

# VIEW IMPACT ASSESSMENT

IN RELATION TO PROPOSED REZONING OF 225  
TERRANORA ROAD, BANORA POINT

Prepared for Wrenn Pty Ltd

23 December 2022

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# 1 Introduction

## 1.1 Background and Purpose of Report

- 1 This report relates to the land at 225 Terranora Road, Terranora (Lot 16 DP 856265). Planit Consulting have, on behalf of Wrenn Pty Ltd, lodged an application to rezone a portion of the site to the Large Lot Residential zone and to create three development lots. As required by the Northern Region Planning Panels' Record of Decision each development lot has an identified building envelope with a maximum building height of 9m from existing ground level.
- 2 The potential of the site has been considered in a variety of forms over a number of years. In November 2017 Planit Consulting prepared and submitted a Visual Impact Assessment to accompany a previous application. Later, in April 2019 a Visual Impact Assessment Addendum was submitted with regard to the draft Tweed Scenic Landscape Strategy by Tweed Shire Council.
- 3 Insight DAS has been engaged to provide a view impact assessment to particularly address the following request of the Northern Region Planning Panel:

*"The revised concept plan is to show, for each residential lot, the location of the future building footprint and building envelope, with the footprints and envelopes being sited and designed to avoid any material loss of views from dwellings to the north and any material intrusion into the views of the escarpment from the south."*

- 4 Specifically, this assessment has been prepared to provide an understanding of the extent to which built form in the proposed building envelopes would affect views from dwelling houses to the north of the site and views to the escarpment from the south.
- 5 This assessment has relied on the following documents and information:
  - Concept Plan prepared by Planit Consulting, Rev 4 dated 19.12.22.
  - Point Cloud LiDAR 2013 obtained from Geoscience Australia's Elevation and Depth - Foundation Spatial Data platform.
  - Digital Elevation Model (DEM) Grid LiDAR 2015 provided by Planit Consulting.
  - Draft Tweed Scenic Landscape Strategy 2018 (the 'SLS') and draft Tweed Scenic Landscape Protection Policy.

## 1.2 Scope and Limitations

- 6 This assessment focuses on impacts on views from public and private viewing opportunities surrounding the subject site, having regard to Tweed Shire draft Scenic Landscape Strategy 2018 (the 'SLS'). While the SLS does not apply to views from private properties, the report also examines the impacts on the views of the dwellings to the north and northwest of the subject site.
- 7 This report has been prepared to accompany a rezoning planning proposal and as such the specifics about building scale, form, and appearance have not been determined. Consequently, this assessment is limited to a consideration of general development parameters, such as the extent of the building envelope, siting, height, and overall scale of potential built form within the building envelopes. Further details such as design and materials would be the subject of further development applications and are generally anticipated to result in a reduced building bulk and opportunity for impact.
- 8 The building envelopes have been proposed with a maximum height of 9 metres, being equivalent to the existing maximum building height requirements for the adjoining residential land to the north, east and west of the subject site. While it would be unlikely for a building to occupy the entirety of each

building envelope, the potential for articulation and architectural treatments to mitigate potential visual impacts of the development has not been assumed in this report, therefore this assessment is considered to reflect a 'worse-case' visual impact outcome. Similarly, the potential for landscaping to screen future built form, or to otherwise limit views from neighbouring properties, has not been specifically considered, however would be relevant through any future Development Application process.

- 9 The assessment area extends 4.5 km from the subject site. It is possible that receptors beyond this assessment area might achieve views to the proposed development, but at such distances view impacts will be nominal.
- 10 The assessment utilises Point Cloud LiDAR 2013 and therefore faces limitations regarding potential changes to the vegetation and built form over time. Field investigation and desktop analysis has been carried out to verify the LiDAR data.
- 11 Inspection of the private properties was not part of the scope. Other tools such as desktop analysis, virtual views, sightline sections and drone imagery were used to analyse the views from private properties.

## 2 The Subject Site

### 2.1 The Site

- 12 The subject site is located close to the existing residential areas of Banora Point and Terranora and has a total area of 10.17 hectares. A 10m wide driveway connects the site to Terranora Road and provides vehicle access to the site. Another access handle extends along the south-eastern boundary of the site to connect with River Road. The proposed lots are to be located through the central part of the site, which is largely cleared of vegetation and has a more even terrain.
- 13 The site is located on the southern side of a prominent escarpment, the ridgeline of which is generally traced by Terranora Road. The escarpment slopes steeply down towards the Tweed Rive, and contrasts with the flat floodplain areas to the south of the river. The combination of floodplain, river, and the dramatic vegetated slopes of the escarpment contribute significantly to the attractive landscape character of the local area, particularly as experienced from locations to the south of the escarpment.
- 14 On the other side of the escarpment ridgeline (to the north of Terranora Road) the land falls more gently towards a widening of Terranora Creek. These slopes are characterised by undulating terrain, varied vegetation cover, and a mix of rural, rural residential, and suburban development.
- 15 As well as step vegetated slopes, the escarpment is characterised by a number of plateaus or steps at varying elevations. The subject site comprises on of these steps.
- 16 The topography of the site generally slopes from north to south, with a high point at the north-western corner of RL 86m and a low point at the south-eastern corner of RL4m. The central part of the site (where the lots are to be located) steps down from the neighbouring properties to the north by approximately 8-16 metres, then slopes gently towards the south, before dropping away dramatically as the escarpment slopes down towards the valley floor.
- 17 While the central part of the site is more open, there is dense vegetation through the western part of the site, extending along the northern boundary, and through the southern part of the site where the terrain is steeply sloping.
- 18 The only built form existing on the site is a dilapidated shed in the north-eastern corner.
- 19 Figure 1 below is an aerial image showing the site and surrounding development, and giving an appreciation of the topography and vegetation cover through the local area. Figure 2 - Figure 6 below are drone photos from the subject site, taken approximately 9 metres above the ground level through the central part of the site. These photos show the topographic and vegetative conditions on the site and the relationship of the site to neighbouring land uses. These drone photos also provide an appreciation of views that may be available to future built form on the site and of views that may be available from the neighbouring houses to the north of the site.
- 20 As can be seen in these photos the views from the subject site (and neighbouring properties) are wide views, some extending through an arc of 180 degrees to the south. The views are also attractive views, particularly because: they are complex views with depth and take in a range of varied landscapes and features; they are views dominated by attractive natural and rural landscapes; a number of the views include views to the Tweed River, one of the main landscape features of the region; and the views extend to Mooball and Mt Jerusalem National Parks which create an appealing and distinctive backdrop to the views.



Figure 1 - Aerial image of site and surroundings. From Council's Interactive Mapping.



Figure 2 - View to north from central part of the site, showing houses to the immediate north of the site.





Figure 3 - View to north from central part of the site, showing houses to the immediate north of the site.



Figure 4 - Views to the west from the subject site.





Figure 5 - Views to east from the subject site.



Figure 6 - View to south from the central part of the site showing nature of views available from the site and form neighbouring properties.

## 2.2 Surrounding Land Uses

21 Land uses surrounding the site include:

- a) Seven houses adjacent the northern boundary of the site. These houses front Terranora Road and The Parapet such that it is the backyards of these houses interfacing with the site. These properties generally sit well above the central part of the subject site (in the order of 20-40 metres higher). A number of these houses achieve expansive views across the site to the south, and a number also benefit from expansive views to the north. The vegetation along the northern boundary of the site provide a visual buffer between some of these properties and the central part of the site.

- b) Vegetated escarpment slopes to the south, continuing down to a rural property on the northern side of the Tweed River. River Road is a local road which runs along the edge of the river and terminates to the south-west of the site.
- c) A large property to the west which appears to be vacant and is characterised by steep vegetated escarpment slopes. Housing further west, some of which achieves views to the subject site.
- d) Housing to the east which, due to intervening vegetation and topography, does not achieve views to the central part of the site.

## 2.3 The Tweed Draft Scenic Landscape Strategy

- 22 Tweed Shire Council has released a draft Scenic Landscape Strategy (the 'SLS') to ensure that the Tweed's exceptional and unique scenic landscape qualities are recognised and enhanced or protected, to the greatest extent possible in the context of new development or land use activity.
- 23 The SLS focuses on protecting and managing scenic landscapes seen from publicly accessible locations and does not apply to views from private property. The strategy offers an interactive mapping tool with mapping data to help applicants explore the important scenic views in the Tweed and prepare a visual impact assessment for development applications.
- 24 The interactive mapping tool identifies two types of viewing situations (dynamic and static situations) and their associated viewsheds are then categorised as being regionally or locally significant depending on a combination of factors including accessibility, number of viewers, viewer activity and viewing time, viewer experience and community preference, as follows:
  - Priority 1 - National or regional significance, promoted at a regional or national level, that attract a significant number of visitors, are easily accessed, highly trafficked and those repeatedly identified through community consultation as having high scenic value, quality, or preference.
  - Priority 2 - Regional significance, promoted at a regional or local level, are moderately trafficked and easily accessed or those identified as having high scenic value quality or preference through community consultation.
- 25 Importantly, the mapped viewsheds are based on unobstructed views related to terrain and do not take into account the effects of vegetation and built form.
- 26 Dynamic viewing situations may include roads, cycleways, walking trails, navigable waterways, and any other route along which an observer appreciates a sequence of views from a series of locations as they move through the landscape and static viewing situations are locations from which a single unchanging view or scene is appreciated and where the viewer is for the most part stationary. They include lookouts, public parks and reserves, beaches, headlands, and places of interest.
- 27 The interactive mapping tool report summary related to the subject site identifies ten Priority 1 viewsheds and 14 Priority 2 viewsheds (refer to Appendix A). An initial review of the identified Priority 1 and Priority 2 viewsheds of the subject site shows that the majority of these viewing situations are a substantial distance from the subject site, and/or their associated viewsheds cover a very small percentage of the site outside the proposed rezoning area. Because of these factors and because the mapped views do not take account of existing vegetation and built form, it is likely that many of these viewing situations might not achieve views to the subject site in reality.
- 28 Considering the bulk, scale, height, and area of the proposed development the viewing situations within 4.5 km of the subject site have been selected for further investigation. These include: Tweed Coast Road linear viewing situation; Tweed Valley Way linear viewing situation; Pacific Highway linear viewing



situation from Priority 1 viewsheds; and Tweed River Panorama linear viewing situation and Terranora Rd linear viewing situation from Priority 2 viewsheds.

29 Either because of distance from the subject site or because the mapped views do not include the proposed building envelopes, the following 7 priority 1 viewshed viewing situations have been excluded from further investigation:

- Tomewin Road linear viewing situation, which is more than 16 km away. Only 1.2% of the subject site is covered by this viewshed, and it is outside the proposed development area.
- Hastings Point Headland static viewing situation, which is more than 14 km away.
- Tweed Regional Art Gallery (Observation Deck) static viewing situation, which is more than 17 km away.
- Jack Evans Boat Harbour static viewing situation, which is more than 8 km away. Only 2.6% of the subject site is covered by this viewshed and it is located outside the proposed development area.
- Cabarita Headland static viewing situation, which is located more than 11 km away.
- Point Danger static viewing situation, which is more than 8 km away. Only 2.6% of the site which is not part of the development area is covered by this viewshed.
- Bruce Chick Reserve static viewing situation, which is more than 5 km away.

30 For the same reason the following 12 Priority 2 viewshed viewing situations were also excluded from further investigation:

- Riverside Drive linear viewing situation, which is more than 7.5 km away. Only 2.7% of the subject site is covered by this viewshed and it is outside the proposed development area.
- Minjunbal Drive linear viewing situation, which is more than 5 km away. Only 3.2% of the subject site is covered by this viewshed and it is outside the proposed development area.
- Bakers Road linear viewing situation, which is more than 19 km away.
- Cane Road and Tumbulgum Road linear viewing situation, which is more than 13 km away.
- Bells Boulevard Cycleway static viewing situation, which is more than 6 km away. Only 1.5% of the subject site is covered this viewshed and it is located outside the proposed development area.
- Blackbutt Lookout static viewing situation, which is more than 43 km away.
- Cunningham Park static viewing situation, which is more than 7 km away. Only 3.0% of the site is covered by this viewshed and it is not part of the proposed development area.
- Cudgera Creek Park static viewing situation, which is more than 14 km away.
- Ocean Avenue and Cycleway static viewing situation, which is located more than 6.5 km away.
- Kerosene Bay static viewing situation, which is located more than 6 km away. Only 1.0% of the subject site is covered by this viewshed and it is located outside the proposed development area.
- Razorback Lookout static viewing situation, which is located more than 5.5 km away. Only 3.9% of the subject site is covered by this viewshed and it is outside the proposed development area.

31 The SLS also identifies ten Landscape Character Units ('LCUs') within Tweed Shire based on various combinations of topography, land cover, land use and water elements.

32 The relevant landscape character units applicable to the subject site are Urban LCU and Rural Hills and Valleys LCU. Figure 7 below shows these Landscape Character Units within and surrounding the site.

- 33 The draft SLS explains that the Rural Hills and Valleys generally covers land where the terrain rises above the Tweed floodplain and ends where elevation rises into the steeper forested slopes of the Caldera rim and ranges. It explains that the visual character in this LCU is created by interplay between vegetation and topographic patterns at all scales that can create an indented or transitional edge between two or more interlocking or connecting areas.
- 34 The SLS explains that the Urban LCU defines the limits of urban development and consists of all land uses for urban purposes, including housing communities, infrastructure, industrial areas and business parks, commercial and retail areas, and community facilities, urban open spaces, and other zoned land where the landscape is dominated by built form.
- 35 As can be seen, a large proportion of the site has been included in the Urban LCU. The majority of the site that is included in the Rural Hills and Valleys LCU will remain vegetated and unaffected by the proposed development.

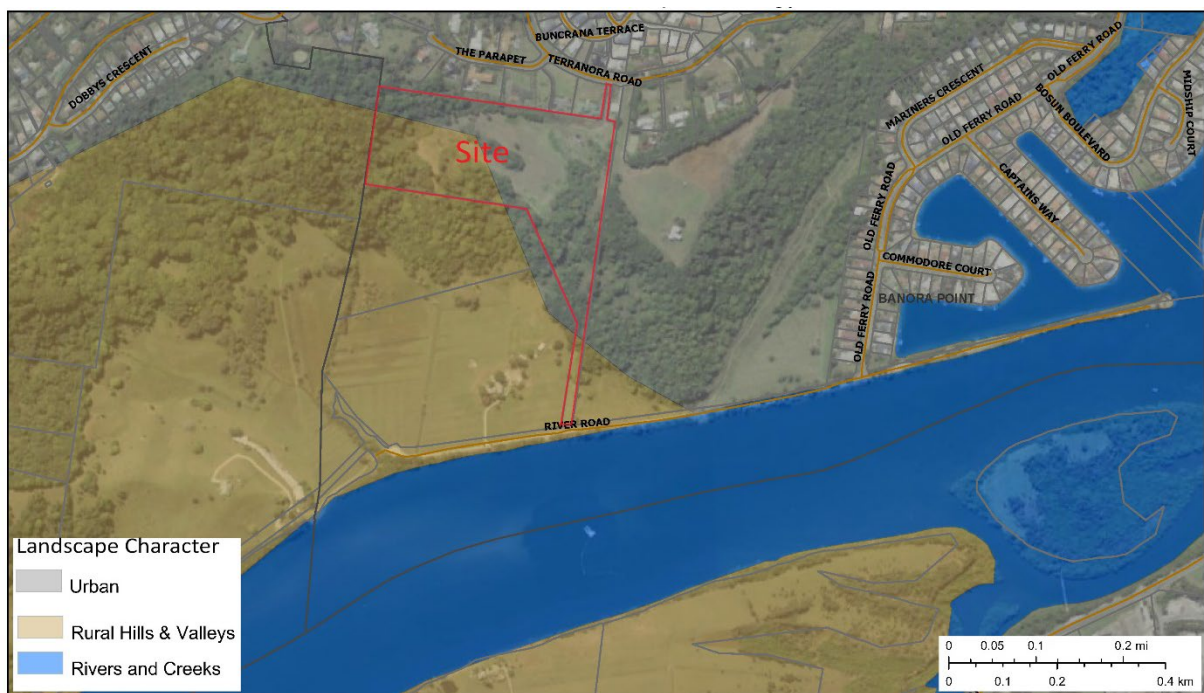


Figure 7 - Landscape character units of the subject site.

