pty Limited | 20 July 2012

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# Mount Pleasant Project Landscape Management Plan

Final

J11062LMP | Prepared for Coal & Allied Operations Pty Limited| 20 July 2012

| | | | |
|---|---|---|---|
| Reviewed by | **Duncan Peake** | Approved by | **Kirstin Macmillan** |
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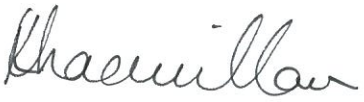
| Signature |  | Signature |  |
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## Tables

# 1 Introduction

## 1.1 Description

This Landscape Management Plan (LMP) has been developed per the Development Consent (DA 92/97) for Coal & Allied Pty Limited's (Coal & Allied) Mount Pleasant Project (the Project). It forms part of the Environmental Management Strategy for the Project.

The Mount Pleasant Project is an approved open cut coal mine located in the Upper Hunter Valley, New South Wales (NSW) approximately 3 kilometres (km) to the west-north-west of Muswellbrook.

The existing visual environment was described in detail in the Mount Pleasant Mine Environmental Impact Statement (EIS) (ERM Mitchell McCotter, 1997) and Mount Pleasant Project Modification Environmental Assessment (EA) (EMM, 2010). In summary, the regional landscape surrounding the Project is dominated by existing mining and industrial activities interspersed with agricultural and pastoral land uses and areas of remnant woodland. The landscape within the site is surmounted by the peak of Mount Pleasant at an elevation of 368m and the radiating drainage lines from this peak have formed a series of well-modulated ridges.

One of the major impacts identified in the EIS was the high level of visibility of the operation in surrounding areas. As one of the mitigating measures for this change to visual amenity, Coal & Allied made a commitment to plant trees along important roads, screening the mine prior to the commencement of operations. Tree screen planting commenced at the project area in 2003, with planting of trees along key roads on land owned by Coal & Allied. Stage 1 involved foresting two blocks on the eastern side of the development which were previously planted. Stage 2 involved planting of trees along key roads on land owned by Coal & Allied. Tree screens in Stage 2 included Wybong Road (approximately 1,359 trees), Kayuga Road (approximately 426 trees), and Dorset Road (approximately 1,918 trees). In autumn/winter 2007, more tree screen planting was undertaken. This consisted of replanting in previously planted land, as well as new planting on Stage 2 areas of land.

## 1.2 Scope

This LMP has been developed in accordance with the relevant conditions from DA 92/97, which was granted for the Project in December 1999 and modified in September 2011. Condition 2 of Schedule 2 requires that the project be developed generally in accordance with the statement of commitments, conditions of the development consent, and the EIS (ERM Mitchell McCotter, 1997) (inclusive of the environmental assessment of the modification, EMM, 2010). The LMP has been developed in consultation with a qualified landscape architect, and with reference to the Rehabilitation Strategy for the project, which describes ecological rehabilitation of disturbed areas, and the Coal & Allied Environmental Procedure 10.1 Visual Management (2007).

This LMP is to be applied during construction and operation of the Mount Pleasant Project. Under the current approval this includes six years of mining operation up to 2020. Table 1.1 below highlights the conditions required to be covered by this management plan, and lists the sections within this document in which they are addressed.

The structure of this plan is as follows:

- Chapter 1 outlines the scope of the management plan and the consent conditions addressed, in addition to providing a summary of the existing visual environment of the Mount Pleasant Project;
- Chapter 2 details the objectives, performance measures and indicators for visual impacts and proposes management actions to mitigate these impacts, as well as a program to monitor these measures;
- Chapter 3 details the visual and landscape treatments for visually sensitive areas and describes the process for identification and assessment of such areas;
- Chapter 4 summarises contingency actions in response to key risks to the success of landscaping; and
- Chapter 5 outlines the reporting and review requirements for this plan.

**Table 1.1 DA 92/97 Consent condition requirements**

| DA 92/97 Consent condition number | DA 92/97 Consent condition requirement | Section of LMP which addresses this requirement |
|---|---|---|
| Schedule 3, Condition 47 (a) | The Applicant shall prepare and implement a Landscape Management Plan to mitigate the visual impacts of the development to the satisfaction of the Director-General and in consultation with Council. This plan must be submitted to the Director-General for approval prior to carrying out any development on site. | - |
| Schedule 3, Condition 47 (b) | Provision for the establishment of trees and shrubs and/or the construction of mounding or bunding:<br>(i) along the access road to the mine site;<br>(ii) around the water storage dams and coal preparation plant;<br>(iii) at other areas identified as necessary for the maintenance of satisfactory visual amenity. | Chapters 2 and 3 |
| Schedule 3, Condition 47 (c) | Details of the visual appearance of all buildings, structures, facilities or works (including paint colours and specifications), aimed at blending as far as possible with the surrounding landscape. | Chapters 2 and 3 |
| Schedule 5, Condition 2 | The Applicant shall ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include: | - |
| | (a) detailed baseline data; | |
| | (b) a description of: | |
| | • the relevant statutory requirements (including any relevant consent, licence or lease conditions); | Chapter 1 |
| | • any relevant limits or performance measures/criteria; | Chapter 2 |
| | • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of the development or any management measures; | Chapter 2 |
| | (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria; | Chapters 2 and 3 |

## Table 1.1 DA 92/97 Consent condition requirements

| DA 92/97 Consent condition number | DA 92/97 Consent condition requirement | Section of LMP which addresses this requirement |
|---|---|---|
| | (d) a program to monitor and report on the:<br>• impacts and environmental performance of the development;<br>• effectiveness of any management measures (see c above); | Chapter 2 |
| | (e) a contingency plan to manage any unpredicted impacts and their consequences; | Chapter 4 |
| | (d) a program to investigate and implement ways to improve the environmental performance of the development over time; | Chapter 2 |
| | (e) a protocol for managing and reporting any:<br>• incidents;<br>• complaints;<br>• non-compliances with statutory requirements; and<br>• exceedances of the impact assessment criteria and/or performance criteria; and | Chapter 5 |
| | (h) a protocol for periodic review of the plan. | Chapter 5 |
| Schedule 5, Condition 4 | Within 3 months of:<br>(a) the submission of an annual review under condition 3 above;<br>(b) the submission of an incident report under condition 7 below;<br>(c) the submission of an audit under condition 9 below; and<br>(d) any modification to the conditions of this consent,<br>the Applicant shall review, and if necessary revise, the strategies, plans, and programs required under this consent to the satisfaction of the Director-General. | Chapter 5 |

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# 2 Management

## 2.1 Environmental aspects

This plan seeks to manage potential visual impacts as a result of operational activities that may affect local and regional visual receptors. These impacts need to be managed to minimise impacts to sensitive visual receptors, and satisfy the conditions of DA 92/97.

The potential impacts from the proposed operations of the Mount Pleasant Project are detailed in the environmental assessments undertaken to date (EA Chapter 6 and the EIS Chapter 13). The development will result in a number of changes to the existing landscape, including:

- progressive excavation of the mine pit;
- construction of a new landform (environment bund) using overburden from the pit;
- construction of the fine rejects emplacement areas;
- construction of the administration, industrial and coal preparation area; and
- construction of the coal transport system (rail).

