6.5 Landscape character and visual impacts

The potential landscape character and visual impacts during construction and operation of the proposal have been assessed as part of the *Urban Design, Landscape Character and Visual Impact Assessment* (Spackman Mossop Michaels, 2022), provided in Appendix G.

6.5.1 Methodology

The landscape character and visual impact assessment (LCVIA) was carried out in accordance with the *Practice Note: Guideline for landscape character and visual impact assessment* (EIA-N04).

The assessment included:

- a landscape character assessment, which assessed the overall impact of a project on an area's character and sense of place
- a visual impact assessment, which assessed the proposal's impacts on views.

The assessment of landscape character involved identifying landscape character zones (LCZ) near the proposal area and assessing the sensitivity and magnitude of the proposal for each zone. This involved analysing aerial imagery to distinguish distinct vegetation communities and growth patterns as well as topography, geology, water and infrastructure. A site visit confirmed the boundary of each zone by experiencing the landscape on foot and in a car.

The assessment of visual impact required the selection of viewpoints overlooking the proposal area. A collection of viewpoints was selected from different locations, distances and directions within the visual catchment of the proposal area. This involved a desktop assessment of the Visual Envelope Map for the proposal and adjustment of each viewpoint to fall within a likely area of observation, including roadways, residential housing, a walking track or lookouts. These viewpoints were verified during the site visit.

The LCVIA identified the sensitivity of individual LCZ and viewpoints and the magnitude of change at each associated with the proposal. Sensitivity refers to how susceptible the environment is to the proposed change. Magnitude refers to the type of proposal and its compatibility with existing landscape character, including scale, form and material composition of elements, as well as their location or setting. Impacts were determined by assessing sensitivity and magnitude using the matrix shown in Table 6-23.

		Magnitude				
		High	Moderate	Low	Negligible	
tivit	High	High	High-moderate	Moderate	Negligible	
Sensitivity	Moderate	High-moderate	Moderate	Moderate-low	Negligible	
	Low	Moderate	Moderate-low	Low	Negligible	
	Negligible	Negligible	Negligible	Negligible	Negligible	

Table 6-23: Landscape character and visual impact rating matrix

6.5.2 Existing environment

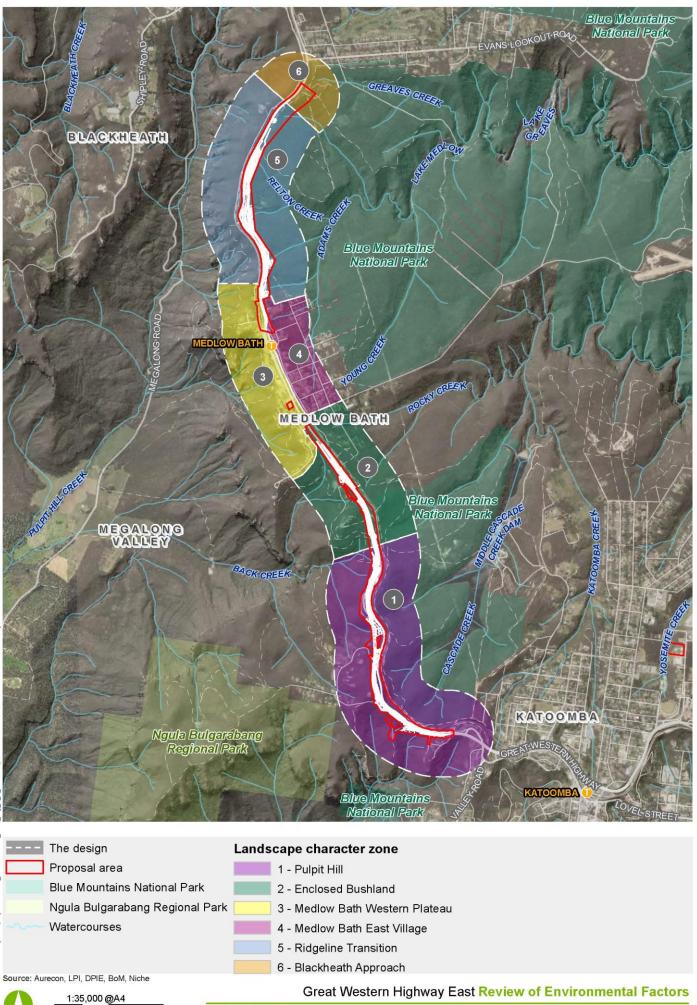
The proposal area contains mostly environmental landscapes. The Katoomba to Medlow Bath section follows undulating topography and is dominated by dense vegetation along the road corridor. As such, most of the Great Western Highway in this section does not have views over the adjoining rail corridor. However, the rail corridor is more visible within the Medlow Bath to Blackheath section. This section is relatively flat, with the Blue Mountains National Park directly to the east of the road corridor in this section.