### 3 The Proposed Development and Visibility

- 36 As reflected in the proposed concept plan (reproduced at Figure 8 below) the proposed development seeks to rezone the subject site into the Large Lot Residential zone and to establish three house lots (Lots 1-3). A two-way 5.5 m internal road would provide access to the lots, extending from Terranora Road, through the access handle at the north-eastern corner of the site and continuing along the northern part of the site.
- 37 The lots would have an area of at least 1 hectare each and would generally be located through the cleared land at the central part of the site. The proposed Lots cover approximately 40% of the subject site. A building envelopes would be located central to each lot. Each envelope would have a length of 35 metres, a width of 20 metres and a total area of 700sqm.
- 38 The location of the envelopes has been determined for all future buildings with consideration of minimising visual intrusion on the Terranora escarpment. Effluent disposal would occur in dedicated areas outside of the building envelopes. It is understood that the height of future built form within the envelopes would be limited to a maximum of 9 metres above existing ground level, as per LEP provisions.
- 39 The building envelopes would be located at least 53 metres away from the northern boundary of the site, and would be separated from the each other by at least 40 metres. The envelope on Lot 1 would sit at an elevation of approximately RL 57 metres. The envelope on Lot 2 would sit at an elevation of approximately RL 67 metres. The envelope on Lot 3 would sit at an elevation of approximately RL 64 metres.
- 40 As noted on the Concept Plan, landscaping will be provided along the southern side of the driveway to mitigate its visual intrusion into the views from Tweed Valley Way and the Pacific Highway. As also noted, the established vegetation buffer between the proposed lots and the existing houses to the north will be retained.
- 41 It is understood that, aside from the access driveway and proposed building envelopes, the balance of the site would be unaffected.

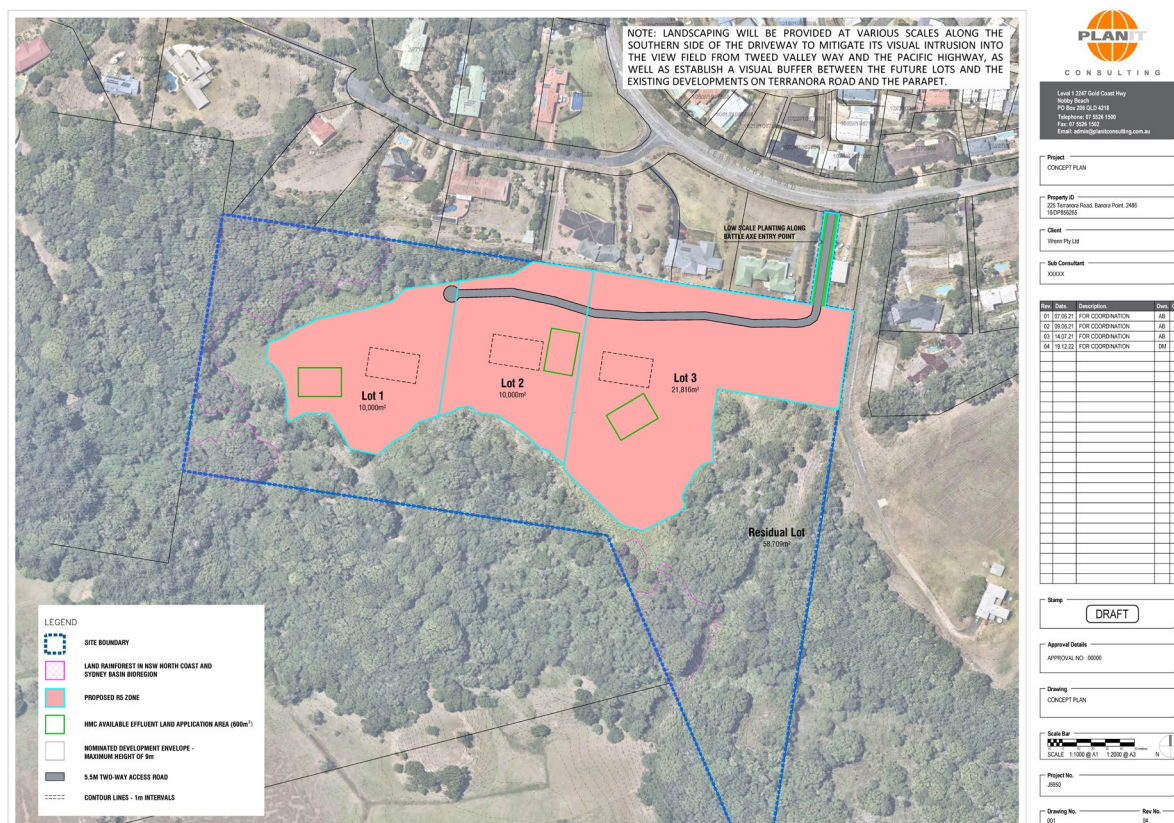


Figure 8 - Concept plan. Prepared by Planit Consulting.

### 3.1 Visibility Mapping

- 42 The study area for this report is identified as 4.5 km from the subject site. This area of investigation was determined through topographic study and through an initial DEM<sup>1</sup> visibility mapping exercise (refer to Figure 9), having regard to the bulk and scale of potential built form within the proposed building envelopes, and the characteristics of the surrounding landscape.

<sup>1</sup> Digital Elevation Model.



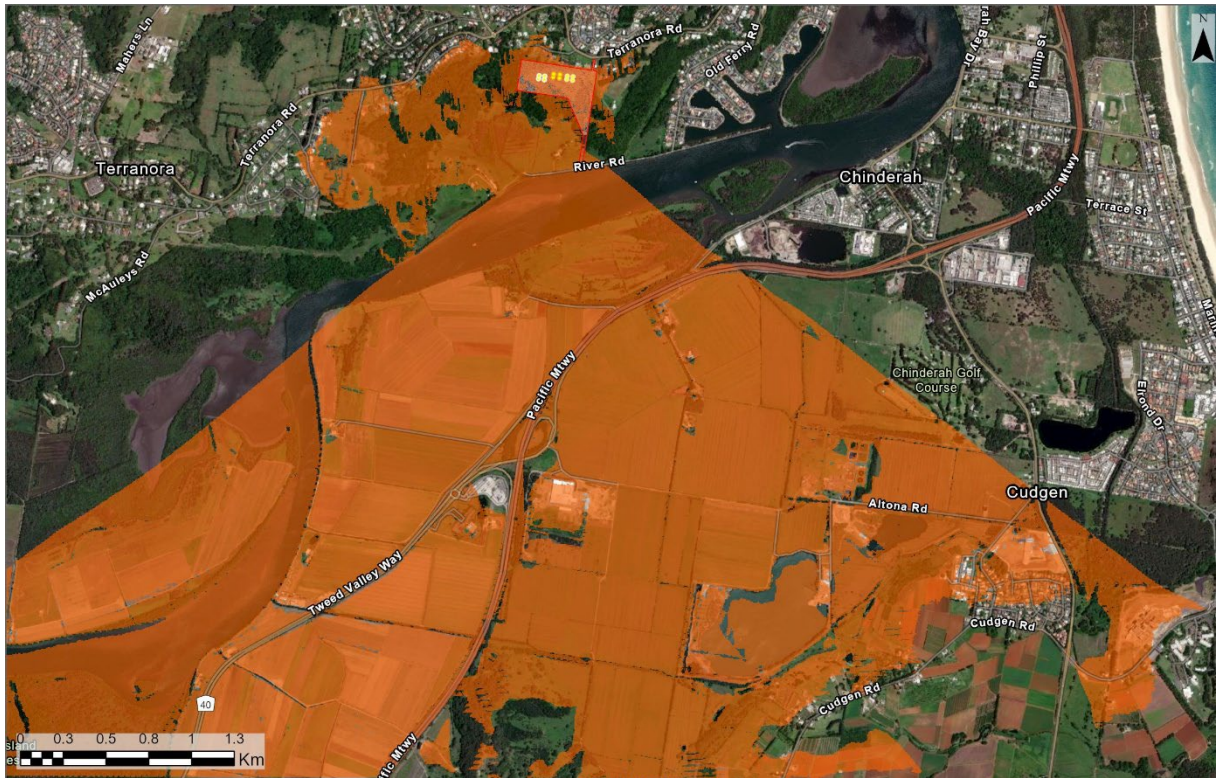


Figure 9 - DEM visibility mapping. Ground data was used for this visibility map.

- 43 The DEM visibility mapping is based on ground data from 2015 and created from a digital raster surface of 5m interval contours. This initial mapping provides a first step understanding of the visibility of the proposed development in relation to the surrounding topography. Twelve reference points were considered for this visibility mapping placed on each corner of the proposed building envelopes at the height of 9 m above the existing ground level.
- 44 The DEM visibility mapping shows that the combined visual catchment of the proposed building envelopes includes limited land to the north, west, and east of the site, and generally extends across the valley floor to the south of the site, across the Tweed River. The ridge situated to the north of the site limits the visibility to the north substantially. There is also a small hill to the east of the site which obstructs views from the east. Another small ridge about 1.5 km west of the site extending from the main northern ridge limits further views from the west.
- 45 To further investigate the visibility of the previously discussed viewing situations and also the residential areas to the north and north-west a DSM<sup>2</sup> visibility mapping was created taking into consideration the effects of vegetation and built form. This visibility mapping utilised a DSM surface created from point cloud LiDAR 2013 data containing vegetation, built form, water, roads and ground data.
- 46 The DSM visibility mapping (refer to Figure 10) shows that Terranora Road and Tweed Coast Road generally do not achieve views to the building envelopes or might achieve a few insignificant glimpses through vegetation and built form.
- 47 The extent of visibility from north, north-west and west is further reduced. The properties north of Terranora Road do not achieve views to the subject site and the extent of visibility to the west is limited to 1.5 km from the subject site.

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<sup>2</sup> Digital Surface Model.



- 48 The next step was to further investigate the visibility of each proposed building envelope separately. For this purpose, four reference point was placed in the corners of the building envelope for Lot 1 and a DSM visibility map was created taking into account vegetation and built form as well as ground data. The same exercise was repeated for Lot 2 and Lot 3. (refer to Figure 5 - Figure 7)

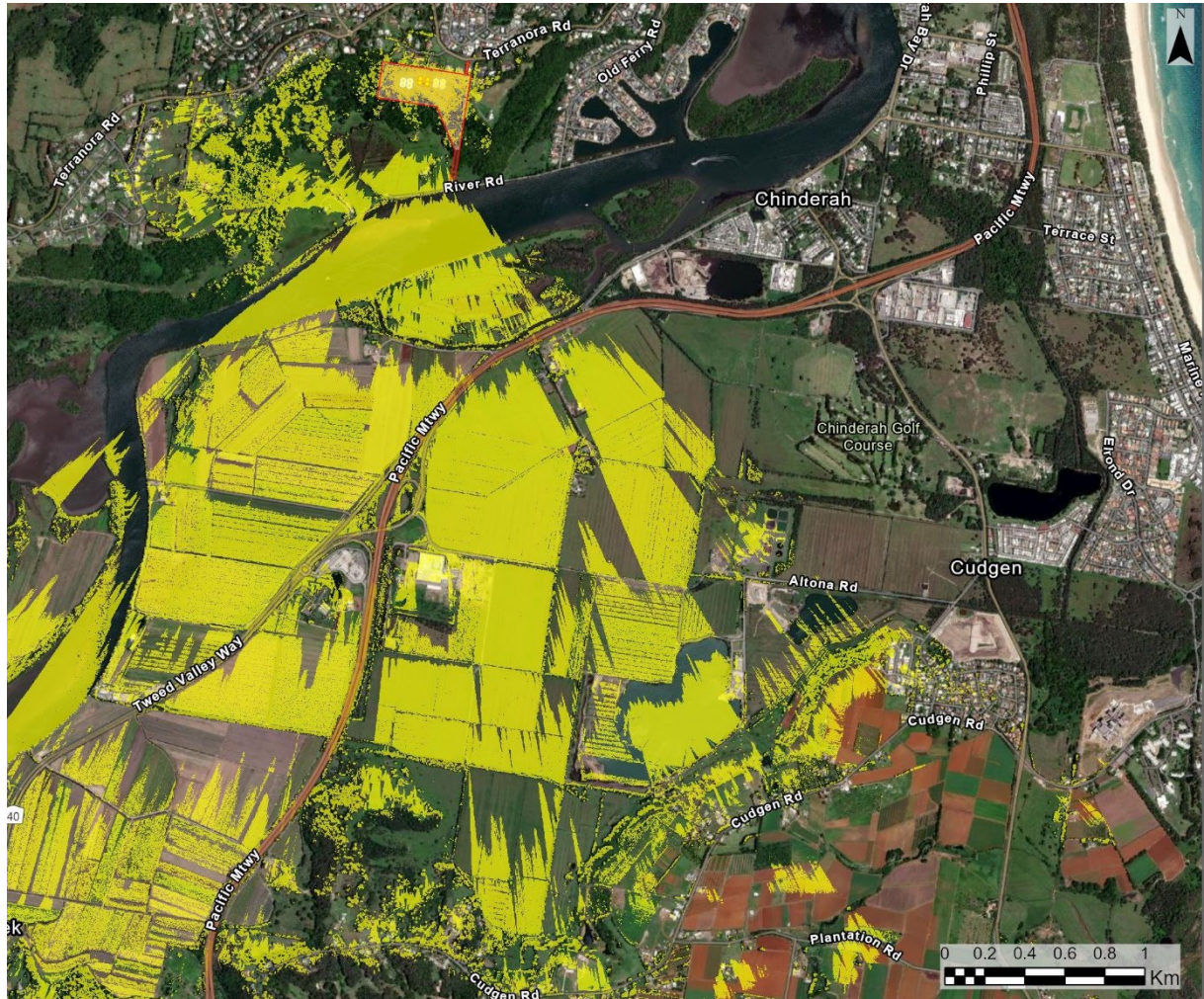


Figure 10 - DSM visibility mapping. Vegetation and built form data was used in addition to ground data.

- 49 In addition to whether the building footprints are visible or not and from where, these maps show the extent of visibility for each envelope (i.e. whether 1, 2, 3, or 4 references points would be visible from any specific viewing location).
- 50 This mapping showed that the building envelope on Lot 1 has the least visibility (Refer Figure 11) and the envelope on Lot 2 has the most visibility (refer Figure 12).
- 51 The results are consistent with the characteristics of the land and the location of the envelopes on the site. Of note:
- a) because the central part of the development site is on the southern side of the escarpment, lower than the defining ridgeline, the main visual catchment is to the south of the site;
  - b) vegetation through the western part of the site and on neighbouring land to the west and east limits views to the proposed building envelopes from the west and east;

- c) the existing vegetation through the north-western part of the site, extending along the northern boundary limits views from parts of the neighbouring properties to the north;
  - d) because the envelope on Lot 2 sits in the most central part of the site it is the most visible for viewpoints to the north and south of the site;
  - e) because Lot 1 sits at a much lower elevation and is more enclosed by vegetation, the envelope on that lot is least visible from viewpoints to the north and south of the site;
  - f) the envelope on Lot 3 is, for viewpoints to the south, obviously the highset envelope and is closest to the skyline (but does not extent above the skyline for these viewpoints); and
  - g) the envelopes for Lots 2 and 3 sit at a much higher elevation compared to Lot 1 (with minimum 4 m and maximum 15 m existing ground elevation difference at the corners of these footprints), they are more visible than the envelope on Lot 1.
- 52 The visibility mapping included below, and desktop analysis of the site and its surroundings determined the key viewpoints for further analysis of view impacts. A total of nine viewpoints were selected. Of these, five viewpoints (VP1 – VP5) are located to the north and northwest of the site, and four viewpoints (VP 6 – VP 9) are south of the site (refer to Figure 20 below).
- 53 The drone photos included at Figure 14 - Figure 19 below provided a means of verifying the visibility mapping (a reverse visibility exercise) and assisted with the identification of viewpoints for further analysis. These images are taken in the vicinity of each of the proposed building envelopes, and a height of approximately 9 metres above the ground (representing the upper limits of the building envelopes).





Figure 11 - Visibility map of Lot 1 building envelope.





Figure 12 - Visibility map of Lot 2 building envelope.





Figure 13 - Visibility map of Lot 3 building envelope.





Figure 14 - View to north from near envelope of proposed Lot 3, 9m above ground.



Figure 15 - View to south from near envelope of proposed Lot 3, 9m above ground.



Figure 16 - View to north from L near envelope of proposed Lot 2, 9m above ground.



Figure 17 - View to south from near envelope of proposed Lot2, 9m above ground.



Figure 18 - View to north from near envelope of proposed Lot 1, 9m above ground.



Figure 19 - View to south from near envelope of proposed Lot 1, 9m above ground.





Figure 20 - Viewpoints location map.



- 54 Excluding the parts of the viewshed that falls on top of vegetation in the local area, the majority of the views from north and north-west are achieved from private properties, hence the five selected viewpoints north of the site are from dwellings in the residential areas (refer to Figure 21). Viewpoints 1, 2 and 3 represent the views from dwellings directly adjoining the subject site to the north, while Viewpoints 4 and 5 are representative of the dwellings at residential areas to the north-west and west of the site.
- 55 The four selected viewpoints from the south are all public viewing points from roads (refer to Figure 22). More specifically, one viewpoint was selected from Pacific Motorway, one from Tweed Valley Road, one from overpass of Tweed Valley way and Pacific Motorway, and one from Cudgen Road.