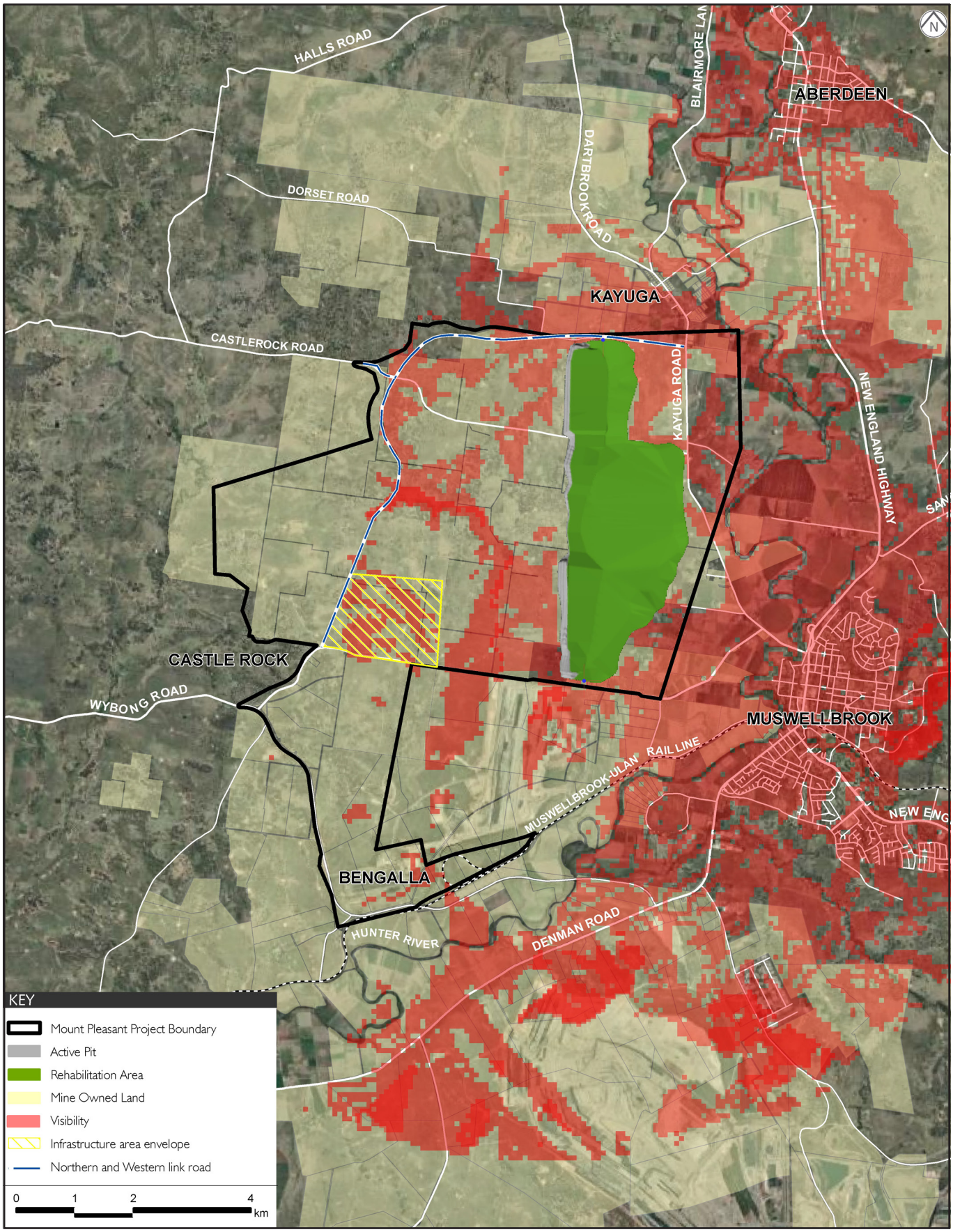
It has been identified that the mining area, water storage dams, CHPP, access roads to the mine site, and infrastructure areas may have visual impacts on the community. Visually sensitive areas identified will be reviewed through a visual impact assessment and viewshed analysis to determine their level of significance and the resultant amelioration required in accordance with the typical landscape treatments described in Chapter 3 of this plan.

Visual sensitivity is a measure of the level of concern attached by the surrounding land users to a change in the landscape character. It is assessed on factors including the number of people affected, landuse, visibility, the current degree of exposure to the style of development proposed, distance of the viewers to the proposed visual change and the duration and frequency of viewing time. The draft viewshed analysis (Integrated Design Solutions, 2011) has been used to determine sensitive visual receivers. The draft viewshed analysis indicates where elements of the operation are visible from the surrounding areas, including Muswellbrook, and was used to determine areas where visual screening will be desirable. The current analysis is illustrated in Figure 2.1 and does not account for vegetation (existing or proposed) therefore it considers the worst case cleared scenario for the mine and overburden area of the site. The appropriate treatment of areas identified has been determined on a rating of minor, moderate or high, generally consisting of the following:

| | |
|---|---|
| Minor | No screening required or minor vegetative screening. |
| Moderate | Vegetative screening only or bunding with vegetation where space is not available. |
| High | Bunding and vegetative screening, possible use of advanced tree stock. |

This process will also be used to determine and assess other sensitive areas requiring screening in the future should the mining operation be approved and continue past 2020.

The performance criteria and associated indicators have been developed in accordance with a range of project related documentation, including the project environmental assessments and DA 92/97.

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**Viewshed analysis of proposed mining operations (2020)**

Mount Pleasant Project Landscape Management Plan

FIGURE 2.1

## 2.2 Objectives and performance criteria

The objectives of this plan include:

- ensuring that the conditions of DA 92/97 and corporate standards are met;
- managing the visual impacts of the project to comply with the performance criteria;
- ensuring the visual and landscape treatments are consistent with the ecological revegetation works described in the Rehabilitation Strategy; and
- modifying activities if required, through reviewing monitoring results against performance criteria, to ensure the objectives continue to be met through the life of the mine.

The performance criteria for the plan are given in Table 2.1.

**Table 2.1 Performance criteria**

| Parameter | Target | Key performance indicator |
|---|---|---|
| Earth bunds | Mounding provides visual screening to target viewpoints. | Mounding heights sufficient to hide targeted infrastructure from view points. |
| Plantings | Plantings provide visual screening to target viewpoints. | Plantings achieve densities sufficient to provide a contiguous visual screen. |
| Visual appearance of buildings, structures, facilities and works | Buildings, structures, facilities and works blend as far as possible with the surrounding landscape. | Finishes on buildings, structures, facilities and works are as detailed in this plan. |

## 2.3 Management actions

Table 2.2 summarises the management and monitoring actions for the plan. The proposed visual and landscape treatments are described in more detail in Chapter 3.

**Table 2.2 Landscape management actions**

| Requirement | Area | Management action | Monitoring |
|---|---|---|---|
| Provision of visual screening | Project area | Design visual landscape screens in consultation with a landscape architect or other suitably qualified professional. | Qualifications of specialists to be provided and records kept. |
| | | Undertake planting and maintenance of visual screens in accordance with Chapter 3 of this plan. | Planting will be reviewed against the LMP. |
| | | Construct visual bunds as required in accordance with Chapter 3. | Monitor bunds for slope failure or uncontrolled erosion. |
| | | | The visual screening provided by bunds and vegetation will be internally assessed annually, in accordance with Environmental Procedure 10.1 Visual Management |

## Table 2.2 Landscape management actions

| Requirement | Area | Management action | Monitoring |
|---|---|---|---|
| | | | (Coal & Allied 2007).<br>The assessment will involve:<br>• a photographic survey and comparison of the mine site from a number of public viewing locations and private residences;<br>• photos from set locations that must provide an extended time sequence of comparable photographs;<br>• a comparison of the impacts of the mine as it develops with the impacts predicted at the sensitive viewer locations identified in the draft viewshed analysis (IDS 2011);<br>• consideration of the effectiveness of tree planting; and<br>• recommendations for additional measures considered necessary or desirable to mitigate visual impacts of the mine.<br>Bunding will not be undertaken in areas where the space exists to create adequate rehabilitated landscape screens (refer to Rehabilitation Strategy), which will also result in a more natural landform in keeping with the existing visual character. |
| | | Plantings will be in accordance with Coal & Allied's Bushfire Management Plan (2003), ie adequate fire breaks will be maintained. Large tree species will not be planted beneath powerlines, close to buildings or underground pipes and cables. In fire prone areas, rough barked or flammable species on the fire-danger side of buildings will not be planted. | Landscaping plans will be reviewed against the requirements of Coal & Allied's Bushfire Management Plan (2003) prior to implementation. |
| | Mine areas | An earth bund (the environment bund) will be constructed along the eastern edge of the mine pit. This bund is designed to emulate the existing landform scale and shape, including a variable ridgeline elevation. It will be progressively vegetated, in accordance with the Rehabilitation Strategy (AECOM 2011). | As for visual screens across the project area. |

