



CHAPTER 23

LANDSCAPE AND VISUAL AMENITY



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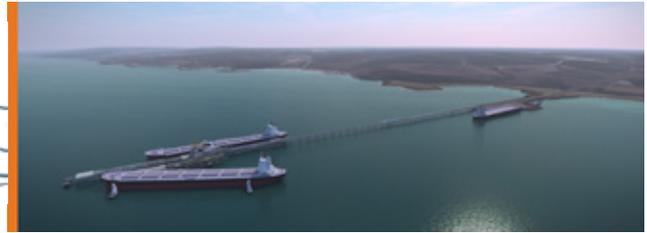
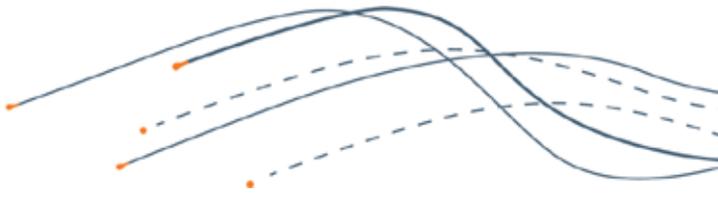
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23 Landscape and Visual Amenity

The CEIP Infrastructure area supports ongoing agricultural activity, including the cultivation and harvest of mixed crops and grazing, representative of a typical South Australian rural landscape. Farm houses and supporting agricultural infrastructure occur throughout the landscape, with bulk grain handling facilities visible at a number of locations nearby, including Kyancutta, Warrambo, Darke Peak, Kielpa and Rudall.

The project area and surrounding region is largely clear of native vegetation, with the exception of designated conservation areas, isolated remnants largely restricted to dune crests and linear strips within road reserves. Inland areas are typified by dryland farming, with scattered farmhouses and agricultural infrastructure visible. Coastal areas are a more dynamic landscape, comprising agricultural activity, beaches, cliffs, dune formations, coastal vegetation, rock outcrops and the ocean.

This chapter provides an overview of the existing environmental values relevant to visual amenity in the areas of the CEIP Infrastructure based on the existing scenic quality, sensitivity of the landscape to change, degree of visual exposure and degree of visual change as a result of the proposed development. Establishment of the CEIP Infrastructure has the potential to affect the existing rural character, reducing the amenity of the locality. The scale of impact to existing environmental values is discussed and, where relevant, management and/or mitigation measures that would minimise impacts are identified.

23.1 Applicable Legislation and Standards

The legislation in relation to landscape and visual amenity is the *Development Act 1993* (the Act). Further information regarding the requirements and relevance of the Act is provided in Chapter 5.

The following policies and standards provide a range of assessable criteria relevant to visual amenity:

- AS 4282: Control of the obtrusive effects of outdoor lighting
- AS 1158.1.1: Lighting for roads and public spaces – Vehicular traffic lighting
- AS 1158.3.1: Lighting for roads and public spaces – Pedestrian area lighting
- AS 2293: Emergency escape lighting and exit signs for buildings
- Principles of Good Design (Office for Design and Architecture 2014)
- Cleve DC Development Plan
- Kimba DC Development Plan
- Land Not Within a Council Area (Coastal Waters) Development Plan
- Tumby Bay DC Development Plan
- Wudinna DC Development Plan+

The nominated Australian standards each specify design criteria that will be incorporated into the CEIP Infrastructure to protect the key environmental and stakeholder values relevant to visual amenity.

The Principles of Good Design identify five overarching design principles that are used to evaluate the design quality of proposed developments. Each of the principles will be incorporated into the final layout and design of the proposed long-term employee village in conjunction with Wudinna DC.

The five principles are:

- **Durability:** new development should consider the surrounding development and promote the desired future character of an area.
- **Inclusivity:** new development should create places for everyone to enjoy, promoting community cohesion.
- **Sustainability:** new development should minimise embodied energy and contribute to social and environmental sustainability.
- **Value:** new development should add value by creating desirable places that attract further local investment.
- **Performance:** new developments should function appropriately for all intended users.

Each Development Plan has a broad range of policy relevant to the design and appearance of the CEIP Infrastructure. In particular, the Development Plans provide that infrastructure development should:

- Be of a high architectural standard.
- Integrate landscaping to enhance the visual appearance of developments.
- Protect areas of scenic or conservation significance from undue damage.
- Cause minimal damage to the natural landform.
- Allow for the progressive rehabilitation of disturbed areas.
- Screen and orientate infrastructure away from public view, tourist and scenic routes.

A detailed discussion of the applicable policy within the relevant Development Plans is provided in Chapter 5.

23.2 Assessment Method

A landscape and visual impact assessment (LVIA) was completed for the entire CEIP. The LVIA assesses the likely effect of the CEIP on landscape and visual amenity, considering the sensitivity of the landscape to change, the presence of publically accessible locations, vantage points and key tourist viewing areas, and identified mitigation measures to reduce the overall visual impact.

The LVIA was undertaken with reference to the Guidelines for Landscape and Visual Impact Assessment (Landscape Institute and Institute of Environmental Assessment 2002), Visual Landscape Planning in Western Australia (WAPC 2007) and Methods of Environmental Impact Assessment (Morris and Therivel 2009). No specific guidelines relating to the assessment of landscape and visual impacts in South Australia are available. The guidelines used for the basis of this assessment are considered representative of standard industry practice. The LVIA was completed in a four step assessment process:

- Desktop study
- Site visit and photography
- Landscape context analysis
- Assessment of visual impacts

Each stage of the four step LVIA assessment process is discussed in the following sections.

23.2.1 Desktop Study

A desktop study was undertaken to determine the most visually prominent components of the CEIP Infrastructure and determine a suitable study area for assessment. To define the study area, a zone of theoretical visual influence (ZTVI) was established. The zone establishes from which areas the project is theoretically visible based on the height of project elements and the regional topography. The ZTVI did not take into account the presence of vegetation or additional landscape elements that may obscure views to the project; therefore, it provided a conservative indication of the visibility of the project.

The ZTVI study area was refined based on the region within which a modification to the landscape will be easily discernible to the naked eye. At distances where landscape modifications blend into the background, the visual impact will be negligible and these areas were therefore not considered. The study area for the CEIP Infrastructure is depicted in Figure 23-1.

Desktop investigations also identified locations that may be more sensitive to visual change, including elevated scenic lookouts, public recreation areas, state and national parks, townships, major thoroughfares and tourist sites.

23.2.2 Site Visit and Photography

A site visit was conducted in April 2014 to photograph and document the LVIA study area. A number of locations surrounding the CEIP Infrastructure (viewpoints) were selected for analysis to provide a representative sample of publically accessible locations in terms of distance and direction. The selection of viewpoint locations was also guided by publically accessible locations nominated by the community during stakeholder engagement activities. Photographs and an analysis of the landscape gathered during the site visit formed the primary basis for the LVIA. Panoramas have been prepared for each of the viewpoints (refer Appendix Z) to simulate the wider horizontal field of view that a person typically experiences, as opposed to what is represented in a single photograph. In all cases, the LVIA has been based on site observations – photos and field notes served as a record only.

23.2.3 Landscape Context Analysis

The capacity of the landscape to absorb additional visual elements was considered with reference to geology, landform and vegetation coverage. This analysis was undertaken to gain an understanding of elements available to restrict line of sight to the CEIP Infrastructure, as well as the existing level of visual amenity.

The study area was categorised into landscape types based on the visual absorption capacity, land use, topography and level of existing visual amenity. Landscape categories were grouped together with other areas displaying similar visual characteristics and sensitivities to modification. The landscape types are identified in Section 23.3.3.