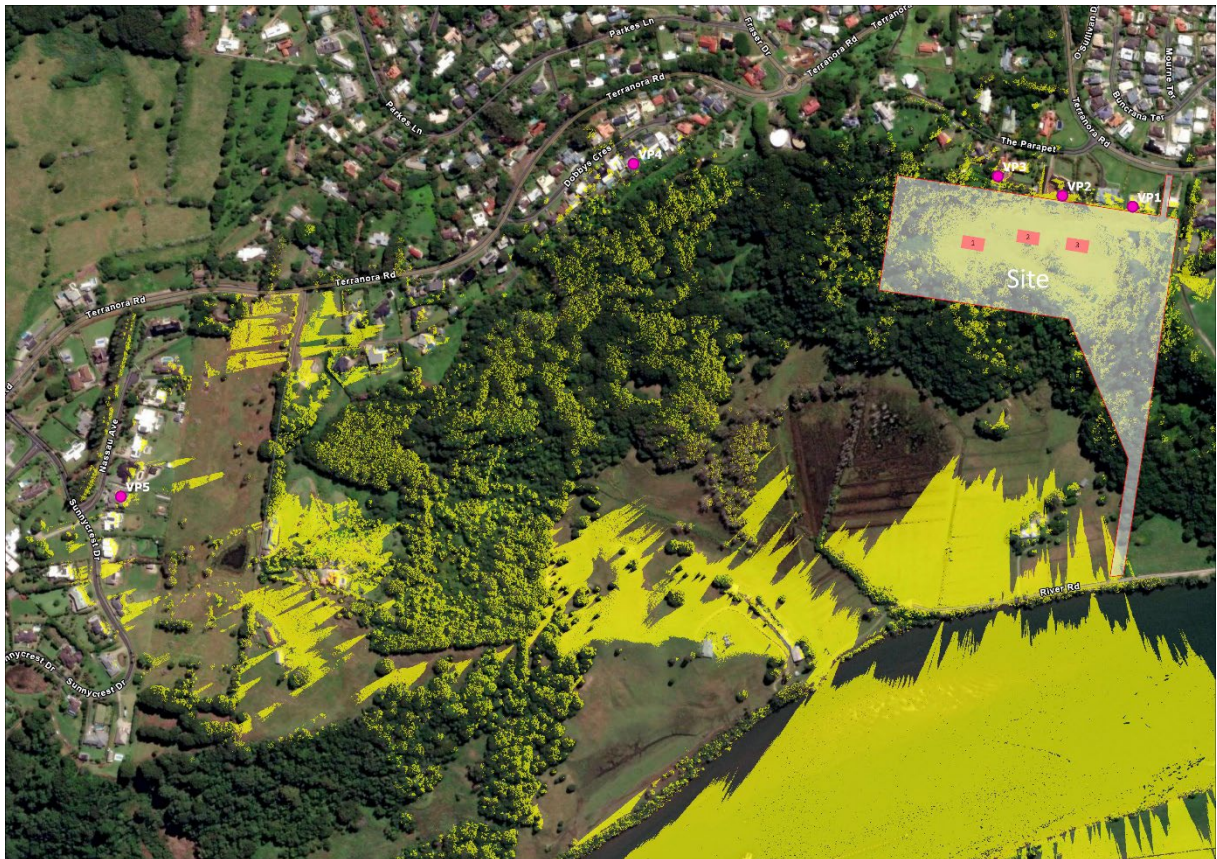


Figure 21 - DSM visibility map and northern viewpoints. Yellow identifies locations from which the building envelopes are theoretically visible.





Figure 22 - DSM visibility map and southern viewpoints. Yellow identifies locations from which the building envelopes are theoretically visible.

## 4 Analysis of Impacts on Key Viewpoints

- 56 The following sections set out the analysis of potential view impacts for each of the nine identified viewpoints. This analysis was informed by photos (where public photos locations were accessible), aerial view maps (for the Viewpoints to the north), virtual views, and sight lines sections.
- 57 The aerial view maps show the relevant view arc from each of the viewpoints to provide an appreciation of the general direction and extent of the relevant views. The parts of the view arcs coloured blue represent views that take in the Tweed River (as an important and attractive landscape feature in the views). The parts of the view arcs coloured yellow are parts of the view that would be obstructed (to some degree) by the proposed building envelopes). Where the parts coloured blue and yellow overlap, this indicates that views to the river may be affected by the proposed building envelopes.
- 58 The virtual models have been prepared in ArcGIS and show the building envelopes within the DSM models (i.e. showing terrain and existing vegetation cover). These virtual views assist with an understanding of how the proposed building envelopes might appear in each view. The virtual views were captured with fields of views equivalent to a 24 or 50mm focal length for a full frame camera. The 50mm focal length better represents the field and depth of view of the unaided, static human eye, but the 24mm is sometimes more useful for representing an object within a wider context.
- 59 For the virtual views from the viewpoints to the north, the DSM data for vegetation along the northern part of the site (between the envelopes and northern boundary) have been removed to provide a clearer appreciation the distance to the envelopes and the location of the envelopes in the views. Obviously, if the vegetation is retained in the northern part of the site the views of the envelopes and the views beyond the site will be obstructed, to varying degrees.
- 60 The sightline sections were prepared in ArcGIS and utilise the DSM. These sections provide an appreciation of the distance and the differences in elevation between the viewpoints and the proposed building envelopes. The sections are taken from the viewpoints through the nearest building envelope and do not necessarily coincide with the central or primary alignment of each view.
- 61 Where depicted in the virtual views and sightline sections, the proposed building envelopes are simple masses extruded to a height of 9 metres. Obviously future built form on the proposed lots and within these envelopes would be articulated and modulated such that it would not occupy the entire envelope.

### 4.1 Key Viewpoints North of the Subject Site

- 62 All of the viewpoints selected here are from private properties, as the visibility maps and site investigation showed roads and public viewing points north of the subject site would not achieve views to the building envelopes.

#### 4.1.1 Viewpoint 1:

- 63 This viewpoint is a house at 227 Terranora Road neighbouring the north-east corner of the site. This house is primarily oriented to the north, with expansive views across Tweed and towards the Gold Coast. The house also has the benefit of expansive views to the south, towards the valley and the river. Of note, this house sits at an elevation of approximately 74 metres AHD, approximately 10-20 metres higher than the proposed envelopes (ground level) for Lots 1-3. The viewpoints is approximately 92 metres from the envelope for Lot 3.
- 64 The view arc from this viewpoint is shown in Figure 23. As shown, this house is likely to achieve expansive views to the south including views of the river, and the valley beyond.



- 65 The proposed building envelope on Lot 3 is the closest to this viewpoint but would still be considerably lower than the viewpoint. The other two envelopes will potentially be visible, but are not in the main direction of the view.
- 66 The virtual view at (Figure 24 below) confirms the extent of the views to the south, and the visibility of the river. The virtual view also shows that, while the envelopes for Lots 1-3 may be visible from this viewpoint, they would not obstruct this views to the river, nor to midground or background ridges systems. The building envelopes for Lot 1 and Lot 2 sit further to the side of the main view and lower than Lot 3.
- 67 Figure 25 and Figure 26 below show a sightline section crossing the nearest building envelope (Lot 3). As can be seen in this section Viewpoint 1 sits about 12m higher than the building footprint which allows for the views to extend above the envelope to the ridgeline to the west.
- 68 The direction of the sightline to the building envelope is towards the south-west of the site and the envelope does not obstruct the views to the river in this direction.

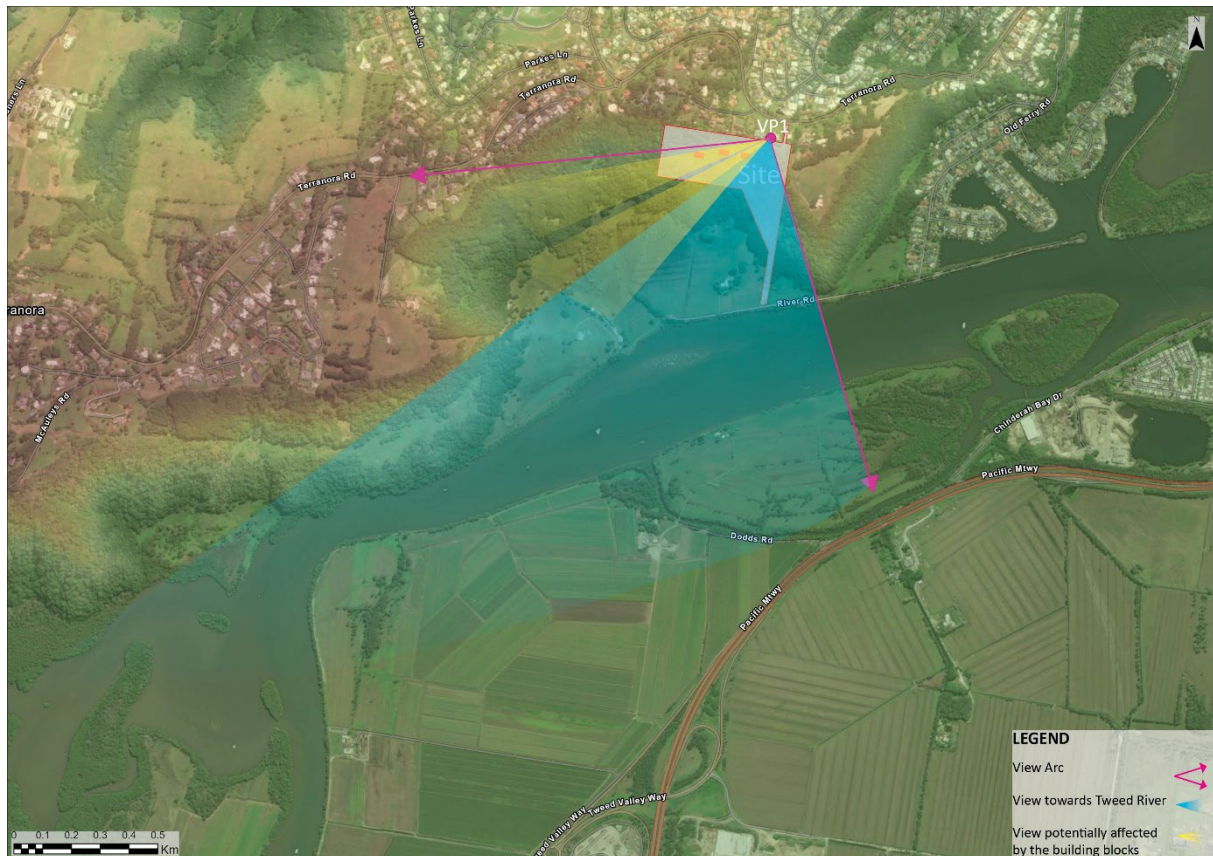


Figure 23 - Viewpoint 1 location map and view arc.



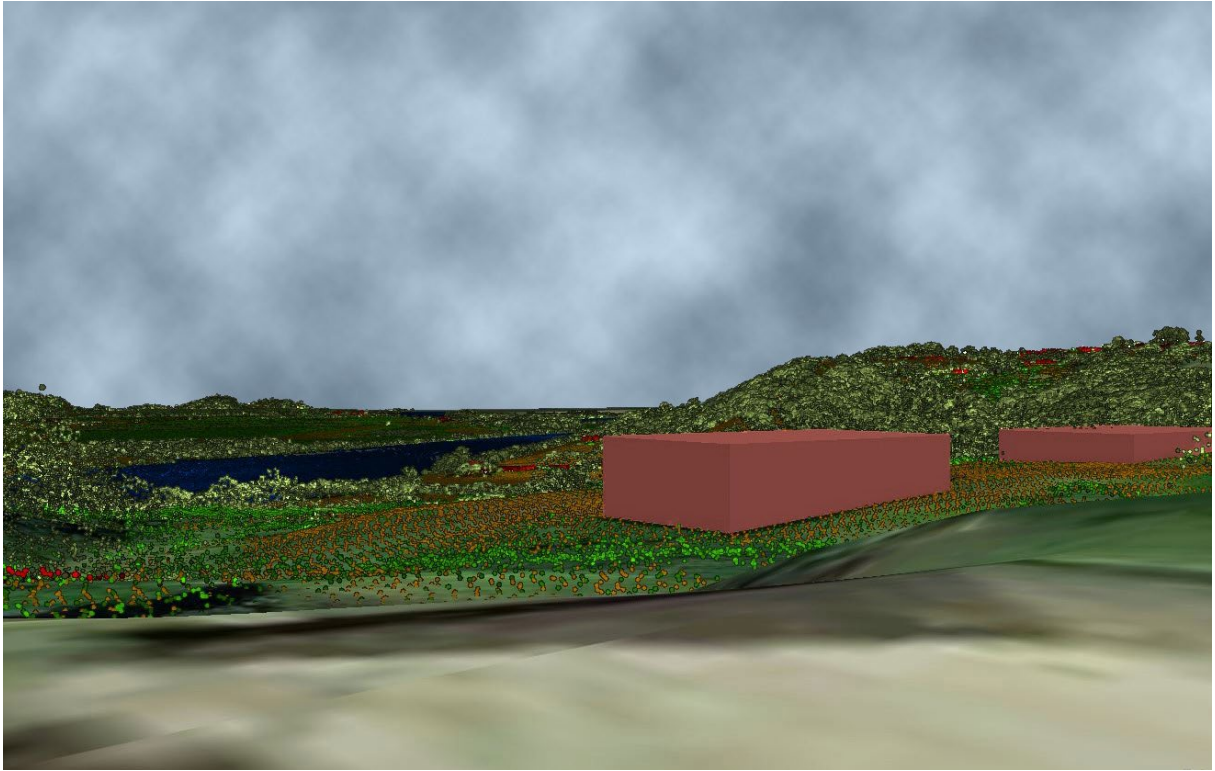


Figure 24 - Virtual view from viewpoint 1.

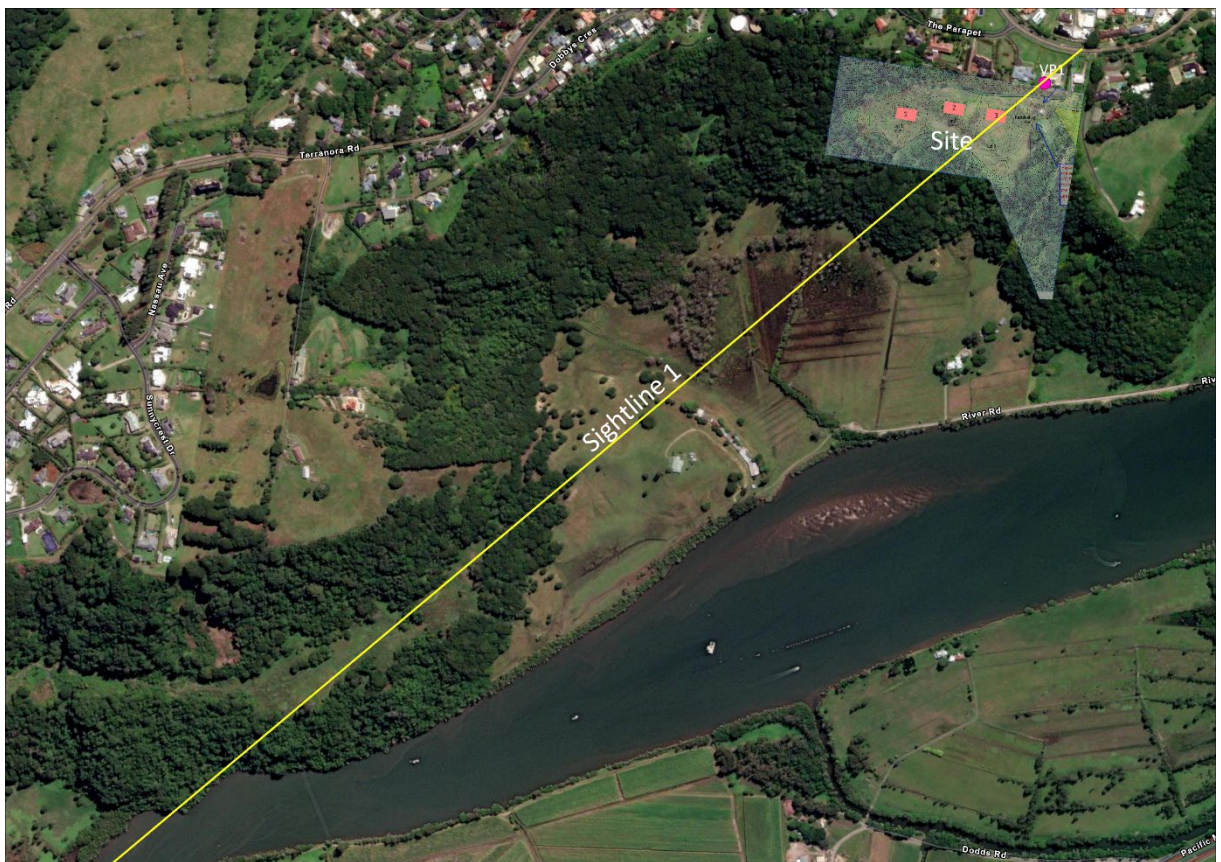


Figure 25 – Sightline 1 location map.

