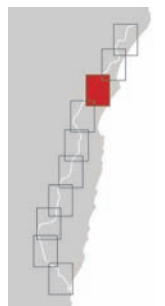
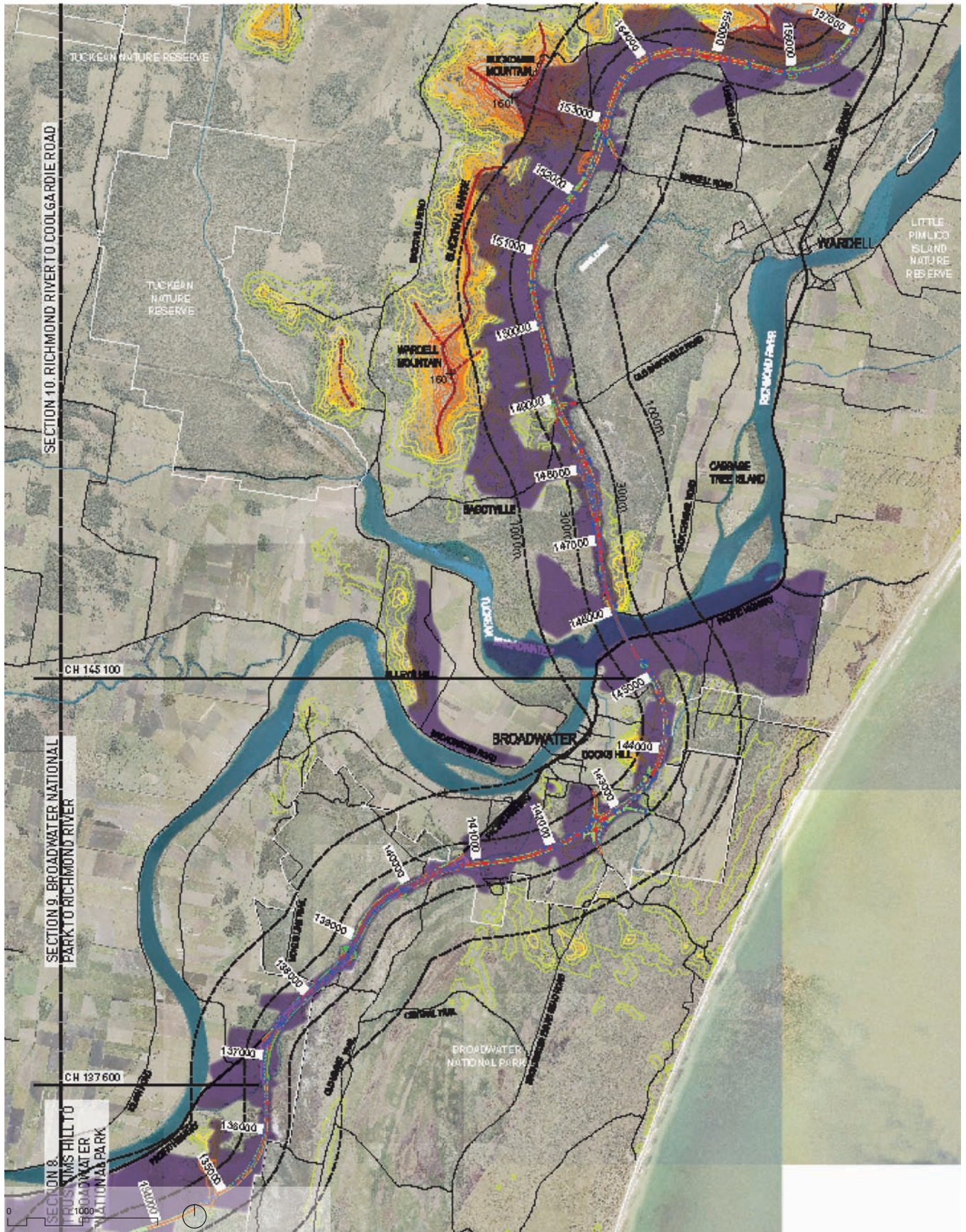


