19 VISUAL AMENITY

19.1 INTRODUCTION

This chapter outlines the visual environmental significance of the proposed southern coal seam methane (CSM) water supply pipeline (the proposed pipeline) on the landscape. A detailed visual amenity technical report is presented in TR 19-1-V2.5 Visual Assessment Technical Report. Note that figures/documents with numbering ending in V2.5, for example, refer to figures/documents contained in Volume 2, Book 5 of the EIS.

19.2 METHODOLOGY OF ASSESSMENT

19.2.1 RELEVANT LEGISLATION AND GUIDELINES

State

The proposed pipeline, outside existing petroleum lease areas is subject to assessment under the *Integrated Planning Act 1997* (IP Act) and *Environmental Protection Act 1994* (EP Act).

Local

The proposed pipeline is subject to provisions of the Planning Scheme for the former Taroom Shire 2006 and the Planning Scheme for the former Murilla Shire 2006.

19.2.2 ASSESSMENT PROCESSES

A baseline study was completed in order to review the visual significance and magnitude of the proposed pipeline on the landscape. The baseline studies recorded and analysed the existing character, quality and sensitivity of the landscape and any visual resources in the vicinity of the proposed pipeline.

The landscape visual assessment consisted of the following key stages (refer Figure 19-1):

- desktop study of existing information
- fieldwork to collect visual data and assess the visual character of the landscape
- classification of the landscape into Visual Character Units (VCU). VCUs are broad tracts of landscape that have unity of character. These VCUs represent areas that contain consistent character in terms of topography, vegetation and land use
- analysis and evaluation to determine the visual impact, including the visual effect and visual sensitivity.

Definitions of VCU, visual impact, visual effect and visual sensitivity are provided below in Figure 19-2.

To assist in the appreciation of the visual effects of the proposed pipeline and its interactions with various landscape settings, a series of photomontage imagery was completed.