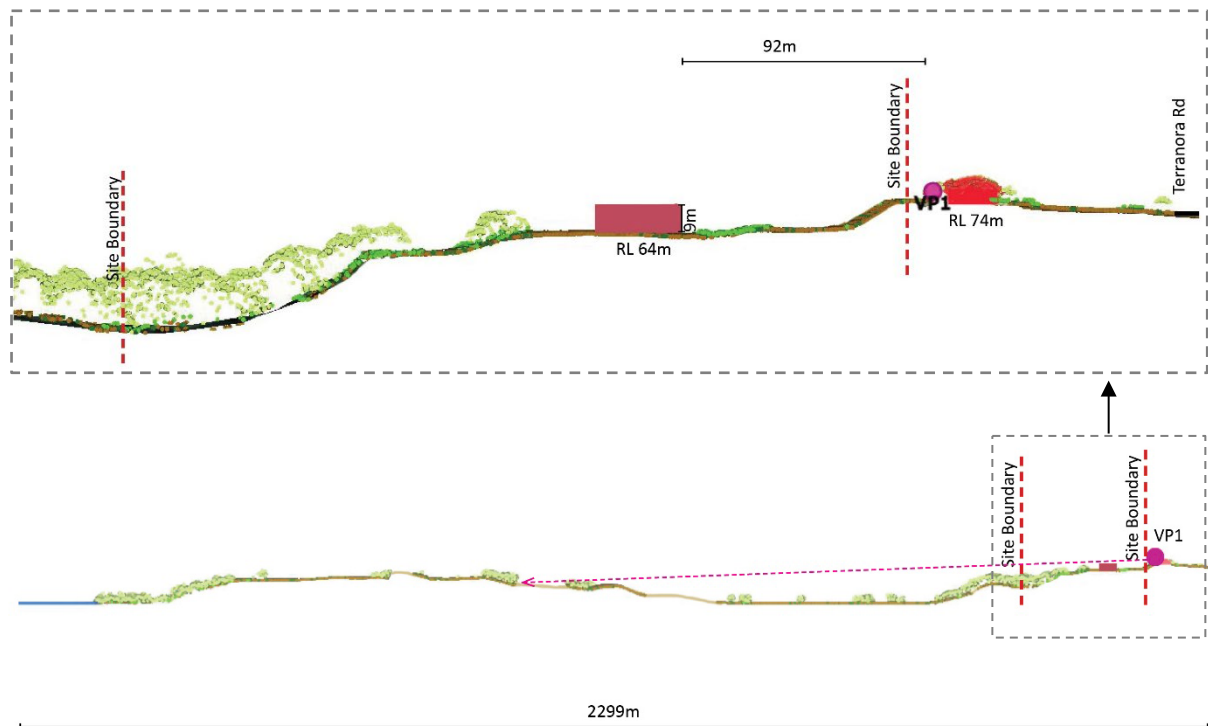


Figure 26 - Sightline 1 and the enlarged segment of it.

#### 4.1.2 Viewpoint 2:

- 69 This viewpoint is a house at 10 The Parapet neighbouring the site to the north. This house is primarily oriented to the north, with expansive views across Tweed and towards the Gold Coast. The house also has the benefit of expansive views to the south, towards the valley and the river. Of note, this house sits at an elevation of approximately 78 metres AHD, approximately 12-22 metres higher than the proposed envelopes (ground level) for Lots 1-3. The viewpoints is approximately 72 metres from the envelope for Lot 2.
- 70 The view arc from this viewpoint is shown in Figure 27. As shown, this house is likely to achieve expansive views to the south including views of the river, and the valley beyond.
- 71 The proposed building envelope on Lots 2 and 3 are the closest to this viewpoint but would still be considerably lower than the viewpoint. The envelope on Lot 1 would not sit within the views towards the river.
- 72 The virtual view (Figure 28 below) confirms the extent of the views to the south, and the visibility of the river. The virtual view also shows that the envelopes for Lots 2-3, if developed to the maximum extent of the envelope, will partially obstruct views to the river.
- 73 Whilst partially obstructing view, the elevation difference and the significant distance between the two envelopes allow for views to the river and at a strategic level, view sharing is facilitated. Through future application processes, opportunity is afforded to further refine and quantify appropriate visual outcomes in accordance with established view sharing principles.
- 74 Figure 29 and Figure 30 below show a sightline section crossing the nearest building envelope (Lot 2). As can be seen in this section Viewpoint 2 sits about 12m higher than the building footprint such that views over the envelopes to the valley floor would still be available.



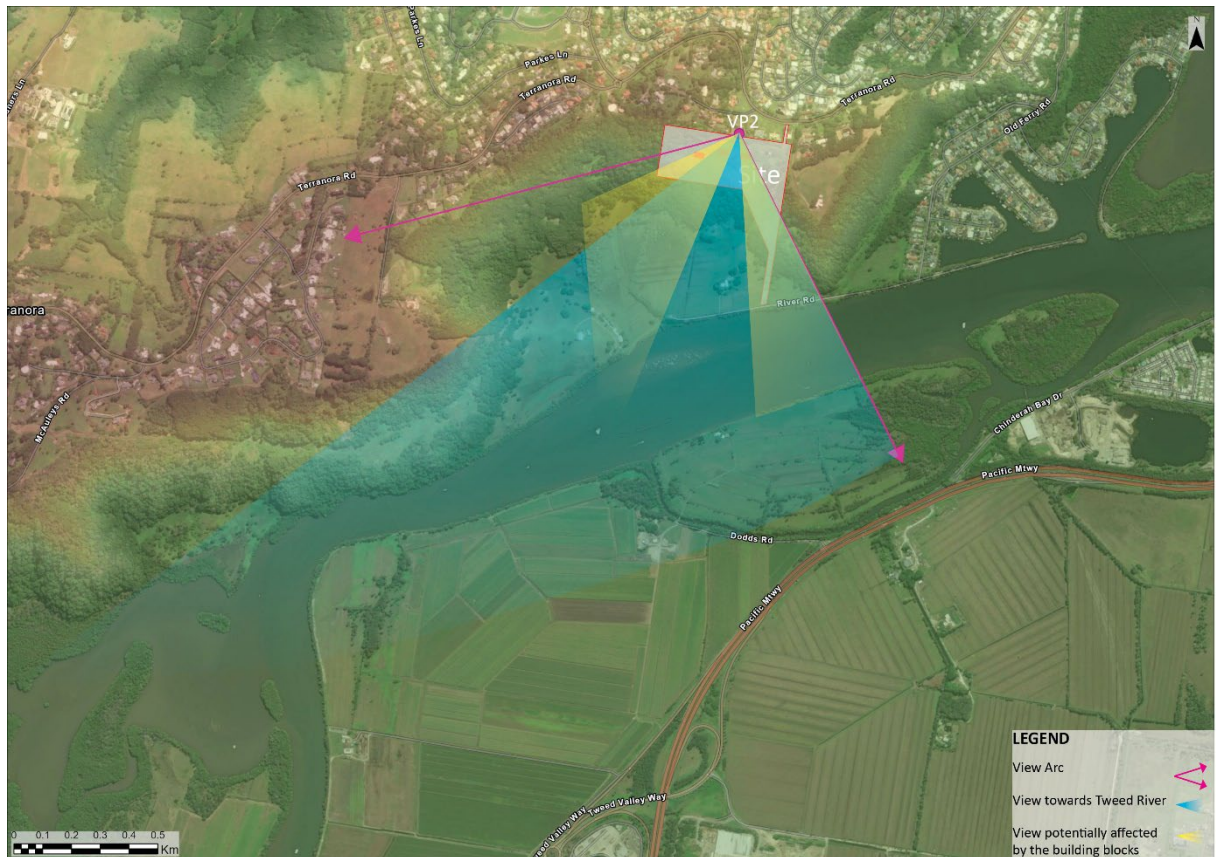


Figure 27 - Viewpoint 2 location map and view arc.

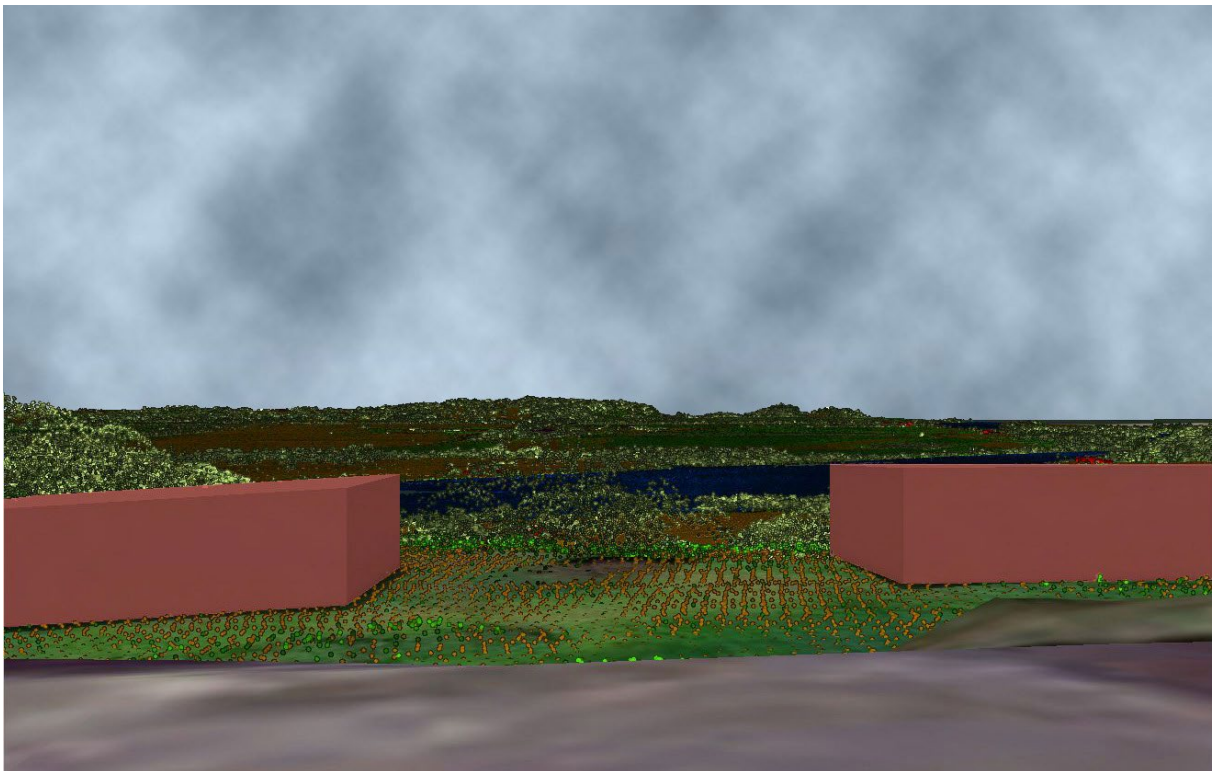


Figure 28 - Virtual view from viewpoint 2.



Figure 29 - Sightline 2 location map.

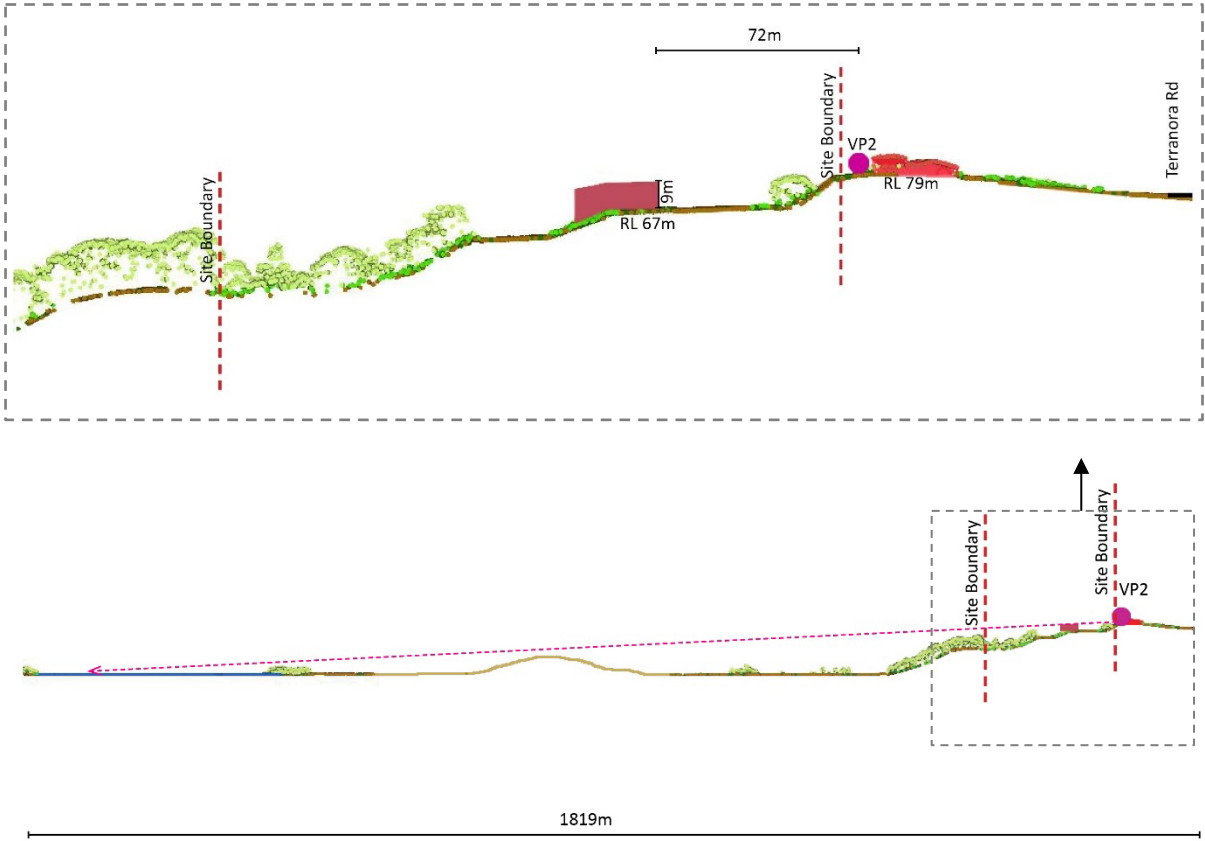


Figure 30 - Sightline 2 and the enlarged segment of it.



#### 4.1.3 Viewpoint 3:

- 75 This viewpoint represents the dwellings neighbouring the site from north-west. These dwellings have partial views towards the river and the escarpment to the south. These houses sit at an elevation of approximately 90-100 metres AHD, approximately 30-40 metres higher than the proposed envelopes (ground level) for Lots 1-3. The viewpoint is approximately 92 metres from the envelope for Lot 1. These views are partially obstructed by existing vegetation through the north-western part of the site.
- 76 The view arc from this viewpoint is shown in Figure 31. As shown, these houses are likely to achieve expansive views to the south including views of the river, and the valley beyond.
- 77 The proposed building envelope on Lots 1 and 2 are the closest to this viewpoint but would still be considerably lower than the viewpoint. The envelope on Lot 3 would not sit within the views towards the river.
- 78 The virtual view at (Figure 32 below) confirms the extent of the views to the south, and the visibility of the river. The virtual view also shows that the envelopes for Lots 1-2 will partially obstruct views to the river. However, because this viewpoint sits at a much higher elevation and about 90-110 metres away from the building envelopes on Lots 1 and 2, views to the river are still available above the envelopes. This is confirmed in the sightline sections at Figure 33 and Figure 34 below.