There are six distinct LCZ for the proposal that are outlined in Table 6-24 and are shown in Figure 6-5. Due to their location, LCZ 3 and 4 are considered across both sections of the proposal. This assessment included the town of Medlow Bath due to its proximity to the two sections of the proposal. The proposal area has been shaped by natural and cultural elements over time. Landscape character has been shaped by landforms, vegetation, views, settlement patterns, and built structures within and adjacent to the proposal area.

Table 6-24: Landscape character zone description

Zone	Description	Landscape view
LCZ 1 – Pulpit Hill (Katoomba to Medlow Bath section)	High landform with densely established indigenous open forest bushland vegetation, dissected by the Great Western Highway.	
LCZ 2 – Enclosed Bushland (Katoomba to Medlow Bath section)	High quality plant communities, densely vegetated enclosed bushland with prominent rock cuttings, edged by roadside vegetation.	
LCZ 3 – Medlow Bath Western Plateau (Katoomba to Medlow Bath and Medlow Bath to Blackheath sections)	Plateau adjacent to the Megalong Valley escarpment, rich in high visual and scenic qualities.	

Zone	Description	Landscape view
LCZ 4 – Medlow Bath East Village (Katoomba to Medlow Bath and Medlow Bath to Blackheath sections)	Flat to gently undulating topography, predominantly low-density housing surrounded by remnant stands of woodland vegetation and mature planted exotics.	
LCZ 5 – Ridgeline Transition (Medlow Bath to Blackheath section)	Native forest, natural bushland sitting high atop the ridgeline. Man-made elements including powerlines detract from the natural landscape in the east, whilst open views over the Megalong Valley exist in the west.	
LCZ 6 – Blackheath Approach (Medlow Bath to Blackheath section)	A mix of natural bushland to the west with steep slopes toward the Megalong Valley and single storey dwellings in the east with planted exotics.	



0

500

1,000 m

Projection: GDA2020 MGA Zone 56 FIGUE

FIGURE 6-5: Landscape Character Zones

Eight viewpoints were selected to represent receivers or sites that have potential to be visually impacted by the proposal. There are five viewpoints (VP 1, VP 3, VP 4 and VP 5) within the Katoomba to Medlow Bath section and three viewpoints (VP 6, VP 7 and VP 8) within the Medlow Bath to Blackheath section. The receivers in these viewpoints include residents, tourists, recreational and park users, pedestrians, cyclists and motorists. The eight viewpoints are shown in Table 6-25 and Figure 6-6a-b.

Table 6-25: Summary description associated with viewpoints



Description

The existing road infrastructure makes up an even proportion of the existing view for motorists and recreational users of the adjacent trail.

VP 1: Entry into Bonnie Doon Reserve along the Great Blue Mountains Trail, looking south east.



The existing vegetation and exposed rock makes up a large proportion of the existing view for motorists travelling along the Great Western Highway.

VP 2: Heritage Interpretation Area along Nellies Glen Road, looking north toward the Great Western Highway.



VP 3: Heritage Interpretation Area along Nellies Glen Road, looking north toward the Great Western Highway.

The existing road infrastructure is in the background of this view, with Nellies Glen Road in the midground. The existing view is dominated by vegetation along the fringes of the existing Heritage Interpretation Area, Nellies Glen Road and the existing Great Western Highway. This view is typical for motorists travelling along Nellies Glen Road, pedestrians and cyclists using the Great Blue Mountains Trail or Six Foot Track, and visitors to the Pulpit Hill heritage interpretation area and adjoining informal carpark.

Viewpoint

Description



An even proportion of the view comprises of the existing road corridor and existing vegetation for pedestrians and cyclists using the Great Blue Mountains Trail and motorists travelling along Explorers Road.

VP 4: Multi use access track on the corner of Explorers Road and the Great Western Highway, looking north.