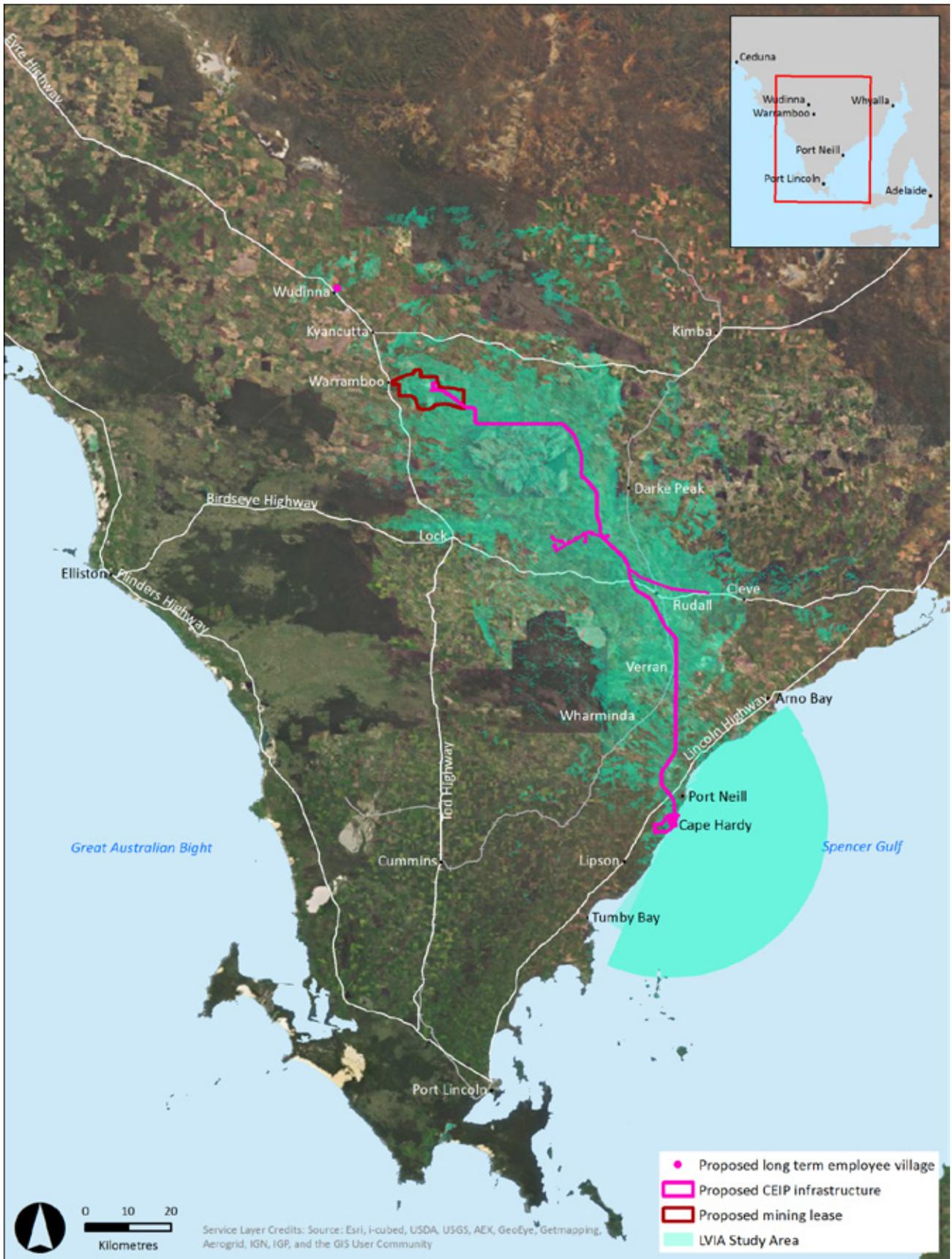


Figure 23-1 CEIP Infrastructure Landscape and Visual Impact Assessment Study Area

23.2.4 Impact Assessment

Impacts to landscape and visual amenity were assessed at each of the nominated viewpoints surrounding the CEIP Infrastructure. Visual impacts were assessed based on three key criteria, each of which were assigned a value of 'high', 'medium', or 'low' to form a rating of overall visual impact. The three key criteria and value rankings are:

- **Distance** – The distance of a viewpoint from an introduced visual element.
 - High – where the proposed development would be a highly dominant element in the view.
 - Medium – where the proposed development would be a moderately dominant element in the view.
 - Low – where the proposed development would be difficult to discern as it is in the far distance.
- **Sensitivity** – The existing level of visual amenity at the viewpoint, in relation to the ability to absorb the visual impacts of the proposed infrastructure. Generally, a highly modified landscape with many artificial elements will have low sensitivity and therefore a greater visual absorption capacity when compared to a natural landscape.
 - High – relatively undisturbed, naturalistic landscapes of high visual amenity.
 - Medium – moderately disturbed landscape, displaying remnant natural features and limited introduction of artificial elements with medium visual amenity.
 - Low – highly modified or disturbed landscapes with low visual amenity.
- **Exposure** – The degree of visual exposure relates to the comparative number of people that are likely to experience the change of visual qualities of the landscape brought about by the construction and operation of the CEIP Infrastructure.
 - High – public areas which experience a high degree of visitation, including populated areas. Public locations with high exposure include areas such as major roads, parks and recreation reserves, scenic lookouts and townships. High sensitivity is generally assigned to locations with the express purpose of observing and appreciating the landscape.
 - Medium – secondary roads such as Balumbah-Kinnard Road and less frequented tourist attractions such as coastal regions and unsealed tourist drives.
 - Low – infrequently visited locations which are separated from populated areas and major thoroughfares including local roads and farm dwellings.

Based on the distance, sensitivity and exposure ratings assigned to each viewpoint, an overall visual impact is determined. The overall rating is determined on a case-by-case basis taking into consideration the individual criteria and site-specific conditions at the viewpoint. Typically, viewpoints that are highly exposed or highly sensitive experience a greater level of impact. Impact tends to decrease with distance as visual elements blend into the horizon and surrounding landscape. Site specific conditions that may influence overall visual impact include the presence of intervening vegetation (which may reduce the level of impact) or the presence of unique landscape features (which may increase the level of impact). The scale of visual impact at each viewpoint is considered as follows:

- **High** – a significant and detrimental change to the landscape characteristics and visual amenity.
- **Medium** – a moderate detrimental change to the landscape characteristics and visual amenity.
- **Low** – a minor detrimental change that is noticeable, however would not result in a substantial change to the visual characteristics of the landscape.
- **Negligible** – the level of visual change would be virtually unnoticeable.
- **Nil** – the development would not be visible, therefore would not have a visual impact.

23.3 Existing Environment

This section provides an overview of the existing environment within the CEIP Infrastructure study area in relation to visual amenity. Topography, vegetation coverage and landscape types are discussed, as well as identified receptors sensitive to the introduction of new visual elements.

23.3.1 Topography

The central Eyre Peninsula is dominated by sand dune covered plains, with several hilly areas and granite plains. The gentle, undulating topography (Plate 23-1) continues to the northeast of the Eyre Peninsula, with several areas of higher elevation near Cowell. To the south, the Lincoln Uplands run along the east coast, with the Marble Range along the west coast.

Topography within the LVIA study area ranges from approximately 30 to 280 m AHD. General uplift towards the northeast is associated with the Gawler Ranges with highest elevations aligned with rocky outcrops. The south-western part of the study area consists largely of northwest-southeast trending dune lines. The majority of the site lies within the dunal planes and is less than 100 m AHD.

The flat to gently undulating nature of the terrain across much of the study area permits clear views across the landscape from most locations. In landscapes such as this, if intervening vegetation or other features such as existing buildings are absent, constructed features have the potential to be seen from a broader area as compared with hilly country, where views of particular features have greater potential to be constrained by intervening terrain.