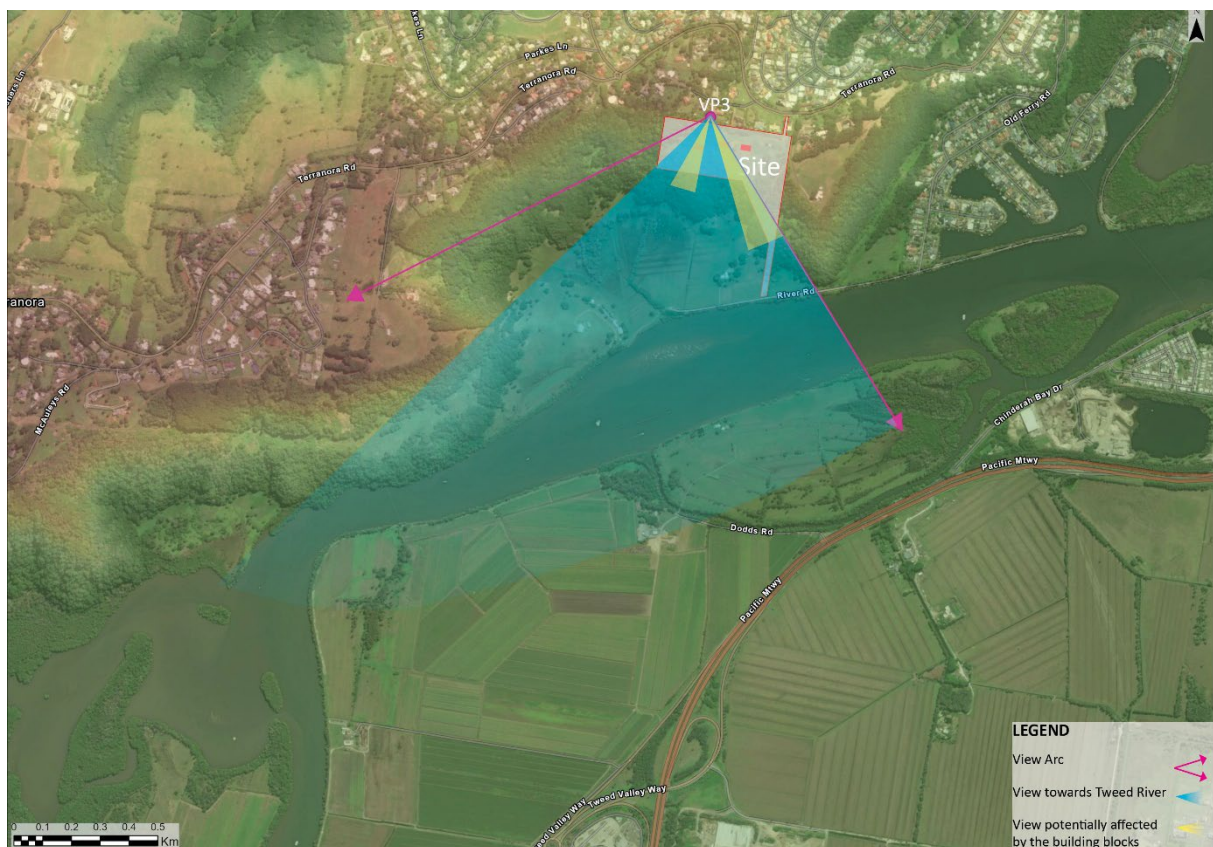


Figure 31 - Viewpoint 3 location map and view arc.

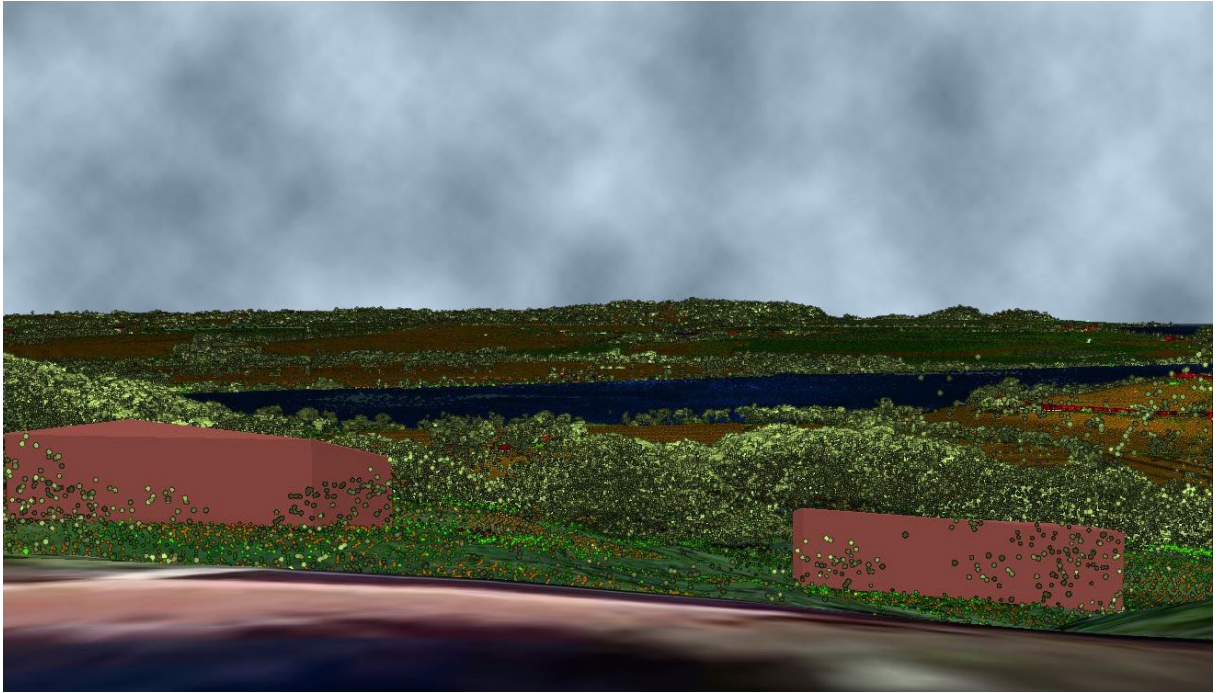


Figure 32 - Virtual views from viewpoint 3.

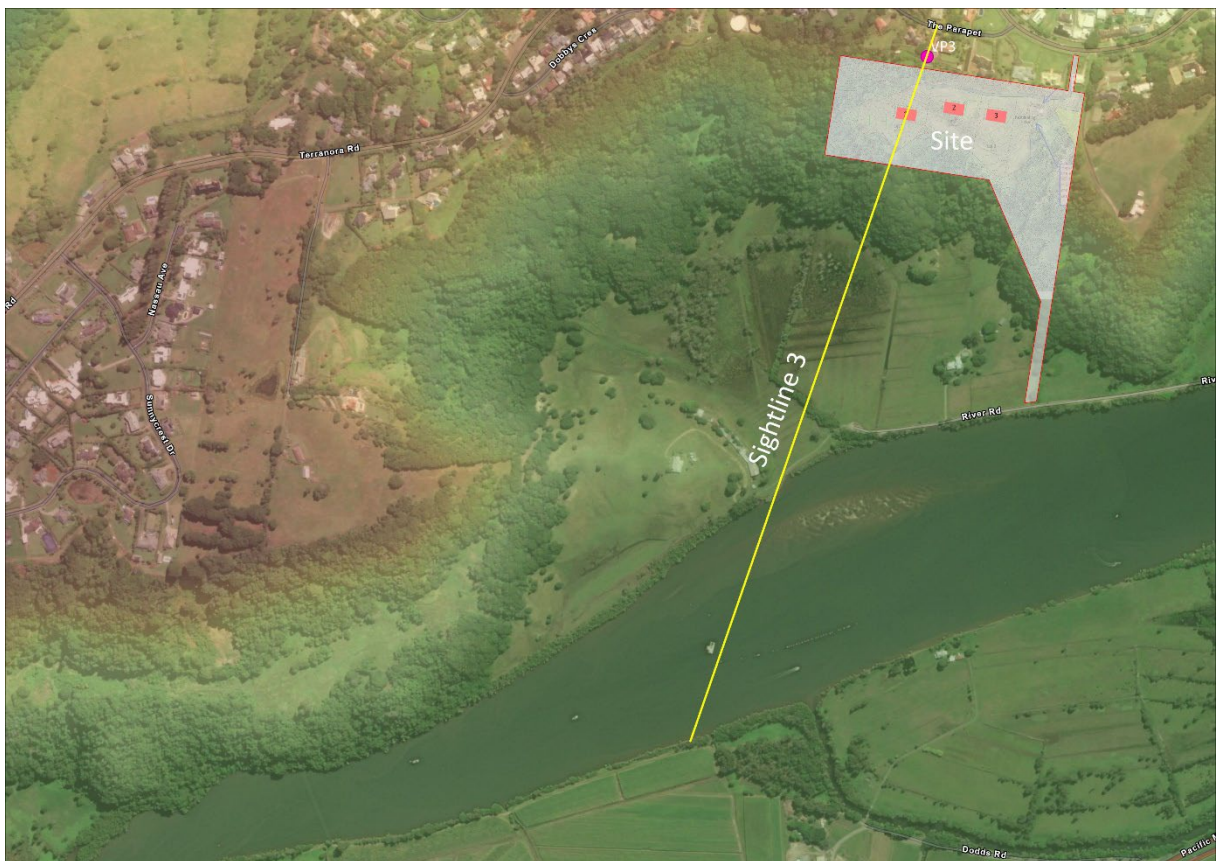


Figure 33 - Sightline 3 location map.



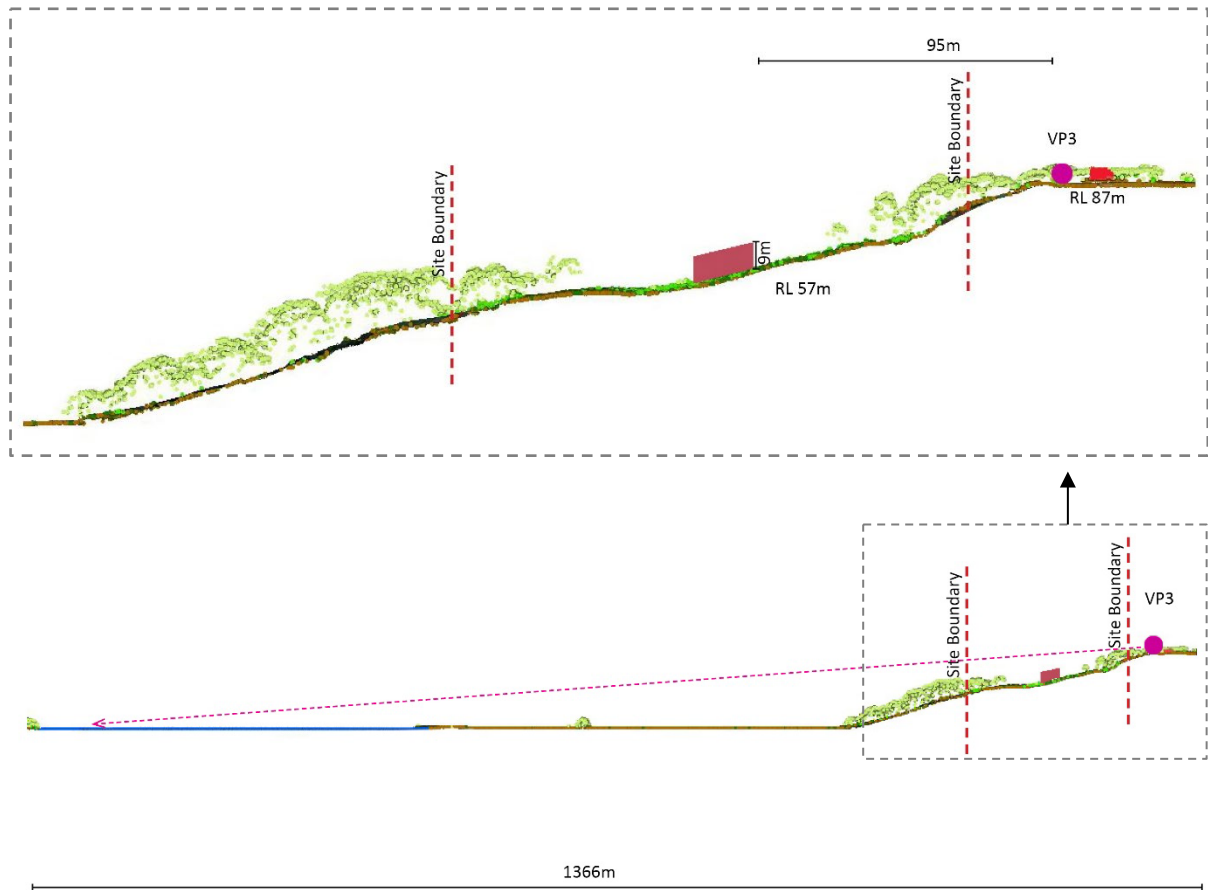


Figure 34 - Sightline 3 and the enlarged segment of it.

#### 4.1.4 Viewpoint 4:

- 79 This viewpoint represents the dwellings to the north-west of the subject site. These dwellings are not neighbouring the subject site and are at least 500 metres away from the site, with dense vegetation in between. As can be seen in Figure 35, although the site can be seen, the main views from this viewpoint are not towards the site and views towards the river would not be interrupted by the proposed building envelopes.
- 80 As shown on Figure 36, the proposed building envelopes can hardly be seen from this viewpoint. To the extent they are seen, the envelopes are much lower than the vegetated hill to the east of the site and do not protrude above the skyline.
- 81 Figure 37 and Figure 38 show the sightline when the view is directed towards the buildings. These figures confirm that the proposed envelopes sit 50m lower than the viewpoint, that the intervening vegetation partially obstruct the views to the envelopes, and that the views to the ridgeline to the east of the site will not be obstructed.



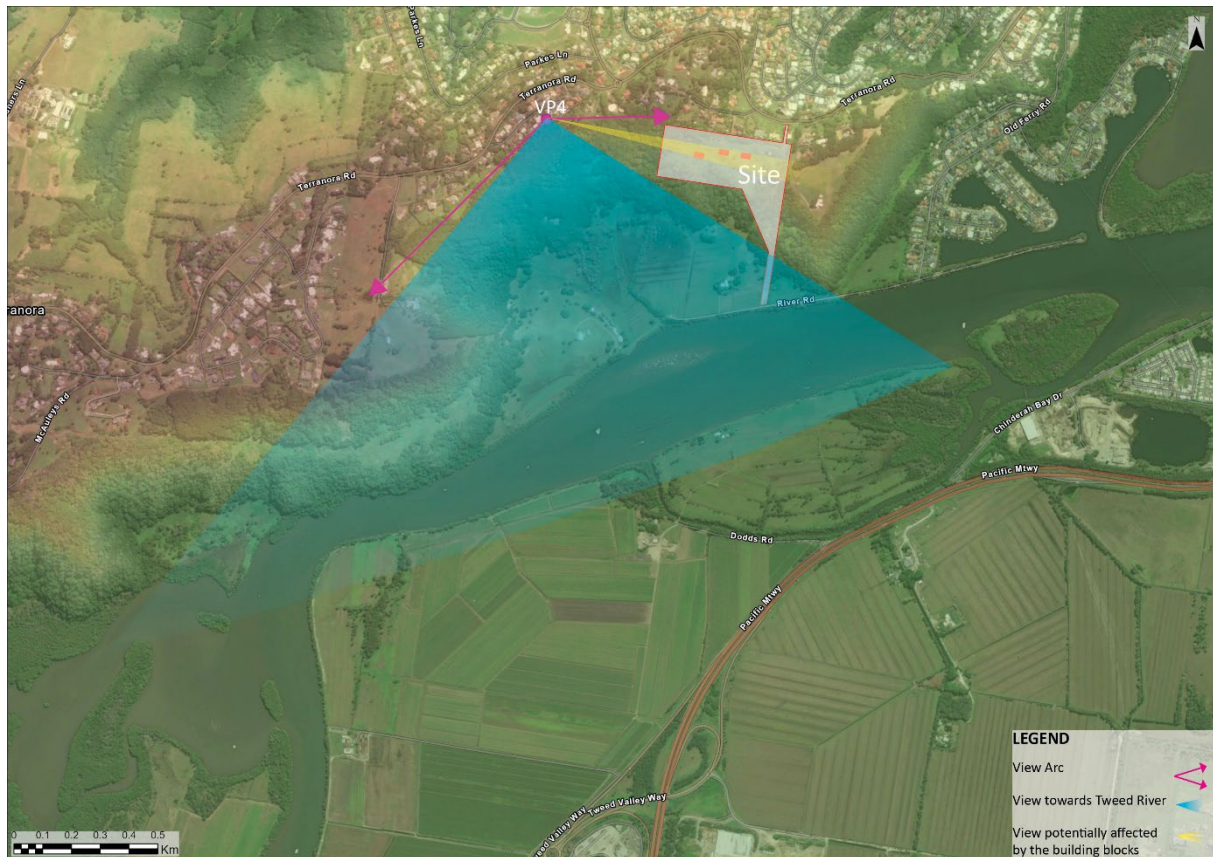


Figure 35 - Viewpoint 4 location map and view arc.

