

**SOUTHERN CROSS GOLDFIELDS  
MARDA EAST PROJECT  
VISUAL IMPACT ASSESSMENT**

JUNE 2014

## **Summary**

The following document details the visual impact assessment (VIA) undertaken for the Marda East Project. At the time of this assessment, the detailed design of the proposed works had not been undertaken. As a result, the data available was limited to demonstrate the location, form and scale of the primary project components only.

The following areas of Visual impact were considered during this assessment:

1. Existing information
2. Landscape Character
3. Valued Characteristics
4. Potential views of the proposal
5. Possible views of the proposal

The assessment identified three distinct Landscape Character Units with the project area having an impact on two of these being the footslopes of the ranges and the surrounding plains.

Visual impacts were considered from the areas of public access (Bullfinch Evanston Road) and from elevated areas surrounding the project areas.

The assessment identified minimal impacts to the views from publically accessible areas but some impacts to views from elevated areas surrounding the project.

## Report

### 1. Existing information

The existing information used in the assessment was the proposed project layout and topographic maps as shown in Map 1 as well as the vegetation and Flora assessment completed by Western Botanical (2014).

### 2. Landscape Character Units (LCU)

The identified landscape units have been described as

#### 2.1. Die Hardy Ranges

##### Study area location

This unit stands distinctly out from and above the surrounding lower lying plains.

##### Character description

The Die Hardy Ranges are a natural LCU characterised by a distinctive rugged range running in a north west to south east direction. The form and line of this character unit are characterised by horizontal to sloping profiles with straight and angular lines at close range views. On the horizon, the landform is folding and curved.

The colours of the Die Hardy Ranges are pale and generic, comprised of olive to fatigue green. Brighter flashes of ochre to orange is viewed from the exposed rocks in mid-ground views and in brighter lighting conditions. Where visible the darker soils contrast with the pale greens and yellows of the vegetation. On the horizon the colours of the ranges are dark and muted, depending on the time of day the colour can be deep blue to brighter green.

The textures of this character unit range from the texture of the vegetation which is rounded and muted to the contrasted rough texture of the sharp cliffs and angular rocks from the BIF. Soils can be rough and angular to gravelly. Soil is not visible between vegetation at distance. Rock faces exposed between the vegetation can appear as horizontal bands on the slopes of the ranges. The visual elements of this landscape character unit are illustrated in the photos.

#### 2.2. Foothills of the Ranges

##### Study area location

This unit is a blending of the steeper ranges to the more gentle surrounding plains. The majority of the Marda East project area is located within this unit with some portions of the project spreading lower into the plains.

##### Character description

The foothills of the ranges are more rounded in shape with no exposed rock faces. The colours of the foothills broadly continue the range colours pale and generic, comprised of olive to fatigue green with occasional stands of brighter gold/green under

certain lighting conditions and attached to certain units of vegetation (DSC\_0098). Soils can be rough and angular to gravelly (DSC\_0124). The textures of this character unit are rounded and muted from a distance (DSC\_0102). Soil is not visible between vegetation at distance.

### 2.3. Gentle Undulating Plain

#### Study area location

This unit extends away from the footslopes and for considerable distance until the next rise from the plain (DSC\_0098, DSC\_0099).

#### Character description

The plains extend like a rolling carpet into the horizon from any elevated point. The colours of the plains are a more uniform dark green and are muted. Some variation in colour and brightness can be observed and can be a mixture of light, vegetation and slight variations in elevation. Soils are gravelly to sandy (DSC\_0118, DSC\_0079). The textures of this character unit are flat and hazy from a distance (DSC\_0088). Soil is not visible between vegetation at distance.

Trees and shrubs grow thick throughout this unit and for a textured side wall along the roadsides impeding visibility very far.

## 3. Valued Characteristics

Visual quality is described in Reading the Remote, Landscape Characters of Western Australia (CALM, 1994) as “the relative visual character of a landscape, expressed as an overall visual impression or value held by society after perceiving and area of land / water.” CALM (1994) identified that visual quality increases with greater:

- naturalness value
- topographic relief and ruggedness
- vegetation and landscape diversity.

The DPI (1997) identified key character indicators that can be used as a basis for classifying the landscape into two preference categories; ‘most’ preferred and ‘least’ preferred landscapes. These preference categories were established for natural, rural and built landscapes. ‘Most’ preferred characteristics are defined as landscape features that are highly valued by the community and contribute to the visual character (DPI, 1997). ‘Least’ preferred are features not valued by the community and detract from the visual character (DPI, 1997). The preference indicators for natural and rural environments are summarised in the Appendix 1.

The study area is entirely within a natural landscape with the historical pastoralist grazing activities have made no discernable changes to the landscape at the regional or

local level. The Die Hardy Ranges were identified as holding key visual landscape values due to a combination of factors such as:

- a high degrees of perceived naturalness
- a degree of topographic variety or vertical relief (dramatic relief, ruggedness, rock outcropping and outstanding ridgelines)
- perceived vegetation characteristics, such as endemic and diverse species

#### 4. Theoretical views of the proposal

The project areas are quite small and restricted to a small area (i.e. only 4 km between them) with only one public road / viewing area and restricted points of view from surrounding elevated locations. It was determined that a simple viewshed analysis could be completed by determining from the topography all possible elevated locations that could view the proposal area and preparing a series of cross sections from the road to the project areas to identify the extent of the possible viewing locations from the public road. The cross sections were prepared using a topographic map with 2m contours. The cross sections identified that it would be theoretically possible to see the project areas from an area of 11km along the Bullfinch Evanston road as well as from various elevated locations surrounding the areas of disturbance. These simple cross sections were then groundtruthed with a visual inspection of the areas during a site visit. The main way of ground truthing the cross sections was by standing at the project areas and looking back at the various possible views to determine line of sight possibilities.