The presence of a few steeply rising ranges (such as Darke Range, Plate 23-2) within an otherwise flat to gently undulating terrain offers the chance to take in panoramic views of the surrounding landscape. It is from locations such as these that visual impact is potentially greatest, if high exposure occurs, as compared with views from lower elevations.

The topography of the Eyre Peninsula and project area are depicted in Chapter 7, Figure 7-7.



Plate 23-1 Undulating Plains near Port Neill



Plate 23-2 Darke Range Viewed from Burtons Road

23.3.2 Vegetation

The majority of land on the Eyre Peninsula has been cleared of native vegetation for agricultural purposes, including broad acre cereal cropping and grazing. Significant areas of native vegetation remain intact, although these are largely restricted to conservation reserves. Isolated patches of degraded vegetation remain along some dune crests, and linear bands of vegetation are commonly present along roadsides. Where these occur, they are often tall enough to restrict views out across the landscape. Land closer to the coastline is generally devoid of vegetation tall enough to inhibit views, with the exception of vegetation along the Lincoln Highway. The other common location where tall vegetation is present is within residential properties and townships with planted and introduced species commonly present.

Plate 23-3 shows a typical view of roadside vegetation over much of the inland regions within the study area, and Plate 23-4 depicts typical coastal vegetation near the proposed port site. Plate 23-5 is an example of the taller vegetation associated with townships (Darke Peak is shown in this example). Figure 23-2 shows the most extensive areas of remnant vegetation within the study area.

In conjunction with topographic variation, vegetation has the greatest capacity to constrain views toward the proposed development within the study area. Roadside vegetation, where it occurs, typically exists as dense stands which are often high enough to inhibit views of all but the tallest constructed elements. It is noted however, that there are locations in these same areas where little to no roadside vegetation occurs. Conversely, vegetation nearer to the coastline, particularly near the port site, has less capacity to constrain views toward the proposed development as it mainly consists of low shrubs and grasses.



Plate 23-3 Typical Roadside Vegetation



Plate 23-4 Typical Coastal Vegetation (near Port Neill)



Plate 23-5 Planted Township Vegetation (Darke Peak)

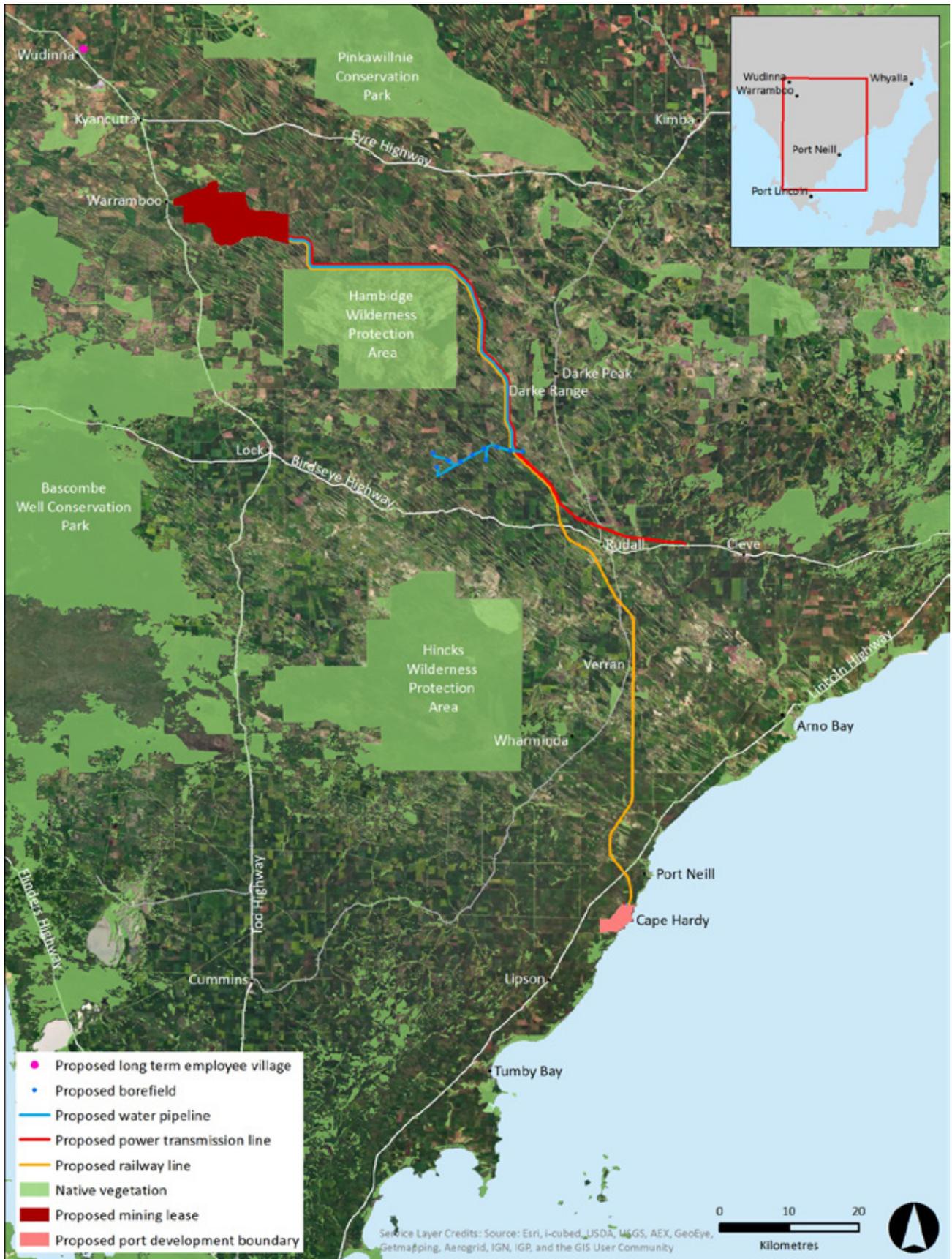


Figure 23-2 Vegetation Coverage across the Study Area

23.3.3 Landscape Types

There are four key landscape types prevalent in the LVIA study area:

- Undulating farmland
- Parks and reserves
- Townships
- Coastal

Landscape types were collated according to areas with similar visual characteristics in terms of vegetation cover, landform, amenity value, level of modification and unique site characteristics. Each landscape type has an associated level of sensitivity to the construction and operation of the CEIP Infrastructure. A summary of the landscape types within the study area and their associated sensitivity to visual modification is provided in Table 23-1.

Table 23-1 Summary of Landscape Types

Landscape Type	Description	Sensitivity to Change
Undulating Farmland	The most prevalent landscape type within the study area. Undulating farmland consists of broadacre agricultural land which has been mostly cleared of vegetation. This landscape type has experienced a continuous change from its original character since European settlement.	Low
Parks and Conservation Areas	Areas of high landscape (experiential) as well as visual (scenic) value. May include recreational parks and reserves with hiking trails and scenic lookouts.	Medium to High (depending on topographical diversity)
Township	Comprising areas of settlement with a relatively high number of viewers. Typically sensitive to visual changes in surroundings.	High
Coastal	Comprising tracts of land along the coast where the ocean is a prominent element of the view. A dynamic landscape which is typically highly valued for its visual amenity and attracts higher levels of visitation.	High

The extent and location of landscape types are depicted in Figure 23-3, and a detailed overview of each landscape type is provided in the following section.

Undulating Farmland

Flat to undulating farmland is a highly represented landscape type within the study area. It generally consists of broadacre agricultural land mostly cleared of vegetation and is primarily used for cropping and grazing. There are residential dwellings and supporting agricultural infrastructure sparsely distributed across the landscape, consistent with rural population densities.