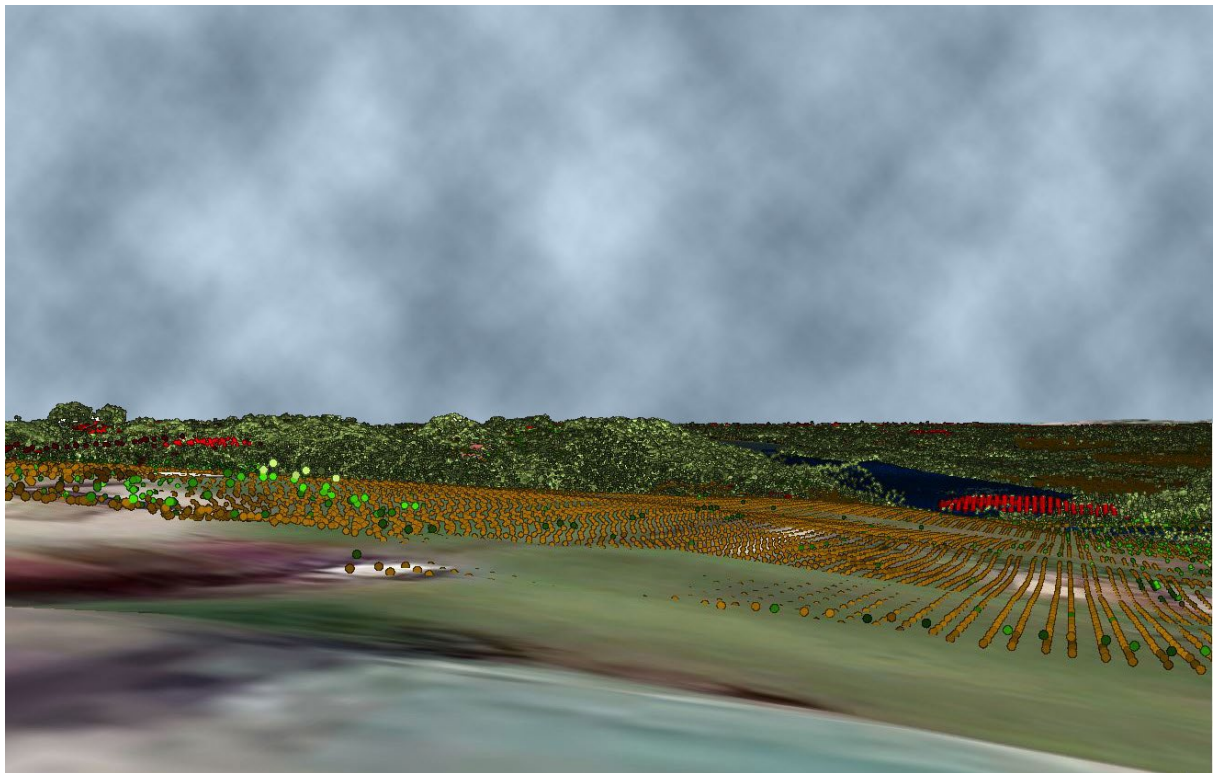


Figure 36 - Virtual view from viewpoint 4.





Figure 37 - Sightline 4 location map.

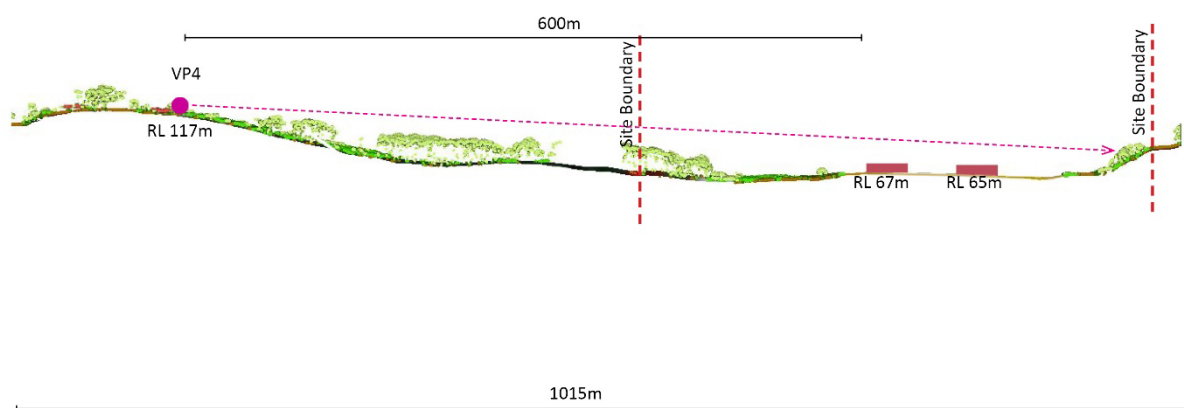


Figure 38 – Sightline 4.

#### 4.1.5 Viewpoint 5:

- 82 This viewpoint represents the dwellings from the residential area further west of the subject site. These viewpoints are more than 1.3km from the site.
- 83 These dwellings have expansive views towards the river and beyond to Kingscliff and the ocean. The view arc from this viewpoint is shown in Figure 39. This figure shows that the proposed building envelopes would not obstruct views to the river.

- 84 Figure 40 shows that, because of the distance and the intervening vegetation, even when the view is directed to the proposed building envelopes they are integrated with the surrounding and do not change the qualities of the views.
- 85 The sightline section at Figure 41 and Figure 42 also shows the distance between the viewpoint and the building block and the elevation difference.

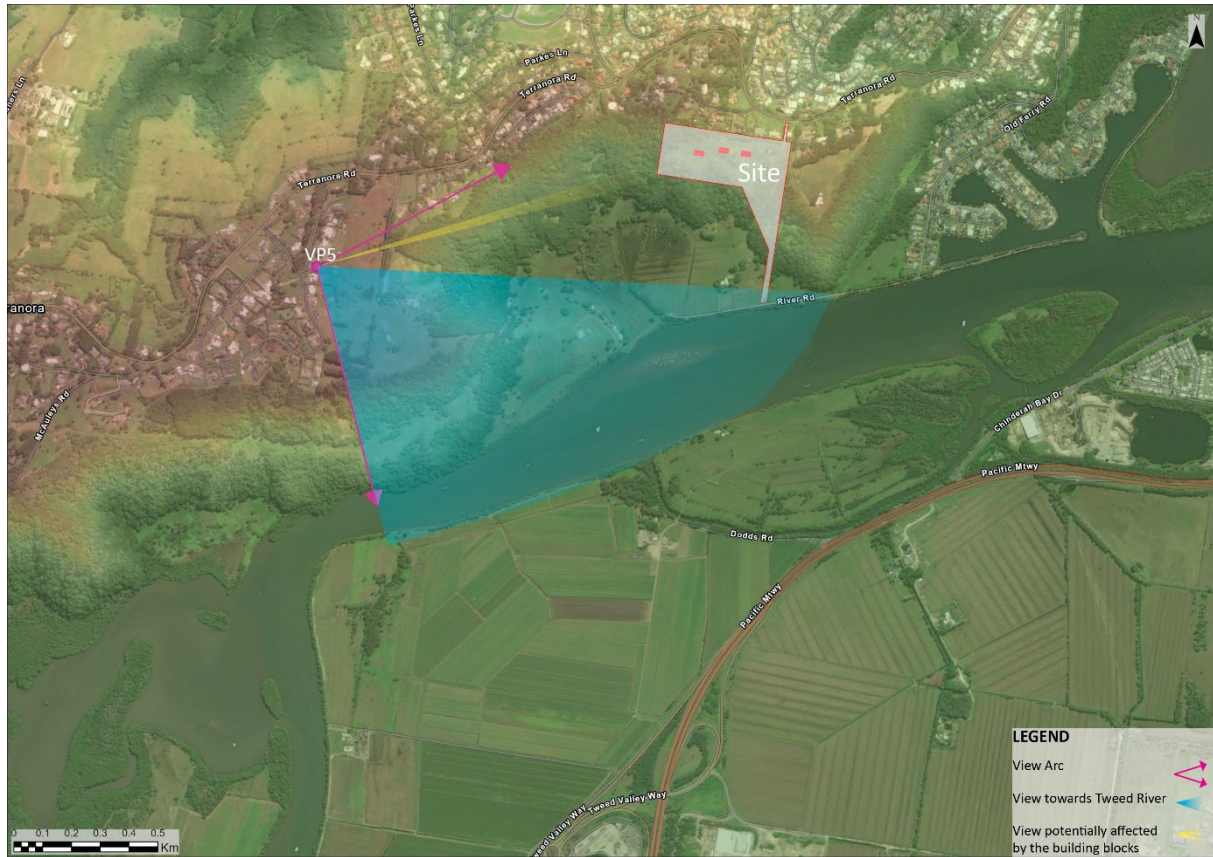


Figure 39 - Viewpoint 5 location map and view arc.



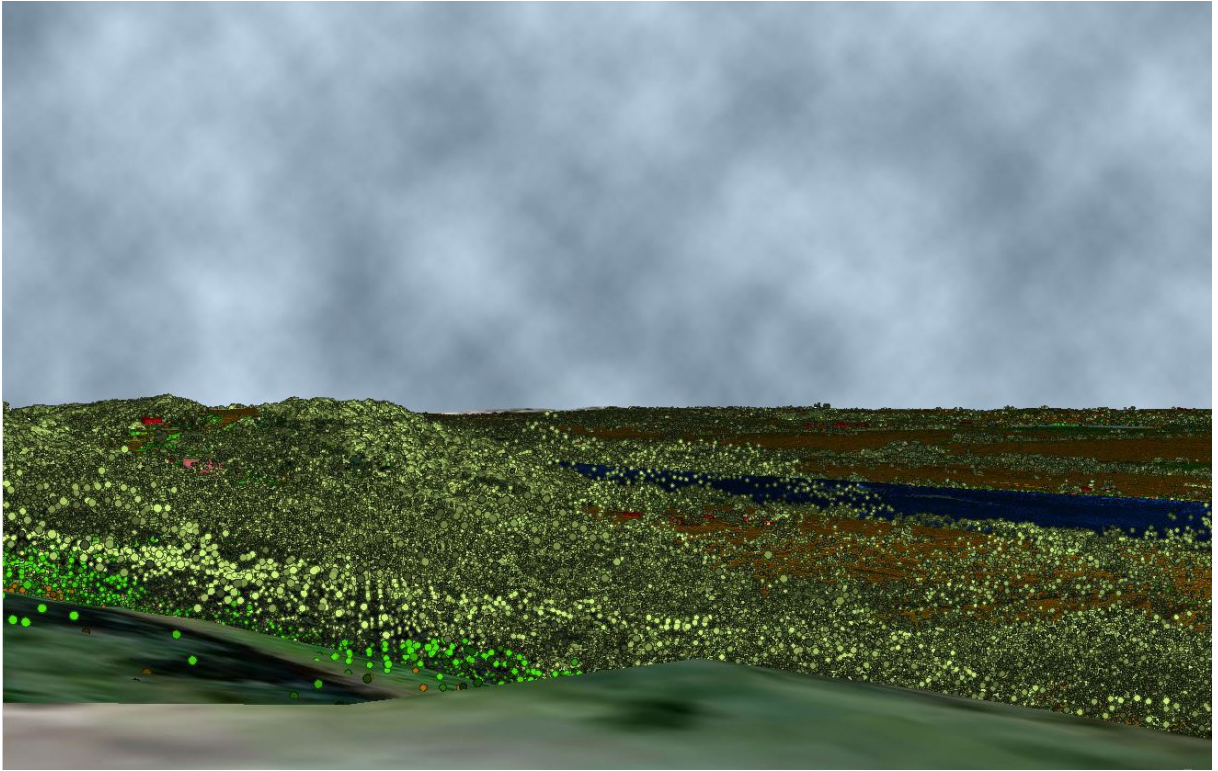


Figure 40 - Virtual view from viewpoint 5.

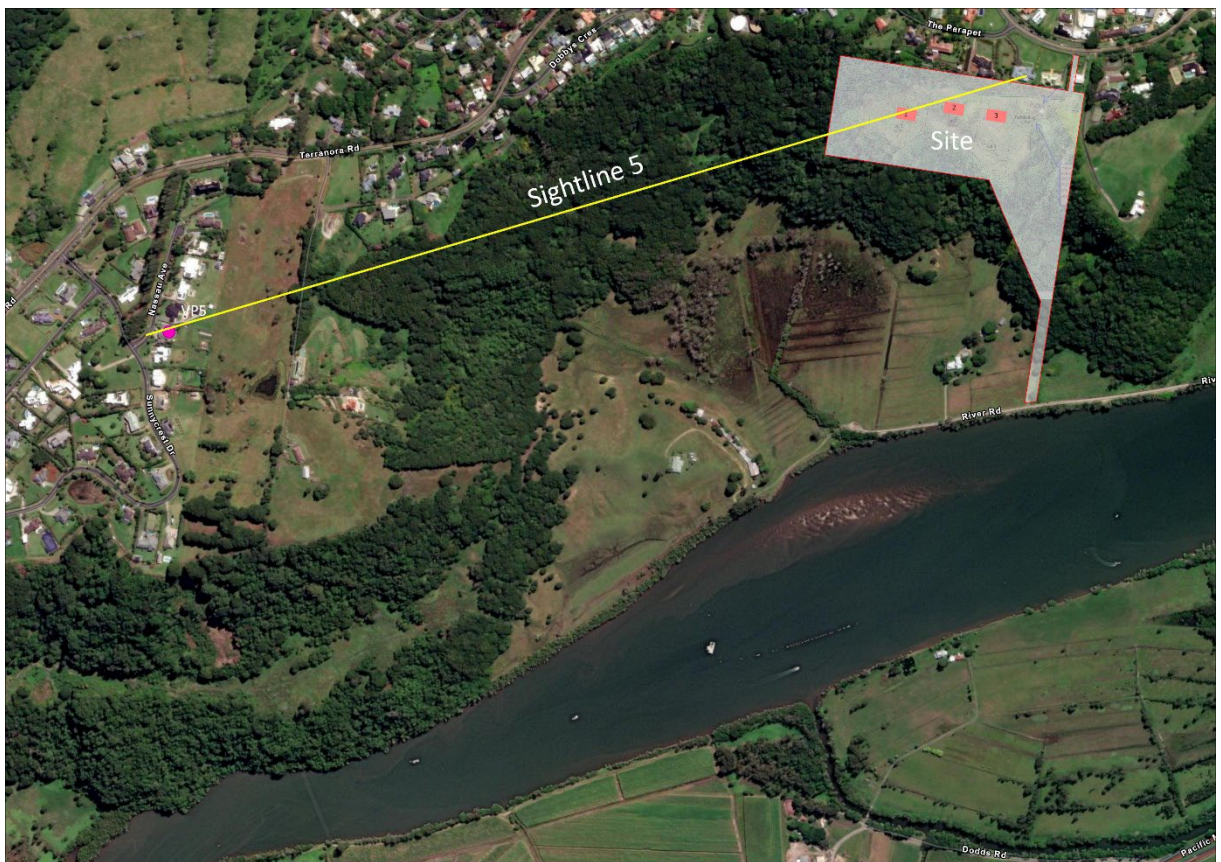


Figure 41 - Sightline 5 location map.

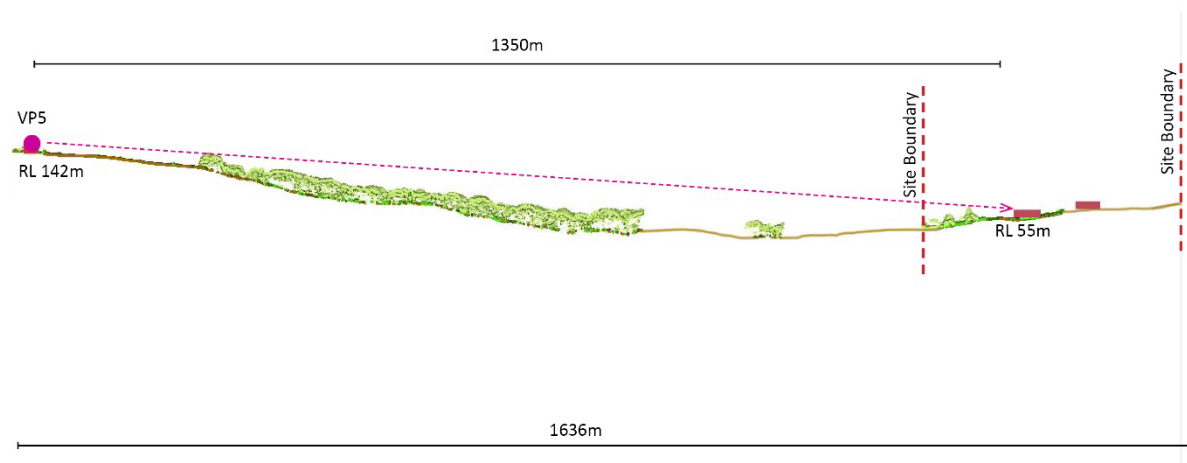


Figure 42 - Sightline 5.

## 4.2 Key Viewpoints South of the Subject Site

- 86 All of the key viewpoints to the south of the subject site are public viewpoints taken from roads traversing the valley and foothills to the south of Tweed River.
- 87 The visibility mapping indicated that, of the viewing situations described in the SLS, Tweed Valley Way and Pacific Highway are the viewing situations with clear views towards the subject site. Viewpoints 6, 7 and 8 have been selected from these two viewing situations.
- 88 The DSM visibility mapping indicated Tweed Coast Road is unlikely to achieve views to the subject site, hence Viewpoint 9 has been selected from Cudgen Road as an alternative viewpoint that does achieve views to the subject site.