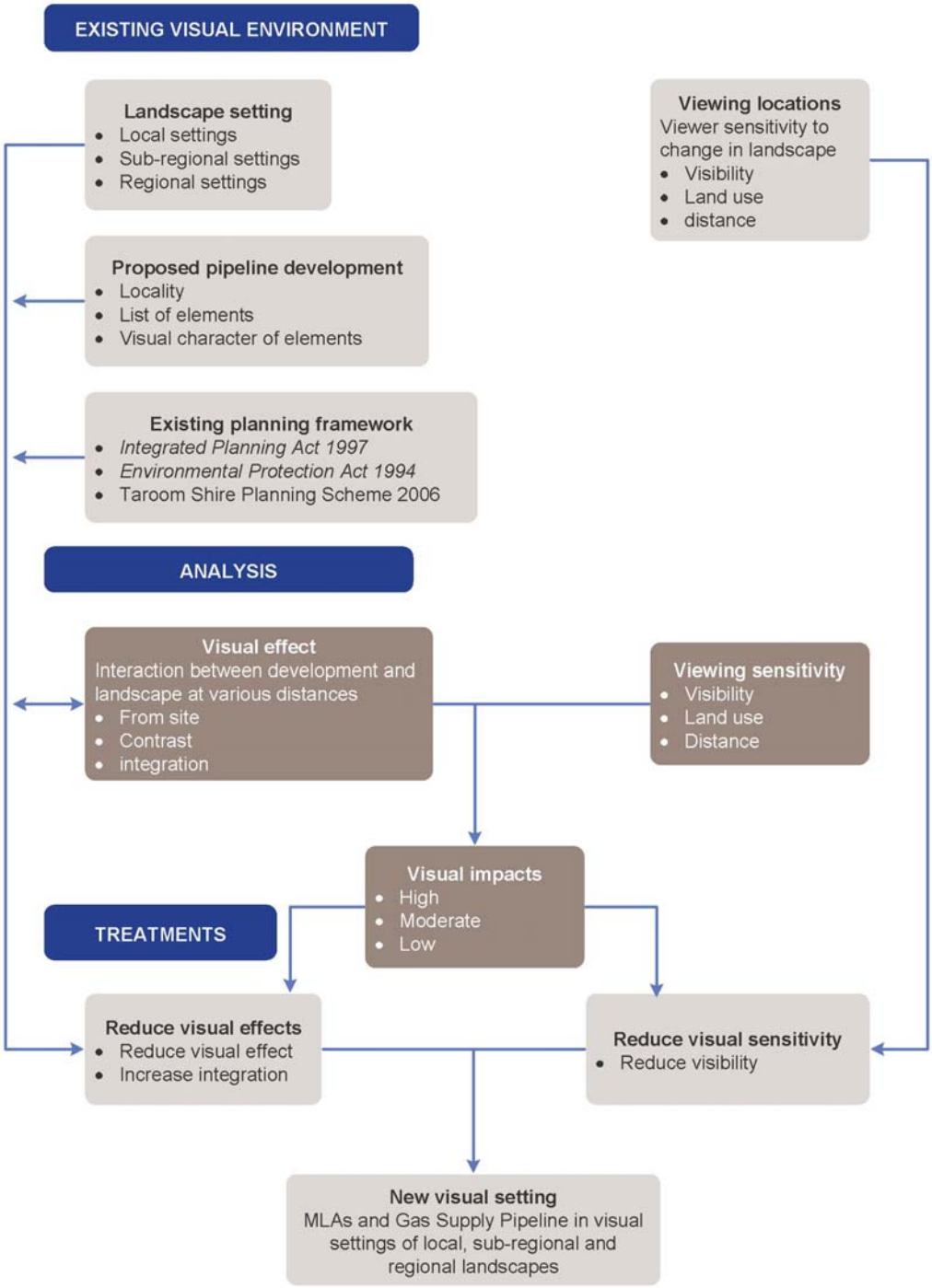

Figure 19-1: Visual assessment methodology

Visual Effect	Visual Sensitivity		
	High	Moderate	Low
High	High visual Impact	High/Moderate Visual Impact	Moderate/Low Visual Impact
Moderate	High /Moderate Visual Impact	Moderate Visual Impact	Moderate/Low Visual Impact
Low	Moderate/Low visual Impact	Moderate/Low Visual Impact	Low Visual Impact

Visual Impact is dependant on the interaction between visual effect and sensitivity.

Figure 19-2: Visual impact

19.3 EXISTING ENVIRONMENT

19.3.1 GENERAL

The 93 km proposed pipeline alignment runs predominantly within or adjacent to the road reserve on the eastern side of the Leichhardt Highway, local roads and open grazing lands.

The Leichhardt Highway is a two-lane sealed state controlled road with wide verges of up to 20 m in some locations. Other roads along the proposed pipeline alignment are Gearys Road, Baileys Road, Fosters Road and Peakes Road. These roads are narrow two-lane bitumen and/or gravel carriageways.

Vegetation along the proposed pipeline alignment is generally a combination of mixed Cypress hardwood, Eucalypt woodland with shrub and grass understory. Large tracts of vegetation on the eastern side of the Leichhardt Highway road reserves have been previously cleared or disturbed due to various infrastructure developments, including telecommunications.

The topography along the proposed pipeline alignment is gentle to moderately undulating with some slight elevation to approximately 360 m in the southern area, and approximately 380 – 420 m around and to the west of the townships of Giligulgul and Guluguba.

In locations where the proposed pipeline alignment follows the highway and local roads, the topography and existing vegetation is such that the view sheds are generally limited to the roads themselves and immediate adjoining lands. This will assist in providing enclosure and containment of views.

The proposed pipeline alignment will also cross various private properties between Baileys Road and Foster Road. These properties are rural allotments of varying size which are utilised for predominantly agricultural land use activities within the study area. The historical land use patterns have resulted in significant clearance of vegetation. Some of these rural residences may have views to the proposed pipeline corridor across cropping and live-stock grazing lands. Some tree cover, however, is scattered throughout these properties which will provide a degree of enclosure and containment of views.

Due to the similarity of the terrain and land cover, rather than establish VCU as is normally the case, Visual Management Units (VMU) have been established based on locations of various roads, road segments and open paddock locations as shown in Figure 19-3-V2.3. The primary characteristics of these VMU are summarised below with typical photographs shown.