VP 5: The corner of Foy Avenue and the Great Western Highway looking

The existing road infrastructure makes up an even proportion of the existing view for residents, motorists and recreational users of the adjacent trail. The existing Great Blue Mountains Trail is buffered by existing vegetation between the roadway.



The existing road and rail corridors are seen in the background of this viewpoint by motorists travelling along Station Street and pedestrians and cyclists using the Great Blue Mountains Trail. This existing infrastructure is

partially screened by existing established vegetation.

VP 6: Existing Great Blue Mountains Trail along Station Street, looking east toward the proposal.

Viewpoint

Description



VP 7: The Gatekeepers Cottage along Station Street, looking Southeast across the Main Western Railway Line toward the Great Western Highway.

The viewpoint is representative of a number of views experienced by residents on Station Street, rail commuters and pedestrians and cyclists. The existing road and rail infrastructure are dominant features within this view.



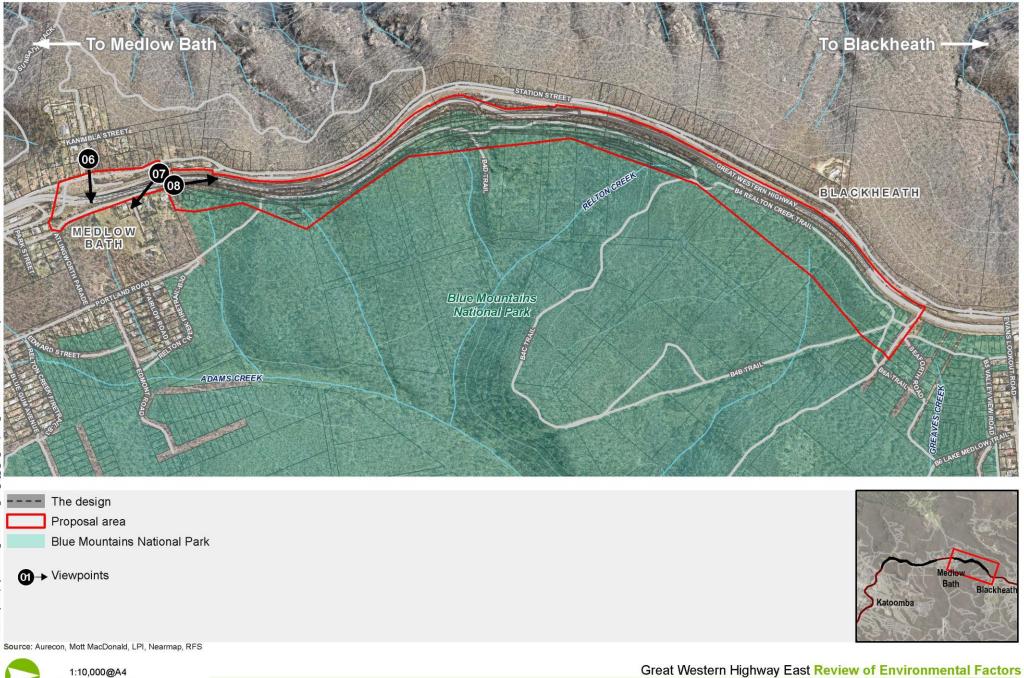
VP 8: Coachhouse Lane looking north toward the proposal and rail corridor in the background.

The view is made up of both transport infrastructure and mature tree and larger shrub vegetation along the road verge and the background. This is representative of the views of residents of Coachhouse Lane and pedestrians.



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Great Western Highway East Review of Environmental Factors



1:10,000@A4

FIGURE 6-6b: Viewpoints

6.5.3 Potential impacts

Construction

General construction activities would result in temporary visual impacts on views near the work for the duration of construction. These include the movement and operation of machinery, light and heavy vehicles, and the erection of temporary structures such as fencing, lighting and construction ancillary facilities. Visual impacts would be experienced due to clearance of vegetation, excavations and earthworks and the presence of construction areas including ancillary facilities and plant and equipment. The visual impacts would be seen by motorists, recreational walkers and cyclists.

However, the greatest visual impacts would be experienced by residents that overlook the construction sites due to their proximity to the proposed work sites. Within the Katoomba to Medlow Bath section, this would include residents on Rowan Lane, Katoomba; Foy Avenue and Delmonte Avenue, Medlow Bath. There would be major visual impacts experienced at residences on Explorers Road, especially those down the valley due to their proximity to the construction of the twin bridges. The incremental construction of the twin bridges would involve construction work at a greater elevation than the current Great Western Highway. Within the Medlow Bath to Blackheath section, visual impacts experienced by residents would be limited to those who live on Coachhouse Lane and Station Street, Medlow Bath near the southern end of the section.