## Table 2.2 Landscape management actions

| Requirement | Area | Management action | Monitoring |
|---|---|---|---|
| | | Vegetation plantings or earth bunds will be installed along access roads to the mine, as necessary in accordance with Chapter 3 of this plan. | |
| | Administration and industrial area | Vegetation plantings and earth bunds will be installed along Wybong Road to screen close views of the area, as necessary in accordance with Chapter 3 of this plan. The tallest elements within this area may be visible above the screen vegetation once it has reached maturity. | As for visual screens across the project area. |
| | Fines rejects emplacement areas | Vegetation plantings will be installed at areas along the dam access road and the Western Link road as necessary in accordance with Chapter 3 of this plan. | |
| | Access roads and ancillary infrastructure, including rail or conveyor transport system | Visual bunds or vegetation screening along parts of; the site access roads, Wybong Road, Kayuga Road, Dorset Road and the replacement rural road to the north and west, as necessary in accordance with Chapter 3 of this plan. | As for visual screens across the project area. |
| | Water storage dams | Vegetation plantings or earth bunds will be installed around those water storage dams which will remain throughout the works and are visually sensitive as necessary in accordance with Chapter 3 of this plan. | As for visual screens across the project area. |
| | Coal handling preparation plant, ROM and product coal stockpiles | Vegetation plantings and earth bunds will be installed along Wybong Road, in accordance with Chapter 3 of this plan.<br>The tallest transfer station tower, the reject bin and tower, the surge bin and tower, the coal preparation plant building and product coal stockpile, and the product coal transfer station tower are taller than the proposed screening vegetation. As far as possible, these will be located below the enclosing tree-lined ridge in the west of the site, such that they are not seen in profile along the ridgeline horizon. | As for visual screens across the project area. |
| | Areas agreed with Council* | Vegetation plantings or earth bunds will be installed at areas agreed with Council as required for maintenance of satisfactory visual amenity, in accordance with Chapter 3 of this plan. | As for visual screens across the project area. |
| | Haul roads | Haul roads will be located behind or to the side of ridges, and below the natural surface level, wherever practical. | Haul road design plans to be reviewed prior to commencement of construction. |

## Table 2.2 Landscape management actions

| Requirement | Area | Management action | Monitoring |
|---|---|---|---|
| Details of visual appearance of buildings, structures, facilities and works | Project Area | Buildings, structures and facilities shall be designed and constructed and/or renovated so they blend as far as possible with the surrounding landscape using unobtrusive, non-reflective and/ or textured colours and materials as described in Chapter 3 of this plan. | The visual impact of buildings, structures, facilities and works within the project area will be internally assessed on an annual basis, following the same process as outlined for visual screening. |

** These areas will be discussed with Council during the finalisation of this Plan. Condition 47 requires this Landscape Management Plan to be prepared in consultation with Council.*

# 3 Visual and landscape treatments

## 3.1 Introduction

The visual impacts of construction works, buildings, infrastructure and mining operations will be controlled through visual and landscape treatments in the form of screen planting and bunding, designed to integrate with the Rehabilitation Strategy to provide additional ecological benefits where possible. Relatively dense plantings of a range of local native vegetation are also effective in minimising wind, dust, and noise.

Areas for bunding are committed to in the EIS and as part of the conditions of DA 92/97. Bunding is more costly than screen planting and will not have the wildlife habitat benefits or community value of vegetative screening. Bunding alone would also be unsightly along road easements and therefore will be undertaken where required in conjunction with planting. Bunding will generally be utilised in more sensitive areas where close views require immediate screening or where the additional height will be needed to lift the vegetative screens. Surplus material stockpiled during road construction will be used to form the bunds.

The works associated with the visual and landscape screening to be implemented during initial construction and the six years of mining operations up to 2020, based on the outline given in the EIS (ERM Mitchell McCotter, 1997), will consist broadly of the following:

### i 2012 (before mining commences)

- Undertake additional screen planting along boundaries adjacent to Kayuga, Wybong and Dorset Roads;
- commence construction of administration, industrial and CHPP;
- commence construction of site and mine access roads;
- commence construction of dams including the raw water, environmental, fines rejects emplacement (tailings) and sedimentation dams; and
- initial screen planting to fine rejects emplacement area.

### ii 2013 - 2014 (up to the start of mining)

- Planting and screening of administration, industrial and CHPP along Wybong Road;
- commence environmental / visual bund construction;
- progressive planting of visual screens and bunds to site and mine access roads;
- progressive planting of visual screens and bunds to dams including the raw water, environmental, fines rejects emplacement (tailings) and sedimentation dams; and
- commence construction of replacement rural access to the north and west.

iii 2014 - 2020

- Completion of additional screen planting for fines rejects emplacement areas; and
- progressive planting of visual screens and bunds to replacement rural access road to the north and west.

The general extent of these works is illustrated in Figure 3.1.

## 3.2 Visual screens

### 3.2.1 Environment bund

The major screening element to be constructed will be the environment bund to the east of the mine pit, created out of the overburden from the mining operation. This bund will take several years to construct during which time it will be visually prominent. During the construction of the bund it will be progressively shaped to a naturalistic form and vegetated with grass and trees. The revegetation of this bund is covered under the scope of the Rehabilitation Strategy. As the vegetation will take approximately five years to contribute any significant effect to the screening effect of the bund it is proposed to provide localised landscape screening to the east of the bund along Kayuga Road which can be undertaken prior to commencement of the mining operations, with screening taking effect sooner. This landscaping will also screen the sedimentation dams to the east of the bund.

As described in Section 1.2.1, trees and shrubs have already been established to the eastern boundary of the project area along Kayuga Road. Additional plantings will be undertaken to enhance the existing established vegetation to complete the screening. In particular understory shrub plantings will be introduced to provide low level screening for passing motorists. Fast growing screen species will be selected to enhance the biodiversity of the area in line with the rehabilitation of the area. New areas of planted screening will also be required to complete the full extent of screening to Kayuga Road. Planting will be through direct seeding and tubestock.

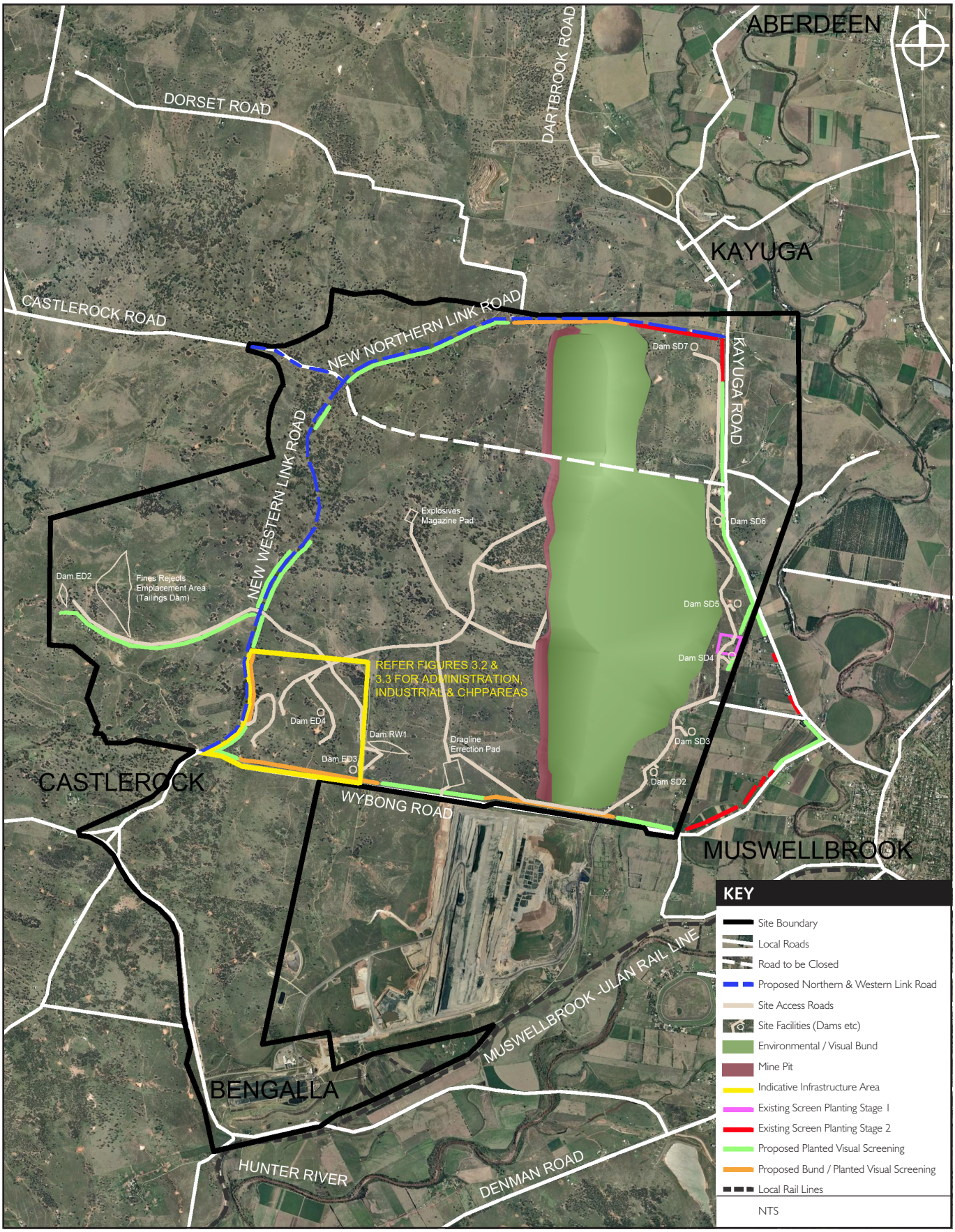
The extent of additional screen planting to Kayuga Road is illustrated on Figure 3.1. The typical planted screen treatment to local roads including Kayuga Road, is illustrated Figure 3.6.