Eight Local VMU include:

- Warrego Highway – Gearys Road section VMU
- Leichhardt Highway (Gearys Road) – Wallan Creek section VMU
- Leichhardt Highway – Kowguran Road section VMU
- Leichhardt Highway – Baileys Road section VMU
- Baileys Road section VMU
- Private property section VMU
- Fosters Road – Peakes Road VMU
- MLA 50230 section VMU.

19.3.2 VISUAL MANAGEMENT UNITS

Warrego Highway – Gearys Road section VMU

The proposed pipeline alignment commences at the Condamine Power Station, travelling west along the northern road reserve of the Warrego Highway for approximately 2 km. The topography is relatively level to gently undulating through this section, and generally dominated by open woodland with grass understorey. The road reserve, however, is cleared of vegetation.

From the Warrego Highway the proposed pipeline progresses north along a local road to an existing high voltage transmission line easement. It then turns west and the proposed pipeline follows the existing transmission line easement until it intersects with the Leichhardt Highway (refer Figure 19-4). Landform is moderately undulating with elevation ranging from 360 m in the eastern section to 300m where the alignment intersects the Leichhardt Highway. Vegetation is predominantly open woodland with regrowth understorey. Trees are cleared along the existing transmission line easement.

Leichhardt Highway (transmission line) – Wallan Creek section VMU

Progressing in a northern direction, the proposed pipeline follows the Leichhardt Highway within the eastern road reserve. The topography is typically flat through this visual management unit with a consistent elevation of approximately 320 m.

This section of the proposed pipeline corridor is within a Significant Vegetation Area. Vegetation is predominantly a mix of tall Eucalyptus with Casuarina and mixed understorey (refer Figure 19-5). Generally, vegetation along the proposed pipeline alignment is narrower than that of the vegetation corridor on the western edge of the highway. Generally views beyond the highway corridor are screened by roadside vegetation.

Part of this section of the corridor is within Petroleum Lease PL216. North of Dalwogan the proposed pipeline alignment crosses Wallan Creek.

Leichhardt Highway – Kowguran Road section VMU

The proposed pipeline alignment continues to travel in a northerly direction following the Leichhardt Highway. The terrain through this section is of a similar elevation to the Wallan Creek VMU with a slight gradual elevation increase to 340 m.

The vegetation buffer on the eastern edge of the highway is more dispersed throughout this VMU allowing views to open grassland areas with scattered trees (refer Figure 19-6).

Figure 19-4: The proposed pipeline travels in an east – west direction along the existing transmission line easement

Figure 19-5: Tall woodland vegetation in the Leichhardt Highway road reserve

Figure 19-6: Scattered vegetation and open grassland along the eastern edge of the highway road reserve

Leichhardt Highway – Baileys Road section VMU

The proposed pipeline alignment continues to travel north along the Leichhardt Highway.

As per the previous VMU, vegetation is generally narrower on the eastern side of the highway compared to the western side. Consequently views are open beyond the highway corridor in some locations. Other areas, however, consist of dense vegetation on both eastern and western sides of the highway (refer Figure 19-7). Vegetation consists of tall Eucalypt forest with Casuarina understorey and some pine species.

Elevation continues to rise to approximately 380 m in the northern section of this VMU.

There are several homesteads close to the highway and proposed pipeline alignment within this VMU.

Figure 19-7: Some areas of the highway have dense roadside vegetation screening views beyond the highway road reserve

Baileys Road section VMU

The proposed pipeline alignment deviates from the Leichhardt Highway at Baileys Road, south of Gurulmundi and travels north along Baileys Road. The proposed pipeline alignment meets the rail corridor and generally runs adjacent for approximately 4.5 km before turning to the north-west.

Baileys Road is a narrow, gravel, two-lane carriageway. Topography again is typically flat with elevations gently decreasing to approximately 360 m.

Throughout this VMU, vegetation is located in road reserves with cleared open paddock adjacent. The vegetation is generally Cypress dominated with scattered tall Eucalypt, with grassland and regrowth understorey (refer Figure 19-8).