There are no anticipated residual landscape or visual impacts resulting from the construction phase of the proposal. Contractors would be required to rehabilitate all work sites prior to and at the end of the construction period. Landscape and visual impacts may arise from rehabilitation work and would be most evident during the first year of operation. Visual impacts may vary depending on final construction methods and staging identified in detailed design.

Operation

Landscape character impacts

The six landscape character zones have been assessed as part of the landscape character study and consider areas both within and beyond the proposal area. A summary of the landscape character impact assessment is presented in Table 6-26.

Table 6-26: Landscape character impacts during operation of the proposal

Zone	Sensitivity	Magnitude	Impact
LCZ 1 – Pulpit Hill	 High Well established indigenous open forest bushland. Bushland plays an important role as a visual backdrop. This LCZ is highly sensitive to change and would not be easily 	 High The proposal would increase the amount of the road-related infrastructure in this LCZ. It would require clearing of mature bushland vegetation. 	High
LCZ 2 – Enclosed Bushland	 able to absorb changes. High Densely vegetated LCZ has a strong relationship with the surrounding National Park, road and rail corridor. Undulating topography and windy nature of the Great Western Highway contributes to the character. Bushland is important as a visual backdrop to the Great Western Highway. This LCZ is highly sensitive to change and would not be easily able to absorb changes. 	 Changes to the natural landform. Moderate The proposal would increase the amount of the road-related infrastructure in this LCZ. It would require clearing of mature bushland vegetation and changes to the natural landform. 	High – Moderate
LCZ 3 – Medlow Bath Western Plateau	 Moderate Nature of the Western Plateau is one of both high visual amenity, overlooking the Megalong Valley and also contributing to the neighbourhood feel of Medlow Bath. Existing proximity to the road and rail corridor allows for this LCZ to absorb change more successfully. 	 Low The proposal would increase road related infrastructure in the northern portion of the Medlow Bath Western Plateau LCZ. The majority of work within this LCZ would be within the existing road corridor. At the tie-in with the Medlow Bath Upgrade, spatial character of the LCZ would be maintained, with the proposal following the existing alignment of the Great Western Highway. 	Moderate – Low
LCZ 4 – Medlow Bath East Village	 Moderate Medlow Bath East Village LCZ predominantly consists of low- density residential housing. This LCZ has a reasonable ability to absorb change near Coachhouse Lane due to an existing retaining wall between the proposal and residences along Coachhouse Lane and the existing proximity of these residences to the road and rail corridor. 	 Low The proposal would increase pedestrian and cyclist access along Coachhouse Lane. Existing bushland along the north-eastern fringe of this LCZ within the proposal area is likely to be cleared. 	Moderate – Low

Zone	Sensitivity	Magnitude	Impact
LCZ 5 – Ridgeline Transition	Moderate	Moderate	Moderate
Transition	• Well established natural bushland that sits high atop the ridgeline, overlooking the Megalong escarpment to the west.	• The proposal would increase the hard surface to the east of the existing Great Western Highway.	
	Combination of mature bushland along the fringes of the road corridor to the east and the rail corridor and associated	• Existing vegetation removal to accommodate the expansion of the roadway and adjacent multi use access path.	
	 Infrastructure to the west. This LCZ would find it difficult to absorb changes. 	• The changes would only slightly impact the spatial character given the existing conditions along the Great Western Highway.	
LCZ 6 –	Moderate	Moderate	Moderate
Blackheath Approach	Consists of a mix of natural bushland with steep slopes away from the transport corridor in the west and single-storey	• The proposal would slightly increase the hard surface to the east of the existing Great Western Highway.	
	 dwellings to the east. This LCZ would find it difficult to absorb changes. 	• Existing vegetation removal to accommodate the expansion of the roadway and adjacent multi use access path. The changes would only slightly impact the spatial character given the existing conditions along the Great Western Highway.	

Visual impacts

Assessment of the visual impacts at eight viewpoints within or near the proposal area and are summarised in Table 6-27.