This landscape type has experienced continuous change to its original character since European settlement. Typically, it is not of high visual amenity when compared to dynamic, naturalistic landscapes. In appearance, it is a landscape which is common throughout much of Eyre Peninsula and the broader regional landscape. Apart from vegetation clearing, other human modifications to the landscape are evident in the form of fence lines, access tracks, roads, sheds, water tanks, cultivated land, grain handling and storage infrastructure, electricity transmission and distribution lines and earthworks.

Plate 23-6 shows undulating farmland east of Warramboe at the northern end of the infrastructure corridor and Plate 23-7 shows a typical grain silo which is a common feature across the Eyre Peninsula, demonstrating the prevalence of agriculture and cereal growing in the region.

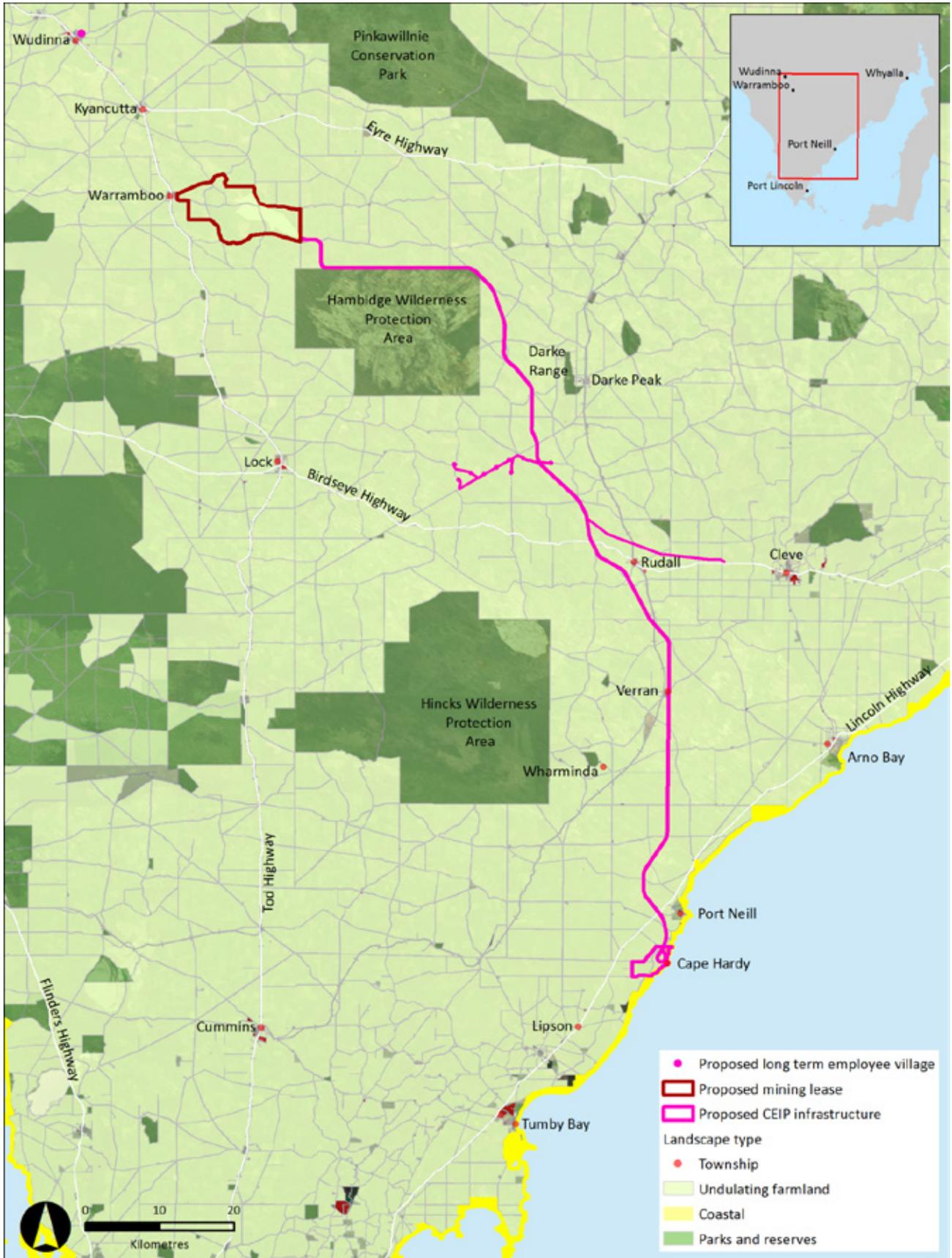


Figure 23-3 Landscape Types across the Study Area



Plate 23-6 Flat to Gently Undulating Farmland (near Warrambo)



Plate 23-7 Grain Silos (Rudall)

Parks and Reserves

The parks and reserves landscape type is typically associated with areas of high landscape (experiential) and visual (scenic) value. That is, parks and reserves landscape is visually valued for engaging with at close range for recreational purposes, as well as for viewing from a distance, especially when it is topographically dynamic. Generally, large areas of contiguous vegetation are sparsely distributed across the Eyre Peninsula, which is a landscape that is primarily dominated by agricultural land. It is for this reason that they are more sensitive to visual modifications as compared with farmland.

The key parks, wilderness protection areas and reserve areas within the LVIA study area include Darke Range, Caralue Bluff, and Hincks and Hambidge Wilderness Protection Areas (WPA). Other conservation areas in the region include Mount Wudinna, Pinkawillinie Conservation Park, Carappee Hill Conservation Park and Rudall Conservation Park. The latter are further away from the CEIP Infrastructure site and are unlikely to be visually impacted by the development.

Darke Range (Plate 23-8) is a prominent local geographical feature of high visual amenity. Although the study area contains large, contiguous tracts of native vegetation (e.g. Hambidge WPA), its terrain is generally flat to gently undulating and is not as topographically dynamic as the isolated peak of Darke Range.



Plate 23-8 Darke Range Viewed from Kirchner Road

Townships

The townships landscape type comprises areas of settlement but does not include standalone rural dwellings. A representation of the visual impact of the proposed CEIP Infrastructure from standalone rural dwellings has been provided to relevant landholders upon request; however, these have not been included in this chapter in order to maintain their privacy.

The visual character of a town and its relationship to the landscape is an important part of its identity and reflective of its history. Townships may be sensitive to the introduction of visual elements as changes to the surrounding landscape context can affect the perceived character of the township. As a result of accommodating higher population densities and the importance of the landscape setting of towns, the township landscape type is typically sensitive to visual changes.

Townships within the LVIA study area include Port Neill, Verran, Cleve and Rudall. Among these, the towns of Cleve and Port Neill are primarily agricultural service centres. Plate 23-9 shows a view of the Cleve Township.



Plate 23-9 Cleve Township

Coastal

The coastal landscape type is prevalent around the port site and comprises tracts of land along the coast where the ocean is a prominent element of the view. At the very edge of the coastline, features such as beaches, cliffs, dune formations, coastal vegetation, rock outcrops and water combine to create a dynamic landscape which is typically highly valued for its visual amenity. As a result of its high landscape and visual amenity, coastal landscapes often attract high levels of visitation for tourism and recreation. It is for this reason that coastal landscapes are highly sensitive to visual modifications.

The coastline adjacent to the port site offers opportunities for recreation including beach activities and fishing. Cowleys Beach is located adjacent to the port site and is accessible via Kiandra Road. It has a car parking area for approximately 30 cars. Beach camping and recreation areas are provided at Lipson Cove, approximately 8 km southwest of the port site and Carrow Wells Beach, approximately 2 km northeast of the port site. Carrow Wells Beach and Lipson Cove are the closest publically accessible locations to the north and south affording views toward the proposed port. Port Neill is located approximately 5 km northeast of the port site.

Plate 23-10 and Plate 23-11 show a view of Cowleys Beach and Lipson Cove respectively.



