# 16 Visual and lighting

## 16.1 Project changes and assessment

### 16.1.1 Relevant project changes

The Project changes that relate to visual impacts are:

- the B-OOP E waste rock emplacement footprint and height will be modified to allow for the out-of-pit tailings emplacements to be developed; the maximum height of the waste rock emplacement will increase from RL430 m to RL450 m;
- the rail spur alignment will be refined; the maximum lateral change will be 250 m along the 28-km long rail spur, which has decreased the distance to the nearest private residences by less than 130 m; and
- the Spring Ridge Road diversion will be modified so that it does not pass between the B-OOP W and B-OOP E waste rock emplacements. The diversion proposed in the EA would have provided motorists views of the MIA and brought them within several hundred metres of the large overburden areas. The proposed diversion will now link up with the Golden Highway to the existing Spring Ridge Road, to the south of mining area B taking traffic around, as opposed to through, the mine.

### 16.1.2 Assessment method

The assessment of the impacts at each of the viewpoints and private receptors in EA has been updated using the methods described in the EA (Section 17.2). The assessment considered whether the level of visual impact will change at each location and whether the original mitigation measures proposed remain relevant, or whether additional measures are necessary.

### 16.1.3 Environmental management

The EA states a lighting management plan detailing the installation and operation of fixed and mobile lighting sources will be prepared. The plan will also describe design features for particular buildings, permanent lighting structures or operating equipment. It will be prepared to ensure the Project's compliance with *AS 4282 – Control of Obtrusive Effects of Outdoor Lighting* and *AS/NZS 1158 – Lighting for Roads and Public Spaces*. The plan will also contain protocols to ensure compliance with *Warrumbungle Development Control Plan No.1 – Shire Lighting Control* to protect Siding Spring Observatory (SSO).

A landscape management plan will also be prepared (EA Section 17.4) that will detail planting and earth mounding measures to reduce the exposure of various viewpoints to the mine operation and infrastructure. Vegetative screens will be based on species common to the immediate area.

CHC commissioned a detailed site assessment of all public roadways and private residences identified for mitigation measures in the form of vegetative screening in the EA in December 2012. This assessment quantified the amount of screening, location and species selection to maximise its effect and match it to the landscape through using endemic species. The fieldwork was undertaken on 4 and 5 December 2012. CHC has received a report detailing species selection and screening design. A tender will be prepared for propagating and planting the screens.

### 16.1.4 Impacts

The visual impacts from each of the viewpoints and private residences incorporating the Project changes are provided in Table 16.1.

## Table 16.1 Visual impacts and mitigation commitments

| Area impacted | Detail of visual impacts described in the EA | Impact of Project change |
|---|---|---|
| • VP1 – Golden Highway | • Visual impact of Mining Area A active emplacement from Years 4 to 20 | • *No change* |
| | • Visual impact of mobile mine equipment working on active emplacements and batters | • *No change* |
| | • Visual impact of active mining operations at the northern tip of Mining Area A between Years 16 and 20 | • *No change* |
| | • Distraction to motorists from light spill from mobile mine machinery and mobile lighting towers | • *No change* |
| • VP2 – Sweeneys Lane | • Visual impact of mining areas A and C active emplacements from Years 1 to 20 | • Temporary views of the increased height of B-OOP E until Year 4 from a distance of more than 5 km. Views of the increased height of this area will become largely obscured by the out-of-pit emplacement areas associated with mining areas A and B when these emplacements reach their maximum height from Year 8. From this point, the increased height of B-OOP E would become largely imperceptible |
| | • Visual impact of mobile mine machinery working on active emplacements and batters to mining areas A and C | • No change |
| | • Visual impacts to active mine operation associated with mining area A | • No change |
| | • Distraction to motorists from light spill from mobile mine machinery and mobile lighting towers | • Potential increased light spill from machinery operating at higher level; however, the mitigation measures will remain the same |
| • VP3/ VP4 – Sweeneys Lane at Willow Park | • Visual impact of mining area A and C active emplacements from Years 1 to 20 | • No change |
| | • Distraction to motorists from light spill from mobile mine machinery and mobile lighting towers | • No change |
| • Residence 1222 | • Visual impacts associated with active emplacements and night lighting to mining area A from Year 1 to 20. Impact reduces from Year 8 with progressive rehabilitation of active emplacements | • This residence has been acquired by CHC<br>• CHC has had an independent site-specific visual impact assessment made and will provide vegetative screening for the benefit of current and future tenants of the property |
| • Residence 1223 | • Potential visual impacts associated with active emplacements and night lighting to mining area A from Years 1 to 20. Impact would reduce from Year 8 with progressive rehabilitation of active emplacements | • CHC has acquired this residence<br>• CHC has had an independent site-specific visual impact assessment made and will provide vegetative screening for the benefit of current and future tenants of the property |