### 3.2.2 Administration, industrial and CHPP area

The mine infrastructure area will be constructed in the south west corner of the project area and will include the CHPP and associated coal stockpiles, an industrial area with workshops, administration, employee facilities, access roads and a rail loading facility including a rail loop extending from the Muswellbrook – Ulan Rail Line, which will pass beneath Wybong Road in an underpass structure. The tallest components of this area, including the tallest transfer station tower, reject bin and tower surge bin and tower, coal preparation plant building, product coal stockpile, and product coal transfer station tower, will be visible above the landscape screening proposed along Wybong Road.

The EIS (ERM Mitchell McCotter, 1997) stipulates that appropriate planting of native trees be interspersed though the industrial and administration area, as well as screen planting and bunding along Wybong Road. Specifically the screening works will consist of:

- bunding with tree and shrub screen planting to Wybong Road for the extent of the adjacent CHPP area. A proportion of the tree planting on the upper section of the bund should be of advanced stock where possible. The remainder of the planting will be tubestock;




27101 - IA Rev A - 22 November 2011

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**Landscape plan (drawing showing landscaping for entire Project)**

Mount Pleasant Project Landscape Management Plan

FIGURE 3.1

- tree planting along the mine access road and plant access roads to provide additional screening and signpost the site. The tree planting should be of advanced stock where possible. The understory will be planted by direct seeding of shrubs, herbs and grasses;

- trees and shrubs will be planted to the address of the administration and bathhouse facility. These plantings will be of advanced tree stock and 150 – 200mm pot shrubs;

- advanced stock trees will be planted through the staff car parking area and surrounding the mine light vehicle carpark to provide shade and reduce wind and dust;

- planting of screening shrubs (tubestock) will be undertaken to buildings and facilities to improve the visual environment for users;

- all remaining exposed areas within the complex will be seeded (by hydromulching) for stabilisation with an appropriate mix of native dryland grass species; and

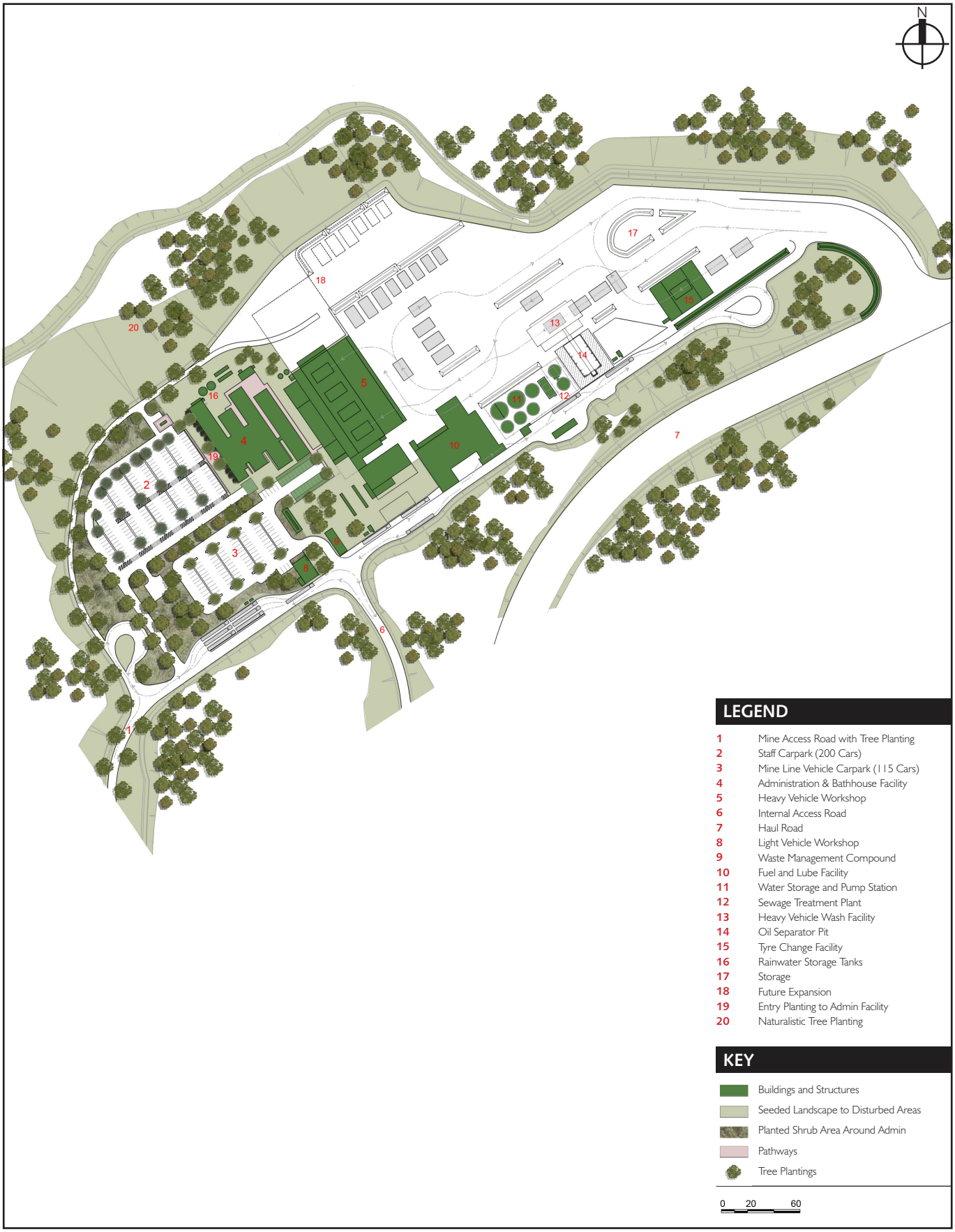
- disbursed screen plantings of naturalistic copses of trees (tubestock) will be planted to the surrounds of the complex with shrubs herbs and grasses planted by direct seeding. Denser screen planting surrounding the coal stockpile areas will act to reduce wind and thus dust from the stockpiles (illustrated on Figure 3.3).

The extent of the landscape and screening works to the administration, industrial and CHPP area is illustrated in Figures 3.2 and 3.3. Figure 3.7 illustrates the typical bund screening section to achieve maximum height in the screening.

### 3.2.3 Fines rejects emplacement area

The fines rejects emplacement area (also referred to as the tailings dam) is located in the south-western corner of the site to the west of the administration and industrial area and the Western Link Road. As noted in the EIS (ERM Mitchell McCotter, 1997), the dam is located within a gully and will be largely screened from public property by the landform and existing remnant woodland vegetation.

Visual screening to the area will consist of planting along the dam access road (as illustrated in Figure 3.8) and the Western Link Road. Planting will consist of tree and shrub tubestock planting together with direct seeding of grasses and herbs. The species mix will be consistent with that to be utilised in the area for revegetation works and will be specific to the nature of the gully in which the dam is located. Figure 3.4 illustrates the extent of screening to the fines rejects emplacement area.




| 27101-1A Rev A - 22 November 2011

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## Landscape concept plan for administration and industrial area

Mount Pleasant Project Landscape Management Plan

FIGURE 3.2


| 27101 - IA Rev A - 22 November 2011

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**Landscaping screening to administration, industrial and CHPP areas**

Mount Pleasant Project Landscape Management Plan

FIGURE 3.3

### 3.2.4 Water storage dams

The water requirements for the mine will be met through mine pit inflows and harvesting of catchment runoff and make up water from the Hunter River. Water would primarily be used in the CHPP, for dust suppression and ancillary uses such as vehicle wash down. Water storage dams would be designed and sized to capture the estimated volumes. The water storage dams on the site consist of environmental, raw water and sedimentation dams.