Plate 23-10 Cowleys Beach



Plate 23-11 Lipson Cove

23.3.4 Key Receptors

Key receptors are localities and travelling routes within the LVIA study area that are more highly frequented by people and hence have greater potential to be visually impacted by the project as compared with less frequented areas. The inclusion of viewpoint analysis locations from key receptors assists with the completeness of the assessment by covering the areas with the greatest risk of impact. This section provides an overview of key receptors within the study area including roads, parks, reserves and townships. Key receptors are identified in Figure 23-4.

Major Roads

The Birdseye Highway runs in an east/west direction across the centre of the Eyre Peninsula. It links Elliston on the west coast to near Cowell on the east coast. It mainly passes through a landscape of undulating farmland as well as the towns of Rudall and Cleve.

The Lincoln Highway links Port Augusta and Port Lincoln over a distance of 327 km along the eastern coast of the Eyre Peninsula. Whyalla is the major town intersected by the Lincoln Highway, with coastal towns such as Port Neill and Tumby Bay also serviced. The Lincoln Highway also passes through predominately undulating farmland landscape, with sporadic views to coastal areas.

Parks and Reserves

Hambidge WPA is located adjacent to the northern part of the proposed infrastructure corridor, approximately 3.5 km southeast of the mine site. It covers around 38,000 ha and contains vegetation mainly consisting of low Mallee in a dune landscape. Its main purpose is for conservation rather than recreation; however an elevated area locally known as Prominent Hill is located within the WPA and rises above the terrain. It is accessible via a track from the south and offers a view over the WPA.

Darke Range is a prominent topographical feature extending for approximately 10 km in a north/south orientation. It is situated approximately 2.5 km west of the township of Darke Peak and 4.4 km east of the closest point of the infrastructure corridor. Darke Range Conservation Park is located at the southern end of the range and is used for recreational purposes such as bushwalking and bird watching. Federation Lookout was constructed during 2001 to commemorate Australia's Centenary of Federation and is also located at the southern end of the range. A directional plaque shows points of interest and it is an 800 m walk to the lookout from the car park area. Federation Lookout is not considered to be highly frequented by tourists as it is only accessible via a farm gate and a steep, rocky access track that would not be suitable for all vehicles.

No component of the proposed CEIP Infrastructure is located in close proximity to any other conservation area. Hincks WPA is approximately 66,300 ha in area and is located at a distance of approximately 12 km to the west of the infrastructure corridor at its closest point. The only other key recreation reserves within the LVIA study area consist of formal and informal caravan parks and camp grounds nearer to the coast, such as those located at Carrow Wells Beach.

Townships

Rudall (Plate 23-12) is a small settlement located approximately midway between the proposed mine and port sites, and approximately 1.5 km east of the infrastructure corridor. It is situated near the point at which the proposed transmission line spur will divert east toward Cleve. The Cummins-Buckleboo Railway passes through Rudall and grain silos are a dominant feature of the town, identifying its link with the agricultural industry.



Plate 23-12 Rudall (Railway Terrace)

Port Neill (Plate 23-13 and Plate 23-14) is a small coastal town on the eastern side of the Eyre Peninsula, about 3 km off the Lincoln Highway and approximately halfway between the major towns of Whyalla and Port Lincoln. It is located approximately 5 km north of the port site and 3 km east of the proposed infrastructure corridor. The town offers protected beaches for swimming as well as a year-round venue for fishing, boating, sailing and scuba diving. Port Neill is an established tourist destination with the local population swelling during summer. At the time of the 2011 census, the population of Port Neill was 136.



Plate 23-13 Port Neill Foreshore



Plate 23-14 Port Neill (corner of Sholl Street and Wallis Street)

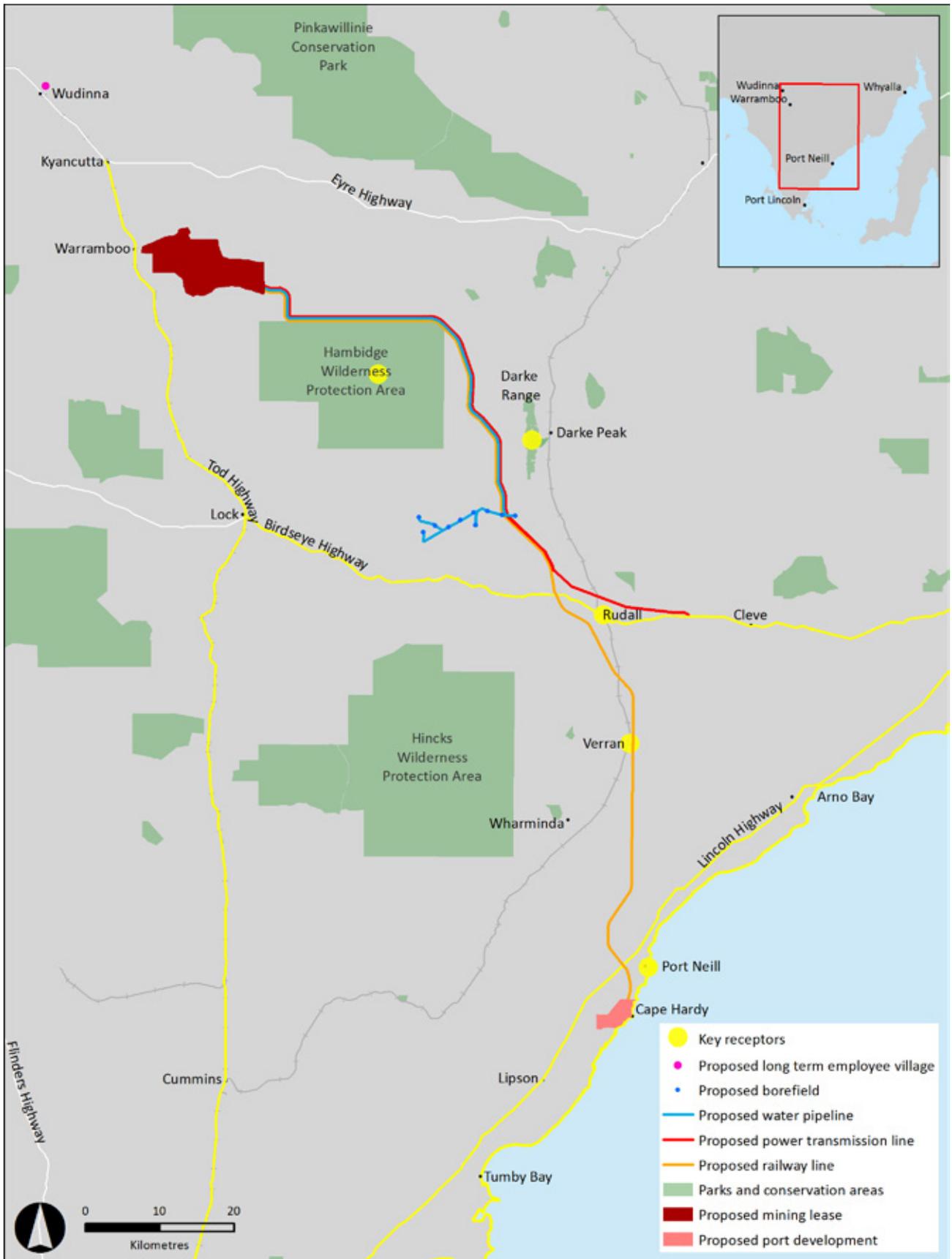


Figure 23-4 Key Receptors within the Study Area

23.3.5 Summary of Key Environmental Values

The CEIP Infrastructure is generally not located within areas commonly regarded as being of significant scenic or aesthetic value. The immediate area in which the CEIP Infrastructure is proposed is predominantly characterised by dryland farming. Isolated patches of vegetation are scattered throughout the landscape, predominantly along road reserves and within townships. Large areas of vegetation are typically restricted to designated conservation parks, dune crests within agricultural paddocks or prominent ranges.