Figure 19-8: Road verges are dominated by Cypress and Eucalypt tree cover

Open field section VMU

North of Giligulgul, the proposed pipeline alignment turns north-west and traverses Lot 28 CP885313, Lot 44 FT988, Lot 36 FT213, Lot 4 FT526 and Lot 39 FT1000 prior to meeting with Fosters Road.

Topography in this VMU is gently undulating from approximate elevations of 320 m to 360 m. This section of the proposed pipeline alignment differs from the above units in that it is cropping and live-stock grazing lands with scattered tree cover (refer Figure 19-9). Homestead buildings, including residences and sheds are features of the landscape character of this VMU.

Figure 19-9: This VMU is dominated by live-stock grazing lands with scattered low tree cover

Fosters Road – Peakes Road VMU

The proposed pipeline alignment follows Fosters Road in a westerly direction. At the intersection of Fosters Road, Hansens Road and Peakes Road the proposed pipeline alignment proceeds north to run adjacent to Peakes Road. The alignment continues along Peakes Road to meet the southern boundary of MLA 50230.

This VMU is gentle undulating terrain with elevations ranging from 340 m to 280 m in the far northern section of the VMU. The land use is typically live-stock grazing and cropping land. Vegetation is scattered tree cover with linear bands of vegetation along some road verges and boundary lines (refer Figure 19-10). Along Peakes Road, there is generally a thin strip of roadside vegetation which includes sections of planted trees and areas of remnant vegetation.

MLA 50230 section VMU

The alignment across the MLA area has not yet been determined and will be dependant on mining infrastructure. The alignment, although not fixed, will cross open grassland and grazing land with scattered low tree cover (refer Figure 19-11). The topography is typically level at an elevation of approximately 280 m. Some linear vegetation is evident along the road verges.

Figure 19-10: Linear strips of roadside vegetation are frequent along Peakes Road

Figure 19-11: This VMU is dominated by open grassland and live-stock grazing land with roadside vegetation in some locations

19.4 DESCRIPTION OF PROPOSED DEVELOPMENT

19.4.1 PROPOSED PIPELINE ALIGNMENT

The proposed pipeline alignment commences at the Condamine Power Station and progresses in a northerly direction to an existing high voltage transmission line easement. It then turns west and follows the existing transmission line easement until it intersects with the Leichhardt Highway. A turn to the north is made and the proposed pipeline follows the Leichhardt Highway road reserve until the deviation to Baileys Road, south of Gurulmundi. North of Giligulgul the proposed pipeline turns to the north-west and traverses Lot 28 CP885313, Lot 44 FT988, Lot 36 FT213, Lot 4 FT526 and Lot 39 FT1000 prior to meeting with Fosters Road. The alignment then follows Fosters Road in a westerly direction and then turns north to run along Peakes Road to meet the southern boundary of MLA 50230. The alignment across the MLA area from the boundary to the mine infrastructure area has not yet been determined and will depend upon finalisation of a mine layout including haul road, pit and dump locations. The proposed corridor is approximately 93 km in length.

The proposed pipeline, for a significant part of its length, is adjacent to the Leichhardt Highway. The remainder of the corridor is in visually less sensitive locations along local roads and across open farm land.

Visual significance of proposed pipeline alignment

The visual significance of the selected alignment is focused on the section parallel to the Leichhardt Highway. Although it is not a designated scenic route, it is a major regional highway and dramatic change to the immediate foreground views from the highway would be viewed with high sensitivity. If existing pipeline infrastructure alignments adjacent to the highway can be used then the sensitivity of this travel corridor will not be impacted on.

The remainder of the corridor uses existing easements, local roads and open fields. Along these alignments the major visual concern is the homesteads and hamlets along the corridor. These locations can have high sensitivity to change in the foreground and middleground views, should such changes create significant visual effects.

19.4.2 PIPELINE CONSTRUCTION

The proposed pipeline will generally be located underground, constructed using a section trench and backfill method. Depth of cover will be between 0.6 m to 1 m and will vary subject to site specific conditions and land uses.