Only dams which will be permanent during the mine operations and which are identified as visible from external areas will have landscape screen planting. The visibility of the dams has been determined using a viewshed analysis which will be updated as required following any changes to the mine design. The draft viewshed analysis (IDS 2011) identifies that the proposed dams will currently be screened by the landscape screening being undertaken already for other larger items. As such no additional screening is currently proposed.

If determined to be required in the future screen planting will consist of tree tubestock planting together with direct seeding of shrubs, grasses and herbs. The species mix will be consistent with that to be utilised in the area for revegetation works and will also be specific for the nature of the gullies and low lying areas in which the dams are located.

### 3.2.5 Perimeter roads

The existing perimeter roads consist of the Wybong, Dorset and Kayuga Roads.

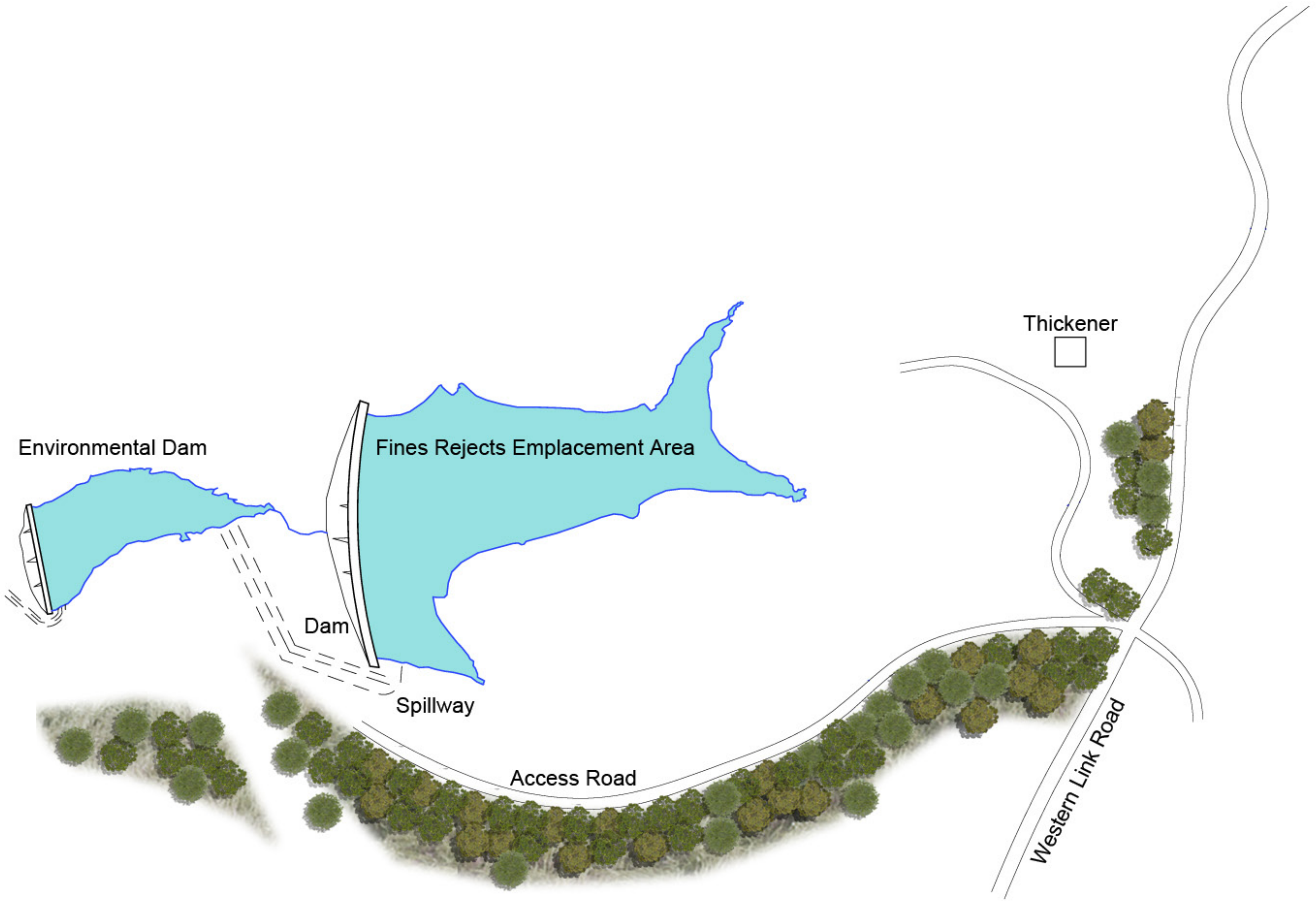
Screening to be provided along Kayuga Road is described in Section 3.1.1. Screening to Dorset and Wybong Roads has already been undertaken, primarily to provide a visual screen from passing traffic. Additional plantings will be undertaken to enhance the existing established vegetation to complete the screening. In particular understory shrub plantings will be introduced to provide low level screening for passing motorists. Fast growing screen species will be selected to enhance the biodiversity of the area in line with the rehabilitation of the area. Planting will be through direct seeding and tubestock.

Dorset Road follows the northern boundary of the site and the EIS (ERM Mitchell McCotter, 1997) stipulates a buffer zone will be maintained along this road with substantial screen planting. Bunding and vegetation screens will be provided in this buffer zone to screen the mine pit, as this is where the mine reaches its closes point to the road reserve at approximately 60 m. Closure of sections of Castle Rock and Wybong Road will be undertaken in conjunction with Council, to assist in reducing visible mine areas from the west and south. A replacement road following the western portion of the site will be constructed in accordance with the Western Roads Strategy. The EIS (ERM Mitchell McCotter, 1997) stipulates that bunding and planting will be provided to screen the Western and Northern Link Road as the pit is not screened by the environment bund from the west and north.

### 3.2.6 Site access roads

Internal site access roads are required to the administration, industrial and CHPP areas, to the mine pit and between other facilities on the site. The visual impact of these roads will be minimised though plantings of tress (tubestocks) in naturalistic clumps located beside the roads where they are visible from outside the site. In addition to the tree plantings direct seeding will be undertaken of shrubs, grasses and herbs consistent with the revegetation plantings of the area.

Typical Treatment
- Screen trees and shrubs planted as tubestock (minimum 2 rows)
- Grasses and herbs planted by direct seeding