The key receptors in the area considered most sensitive to visual change include:

- Major roads
 - Birdseye Highway
 - Lincoln Highway
- Conservation areas
 - Hambidge WPA
 - Darke Range
- Townships
 - Darke Peak
 - Rudall
 - Verran
 - Port Neill
 - Cleve
- Coastal areas surrounding the port site

Individual landholders and dwellings on private property located outside of townships were also identified as key receptors in determining the level of visual impact. As part of Iron Road's ongoing stakeholder engagement activities, a digital representation of the proposed CEIP Infrastructure as viewed from private dwellings will be prepared upon request from the individual landholder. A number of visual representations have been prepared for these individual landholders; however for the purposes of protecting the privacy of these landholders, the representations have not been presented in this chapter.

23.4 Design Measures to Protect Environmental Values

The route selection for the proposed infrastructure corridor avoided known areas of landscape or scenic significance. Similarly, the proposed port was sited to avoid known areas regarded for coastal amenity and utilised for recreation purposes (such as Lipson Cove).

In addition, the following design control measures have been incorporated to minimise impacts to visual amenity as a result of the construction and operation of the CEIP Infrastructure:

- Air quality and dust management measures as discussed in Chapter 10.
- All outdoor lighting on site will be designed to minimise spillage and the visual impact of CEIP Infrastructure, without compromising the safety of workers on site. Australian Standards provide specific guidelines on lighting levels and general lighting setups to control the obtrusive effects of outdoor lighting. Relevant standards that will be applied are:
 - AS 4282: Control of the obtrusive effects of outdoor lighting
 - AS 1158.1.1: Lighting for roads and public spaces – Vehicular traffic lighting
 - AS 1158.3.1: Lighting for roads and public spaces – Pedestrian area lighting
 - AS 2293: Emergency escape lighting and exit signs for buildings

23.5 Impact Assessment

Activities undertaken during construction and operation of the CEIP Infrastructure will result in impacts to the existing environmental values and visual amenity of the area. Discussion of the impacts to visual amenity is provided below. Impacts have been assessed in accordance with the impact assessment methodology outlined in Section 23.1.

The construction and operation of the CEIP Infrastructure will impact the landscape and visual amenity of the immediate locality as a result of:

- Removal of vegetation
- Soil disturbance and stockpiling
- Dust emissions
- Development of buildings and infrastructure in areas where they do not currently exist
- Lighting to allow 24 hour operation
- Increase in the number of people, vehicles and machinery

Viewpoint locations utilised for the purposes of the CEIP Infrastructure LVIA are summarised and presented spatially in Figure 23-5 for the infrastructure corridor, transmission line and borefield, and summarised and presented spatially in Figure 23-6 for the port. The viewpoints have been selected to be representative of a range of distances and directions from the respective components of the CEIP Infrastructure. An analysis of each viewpoint was undertaken in accordance with the methodology outlined in Section 23.1, which is presented in Appendix Z. A summary table of key impacts is provided in Section 23.5.1.

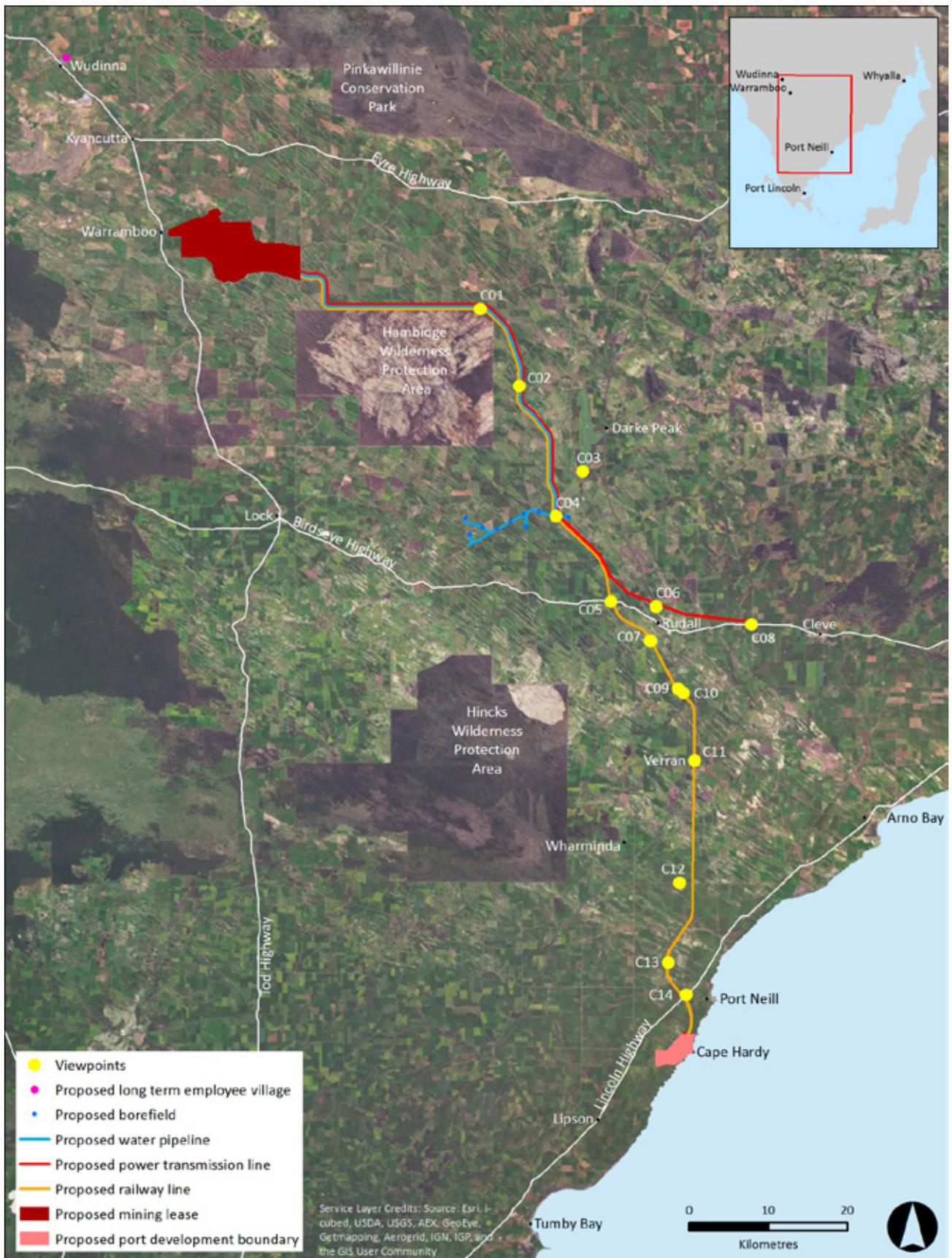


Figure 23-5 Infrastructure Corridor Viewpoint Locations



Figure 23-6 Port Viewpoint Locations

23.5.1 Summary of Impacts

Impacts relating to visual amenity as a result of the construction and operation of the infrastructure corridor and port are summarised in Table 23-2 and Table 23-3.

Through the implementation of design and management controls, the majority of impacts have been reduced to medium or below which are considered to be as low as reasonably practicable and therefore acceptable. High impacts are identified at North Coast Road (P07) and Cowleys Beach (P08) due to the proximity of port site infrastructure, the high sensitivity of the surrounding landscape and the high utilisation of the areas for scenic and recreation purposes.