Legend

- |  |  |  |   |
|--|--|--|---|
|  | Alignment: Interim option                  |  | Strong ridgelines   |
|  | Alignment: Ultimate option                 |  | Notional ridgelines   |
|  | Areas of cut                               |  | Visual Envelope   |
|  | Areas of fill                              |  | National Parks, State Forests,<br>Nature Reserves, Conservation Areas |
|  | Existing Pacific Highway route             |  | Waterways   |
|  | Existing Pacific Highway Upgrade alignment |  | Contours at 10m interval  |
|  |  |  | Distance from road centreline   |

VEM 08

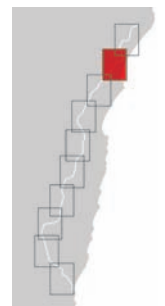


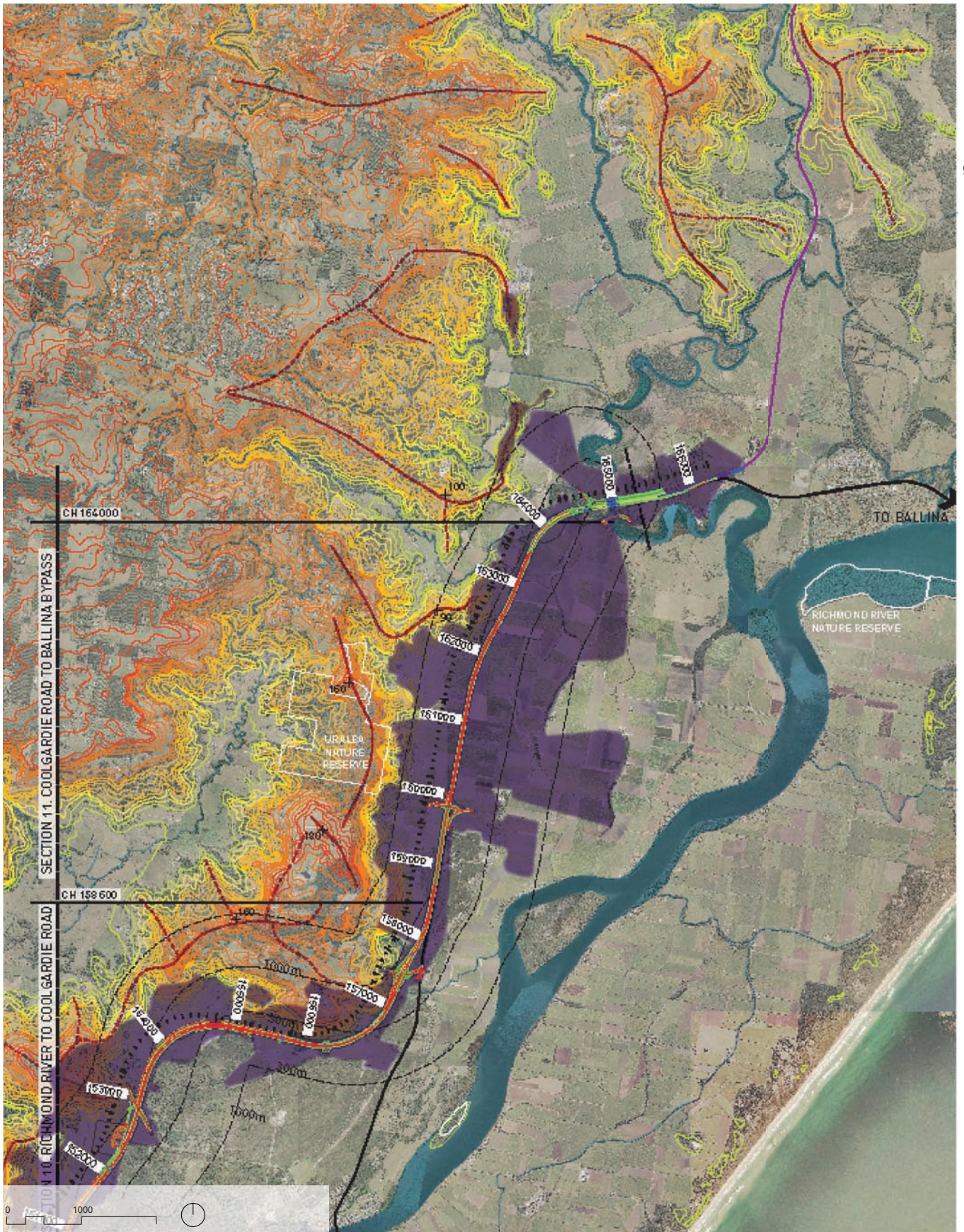


Legend

- |  |  |  |  |
|--|--|--|--|
|  | Alignment: Interim option                  |  | Strong ridgelines  |
|  | Alignment: Ultimate option                 |  | Notional ridgelines  |
|  | Areas of cut                               |  | Visual Envelope  |
|  | Areas of fill                              |  | National Parks, State Forests, Nature Reserves, Conservation Areas |
|  | Existing Pacific Highway route             |  | Waterways  |
|  | Existing Pacific Highway Upgrade alignment |  | Contours at 10m interval   |
|  |  |  | Distance from road centreline                                      |

VEM 09

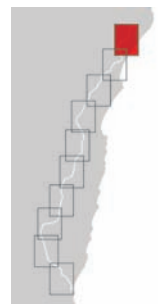




Legend

- |  |  |  |   |
|--|--|--|---|
|  | Alignment: Interim option                  |  | Strong ridgelines   |
|  | Alignment: Ultimate option                 |  | Notional ridgelines   |
|  | Areas of cut                               |  | Visual Envelope   |
|  | Areas of fill                              |  | National Parks, State Forests,<br>Nature Reserves, Conservation Areas |
|  | Existing Pacific Highway route             |  | Waterways   |
|  | Existing Pacific Highway Upgrade alignment |  | Contours at 10m interval  |
|  |  |  | Distance from road centreline   |

VEM 10



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### 3.2.3\_ Frequency

Frequency considers the number of people who might view the project. Three categories were determined as follows:

\_ **Low frequency:** residences where there are few inhabitants and visitors to private properties.

\_ **Medium frequency:** roads, public walkways or parks that have medium usage by the general public.