## Table 16.1 Visual impacts and mitigation commitments

| Area impacted | Detail of visual impacts described in the EA | Impact of Project change |
|---|---|---|
| • Residence 3224 | • Visual impact of mining areas A and B active emplacements from Years 1 to 20. Impact from Mining Area A reduces from Year 8 with progressive rehabilitation of active emplacements. Some rehabilitation of emplacements will start in Year 12; however, most rehabilitation does not occur until Year 21<br>• Impacts of views to B – OOP E until Year 4 when rehabilitation is complete<br>• Impacts of views to CHPP area, which will remain for life of the Project<br>• Night light impacts from above operations | • An offer to acquire this residence has been made by CHC, negotiations continue<br>• CHC has had an independent site-specific visual impact assessment made and will provide vegetative screening for the benefit of current and future tenants of the property |
| • Residence 3218 | • Visual impact of mining areas A and B active emplacements from Years 1 to 20. Impact from mining area A reduces from Year 8 with progressive rehabilitation of active emplacements. Some rehabilitation of emplacements will start in Year 12; however, most rehabilitation does not occur until Year 21 | • CHC has acquired this residence<br>• CHC has had an independent site-specific visual impact assessment made and will provide vegetative screening for the benefit of current and future tenants of the property |
| • Residence 1213 | • Visual impact of Mining Areas A and B active emplacements from Years 1 to 20. Impact from Mining Area A reduces from Year 8 with progressive rehabilitation of active emplacements. Some rehabilitation of emplacements will start in Year 12; however, most rehabilitation does not occur until Year 21 | • CHC has acquired this residence<br>• CHC has had an independent site-specific visual impact assessment made and will provide vegetative screening for the benefit of current and future tenants of the property |
| • VP5 – Spring Ridge Road/mine access road | • Visual impacts from mining areas A and B active emplacements, AC-OOP, B-OOP W and B-OOP | • The amended Spring Ridge Road diversion is no longer between B-OOP W and B-OOP E waste rock emplacements so there will be no foreground views of these emplacements |
| | • Potential distraction to motorists from views to CHPP area and ROM coal stockpile | • The mine access road off the Spring Ridge Road diversion will only be used by traffic travelling to the mine and only mine-related traffic will have foreground views of the CHPP and ROM coal stockpile |
| | • Light spill and sky glow impacts from mine operations and infrastructure | • The amended Spring Ridge Road diversion will result in motorists being further from any lighting sources associated with the Project |
| • VP6 – Dapper Road/Spring Ridge Road diversion | • Visual impact of mining area B active emplacements from Years 1 to 20 | • The Spring Ridge Road diversion is now to be built before operations begin, rather than in Year 12, as assessed in the EA. Realignment before mining begins, combined with targeted vegetative screening along this alignment, will result in better visual amenity from this viewpoint |
| | • Visual impacts to active mine operation associated with Mining Area B from Years 1 to 20 | • As above |

## Table 16.1 Visual impacts and mitigation commitments

| Area impacted | Detail of visual impacts described in the EA | Impact of Project change |
|---|---|---|
| | • Light spill and sky glow associated with active mine and active emplacement operations in mining area B and B-OOP W. | • As above |
| • VP7 – Spring Ridge Road and Laheys Creek Road intersection | • Visual impact of mining area B active emplacements from Years 12 to Year 20 and B-OOP W from Years 8 to Year 16 | • Due to intervening topography and distance (more than 1 km) views of B-OOP E, and therefore the increased height of the overburden, will not be possible from here |
| | • Light spill and sky glow associated with active mine and active emplacement operations in Mine Area B and B-OOP W | • No change |
| • VP8 – Laheys Creek Road (rail crossing) | • The rail crossing embankment will create a new dominant/permanent visual element in the landscape | • No change |
| • Residence 3108 | • Visual and lighting impact of train movements close to receptor | • Minimal change in the alignment of the rail line close to this private residence. No change in the level of visual impact from this element of the Project |
| • Residence 5001 | • Visual and lighting impact of train movements close to receptor | • Minimal change in the alignment of the rail line close to this private residence. No change in the level of visual impact from this element of the Project |
| • VP9 – Brooklyn Road | • Visual and lighting impact of train movements close to roadway | • No change |
| • Residences: 3062, 3052, 3057, 3041, 3043 | • Visual and lighting impact of train movements close to receptor<br>• Visual impact of railway embankments creating a dominant visual element in the landscape | • Residence 3057 has been acquired by CHC. Amenity agreements have been reached with 3041 and 3043. CHC has a purchase agreement in place with 3052 if the owner decides to sell<br>• CHC has had an independent site-specific visual impact assessment made and will provide vegetative screening for the benefit of current and future tenants of the property<br>• Residence 3062 remains privately owned. CHC has had an independent site-specific visual impact assessment made and will provide vegetative screening to obscure the property's views to the rail line |
| • VP10 and VP11 – Castlereagh Highway | • Potential lighting impacts of train movements approaching highway | • No change |

## 16.2 Response to submissions

### 16.2.1 Visual impacts to surrounding land/houses

**Submissions**

C-4

**Issues**

Wellington Council comments the views from residences 1213, 3218, 1222, 1223 and 3224 will be adversely affected by overburden dumps and night lighting every year of mine operations and mitigation measures to the satisfaction of the landowners are required.

**Responses**

CHC has since acquired all of these properties.