Table 6-27: Viewpoint impact assessment summary

Viewpoint	Sensitivity	Magnitude	Impact
<section-header></section-header>	 High Existing road infrastructure makes up an even proportion of the existing view. The experiential quality of the meandering roadway enclosed by bushland is highly sensitive to change given any work that would remove vegetation and alter the perceived curvature of the roadway would affect the road user experience. 	 Moderate Widening of pavement in the foreground of this viewpoint. Vegetation along the southbound carriageway will require clearing. Vegetation installed as part of the proposal landscape design would somewhat reduce the visual effect of change over time and mitigate increased light spill at night. 	High – Moderate
<complex-block> Prove Prove</complex-block>	 High Existing vegetation and exposed rock make up a large proportion of the existing view. The experiential quality of the meandering roadway enclosed by bushland is highly sensitive to change and changes to this spatial quality via the removal of vegetation and increase in hardstand would substantially affect the road user experience. 	 High Large benched cutting directly adjacent to the widened northbound carriageway. Vegetation clearing and the widening of the roadway would result in a substantial change to the visual composition of this viewpoint. Vegetation installed as part of the proposal landscape design would only provide minor mitigation over time. 	High

Viewpoint	Sensitivity	Magnitude	Impact
Account of the fragment of the	 Sensitivity Moderate Existing view is dominated by vegetation along the fringes of the existing Heritage Interpretation Area This viewpoint would be sensitive to change as 	 Magnitude Moderate The proposal would relocate the existing Nellies Glen Road behind the location of this viewpoint. Introduction of a large rock cutting along the northbound carriageway to enable a realignment of the road corridor. 	Impact Moderate
	changes to the vegetation would result in limited ability to absorb changes.	 Vegetation clearing and the widening of the roadway will result in a substantial change to the visual composition of this viewpoint. Vegetation installed as part of the Proposal landscape design would reduce the visual effect of change over time. 	

Viewpoint	Sensitivity	Magnitude	Impact
<complex-block><complex-block></complex-block></complex-block>	 Moderate An even proportion of the view comprises of the existing road corridor and existing vegetation. This viewpoint would be sensitive to change given alterations to dense vegetation would result in limited ability to absorb changes. 	 High The proposal would provide a bridge crossing over Explorers Road, increasing light spill. Removal of existing bushland vegetation. Existing Highway would remain as an access way onto the Great Western Highway, from Explorers Road. Substantial changes to the enclosed character of this portion of the proposal would result in a high magnitude of change. Revegetation strategies installed as part of the proposal landscape design would reduce the visual effect of change over time and further mitigate light spill. Given the required bridge infrastructure and setbacks the experience of users is unlikely to be regained 	High – Moderate

Viewpoint	Sensitivity	Magnitude	Impact
VP 5	ModerateThe existing road	ModerateThe proposal would introduce the	Moderate
Proposed fendin Proposed varter quality basin Realigned privational proposed guardral proposed guardral proposed proposed along proposed fill Proposed Fill	infrastructure makes up an even proportion of the existing view.	raising and widening of the.Vegetation along the northbound	
	 The existing Great Blue Mountains Trail is buffered by existing vegetation between the roadway. The experiential quality of the roadway upon entering Medlow Bath is enclosed by mature vegetation and as such is sensitive to change given any work that would remove vegetation and alter road user experience 	 carriageway will require clearing with fill batters proposed on either side of the carriageway. Vegetation installed as part of the proposal landscape design would reduce the visual effect of change over time and light spill. 	

Viewpoint	Sensitivity	Magnitude	Impact
<caption></caption>	 Low The existing road infrastructure is seen in the background of this view, partially screened by existing established vegetation. The foreground of the existing view is dominated by vegetation along the fringes of the existing rail corridor, the highway and rail infrastructure are seen as dominant existing features in the background. As a result, this viewpoint would be able to absorb changes given the existing screen planting, as well as existing built elements 	 Low The proposal would relocate the existing retaining wall along the rail corridor and relocate the associated rail infrastructure. As a result of this widening, there would not be a substantial change to the visual composition of this viewpoint. Vegetation installed as part of the proposal landscape design would assist in further reducing the visual effect of change over time. 	Low
<section-header></section-header>	 Low The existing road and rail infrastructure are dominant features within this view. As a result of extensive infrastructure in the foreground, this viewpoint would be able to successfully absorb changes. 	 Moderate The proposal would relocate the existing retaining wall along the rail corridor and relocate the associated rail infrastructure. The proposal would not be a significant change to the visual composition of this viewpoint. There would likely be increased traffic travelling past this viewpoint and light spill at night from the proposal. 	Moderate – Low