The proposed pipeline will require a lift pump station at the Condamine Power Station. Air release points will be at high points along the proposed pipeline at approximately 800 m spacing as well as scour outlets at approximately 1 to 2 km apart.

The construction corridor will be approximately 20 m wide with the construction period of approximately 9 months. Construction will involve delivery of pipe sections to lay down points along the proposed pipeline alignment. Typical machinery used for pipeline construction and installation will involve delivery trucks for pipe sections, trucks for importing bedding material, backhoe/excavator and mobile crane.

Visual character of pipeline construction

The creation of a 20 m wide construction footprint and the construction of a pipeline in it can create strong visual effects.

This pipeline construction process will alter the local landscape character. This change will be created by the removal of ground cover be it grass or shrub cover. The resultant exposure and then excavation of the trench will create strong colour contrast with the adjoining landscape area. The extended linear character of this change through the landscape will create strong line contrast.

If tree cover exists, the clearing of trees will also increase the level of contrast between the existing landscape and that of the proposed pipeline corridor creating a strong visual effect.

Much of the visual effect is related just to the construction period with form and colour contrast removed when restoration of ground cover is completed. Should there be tree removal associated with construction, the diminution of the visual effect will not be as great unless some tree cover restoration is undertaken

19.5 POTENTIAL IMPACTS

Visual impacts resulting from the proposed pipeline in any location are a product of both visual effects and visual sensitivity as outlined in Figure 19-2.

19.5.1 VISUAL EFFECTS

Potential visual effects during the proposed pipeline construction will result from the removal of ground cover in all locations and temporary earthworks associated with trenching. The removal of vegetation and topsoil will create a colour and minor form contrast to untouched areas and may detract from the landscape character of the highway, roadway and surrounding landscape settings. This contrast, at least during the

construction phase, will also create a strong line in the landscape. The proposed pipeline corridor will, however, reflect the alignment of roadways and fence lines in a locality and in this way not contrast with the established line pattern of the landscape.

In addition to disturbance of ground cover, there will also be removal of shrub and tree cover generally in the form of scattered trees, open woodland or forest areas in some locations along the highway. This will increase the level of contrast and depending on the extent of "feathered edge" to the vegetation clearing, may create longer term linear elements in the landscape increasing visual effect levels.

The construction of the proposed pipeline will require up to 20 m clear space. This will allow for trenching equipment, pipe laying equipment as well as pipe delivery truck and general vehicle movement. However, where possible, vegetation clearing will be restricted to less than 20 m.

The removal of grass, trenching work and other activities associated with construction are temporary and the visual effect of this is removed once restoration and re-grassing is accomplished. However, where woodland, dense shrub or forest is removed the linear effect of vegetation clearing will be more long lasting.

The visual effects of the proposed pipeline construction have been illustrated in Figures 19-12-V2.3 to 19-17b-V2.3. These photomontages illustrate the visual effects in different visual settings along the proposed pipeline alignment.

Visual effects will in the short term be high due to strong contrast created by ground cover removal, trenching and pipe laying activity. However, this visual effect is short term and is reduced to low once restoration and re-grassing has been completed.

In treed areas, visual effects will remain at moderate levels where there is a strong edge to vegetation clearing. Otherwise, similar low to moderate visual effect levels will be experienced once ground covers are re-established.

Visual effects may also stay at a somewhat elevated level if there is a restriction to management of the corridor and that this will create a linear visual difference between the corridor and adjoining farm areas.

Figure 19-12-V2.3 shows the various photomontage locations described below.

19.5.2 VISUAL EFFECT ILLUSTRATED BY PHOTOMONTAGE

Figures 19-13-V2.3 Peakes Road

In this section of Peakes Road, the proposed pipeline is constructed in the middle of the road. The visual effect is to create a minor variation to the existing road surface (refer Figure 19-13a-V2.3) as a result of new road material being used to rectify the road gravel surface (refer Figure 19-13b-V2.3).

The visual effect of the proposed pipeline construction in this situation is low.

Figures 19-14-V2.3 Peakes Road

This photomontage illustrates the effect of the proposed pipeline utilizing a minor rural road verge. It can be seen from the existing visual setting of the road that the vegetation is relatively close to the shoulder of the road (refer Figure 19-14a-V2.3). This vegetation has to be cleared to enable pipeline construction (refer Figure 19-14b-V2.3).