### 4.2.1 Viewpoint 6:

- 89 This viewpoint represents views for people travelling along the Pacific Motorway where it has views to the subject site. The viewpoint is from the closest section of the road to the site and at about 1.5 km away from the proposed building envelopes (refer to Figure 43). This view is representative of a number of viewing opportunities along this section of the road.
- 90 Figure 43 shows the existing view taken with a 50mm focal length and Figure 44 is a virtual view with an equivalent field of view.
- 91 Figure 43 shows that the view towards the subject site is an attractive view, extending across the river valley to the escarpment which presents as an attractive treed backdrop, with limited built form intrusions. Where they are visible, existing buildings are generally integrated amongst the vegetation on the slopes of the escarpment and do not protrude above the ridgeline.
- 92 The virtual view shows that building envelopes on Lots 1 and 2 will sit well below the vegetated skyline and the envelope on Lot 3, while higher, still does not protrude above the skyline. The envelopes are well separated allowing for vegetation in between to integrate them into the landscape. They also have distance from the row of houses above them with vegetation in between to avoid the impression of a dense built form image.



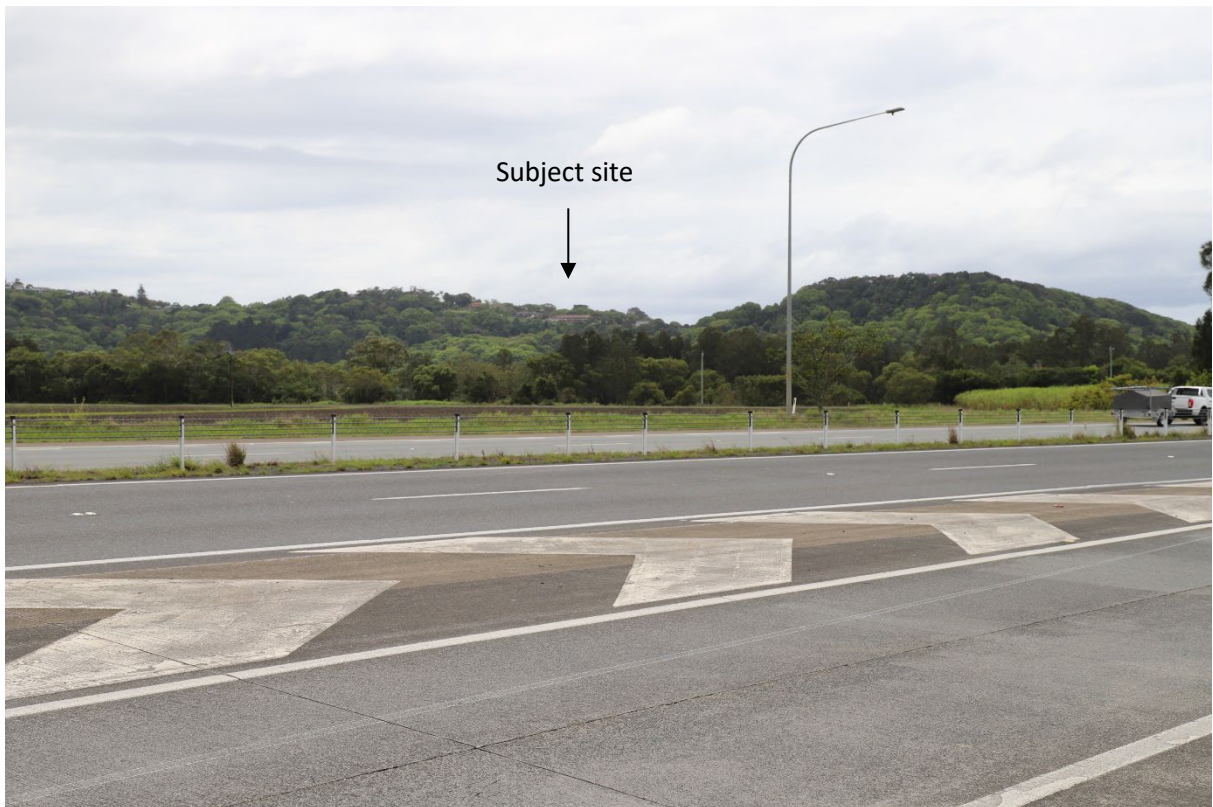


Figure 43 - Viewpoint 6 - Existing view from Pacific Motorway looking north towards the site.

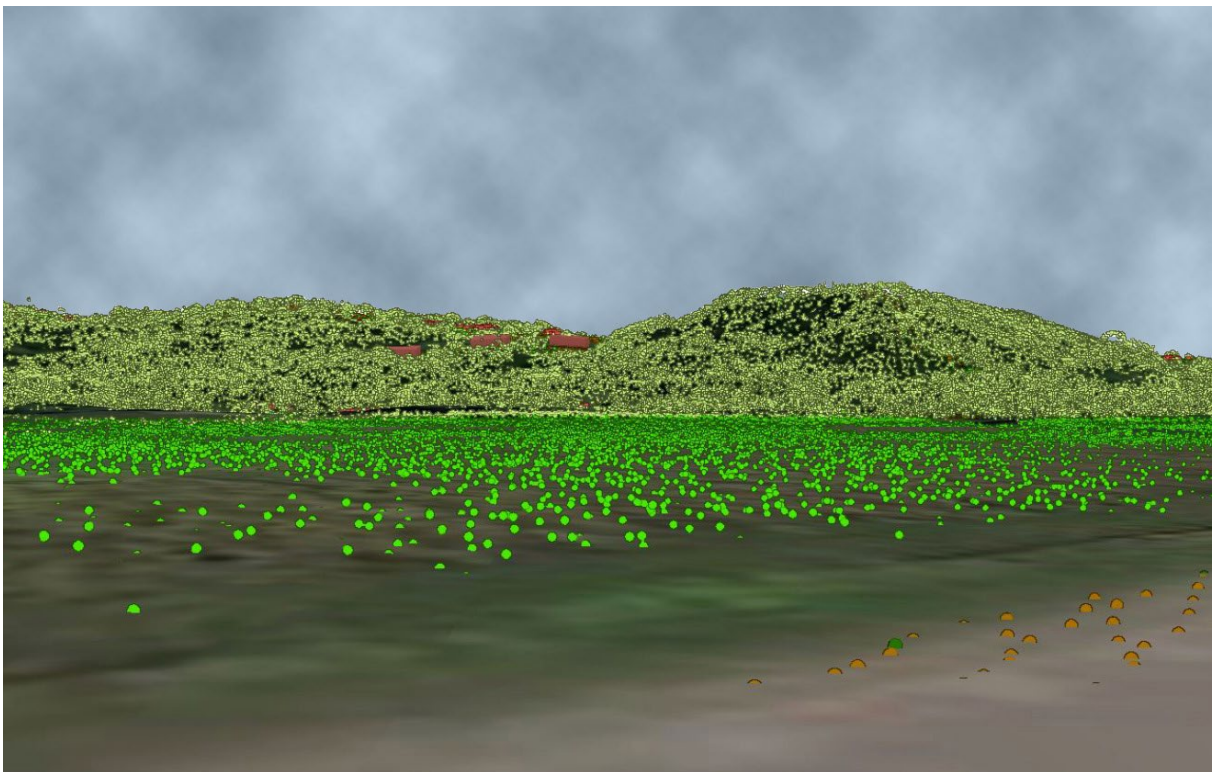


Figure 44 - Virtual view from Viewpoint 6 showing the proposed development.

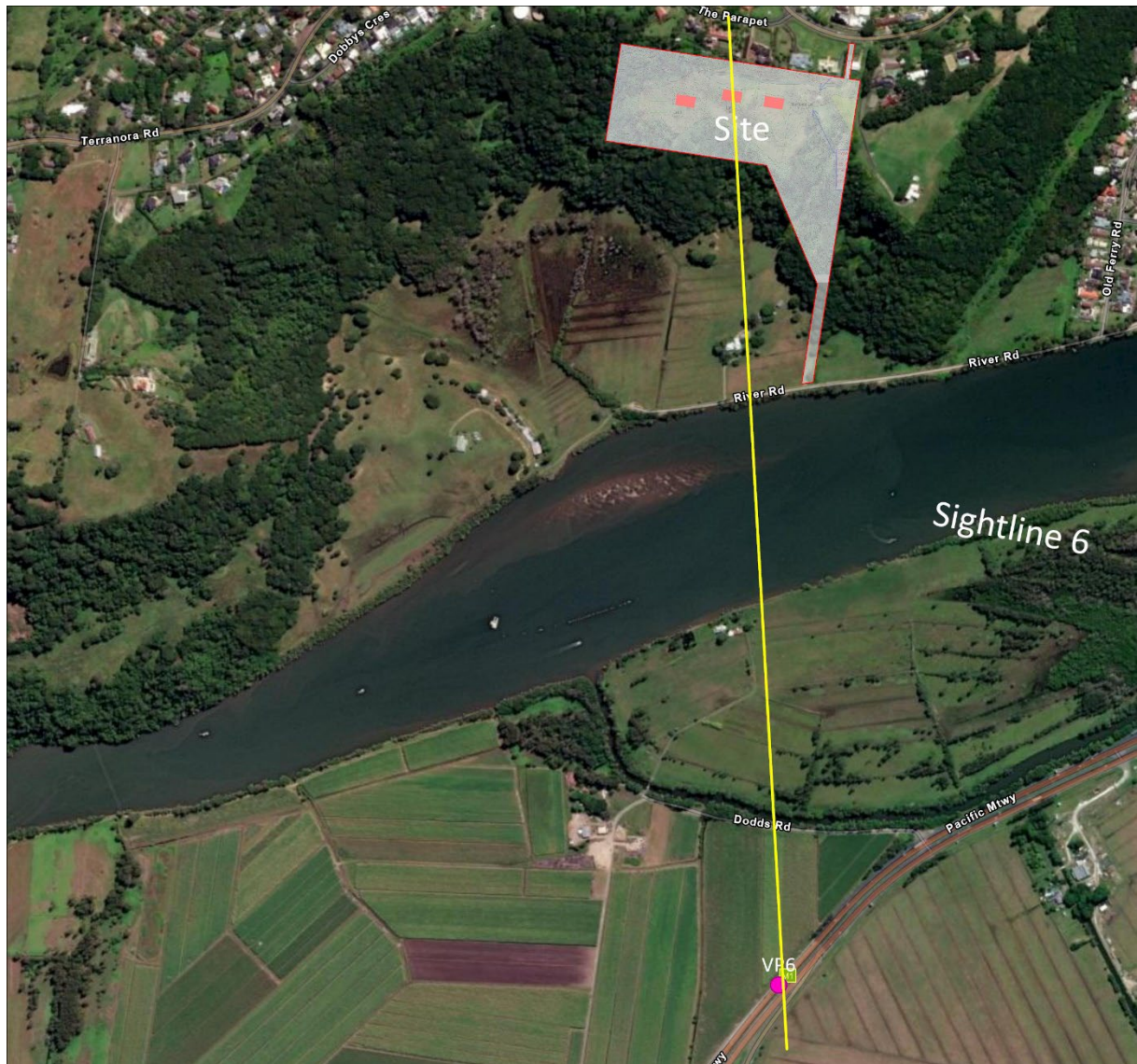


Figure 45 - Sightline 6 location map.

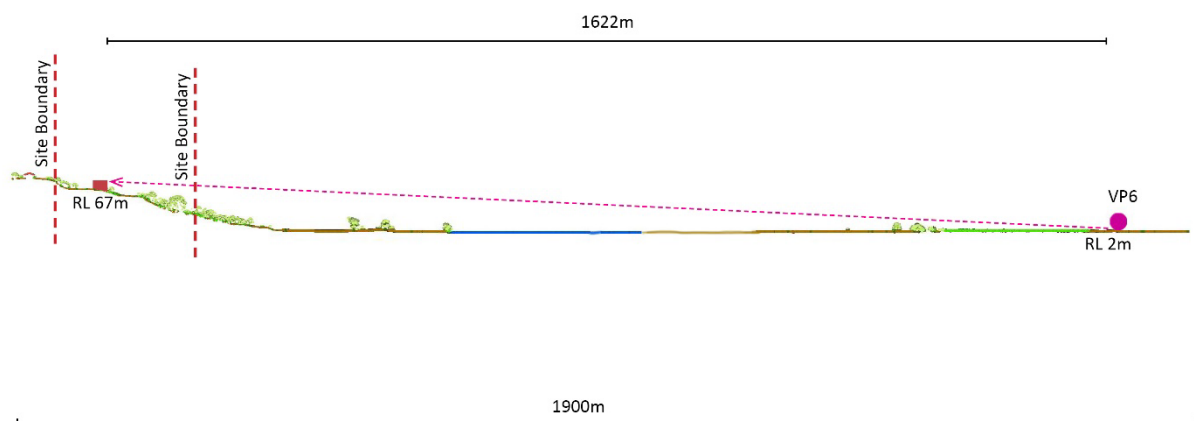


Figure 46 - Sightline 6.



#### 4.2.2 Viewpoint 7:

- 93 This viewpoint is from the overpass of Tweed Valley Way and the Pacific Motorway. The viewpoint is slightly more elevated in relation to its surroundings which has a flat topography all the way up to Tweed River.
- 94 As for Viewpoint 6, the view towards the subject site is an attractive view, extending across the river valley to the escarpment which presents as an attractive treed backdrop, with limited built form intrusions. Where they are visible, existing buildings are generally integrated amongst the vegetation on the slopes of the escarpment and do not protrude above the ridgeline.
- 95 This viewpoint is about 2.2 km from the subject site and, as can be seen in Figure 47 and Figure 48 below, the proposed building envelopes are hardly noticeable in this view.
- 96 To better understand how the proposed development sits within the landscape Figure 49 shows a magnified view of the subject site from Viewpoint 7. The magnifying enables a better appreciation of the building envelopes, and shows that they would be very well integrated into the landscape and do not make an impact.



Figure 47 - Viewpoint 7 - Existing view from near Tweed Valley Way overpass.

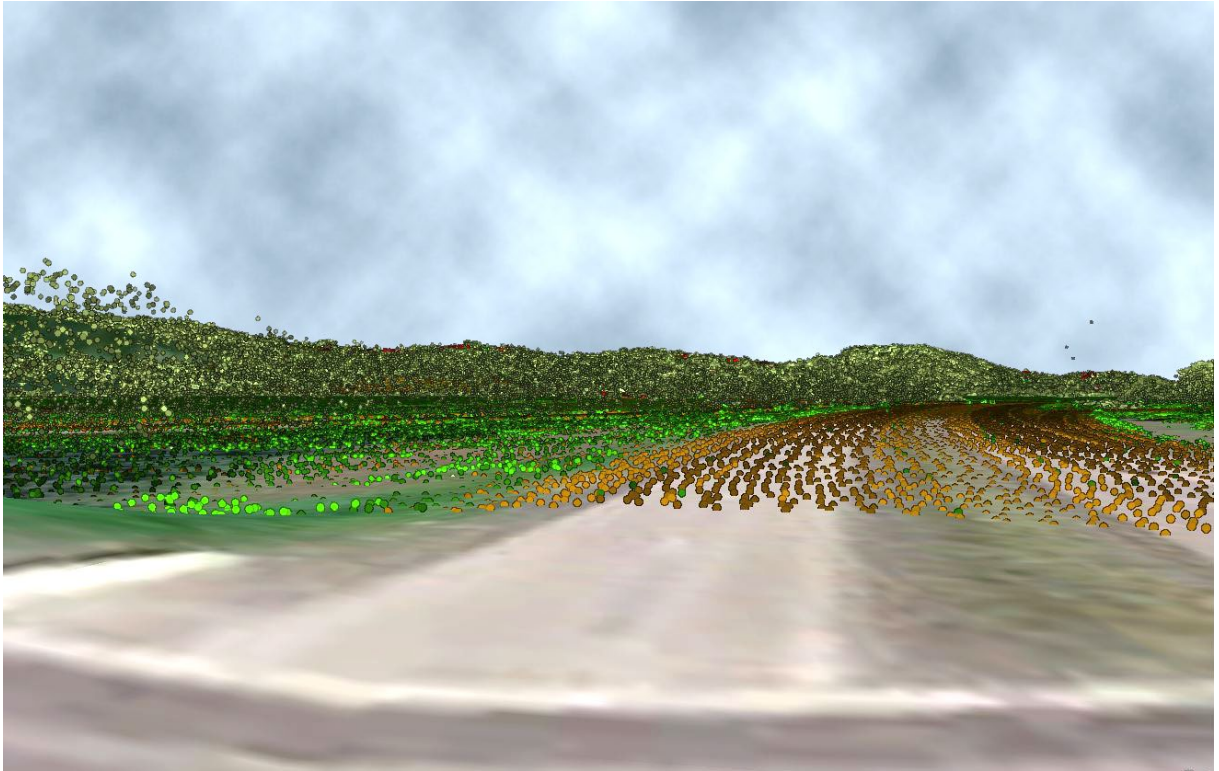


Figure 48 - Virtual view from viewpoint 7. (Equivalent to 24mm photo)