### 16.2.2 Impact on tourism

**Submissions**

I-12, I-13, I-176

**Issues**

Submissions comment that mines are an eyesore that tarnish tourism appeal, particularly for wine tours.

**Responses**

The Golden Highway to the north of the Project and the Castlereagh Highway to the east, are used by tourists. All local roads close to the Project have low traffic volumes and are unlikely to carry much tourism traffic. Viewpoints on local roads are summarised in Table 16.1. There are no vineyards close to the Project, with the nearest NSW wine regions of Mudgee and Orange, about 60 km and 200 km away, respectively.

The Golden Highway between Dubbo and Dunedoo carries 1,050 vehicles/day, (EA Figure 12.3). In the absence of mitigation measures, from years 4 to 21 views of mining area A would be possible for motorists travelling along the highway. CHC will plant an extensive vegetative screen along the Golden Highway in early 2013 to allow a visual barrier to develop before mining operations are visible to motorists. Mining operations will start in 2015, so the visual buffer will have six years to grow before Year 4. Provided the vegetative screening is maintained following planting, the overstorey species are expected to grow 5–6 m, which will buffer views of mining operations from the highway.

Traffic counts in February 2010 show the Castlereagh Highway carries much less traffic than the Golden Highway (670 vehicles/day), but is an important route linking Lithgow and Mudgee through to Dunedoo. There are no views to the mine from the highway. However, there will be up to ten coal train movements per day (24 hours) that will be visible to motorists. The rail line will pass under the highway within a cutting and will have minimal visual impact.

There will be few opportunities for tourists to view the mine and no impacts to the aesthetics of the region or related tourism impacts.

### 16.2.3 Night-sky friendly lighting

**Submissions**

CA-1, NA-1, G-8

**Issues**

The Australian Astronomical Observatory (AAO) comments that statutory controls are in place to protect night-sky conditions at the SSO and wants night-sky friendly lighting incorporated in the Project based on suitable expert advice. The AAO supports this Project providing maximum attention is given to the design of all artificial lighting to meet approved reduction of light pollution. This includes that all lighting fittings (all exterior lights, including floodlights) have full cut-off (FCO) light distribution and, where practical, vehicles should have their headlamps on 'dip' beam especially when driving in the direction of the observatory. The EPA also recommends CHC engage with the AAO and SSO about the proposed controls.

**Response**

CHC has consulted with the AAO and SSO and will continue to consult with these organisations in developing the Project's lighting management plan in association with a mutually agreeable lighting consultant.

CHC will engage an experienced and suitably qualified expert organisation to prepare a detailed light management plan for the Project that will include the measures the AAO described. The plan will be made available to the AAO and the Australian National University (ANU) for comment and will need to be approved by the DP&I before being finalised. CHC will implement the plan and regularly report on its performance.

### 16.2.4 Dust-reflected light impacts on the observatory

**Submissions**

NA-1, G-8

**Issues**

The EPA and Lighting Analysis and Design comment that dust around the mine could increase lighting impacts on the SSO.

**Responses**

As described in the EA (Chapter 14), dust emissions from the Project will be minimised. The air quality management plan will further detail dust management measures and monitoring (see Section 14.4). These measures along with those described in the light management plan will minimise light being reflected off dust above the mine.

Potential impacts of dust from the Project on the observatory are discussed in Section 13.

### 16.2.5 Lighting management plan

**Submission**

NA-1

**Issues**

The EPA notes that a lighting management plan will be prepared to comply with AS 4282 and AS/NZS 1158. However, the EPA comments that not enough information has been provided to demonstrate that this can be achieved in practice. It recommends further assessment of the potential impacts of lighting on surrounding lands, as well as the observatory, in accordance with the requirements of Warrumbungle Shire Council's Development Control Plan No.1 – Shire Lighting Control and other applicable environmental planning instruments.

**Response**

The EA considered the potential impacts of lighting at viewpoints (private residences and public roadways) around the Project. It identified the major source of light spill was likely to be from machinery and mobile lighting plant on the active overburden areas. The lighting management plan will detail:

- early targeted foreground planting along selected sections of public roadway to screen views to mining area A, thereby reducing potential impacts, including distraction to drivers;
- measures to stage workings on out-of-pit emplacements benches wherever possible so that outer embankments around the perimeter are created first — these will provide a visual screen while work occurs in the central part of the emplacement; the emplacements will be designed to minimise light spill;
- the need to make site-specific visual impact assessments to determine the level of impact to any private properties and to develop specific mitigation measures to minimise the impacts of night lighting;
- procedures for operating machinery and the position and arrangement of mobile lighting plant to minimise potential light spill; and

CHC expects to meet the requirements of Warrumbungle Development Control Plan No 1.

## 16.3 Conclusion

The changes to the Project along with the acquisition of a number of residences that were visually impacted mean there will be no greater visual or lighting impacts associated with the Project than were considered in the EA. The following additional measures will be taken to address comments received:

- CHC will engage an experienced and suitably qualified expert organisation, following discussions with representatives of the AAO and Siding Springs Observatory to prepare a detailed light management plan;
- CHC will provide the lighting management plan to the AAO and ANU for comment; and
- CHC will regularly report on its performance against the requirements of the lighting management plan.