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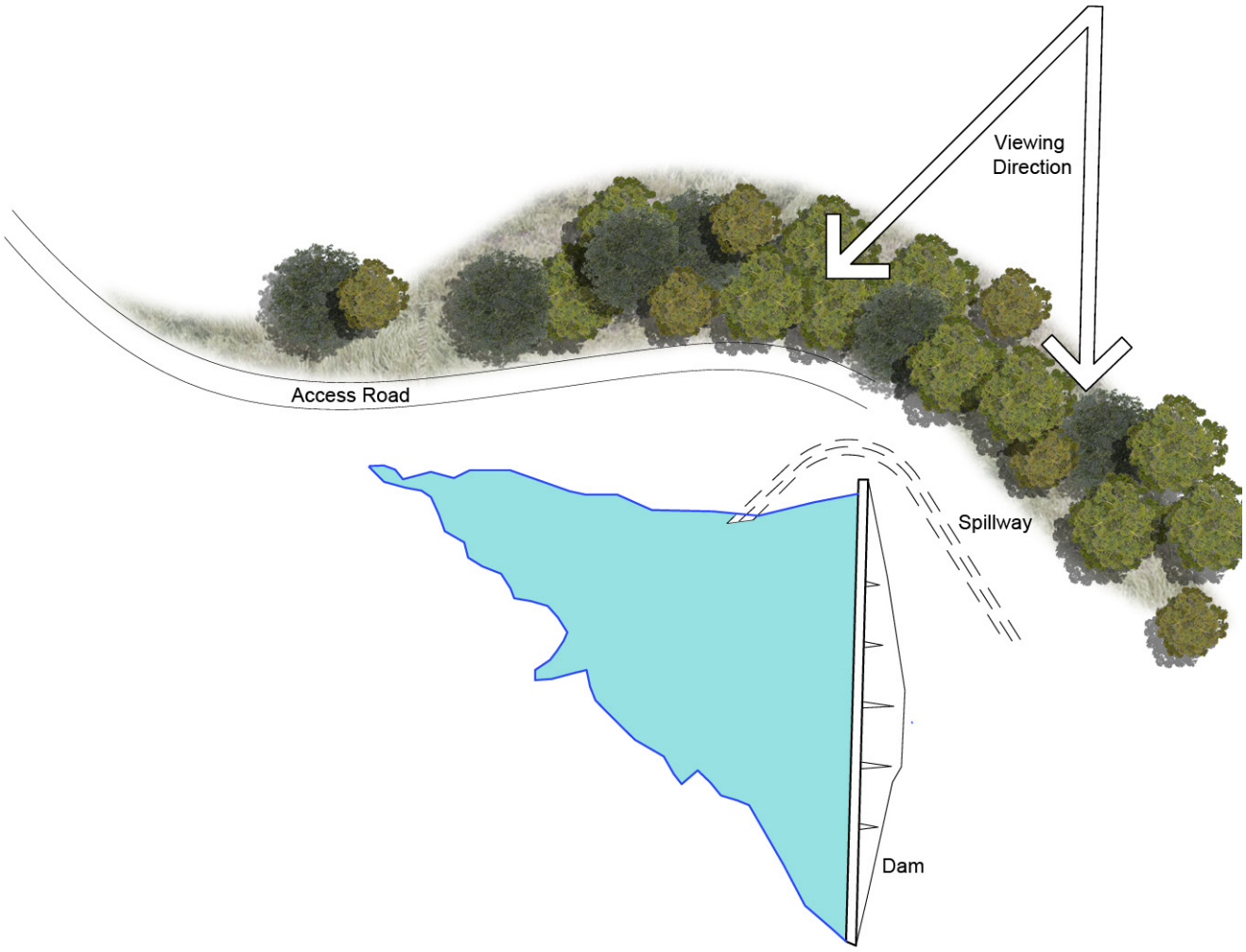
**Extent of screening to fines rejects emplacement area**

Mount Pleasant Project Landscape Management Plan

FIGURE 3.4

Typical Treatment
- Screen trees planted as tubestock (minimum 2 rows)
- Shurbs grasses and herbs planted by direct seeding
- Planting to be 'faded out' naturalistically outside the viewing zone



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**Typical example of dam screening**

Mount Pleasant Project Landscape Management Plan

FIGURE 3.5

Typical Treatment
- Screen trees planted as tubestock
- Shurbs grasses and herbs planted by direct seeding


Road Reserve

4m | 5m | 5m | 5m | 4m

| 27101 - 1A Rev A - 22 November 2011

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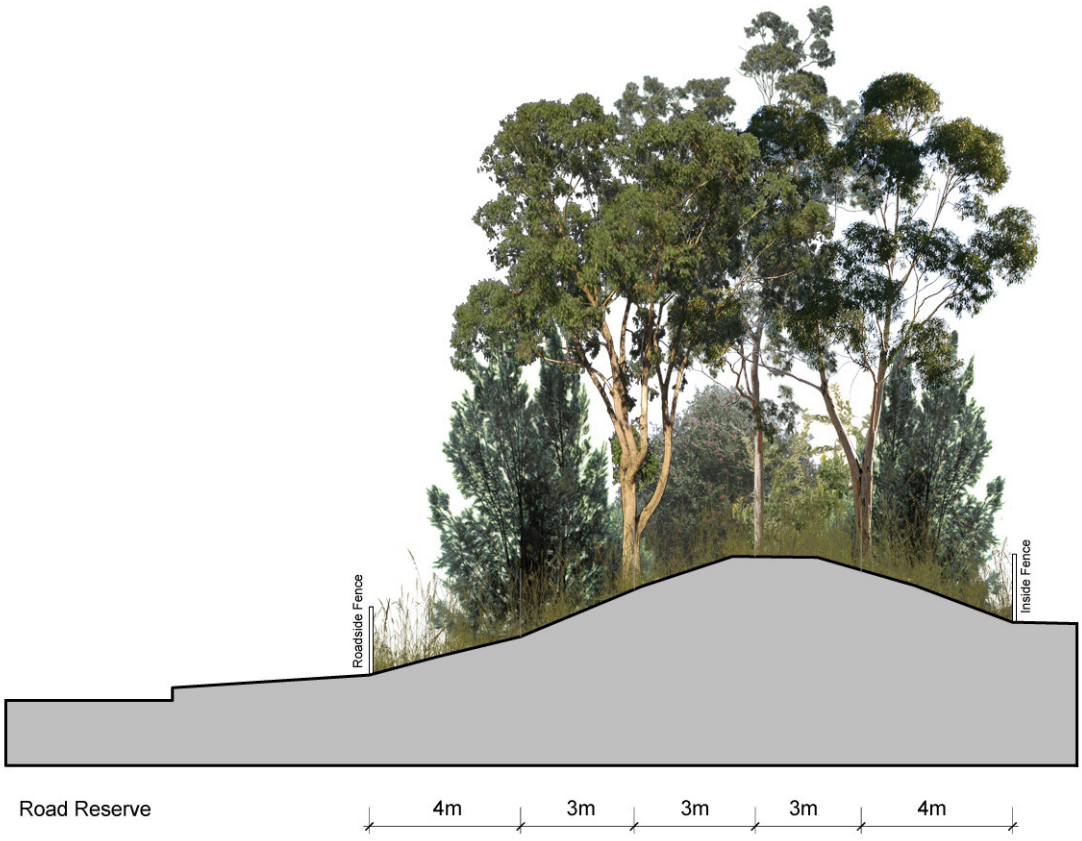
**Typical section of planted screening to local roads**

Mount Pleasant Project Landscape Management Plan

FIGURE 3.6

Typical Treatment
- Screen trees planted as tube or advanced stock
- Shurbs planted by seeding or tubestock
- Grasses and herbs planted by direct seeding
- Large shrubs / small trees planted on lower slopes
  of bund to screen at low level
- Tall trees planted on top of bund to give maximum height

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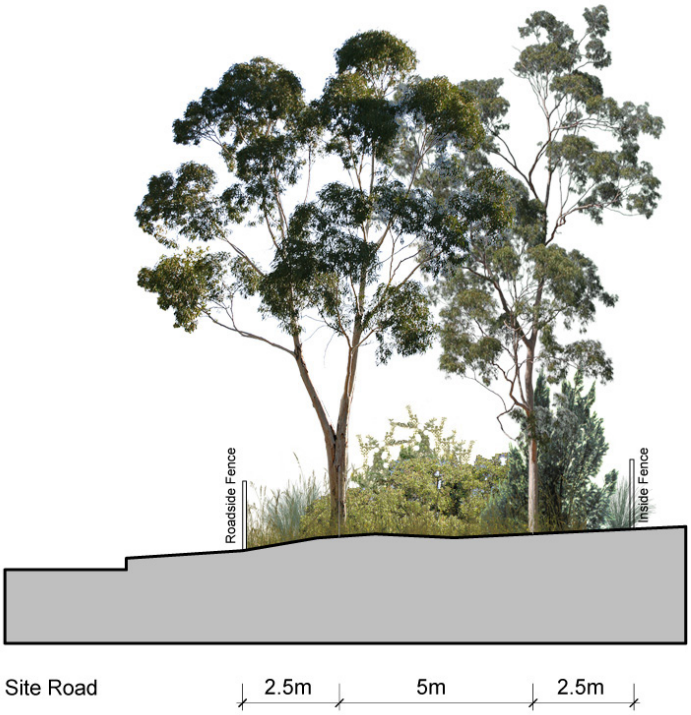
**Typical section of planted screening with bund to local roads**

Mount Pleasant Project Landscape Management Plan

FIGURE 3.7

Typical Treatment
- Screen trees planted as tubestock
- Shurbs grasses and herbs planted by direct seeding

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**Typical section of site access road screening**

Mount Pleasant Project Landscape Management Plan

FIGURE 3.8

## 3.3 Building treatments

Buildings and infrastructure will be designed to minimise their visual impacts on the surrounding environment. This will involve attention being given to the:

- use of non-reflective and textured building materials to avoid glare;
- use of colours that will complement the surrounding environment. Muted greens or beige are to be utilised, except where bright colours are necessary for safety reasons;
- infrastructure will be maintained in good order and in tidy condition; and
- storage areas will be maintained in a tidy condition and located, as far as practicable, in areas not visible to the public.