Although the vegetation clearing in this instance appears significant, retained vegetation within the road reserve retains the character of the reserve and the visual effect is moderate.

Figures 19-15-V2.3 Open fields north of Gilgulgul

This photomontage illustrates the effect of the proposed pipeline construction in an open field. The continuity of the grassland (refer Figure 19-15a-V2.3) is temporarily disrupted during the construction process and before grass cover re-establishes the grass cover and continuity (refer Figure 19-15b-V2.3).

The visual effect is low shortly after completion of the construction.

Figures 19-16-V2.3 Baileys Road

In this section of the corridor the proposed pipeline is located on Baileys Road. This is a minor rural road in the area (refer Figure 19-16a-V2.3). The proposed pipeline will generally be located within the roadway itself, negating any need for vegetation clearing. However, in some cases there may be some modification of road verge conditions where the road alignment alters to dramatically to allow for the proposed pipeline alignment to follow (refer Figure 19-16b-V2.3).

The visual effect in this locality is generally low, reflecting the 'in' roadway location of the proposed pipeline.

Figures 19-17-V2.3 Leichhardt Highway

This photomontage illustrates the most significant visual effect as it is adjacent to the highway. The existing visual setting in this location and much other highway location consists of forest vegetation adjacent to the road shoulder (refer Figure 19-17a-V2.3). There is, however, a strip of cleared land between the road verge and the beginning of the tree line.

The proposed pipeline in this situation is located within the road verge adjacent to the tree line and for the greater part utilising the cleared verge areas. However, in some locations the tree line is too close to the verge and some clearing is required (refer Figure 19-17b-V2.3).

The visual effect of this will initially be high but once the clearing is done and the ground levels restored, the new landscape will borrow visually from the existing one in having a varied tree edge with glimpses and views to adjoining land use areas. The visual effect will reduce to low on consolidation of the restored ground levels and ground cover following completion of the pipe laying process.

19.5.3 VISUAL SENSITIVITY

Visual sensitivity to the proposed pipeline construction is due to two sources, views from the highway and the adjacent roadways and from adjoining homesteads and farm areas.

The Leichhardt Highway is considered to have high sensitivity to immediate foreground views (less than 500 m), given its regional highway status and significant amounts of tourist traffic. The visual sensitivity of the highway will be affected by the degree of visibility to the proposed pipeline corridor. Generally there is good vegetation cover on the road side that will eliminate views even during the construction process. However, where there is no tree cover in the road reserve there will be open views to the proposed pipeline

corridor, including other existing infrastructure easements. Again, however, views to the ground plain will often be limited due to elevation differences between the highway and the adjoining corridor lands.

Other roads are considered to have low sensitivity due to their local rural road status.

Views from homesteads are considered to have potentially high visual sensitivity to operations, if corridor establishment and pipe laying operations occur in the foreground (up to 1 km) and near middleground (up to 2.5 km the locations of homesteads close to the proposed pipeline corridor are illustrated in Figure 19-18-V2.3.

Field assessment indicated that visual exposure of the proposed pipeline was generally very limited. Should views be visible then a high sensitivity would result which in turn would affect impact levels in relation to that viewing location.

19.5.4 VISUAL IMPACTS

Visual impacts in the short term can potentially be high. Such an impact level is dependant on the corridor and construction works being visible to sensitive view locations such as the highway and or homesteads. During the construction period impacts will be moderate to high due to the high visual effect levels and close proximity of the road and potentially some homesteads.

However, this impact will reduce to low when appropriately managed rehabilitation and ground cover vegetation is restored. This low impact level will also be the case areas where trees occur unless a strong edge is created in the clearing process and view lines from sensitive receptors are close to parallel to the corridor. In such cases a moderate visual impact may continue until the tree clearing line is softened due to regrowth of vegetation.

19.6 MITIGATION MEASURES

19.6.1 GENERAL

Visual mitigation strategies will reduce the visual effect of the proposed pipeline construction process and aim to reduce contrast created by clearing and earthworks.