Table 23-2 Infrastructure Corridor Viewpoint Locations and Visual Amenity Impacts

Impact	Comment	Level of Impact
Viewpoint C01 Wudinna-Darke Peak Road, 3.9 km southeast of intersection with McDonald Road	The infrastructure corridor would be a prominent visual element from this viewpoint due to the clearance of the majority of roadside vegetation visible in the image. The corridor will be largely screened when viewed from Wudinna-Darke Peak Road north and south of this location by vegetation within Hambidge WPA. This viewpoint is on a local road which experiences low visual exposure and the visual amenity of the conservation area, as seen from a distance, is moderately sensitive to visual modifications.	Medium
Viewpoint C02 Edwards Road, on the corner of O'Connor Road	Although the infrastructure corridor is within close proximity to this viewpoint, it would be mostly concealed from view due to intervening vegetation. The transmission line would appear above and in between the vegetation and would represent a noticeable visual element. On balance, due to the low visual exposure and low sensitivity to visual modifications at this viewpoint, the overall visual impact is considered to be low.	Low
Viewpoint C03 Federation Lookout, Darke Range	Despite medium sensitivity and exposure, the receiving landscape has a high visual absorption capacity for the introduction of an additional linear element which would not appear discordant with existing linear elements in the landscape. As such, the CEIP Infrastructure is not considered to be a highly prominent feature from this viewpoint.	Low
Viewpoint C04 Kilroo-Kielpa Road, 3.2 km southeast of intersection with Dog Fence Road	This location experiences low visual exposure and the landscape has a low sensitivity to visual change. In addition, the majority of the infrastructure corridor would be partially to fully concealed by roadside vegetation with the exception of the railway crossing point.	Low
Viewpoint C05 Birdseye Highway, 50 m west of Pedersen and Phelps Road intersection	Although there would be a clear view of the railway crossing within close proximity to a highly exposed location, the landscape sensitivity is low. Extended views of the railway line across the landscape are largely obscured by roadside vegetation.	Medium
Viewpoint C06 Balumbah-Kinnard Road, 2.5 km north of intersection with Birdseye Highway	The proposed transmission line would be largely obscured by roadside vegetation and extended views across the landscape are limited. The proposed transmission line would not represent a substantial visual change as it would be co-located with the existing transmission line.	Low
Viewpoint C07 Swaffer Road, 175 m northeast of intersection with Phelps Road	Although there is a relatively clear line of sight toward the railway, the sensitivity of the landscape to visual changes is low and this location has low visual exposure.	Low

Impact	Comment	Level of Impact
Viewpoint C08 Birdseye Highway, at the intersection of Pine Corner Road	The degree of visual change to the existing landscape would be moderated by the presence of existing electricity infrastructure including the transmission line and substation. Although the viewpoint is located within an area of high visual exposure, the sensitivity of the landscape to visual change is low. The proposed transmission line does not represent an unfamiliar built form in this landscape and is not considered to be a dominant visual element.	Low
Viewpoint C09 Balumbah-Kinnard Road, 20 m from intersection with Cummins-Buckleboo railway line	There would be a clear view of the railway and rail overpass within close proximity to this viewpoint. The viewpoint is a moderately exposed location; however the landscape sensitivity is low. As such, the overall visual impact is considered to be medium, and is considered reflective of the exposure of the location, the proposed degree of visual change and the sensitivity of the landscape to change.	Medium
Viewpoint C10 Balumbah-Kinnard, 500 m from the intersection of Taragoro Road	With the exception of partial views to the rail overpass, the proposed CEIP Infrastructure would be concealed from view by the presence existing vegetation. No element of significant visual change will be observed from this viewpoint.	Negligible
Viewpoint C11 Intersection of Cleve-Verran Road and Balumbah-Kinnard Road	With the exception of partially obscured views to the railway between gaps in roadside vegetation, the proposed CEIP Infrastructure would be concealed from view by the presence of existing vegetation. The proposed CEIP Infrastructure does not include any significant vertical elements at this location that will be noticeable above the vegetation. No element of significant visual change will be observed from this viewpoint.	Negligible
Viewpoint C12 Wharminda Boundary Road, 900 m east of intersection with Wills Road	The infrastructure corridor would appear as a low profile linear element within a landscape of low exposure and low sensitivity to visual modifications. Although the railway line would be clearly visible, it would not appear dissimilar to the many other linear elements that traverse the landscape at this location, such as dirt roads and bands of vegetation.	Low
Viewpoint C13 Chilmans Road, 2.3 km northwest of intersection with Wills Road	The railway would appear as a low profile element within a landscape of low exposure and low sensitivity to visual modifications. Although the railway line would be clearly visible, it would not appear dissimilar to the many other linear elements that traverse the landscape at this location, such as dirt roads and bands of vegetation.	Low
Viewpoint C14 Lincoln Highway, 1.6 km northeast of intersection with Brooker Road	There would be a clear view of the railway west of this viewpoint. The proposed Lincoln Highway overpass of the railway will resemble the existing crest of the Highway already visible on the horizon of the image and is not considered a significant visual change. The viewpoint is a highly exposed location; however the landscape sensitivity is low. As such, the overall visual impact is considered to be medium, and is considered reflective of the exposure of the location, the proposed degree of visual change and the sensitivity of the landscape to change.	Medium

Table 23-3 Port Viewpoint Locations and Visual Amenity Impacts

Impact	Comment	Level of Impact
Viewpoint P01 Headland near Port Neill township (locally known as Cape Burr)	The port site would be mostly concealed from view due to intervening terrain with the exception of the jetty. The jetty would extend as a linear element on the horizon, located at a substantial distance away (approximately 8.5 km south) and would not be a prominent visual element.	Negligible
Viewpoint P02 North Coast Road, 1.2 km southwest of intersection with Port Neill Scenic Drive	The port site would be mostly concealed from view due to intervening terrain with the exception of the jetty. The jetty would extend as a linear element on the horizon, located at a substantial distance away (approximately 6.7 km south) and would not be a prominent visual element.	Negligible
Viewpoint P03 Carrow Wells Beach, 380 m east of intersection with North Coast Road	No element of the proposed port will be visible from this location.	Nil
Viewpoint P04 Lincoln Highway, 1.2 km southwest of intersection with Lutheran Church Road	No element of the proposed port will be visible from this location.	Nil
Viewpoint P05 North Coast Road, 2 km northeast of intersection with Brayfield Road	Although the port site would be a significant visual element at this viewpoint, partial screening of the site is provided by the crest adjacent to North Coast Road. Landscape sensitivity at this viewpoint is medium, as is the level of exposure. As such, the overall visual impact is considered to be medium, and is considered reflective of the exposure of the location, the proposed degree of visual change and the sensitivity of the landscape to change.	Medium
Viewpoint P06 North Coast Road, 435 m northwest of intersection of Brayfield Road	Although the port site would be a significant visual element at this viewpoint, partial screening of the site is provided by the crest adjacent to North Coast Road. Landscape sensitivity at this viewpoint is medium, as is the level of exposure. As such, the overall visual impact is considered to be medium.	Medium
Viewpoint P07 North Coast Road, 870 m south of intersection of Brayfield Road	The port site would be a dominant visual element at this viewpoint, with little to no relief offered by topography or vegetation when viewing the stockpile, materials handling facility or jetty. Partial screening of the rail loop and construction camp will occur as a result of the crest near Brayfield Road. Landscape sensitivity at this viewpoint is medium, as is the level of exposure. As such, the overall visual impact is considered to be high.	High
Viewpoint P08 Cowleys Beach car park, 80 m east of Kiandra Road	The jetty would be a dominant visual element from a highly sensitive and highly exposed viewpoint. All other components of the port site would be screened from view due to intervening terrain. Landscape sensitivity at this viewpoint is high, as is the level of exposure. As such, the overall visual impact is considered to be high, and is considered reflective of the exposure of the location, the proposed degree of visual change and the sensitivity of the landscape to change.	High