Figures 3.9 and 3.10 provide a visual impression of the CHPP area illustrating the building construction and treatment.

## 3.4 Planting

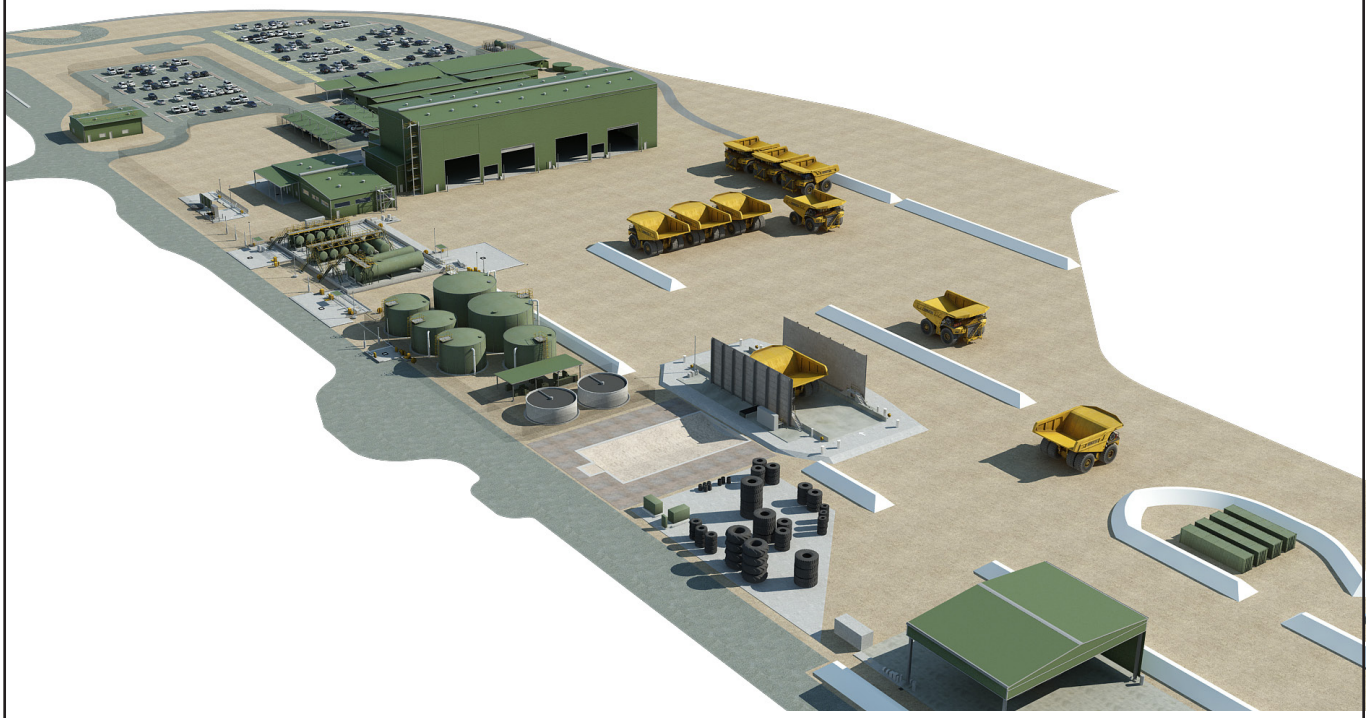
Visual screen plantings will include trees and shrubs of varying heights and be of sufficient width (at least 10m) to provide good visual screening and be sustainable. Trees will be planted at least four rows deep, with approximately 3m between trees along the rows. Where understory planting is tubestock these will infill between trees every metre. A mix of shrubs such as callistemon, melaleuca and acacia, will alternate with taller trees such as eucalypts and casuarina, to ensure that visual screening is rapid and will also be maintained as the screen matures. Arrangement of native plants will be random, and unevenly distributed to create a naturalistic character.

In areas where advanced stock is to be used, such as in and around the administration and industrial area, detailed plans will be prepared by a landscape architect or suitably qualified professional which specify the location, size, density and species mix of all planting.

### 3.4.1 Planting procedures

The following typical procedures will be followed for landscape planting areas:

- vegetation will be established by direct seeding or the planting of tubestock, except where advanced plantings are recommended (section 3.2);
- seeding will be made up of a mix of cover crop species and native grass / shrub species. The cover crop species selected must be sterile annual species which will not persist after the first year. The native grass / shrub species form the permanent vegetation;
- direct seeding has been noted as the typical method of seeding for the purpose of this report. Should site or local experience show other methods (eg hand-broadcasting, brush-matting, hydromulching; spreading seed-bearing hay, or air seeding) to be more successful these methods may be used in preference;
- seeds for native species will be of good quality, locally collected where possible and certified if sourced externally in accordance with the Rehabilitation Strategy (AECOM, 2011);



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**Indicative building treatment overall view**

Mount Pleasant Project Landscape Management Plan

FIGURE 3.9

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**Indicative building treatment**

Mount Pleasant Project Landscape Management Plan

FIGURE 3.10

- only healthy, actively growing plant stock to be used. Tubestock will be sourced from a reputable nursery and will be <30cm in height, air pruned, with no “J-roots”, disease or chlorosis evident;
- advanced plantings will be approximately one to two metres in height upon installation;
- plants will be well watered before and after planting;
- to reduce competition, a single or double application of non-selective herbicide such as glyphosate in 1m wide strips along planting rows two to four weeks prior to planting will generally be sufficient;
- each planting area will be pegged, deep ripped and fenced with gates;
- planting holes will be at least twice the size of the pot or tube to be planted;
- weed free mulch recycled from the slashing and clearing on the site will be used within landscape screen planting areas. Where an area has been identified as requiring mulch, and mulch is not available from on-site sources commercially available forest blend mulch will be used;
- trees will be planted at least 5m from fence lines, access tracks and roads to allow vehicle access and maintenance, and reduce the chance of falling branches damaging fences. They will not be planted close to buildings or underground pipes or cables;
- in general, fertiliser and tree guards should not be required in mass planting areas;
- planting will occur preferentially between May to August, with deep ripping occurring four to six weeks prior to planting; and
- if planting in times of prolonged drought or adverse conditions, the inclusion of mulch mats and/or water absorbent crystals around the base of the plantings and follow up watering will be used, where it has been identified that this will assist in the survival of the plants.

### 3.4.2 Indicative species

The most appropriate species mixes for visual screening will consider information from Coal & Allied’s previous local experience at other mines and where it is relevant, the findings of the growth trials undertaken for the site rehabilitation, when this information is available in the later stages of the project (refer to the Rehabilitation Strategy for more detail on growth trials). Preference will be given to species which are endemic to the site. It is recognised that endemic species may not be commercially available in the numbers required to undertake the visual landscape screening. In this case other appropriate native species which have performed well in the local area will be used.

An indicative species list for the landscape works is described in Table 3.1. Planting mixes in each area of the site should be tailored to match the species utilised in that area for the revegetation works.

## Table 3.1 Indicative species list

| Botanical name | Common name | Locally endemic (LE) or belonging to an endangered ecological community (EEC) |
|---|---|---|
| **Trees** | | |
| *Angophora floribunda* | Rough Barked Apple | LE |
| *Brachychiton populneus ssp populneus* | Kurrajong | LE |
| *Callistemon salignus* | Willow Bottle Brush | LE |
| *Casuarina cunninghamiana* | River Oak | LE |
| *Casuarina leumannii* | Bull Oak | LE |
| *Corymbia maculata* | Spotted Gum | LE |
| *Corymbia citriodora* | Lemon Scented Gum | LE |
| *Eucalyptus albens* | White Box | EEC |
| *Eucalyptus blakelyi* | Blakely's Red Gum | EEC |
| *Eucalyptus camaldulensis* (gullies and water courses) | River Red Gum | LE |
| *Eucalyptus crebra* | Narrow-leafed Iron Bark | LE |
| *Eucalyptus dawsonii* | Slaty Gum | LE |
| *Eucalyptus microcarpa* | Western Grey Box | EEC |
| *Eucalyptus molccana* | Grey Box | EEC |
| *Eucalyptus melliodora* | Yellow Box | EEC |
| *Eucalyptus punctata* | Grey Gum | LE |
| *Eucalyptus tereticornis* | Forest Red Gum | LE |
| *Melaleuca bracteata* (gullies and water courses) | White Cloud Tree | LE |
| *Melaleuca linarifolia* | Narrow Leaf Paperbark | LE |
| *Melaleuca styphylliodes* (gullies and water courses) | Prickly Leafed Paperbark | LE |
| **Shrubs** | | |
| *Acacia amblygona* | Fan Wattle | LE |
| *Acacia decora* | Western Golden Wattle | LE |
| *Acacia decurrens* | Green wattle | LE |
| *Acacia falcata* | Sickle wattle | LE |
| *Acacia filicifolia* | Fern leaf wattle | LE |
| *Acacia implexa* | Hickory wattle | LE |
| *Acacia salicina* | Coobah Wattle | LE |
| *Dodonaea viscosa* | Hoop Bush | LE |
| *Breynia oblongifolia* | Coffee Bush | LE |
| *Lissanthe strigosa* | Peach Heath | LE |
| *Exocarpus cupressiformis* | Native Cherry | LE |
| *Bursaria spinosa* | Native Blackthorn | LE |
| *Pultenaea cunninghamii* | Spiny Bush Pea | LE |
| **Grasses and herbs** | | |
| *Aristida vagans* | Threeawn Speargrass | LE |
| *Austrodanthunia fulva* | Wallaby Grass | LE |