\_ **High frequency:** public places and thoroughfares that have high usage.

### 3.2.4\_ Duration

Duration refers to the length of time people would have to view the project, and generally references the amount of it that is visible. It is a term that is used when describing the magnitude of the project at any given view point.

\_ **Short duration:** views from naturally vegetated (forest or woodland) areas or industrial areas that partially obscured by topography, landscaping or structures.

\_ **Short to moderate duration:** views from local roads where the duration of the view is short to moderate, many of the viewers are frequent users of the road, and their visual sensitivity is constrained because the orientation of the viewer is focussed on the road for much of the time (a viewer travelling in a vehicle has only a 20 degree angle of vision either side of the centre view of the road and at speeds of 100 kilometres per hour and focusing distance of 600 metres (Roads and Traffic Authority, 1991)).

\_ **Long duration:** Long duration views are from residential and public recreational areas. Views include elements that dominate the landscape.

Long duration views from housing or views from public places that have high visitation would have the highest visual impact. Short duration views, which are partially obscured by existing topography, landscape or structures, would have the lowest visual impact.

### 3.2.5\_ Distance

The greater the distance, the less detail is observable and the more difficult it is to distinguish changes from their background, which in turn diminishes visual impact.

Distance zones were determined around the project within the visual catchment area based on an observer eye height of 1.5 m above ground level. The distance zones are as follows:

\_ **Foreground zone:** Areas within 0-300 m of the viewer. Within this range the observer experiences maximum discernment of landscape details, such as shape, colour and contrast.

\_ **Middle ground zone:** Areas between 300 m and one kilometre. Within this range, vegetation textures and land use patterns are visible to the observer.

\_ **Distant zone:** Areas greater than one kilometre from the project. Within the range, textures and patterns are indistinct to the observer. The viewer is unaware of individual details and discerns broader landscape units as patterns of light and dark.