Viewpoint	Sensitivity	Magnitude	Impact
<image/>	 High The view is made up of an even ratio of transport infrastructure and mature tree and larger shrub plantings along the road verge and the background. The sensitivity of this view to change is high given the limited ability of this 	 Magnitude Moderate The proposal would introduce the widening of pavement in the foreground of this viewpoint. Introduction of a multi-use access trail, where previous access was restricted. Vegetation along the southbound carriageway would require clearing with a retaining wall and batter proposed along the edge of the 	Impact High – Moderate
	 view to absorb changes to the removal of existing established vegetation along the fringe of the road corridor. The view is sensitive given the existing residential properties along Coachhouse Lane, which would be impacted by changes to this view, in the form of partial screening of incoming traffic from this viewpoint. 	 proposed along the edge of the roadway and access path. Vegetation installed as part of the proposal landscape design along the batter would somewhat reduce the visual effect of change over time and reduce increased light spill. 	

6.5.4 Safeguards and management measures

Safeguards and management measures for landscape and visual impacts are presented in Table 6-28.

Table 6-28: Safeguard and management measures - landscape character and visual impact

Impact	Environmental safeguards	Responsibility	Timing	Reference
Landscape character and	An Urban Design Plan will be prepared to support the final detailed project design and implemented as part of the CEMP.	Contractor	Detailed design/pre-	Standard safeguard
visual impact	The Urban Design Plan will present an integrated urban design for the project, providing practical detail on the application of design principles and objectives identified in the environmental assessment. The Plan will include design treatments for:		construction	
	 location and identification of existing vegetation and proposed landscaped areas, including species to be used 			
	 built elements including retaining walls, bridges and noise walls 			
	• pedestrian and cyclist elements including footpath location, paving types and pedestrian crossings			
	fixtures such as seating, lighting, fencing and signs			
	 details of the staging of landscape work taking account of related environmental controls such as erosion and sedimentation controls and drainage 			
	 procedures for monitoring and maintaining landscaped or rehabilitated areas. 			
Proposal	Rail infrastructure will be screened using shrubs and trees, where possible	Transport	Detailed	Additional
design	 Cut and fill batters will be rounded to help integrate into the existing landform and create a more naturalised appearance. 		design	safeguard
	Opportunities to reduce the proposal footprint will be explored during detailed design			
	Connectivity and access to the existing and proposed heritage interpretation area will be enhanced.			
	Exposed rock faces will be retained in the rock cuttings			
Bridges	• The bridge design and the design of peripheral elements will be refined to reduce its visual impact.	Transport	Detailed design	Additional safeguard
Bicycle and	• Cyclist and pedestrian access will be improved through new and upgraded, multi-use access tracks	Transport	Detailed	Additional
pedestrian	• Visibility of proposed multi-use access tracks and adjoining residential properties will be improved.		design	safeguard
Structures	• Design of new retaining walls will have finishes of a high standard and quality that is in keeping with the Great Western Highway character.	Transport	Detailed design	Additional safeguard
Landscape implementation	 Fill batters will be screened where possible using seeding, shrubs and trees, as well as bushland reconstruction techniques. 	Transport	Detailed design	Additional safeguard

Impact	Environmental safeguards	Responsibility	Timing	Reference
	• Buffer planting will be introduced in front of the retaining wall at the southern entry into Medlow Bath to minimise visual impacts.			
	Bushland reconstruction and bushland seeding will be maximised where possible.			
	Native and endemic plantings will be used along the highway outside of the village.			
	 Revegetation with appropriate species will be maximised along the highway to reduce perceived corridor width. 			
	• The selection of plant species will complement and integrate with the existing environment.			
	Opportunities for additional tree plantings along the proposal corridor will be investigated.			
Construction visual impact	 The layout of ancillary facility sites will be designed to limit impact. The design will consider: screening of boundaries facing sensitive receivers or views 	Contractor	Pre- construction / Construction	Additional safeguard
	 careful placement of structures and buildings to maintain viewpoints or provide additional screening of site activities. 			
Construction visual impact	Ancillary facilities will be maintained, kept tidy and well-presented including sorting regular removal of excess materials to reduce visual impact.	Contractor	Construction	Additional safeguard
Construction visual impact	Ancillary facility sites and temporary construction areas will be progressively restored to at least their pre- construction conditions when no longer required.	Contractor	Construction	Additional safeguard