The theoretical (line of sight) locations for views of the proposal area can be described as:

1. An area of 11 km along the Bullfinch to Evanston Road (north of the Die Hardy Pass)
2. Elevated positions along the southern end of the Eastern Limb of the Die Hardy Ranges
3. Elevated Positions from along the Southern end of the Die Hardy Ranges (Mt Geraldine)
4. Elevated areas on the Footslopes along slope from Red Legs

DPI (2007) suggests the following scales to measure visibility; Foreground (0- 500m), Mid-ground (500m-6.5km) and Background (6.5-16.5km). These three categories relate to the level of detail that is visible to the observer. As distance increases, colours and textures tend to become less obvious, whereas line and form become more dominant. The Bullfinch Evanston Road afforded possible views of the project areas (excluding haul road intersections – see below) in the distance zones of Mid-ground to Background and the views from the elevated locations were all Mid-ground views.

A full description of theoretical views is shown in Table 1

Table 1 – Theoretical Views

Access	Name of view	Description of theoretical view	Visibility Measure
Public Vehicle Access	Bullfinch Evanston Road (south of the Die Hardy Pass)	There are views of the Die Hardy ranges on approach from the south but as the project areas lie to the north east of the range there are no possible views of the project areas	N/A
	Bullfinch Evanston Road (Die Hardy Pass)	As the road passes through the Die Hardy Ranges pass there are no views beyond the sides of the pass	Mid-ground
	Bullfinch Evanston Road (north of the Die Hardy Pass)	For a distance of some 11 km the areas of the project are theoretically visible.	Mid-ground Background
No Public Vehicle Access	Die Hardy Range (Central Ridge)	No views of the project areas as they lie behind topographic features	
	Footslopes adjacent to Red Legs Hill	Views to the project area	Foreground
	Die Hardy Range (Eastern Limb)	Views to the project area	Mid-ground
	Die Hardy Range (Mt Geraldine)	Views to the project area	Mid-ground

#### 5. Possible views of the proposal

During the field visit each of these theoretical views was visited to determine both the theoretical view experience, the real view experience toward the project as well as the possible impact on the real view should the project proceed.

The visual absorbance capacity of the vegetation along the roads in the study area was identified to be high, relative to the proposed works, and the location and orientation of views.

It is anticipated that the impact rating on identified views from along public roads is expected to be negligible at best and 'blending' at worst. Visual mitigation strategies were described to ensure the visual management objectives are achieved, and visual impacts minimised.

Table 2 summarises the possible and real view experiences and impacts on those views from the project.

## Conclusion:

The visual management objectives identified for the management of these views are *“the protection and maintenance of the Die Hardy Ranges which form a feature view on the horizon for passing motorists”*. The proposal area is located within the footslopes of the ranges and will not be visible to those passing motorists due to a mixture of landform and vegetation obstructions and the high degree of visual impact absorption in the road verge vegetation which impedes views to the lower portions of the ranges. Views from elevated positions within the footslopes and some areas of the range will be impacted by the proposal location but none of these areas are publically accessible.

Table 2 – Theoretical and Real Views and Possible impacts from project

Access	Name of view	Theoretical View Experience	Compensating Factors	Real view experience	Possible impact
Public Vehicle Access	Bullfinch Evanston Road (south of the Die Hardy Pass)	N/A		None	None
	Bullfinch Evanston Road (Die Hardy Pass)	N/A		None	None
	Bullfinch Evanston Road (north of the Die Hardy Pass)	Distant to midrange views	Obstructed by landform and vegetation High levels of visual absorption	Fleeting glimpses of upper levels of ranges but the vegetation and landforms restrict views	None
No Public Vehicle Access	Die Hardy Range (Central Ridge)	N/A		None	None
	Red Legs Hill and adjacent footslopes	Close views with feature views where elements of landform stand out	Obstructed views by existing vegetation	Slightly obstructed views	Visual impacts as the project disturbance will be visible
	Die Hardy Range (Eastern Limb)	elevated panoramic views feature views where the landform stands because it is directly in the field of view or because it is a distinctive landscape feature	Obstructed views by existing vegetation	Slightly obstructed views	Visual impacts as the project disturbance will be visible
	Die Hardy Range (Mt Geraldine)	elevated panoramic views feature views where the landform stands because it is directly in the field of view or because it is a distinctive landscape feature	Obstructed views by existing vegetation	Slightly obstructed views	Visual impacts as the project disturbance will be visible

## References

CALM (1994) Reading the Remote: Landscape Characters of Western Australia. Department of Conservation and Land Management, Western Australia.

Department of Environment and Conservation (2007). Banded Ironstone Formation Ranges of the Midwest and Goldfields. Interim Status report, Biodiversity Values and Conservation Requirement. Department of Environment and Conservation, September 2007.

Department of Planning and Infrastructure (DPI) (2007) Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design. Western Australian Planning Commission, Perth.

Western Botanical (2014) Marda East Project , Level 2 Flora and Vegetation Survey, Consultants report prepared by J Warden and G. Cockerton for Southern Cross Goldfields Limited, Ref WB813.