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View locations that fall within the foreground zone are considered to be in the zone of highest visual impact because the proposed development would be part of their ground views. Changes to views in the middle ground are considered to be important but less important than in the foreground. This is because the subject site is further from the viewer and would therefore occupy a lower proportion of the total view from the identified viewer location. It is considered that visual impact or viewer locations within the background zone is of least significance, however, still worthy of consideration. In some cases, wholesale change of broad distant views in terms of colour, texture and pattern can still be significant.

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#### 3.2.6\_ Magnitude (refers to the degree of change)

Magnitude refers to the nature of the project and its proximity to the viewer. For the visual assessment magnitude is determined for each selected viewpoint to assist in determining visual impact at that location. It represents the contrast between the scale, form and character of the proposed development and the context into which it is to be placed. A high magnitude results if the proposal is a major development and contrasts strongly with the existing landscape. Similarly, where the existing environment is heavily modified by the proposed development, for example through the large scale removal of vegetation, a high magnitude rating would also result. A moderate magnitude rating would result if the proposed development is moderately integrated with the landscape where, for example, surrounding vegetation or topography provide a measure of screening, background or other form of visual integration of the development with its setting. A low magnitude occurs where there is minimal contrast and a high level of integration of form, line, shape, pattern, colour or texture values between the development and the surroundings.

In assessing the magnitude of this project the following typical judgments have been used to ensure that ratings of magnitude are consistently applied. Magnitude ratings may be affected by one or more of the above conditions and also need to take into account the distance of the view. The table below provides a summary of typical judgments that have been applied in assessing the project.

Table 17\_ Magnitude ratings

Typical condition	Magnitude (range)
Elevated bridges	High
Deep cut and fill embankment areas.	High – moderate
Elevated interchanges.	High – moderate
New dual carriageway in forest/ woodland setting.	High – moderate
New dual carriageway in agricultural setting.	Moderate – low
Existing carriageway duplication in agricultural setting.	Moderate – low
Existing carriageway duplication in forest/woodland setting.	Low – negligible
Low level bridges.	Low
Duplicated low level bridges	Low – negligible

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### 3.2.7 Sensitivity

Visual sensitivity is a measure of the quality of a view and its importance to different user groups, areas or locations. For example, views of undeveloped natural landscape areas have higher sensitivity than developed landscapes when considering new road infrastructure development, and public vantage points that attract many viewers have higher sensitivity than views that are rarely seen. Sensitivity is determined for each selected vantage point to assist in the determination of visual impact at that location. Visual sensitivity depends on a range of user-group characteristics and the authors knowledge and experience of public perception of the quality of particular land uses and landscapes. Visual sensitivity includes consideration of the perceived cultural value of the visual environment and elements within it.

In assessing the sensitivity of the project the following typical judgments have been used to ensure that ratings of sensitivity are consistently applied. Sensitivity ratings may be affected by one or more of the above conditions. The table below provides a summary of typical judgments that have been applied in assessing the project.

**Table 18\_ Sensitivity Ratings**

Typical condition	Sensitivity (range)
High scenic, conservation, or heritage value.	High
Public lookouts and popular public vantage points.	High
Many people, long duration, repetitive views.	High – moderate
Many people, short duration, repetitive views.	Moderate
Few people, long duration, repetitive views.	Moderate
Few people, short duration, repetitive views.	Low
Fleeting views (from motorists).	Low
Developed area which already comprises many roads.	Low

### 3.2.8 Impact

The combination of sensitivity and magnitude provides the rating of the visual impact. The impact is calculated using the landscape character and visual impact grading matrix, provided in the RTA Guide EIA N04 (refer Table 3 in Section 2), which provides consistent terminology for the assessment.

In summary the visual impact depends upon the visual catchment area (extent of visibility), visual sensitivity (the number of views, duration of view and distance) and magnitude (type of change and where the change would occur). The visual impacts can either be positive or negative.

The following impact assessment (section 3) addresses 75 vantage points along the project alignment and determines visual impact as a function of magnitude and sensitivity judgements applied as identified in Tables 17 and 18 above. Text rationale for these judgements is provided for each vantage point setting. Specific engineering, urban design and landscape mitigation strategies are determined for each location to address the impact assessment. This includes areas where a high or moderate to high visual impact is determined to ensure that the right strategies are used to minimise the visual impact of the proposed change.