Visual mitigation strategies include:

- corridor location
- minimise corridor clearing
- sectionalising work areas
- fragmenting construction functions in corridor
- management of top soil
- re-establishment of ground cover
- re-establishment of shrub and tree cover
- screening of sensitive receptors.

19.6.2 CORRIDOR LOCATION

The major factor that will influence both visual effect and visual sensitivity/visibility is the corridor location. The main location where this is critical is adjacent to the highway.

Along the highway, the eastern side of the highway is visually preferred as it supports less vegetation that could be affected by clearing. This side of the highway is further enhanced by the existence of proposed pipeline and communication cable easements adjacent to the highway easement itself.

Use of a widened corridor, outside the road reserve is the preferred visual alignment. Failing this, use of the area at the outside edge of the highway road reserve is preferred. Should this area be required for use, development of an asymmetric corridor is the desired visual development outcome.

19.6.3 SECTIONALISING WORK AREAS

The establishment of a pipeline has the potential to create a high visual effect along the length of the pipeline. The proposed pipeline will be established in sections to enable early restoration and minimise the length of impact and the time over which it is experienced.

19.6.4 MINIMISE CORRIDOR CLEARING

Although a corridor width of 20 m will be established, it may not be necessary to clear this full width. Where practicable, pipe delivery, pipe laying, backfilling and restoration all other operations such as pipe lay down areas, storage areas, etc should avoid visually sensitive areas.

Staggering of operations in visually sensitive locations will be undertaken where practicable to minimise the need to clear wide corridor areas.

19.6.5 FRAGMENTING CONSTRUCTION CORRIDOR FUNCTIONS

Tree clearing will be minimised in visually sensitive locations where practicable. Measures that can be undertaken to reduce tree clearing include moving laydown and associated worksites laterally to minimise tree clearing and/or to achieve the ‘feathered corridor’ edge that will avoid the creation of a visual ‘gun barrel’ through wooded areas.

19.6.6 FEATHERING CORRIDOR CLEARING

Where there are long and sensitive views along corridors, the corridor edges will be ‘feathered’ where practicable to prevent hard and regular edges to clearings.

Where practicable, the upper canopy (mature trees) will be retained during clearing to assist in minimising the visual impact of clearing.

19.6.7 RE-ESTABLISHMENT OF GROUND COVER

In most cases, initial restoration will involve the establishment of grass cover. Selected grass species should be of types that occur in adjoining field areas where practicable to reduce the major visual effect created by colour contrast between exposed soil and adjoining grasslands or other vegetation types.

In bushland areas where mulch is not used, sterile grasses that will provide soil protection values should be used to assist in re-establishment of shrub and tree cover

Re-establishment of shrub and tree cover will be completed according to specified rehabilitation practices outlined in Chapter 17A. Such restoration will remove the more subtle contrast factor between the proposed pipeline corridor and the adjoining vegetation. The reestablishment of large trees on the proposed pipeline is not desirable. Use of indigenous shrubs and small trees will also remove the linear visual effect of clearing through native vegetation.

Should cultural planting, say along a driveway be removed, such plantings will where practicable be re-established in close proximity based on mutual agreement with the land owner.

19.6.8 SCREENING OF SENSITIVE RECEPTORS

In the unlikely circumstance that a homestead is adversely affected by the post re-habilitated landscape, plantings will be carried out adjacent to the affected viewing area to provide screening of visual integration of the affected landscape.

19.7 RESIDUAL IMPACTS

It is considered that there will be no significant residual visual impact created by the proposed pipeline construction, especially if it is located outside of the road reserve in areas already previously cleared along the visually sensitive Leichhardt Highway. This is due to the underground location of the proposed pipeline and the ability to restore surface areas to blend in with the adjoining landscapes.

Even where tree clearing is needed it is considered that the open woodland character of the landscapes and the unlikelihood of critical view lines being parallel to such clearings would minimise potential for lasting high visual impacts.

If critical and ongoing visual impacts are created in isolated situations, the implementation of mitigation strategies, including at viewing points, landscape treatments will ensure that no significant residual visual impacts are experienced.