Impact	Comment	Level of Impact
Viewpoint P09 Kiandra Road, 4 km east of intersection with Lincoln Highway	The port site would be a moderately dominant element at this viewpoint, with partial screening of the proposed port by intervening terrain. Landscape sensitivity at this viewpoint is medium, as is the level of exposure. As such, the overall visual impact is considered to be medium, and is considered reflective of the exposure of the location, the proposed degree of visual change and the sensitivity of the landscape to change.	Medium
Viewpoint P10 Lipson Cove Road, 6.7 km east of intersection with Lincoln Highway	Although the landscape is of high visual amenity and high exposure, visibility of the port site would be largely restricted by intervening terrain and the distance. The jetty would be the only element discernible, and would appear as a low profile linear element on the horizon line.	Low

23.5.2 Long-Term Employee Village

The long-term employee village is proposed to be located immediately adjacent to the northeast of the township of Wudinna over an area of up to 5 ha in size. The exact location of the village is being determined in consultation with Wudinna DC; however it will be located within the investigation zone as shown in Chapter 4. Part of the investigation zone, located west of Standley Road, is depicted in Plate 23-15. Wudinna DC is currently undertaking a structure planning process for the Wudinna township to support the establishment of the proposed long-term employee village.

The structure planning process is being funded by Iron Road. It will:

- Determine the preferred location of the village
- Identify opportunities for co-sharing of recreational facilities with the existing town
- Identify any infrastructure upgrades required to support the village
- Nominate design measures/features suitable to accommodate the village as a logical extension to Wudinna

The long-term employee village will comprise up to 250 units and accommodate up to 300 personnel. It will also include an administration building, dining and kitchen building, car parking, recreation and other ancillary facilities. All boundary setback areas with road frontages will include landscaping as determined in consultation with Wudinna DC. The internal accommodation areas will be landscaped for screening and shade purposes.



Plate 23-15 Long-Term Employee Village Investigation Zone (West of Standley Road)

No viewpoint analysis of the proposed long-term employee village has been undertaken as part of the LVIA. The analysis was not completed as the final location and layout of the village is currently being determined in conjunction with Wudinna DC and is yet to be finalised. Iron Road and Wudinna DC through consultation with the local community have identified the following objectives to be incorporated in the siting and design of the proposed village:

- Maximise the economic benefit to goods and services providers within Wudinna through the establishment of linkages between the proposed village and the existing township.
- Promote the use and integration of shared facilities and services.
- Incorporate landscaping at all road frontages and amongst the various structures within the village to soften the overall visual impact.
- Utilise stormwater runoff and improved infrastructure within the village to support the ongoing operation of existing infrastructure within Wudinna (e.g. utilising captured stormwater for watering of the town oval).
- Develop the village as a logical extension to the Wudinna township utilising consistent colours, materials, landscaping and street layout within a compact urban form.
- Undertake the establishment of the village in accordance with the objectives and principles of development controls relevant to accommodation for temporary/transient populations (e.g. tourist accommodation) as outlined in the Wudinna DC Development Plan.
- Maximise opportunities for the adaptive, beneficial reuse of infrastructure within the village following closure of the mine.

Regardless of the final location of the village, Standley Road will be utilised as a key access point. A band of roadside vegetation runs parallel to both sides of Standley Road (Plate 23-16), and will restrict extended views toward the village from the existing Wudinna township.



Plate 23-16 Roadside Vegetation Adjacent to Standley Road

23.6 Control and Management Strategies

In order to minimise and mitigate impacts to landscape and visual amenity during construction and operation activities, the following control and management strategies would be incorporated into the Construction Environmental Management Plan (CEMP) or Operations Environmental Management Plan (OEMP) and implemented for relevant project components. Key control and management strategies are outlined below in Table 23-4. Chapter 24 provides a framework for implementation of these strategies. A register of the environmental controls for the whole of the CEIP Infrastructure is presented in Appendix AA (construction) and Appendix BB (operation).

Table 23-4 Control and Management Strategies: Visual Amenity

Control and Management Strategies	EM ID
The impacts to visual amenity as a result of vegetation clearance will be managed through implementation of the flora and fauna CEMP and OEMP requirements.	VA_C1
The impacts to visual amenity as a result of earthworks and land clearance that could result in scarring of the landscape will be managed through implementation of the soil and land quality CEMP and OEMP requirements.	VA_C2
Demobilisation of construction equipment from site as soon as practicable to minimise affect to visual amenity.	VA_C4
Establishment of native vegetation to the east of North Coast Road adjacent to the port site to provide visual screening of the port site.	VA_O1
Where practicable, buildings and structures will be of muted, earthen tones consistent with dominant colours in the landscape; highly reflective materials will be avoided to avoid glare and reduce the visibility of buildings and structures.	VA_O2
Landscaping will be incorporated in association with each project component utilising locally endemic species. The landscaping will be used to manage surface water runoff as part of broader Water Sensitive Urban Design (WSUD) measures, and to provide visual relief and partial screening of the CEIP Infrastructure.	VA_O3
The impacts to visual amenity as a result of visible dust will be managed through implementation of the air quality CEMP and OEMP requirements.	VA_C3 VA_O4

23.7 Residual Risk Assessment

Residual risks are impact events that would not be expected as part of the normal operation of the CEIP Infrastructure, but could occur as a result of faults, failures and unplanned events. Although the risks may or may not eventuate, the purpose of the risk assessment process is to identify management and mitigation measures required to reduce the identified risks to a level that is as low as reasonably practicable and therefore acceptable. The visual amenity management measures identified are presented in Section 23.6 and form the basis of the environmental management framework presented in Chapter 24.

The final appearance and location of the CEIP Infrastructure is largely known, and alterations to the visual amenity and landscape quality will occur. As such, affects to landscape and visual amenity are considered an impact (i.e. the change will occur) rather than a risk. The visual impact of the CEIP Infrastructure is discussed in Section 23.5; however it is acknowledged that perceptions of impacts to the visual amenity and landscape quality will vary between individuals and may not necessarily correspond with the nominated impact levels.

23.8 Findings and Conclusion

The landscape and visual impact assessment conducted for the proposed CEIP Infrastructure identified that it will not generally be located within areas commonly regarded as being of significant scenic or aesthetic value. The LVIA study area is characterised by dryland farming, with sparse clumps of vegetation scattered throughout the landscape, predominately along road reserves and within townships. Large areas of vegetation are restricted to conservation parks or isolated to prominent ranges or dune crests within agricultural paddocks.

The key receptors in the area considered most sensitive to visual change include:

- Major roads
 - Tod Highway
 - Birdseye Highway
 - Lincoln Highway
- Conservation areas
 - Hambidge WPA
 - Darke Range
- Townships
 - Darke Peak
 - Rudall
 - Verran
 - Cleve
 - Port Neill
- Coastal areas surrounding the port site

Individual landholders and dwellings on private property located outside of townships were also identified as key receptors in determining the level of visual impact. As part of Iron Road's ongoing stakeholder engagement activities, a digital representation of the proposed CEIP Infrastructure as viewed from private dwellings will be prepared upon request from the individual landholder.

Wudinna DC is currently undertaking a structure planning process for Wudinna to support the establishment of the proposed long-term employee village.

The structure planning process is being funded by Iron Road and will determine:

- The preferred location of the village
- Opportunities for co-sharing of recreational facilities with the existing town
- Any infrastructure upgrades required to support the village
- Design measures/features suitable to accommodate the village as a logical extension to Wudinna

Through the implementation of design and management controls, the majority of visual impacts have been reduced to medium or lower which is considered to be as low as reasonably practicable and therefore acceptable. High impacts are identified at North Coast Road (P07) and Cowley's Beach (P08) due to the proximity of port site infrastructure, the high sensitivity of the surrounding landscape and the high utilisation of the areas for scenic and recreation purposes.