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### 3.2.9\_ Viewpoint locations

Viewpoints are public or private places where the proposed development can be viewed. Illegal or uncommon use of land which results in a view of the site have not been considered. Specifically, viewer locations have been chosen to:

1. Address views from public vantage points (streets, lookouts, public places).
2. Typically represent homes or particular views that might be experienced from people's homes.
3. Address a location of high impact and major change (bridges, overpasses).
4. Address areas where there is no current road alignment, where new infrastructure is introduced in native forest or traditional agriculture areas.
5. Address places of interest or high perceived cultural value such as heritage or conservation items, lookouts, schools or community facilities as well as near key private residences.
6. Typically represent the full 155 km project alignment and nominated catchment area.

### 3.2.10\_ Individual houses

A large number of individual houses would be impacted to a small or large degree by the project. It is beyond the scope of this visual assessment to provide a detailed landscape assessment and solution to address the impact for every house along the proposed highway alignment. This work would necessarily include access to private property and review of each house layout to understand the location of living areas and external windows. Final detailed design documentation would need to address and mitigate the impact of the project to each of these homes as much as possible. In order to understand the possible scope of this work a detailed schedule was prepared (refer Appendix D) to identify every habitable and uninhabited building located within 300 metres of the proposed highway with as much accuracy as possible using aerial imagery. From this research it was determined that 313 inhabited and 116 uninhabited buildings are located within this zone along project length.

In selecting the vantage points as a basis for the overall assessment of the project, care has been taken to typically address as many changed views as possible as well as focusing on the major proposed structures. In most cases the identified buildings are addressed either a specific or a typical vantage point in the assessment. There are about 36 houses that are not specifically or typically addressed (refer Appendix D). Whilst there is no particular vantage point assessment for these houses, all houses within the visual catchment of the project are addressed in the concept design where strategies are provided to ensure that forest and/or screen vegetation is retained, reinstated or established to minimise disturbance as much as possible.

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#### **3.2.11\_ Sugarcane plantations**

Along the project route, particularly north of Tyndale, sugarcane plantations are a defining feature of the visual catchment. Sugarcane generally grows between two and four metres high and is harvested from July to November either one or two years from planting. In essence the filtered screening offered by sugarcane crop rotation has a major impact on the visual envelope map. For the purpose of the visual assessment, it is assumed that the sugarcane crops have been harvested and does not provide a tall screen to the project.

#### **3.2.12\_ Construction phase**

Existing vegetation within the construction zone boundary, and outside the required clear zone areas, should be retained wherever possible. Where clearing is necessary the areas should be reinstated post construction as revegetation works. For the purpose of the visual assessment however, it is assumed that vegetation would be removed from the road corridor potentially out to the construction boundary. This would result in a more severe impact than would evolve over time due to regeneration; however the initial affect needs to be considered.

All temporary clearing works including site construction compound areas, and site construction activity outside of the construction boundary, are excluded from the visual assessment.

#### **3.2.13\_ Noise attenuation structures, including noise walls**

Large portions of the project pass through sparsely populated landscapes, where noise receivers are low in number and scattered in location. It is understood, from preliminary acoustic advice and documentation, that the majority of noise attenuation treatments along the proposed highway would be in the form of architectural treatments to localised properties, or if necessary low noise pavements.

#### **3.2.14\_ Interim and ultimate upgrade options**

The project approval is for a class M standard upgrade for the full length of the proposed highway. At this stage, however, it is proposed that an interim upgrade option will be built in the first instance which achieves a class M standard development for most of the project but a class A standard upgrade in some places. The ultimate class M standard upgrade version will be built at a later date. In all cases interim and ultimate upgrade options are addressed as part of the visual impact assessment as appropriate.

#### **3.2.15\_ Land use**

Is it assumed that existing land uses are to be retained. No proposed developments or land uses changes have been highlighted outside of the project corridor for the purpose of this visual assessment study.