**Table 3.1 Indicative species list**

| Botanical name | Common name | Locally endemic (LE) or belonging to an endangered ecological community (EEC) |
|---|---|---|
| *Cymbopogon refractus* | Barbed Wire Grass | LE |
| *Dianella longifolia var. longifolia* | Pale Flax Lily | EEC |
| *Dichondra repens* | Kidney Weed | LE |
| *Lomandra filiformis* | Wattle Mat Rush | EEC |
| *Lomandra multiflora* | Many Flowered Mat Rush | LE |
| *Stipa sp.* | Spear Grass | LE |
| *Themeda australis* | Kangaroo Grass | EEC |

## 3.5 Landscape maintenance

Regular inspections will be implemented to monitor the progress of the screens. The timing of the inspections will be more frequent in the early stages, moving to annual as the screens become established. Results of the inspections will be used by the site environmental personnel to arrange for maintenance works to be undertaken on a priority basis.

### 3.5.1 Weed control

Weed control will be an important aspect of the long term success of the landscape areas and will indicatively include the following:

- ensure machinery hygiene protocols are implemented to control the spread of weeds;
- maintenance staff shall be familiarised with the identification of weed species and their control where the control category is a legal requirement under the NSW *Noxious Weeds Act 1993*;
- regular inspections will be conducted, initially at least quarterly, to highlight areas requiring attention;
- where significant areas of weed species or noxious weeds as declared by the Upper Hunter Weeds Authority are observed, spraying or other treatment will be arranged as soon as practical;
- weeds may be controlled by physical removal or spraying;
- suitable measures will be implemented for spraying to ensure the safety and effectiveness of application. These measures will include the approval of contractor and chemicals, timing of application during active growth, weather conditions and location of sensitive environmental areas;
- records of spraying activities including area sprayed, the product used, dilution rates, weather conditions and other criteria as required under the NSW *Pesticides Act 1999* must be kept. Areas where weed control has been conducted will be recorded in a GIS database;
- success of spraying should be assessed by visual inspections and follow up spraying undertaken as necessary;

- an Annual Report is to be developed at the conclusion of each year's works program summarising all works undertaken and provide direction for the following year's works program with the development of an Annual Works Schedule; and

- the Annual Works Schedule shall include a monitoring schedule which is to be continued throughout the life of the operation to enable the results of monitoring to be compared providing an indication of the progress of control methodologies.

### 3.5.2 Replanting / reseeding / fertiliser application

Initial replanting of losses and reseeding of failed areas will occur three months after planting. Following this it will be undertaken on an as required based upon the results of annual inspections and/or rehabilitation monitoring. An annual application of fertiliser and / or macro or micro nutrients) may also occur where required.

### 3.5.3 Administration and industrial area

In addition to the maintenance activities described above the landscape in and around the administration and industrial area will require additional maintenance consisting of:

- regular watering during plant establishment (12 months) of advanced stock where planted;

- regular mowing of grassed areas within the precinct; and

- slashing of the grassed areas directly surrounding the precinct, as part of the planned work schedule for August, September and October each year.

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# 4 Contingency actions

Table 4.1 summarises key risks to the success of landscaping and proposed contingency measures to mitigate these risks.

**Table 4.1 Key risks and proposed mitigation measures**

| Risks | Proposed mitigation measures |
|---|---|
| Inadequate weed control leading to widespread failure of landscape screens. | • Review weed control measures and consult with rehabilitation professional as required to amend control measures. |
| Poor construction of landscaping sites, including inadequate or insufficient topsoil. | • Relevant personnel to be aware of and implement the requirements of this management plan. |
| Low or unsustainable nutrient levels in landscaping areas. | • Increase and prolong the soil organic matter and microorganism activity through the use of organic mulches or growth mediums. |
| Wind and water erosion on moulding/bunding. | • Rapidly stabilise the substrate and increase organic matter by applying mulch.<br>• Sow with sterile annual cover species to provide rapid stabilisation and erosion control while the native species included in the mix establish. Introduced perennial pasture species will not be used as these restrict establishment and recruitment of native plants. |
| Lack of follow-up maintenance. | • Review landscape maintenance program and amend as required. |
| Limited rainfall. | • Plant local native species adapted to the local climatic conditions. Plant/sow during the autumn - spring periods. |
| Insect attack/disease etc on vegetation. | • Aim to encourage diversity within the vegetation community and undertake regular monitoring. Encourage spiders, insects, frogs, lizards and insectivorous birds possibly by providing suitable habitat and food resources such as nesting boxes, logs, rocks (refer to Rehabilitation Strategy). |
| Failure of tree and shrub plantings as visual screens. | • Detect failure in annual inspections. Assess reasons for failures including extreme weather, fire, and species specific failure, and undertake soils tests.<br>• Refine planting species and seed mixes to species found to have performed well in trials, if information if available (refer to Rehabilitation Strategy) and reviews of existing and earlier stage plantings.<br>• Ameliorate identified adverse conditions and re-plant with suitable species. |

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# 5 Reporting and review

## 5.1 Reporting

Details on the monitoring and performance documented in the LMP are to be reported in the Annual Environmental Management Report (AEMR).

## 5.2 Review

The performance of the landscape management system will be reviewed annually, along with the environmental performance of the project. The review will include:

- a comprehensive review of the monitoring results of the development over the past year, which includes a comparison of these results against the:
  - relevant performance measures/criteria;
  - monitoring results of previous years; and
  - relevant predictions in the EIS;
- identification of any failure to meet performance measures / criteria over the last year, and description of what actions were (or are being) taken to ensure these are met;
- identification of any discrepancies between the predicted and actual visual impacts of the development, and analysis of the potential cause of any significant discrepancies; and
- a description of what measures will be implemented over the next year to improve the performance of the landscape management system.

The LMP will be reviewed within three months of the submission of the annual review and updated to the satisfaction of the Director-General of the Department of Planning and Infrastructure where necessary. The plan will also be reviewed within three months of the completion of an independent environmental audit or any modification to the consent conditions.

Any major amendments to the LMP that affect its application will be undertaken in consultation with the appropriate regulatory authorities and stakeholders. Minor changes such as formatting edits may be made with version control on the Project website.

The LMP may also be revised due to:

- deficiencies being identified;
- results from the monitoring and review program;
- recommendations resulting from the monitoring and review program;
- changing environmental requirements;
- improvements in knowledge or technology become available;

- changes in legislation;
- where a risk assessment identifies the requirement to alter the plan; or
- following updating of the Mining Operation Plan.

# References

AECOM, 2011, *Mount Pleasant Rehabilitation Strategy*. Report prepared for Coal & Allied.

Coal & Allied, 2007, *Mount Pleasant Project Annual Environmental Management Report.*

DnA Environmental, 2010b**,** *Biodiversity Management Plan for the Proposed Mount Pleasant Project Biodiversity Management Areas*. Report prepared for Coal & Allied.

EMGA Mitchell McLennan, 2010, *Mount Pleasant Project Environmental Assessment*. Report prepared for Coal & Allied.

ERM Mitchell McCotter, 1997, *Mount Pleasant Project Environmental Impact Statement*. Report prepared for Coal & Allied.

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