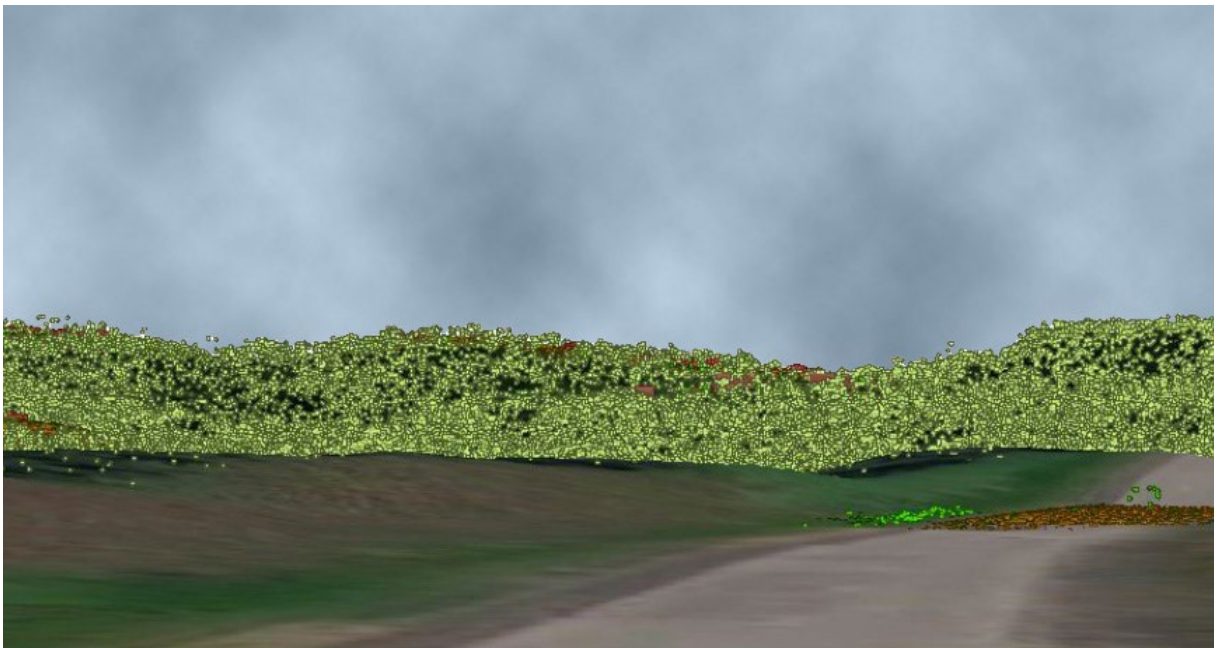


Figure 49 - Magnified virtual view from viewpoint 7.



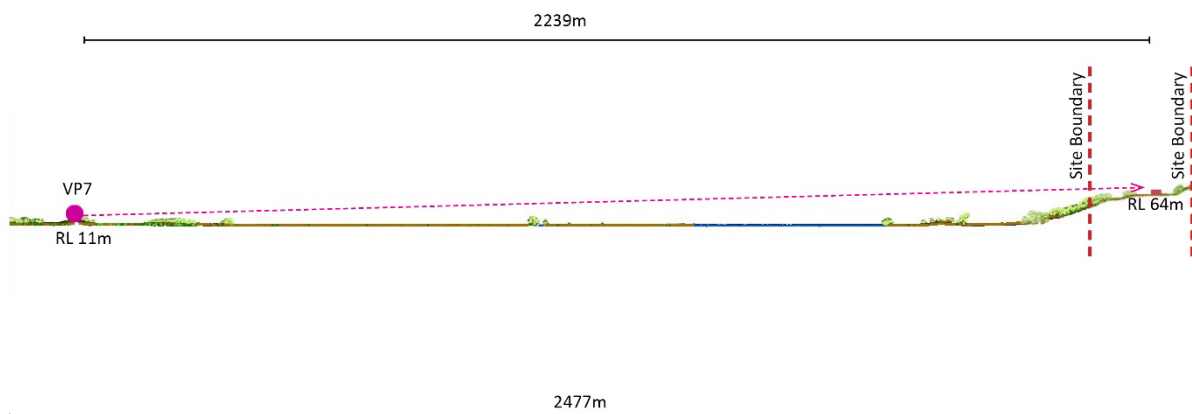


Figure 50 - Sightline 7.

#### 4.2.3 Viewpoint 8:

- 97 This viewpoint is from Tweed Valley way at about 2.7 km from the subject site. As shown at Figure 51, the vegetated escarpment provides an attractive backdrop for this view. Existing dwellings along the slopes of the escarpment and on the ridgeline can be seen in but are not impactful from this viewpoint as they are well integrated with the surrounding vegetation. Figure 52 below shows that the proposed envelopes would be similarly well integrated.



Figure 51 - Existing view from Tweed Valley way towards north.

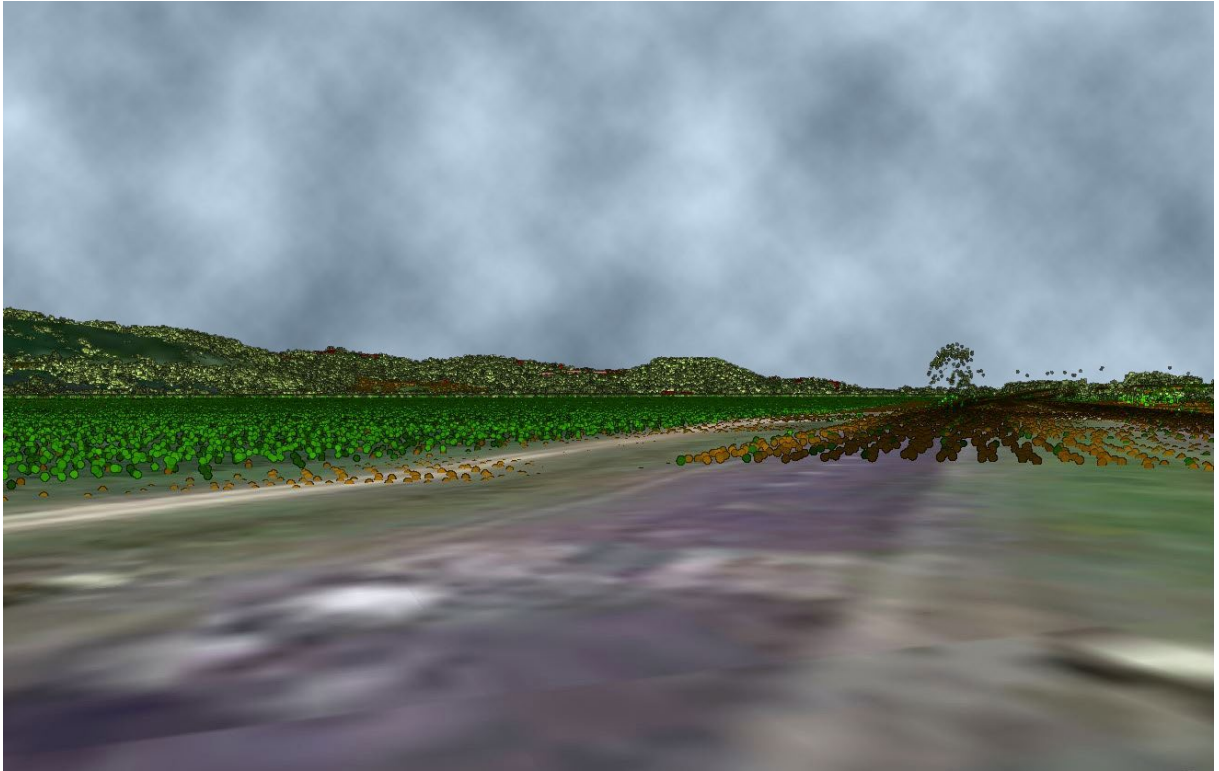


Figure 52 - Virtual view from Viewpoint 8.

#### 4.2.4 Viewpoint 9:

- 98 This viewpoint is from Cudgen Road which is one the few distant local roads that achieve some views to the subject site. The viewpoint is 4.5 km away from the site.
- 99 Figure 53 shows the existing view and shows that existing dwellings on the escarpment can be seen but are very small elements in an expansive and distant view. Figure 54 below shows that the proposed envelopes would have similar or lesser visibility.





Figure 53 – Existing view from Cudgen Road (Viewpoint 9) to the north.

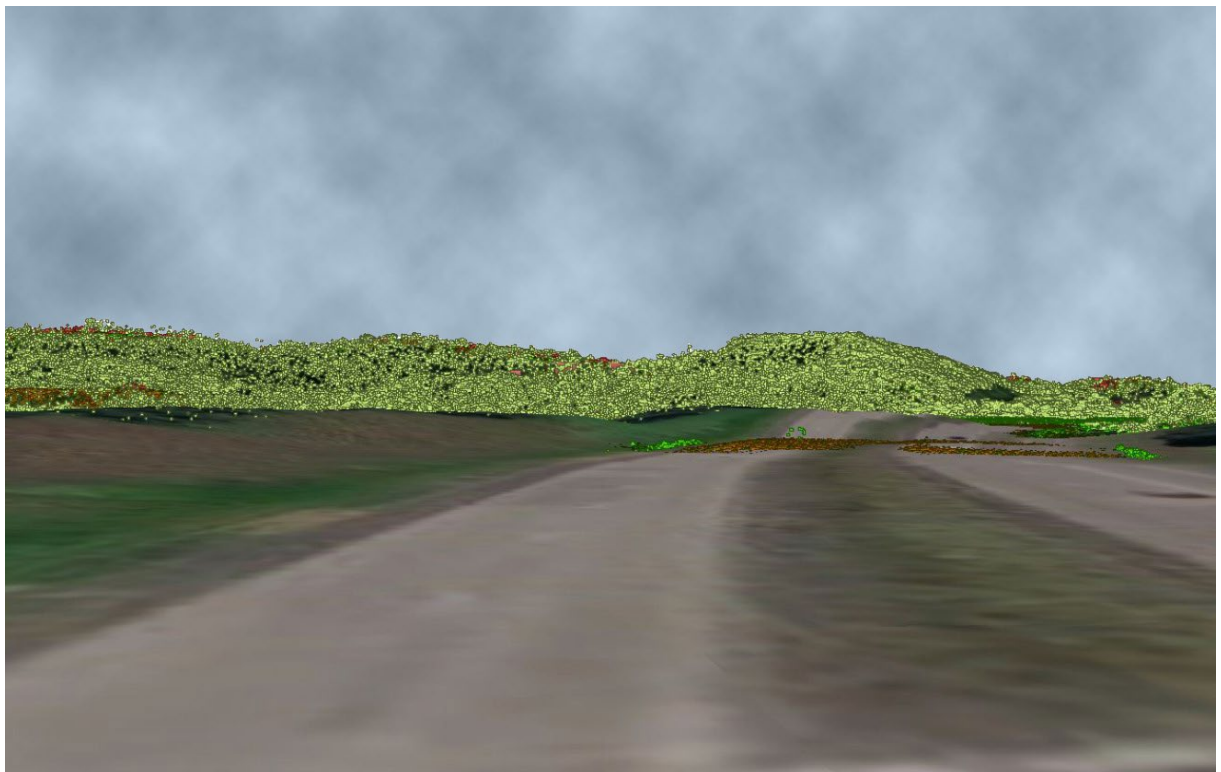


Figure 54 - Virtual view from Viewpoint 9 to the subject site.

## 5 Summary and Conclusions

- 100 Insight DAS has been engaged to provide a view impact assessment in relation to land at 225 Terranora Road, Terranora (Lot 16 DP 856265). The current planning proposal seeks to rezone a portion of the site to the Large Lot Residential zone and facilitate three development lots. Within a concept masterplan each development lot has an identified building envelope, with future built form to be located within each envelope to a maximum height of 9 metres above height of 9m from existing ground level.
- 101 Acknowledging the strategic context of the building envelope, this analysis has effectively considered a worse-case scenario. Future applications offer opportunity to refine this analysis through greater building detail and form. These future processes are strongly expected to reduce the extent of building bulk, and further confirm limited view impact.
- 102 Visibility mapping was prepared by InsightDAS to understand the potential visibility of the proposed building envelopes. As a first step DEM visibility mapping was prepared considering only ground data to exclude the areas which will not have any views to the site because of the topography. The second step was to prepare a DSM visibility map to identify the areas which will potentially achieve views to these building envelopes considering the effects of vegetation and built form in obstructing the views. Three separate visibility maps were created for each envelope to further understand the likely visibility of each envelope.
- 103 The visibility mapping and field investigations allowed identification of nine viewpoints for further investigation. These included five viewpoints from private properties to the north, northwest and west of the site and four viewpoints from roads traversing the valley and foothills to the south of the Tweed River. Three of these viewpoints were representative of identified viewing situations in the draft Scenic Landscape Strategy.
- 104 View analysis was undertaken for each these identified viewpoints. This included mapping of viewsheds, preparation of virtual views, and sightline sections. The analysis revealed the following:
- a) Views to the south from Viewpoints 1, 2 and 3 would be affected to varying degrees by built form within the building envelopes. However, due to the separation between the envelopes and the relatively significant difference in elevation between these viewpoints and the envelopes, a large portion of the main views from these viewpoints to the notable landscape features, the river and the valley would remain.
  - b) Viewpoints 4 and 5 do not have their main direction of the view towards the site and their views will remain expansive. When views are directed towards the site, the envelopes would remain well below the skyline and the vegetated hill to the east of the site. The distance, the intervening vegetation and the scale of the potential development would substantially limit impacts on views from these viewpoints.
  - c) Viewpoint 6 is the closest of the viewpoints to the south and provides an appreciation of views from Tweed River. In this view none of the building envelopes protrude above the skyline and the envelopes would be well integrated with the vegetation on the site, similar to existing built form on the escarpment.
  - d) Because of distance, the proposed building envelopes would have very low impacts on Viewpoints 7 and 8 and, like other built form on the escarpment, would appear well integrated with the escarpment vegetation.
  - e) From Viewpoint 9, and again due to distance, the impacts from the building envelopes would be negligible.
- 105 Ultimately the analysis determined that:



- a) While built form within the proposed building envelopes may obstruct limited parts of the views from the houses to the north of the site (noting that some of these views are and could further be obstructed by vegetation), the outcome was reflective of a appropriate view sharing outcome. While it is not considered necessary, there is ample space available for planting between the proposed building envelopes and the northern boundary to accommodate vegetation that could screen built form within the building envelopes. Furthermore, contextual dwelling design and materials is anticipated to reduce the already limited impacts on views.
- b) Due to the location of the building envelopes on a step of the escarpment, the envelopes would not have significant impacts on views from viewpoints to the south of the site. Built form in these envelopes would not protrude above the skyline and would be likely to be well integrated with the vegetation on the escarpment. While it is not considered necessary, impacts on views from the south could be further mitigated by requiring that future built form in the building envelopes is of recessive colours and has articulated roof forms.

## APPENDIX A – Draft Scenic Landscape Strategy

### Summary of Viewsheds

For 225 Terranora Road, Banora Point 2468

Area of interest: 10.17 ha

Detailed viewshed maps in relation to the developable area of the subject site:

Bruce Chick Reserve Viewshed

Pacific Motorway

Terranora Road viewshed

Tweed Coast Road

Tweed Valley Way

Tweed River Panorama Viewshed



## Summary

Name	Count	Area(hectares)	Length(km)
Priority 1 Viewsheds Applicable	10	101.75	N/A
Priority 2 Viewsheds Applicable	14	142.45	N/A
Landscape Character Units	2	10.17	N/A

## Priority 1 Viewsheds Applicable

#	Address	Viewshed Name	Viewshed Type	Priority	% land covered by viewshed	Area land covered by viewshed	Area(hectares)
1	225 Terranora Road BANORA POINT 2486	Tweed Coast Road	Linear	Priority 1	23.6 %	2.4 Ha	10.17
2	225 Terranora Road BANORA POINT 2486	Tweed Valley Way	Linear	Priority 1	94.8 %	9.6 Ha	10.17
3	225 Terranora Road BANORA POINT 2486	Tomewin Road	Linear	Priority 1	1.2 %	1239.0 m2	10.17
4	225 Terranora Road BANORA POINT 2486	Pacific Highway	Linear	Priority 1	87.5 %	8.9 Ha	10.17
5	225 Terranora Road BANORA POINT 2486	Bruce Chick Reserve	Static	Priority 1	82.1 %	8.4 Ha	10.17
6	225 Terranora Road BANORA POINT 2486	Hastings Point Headland	Static	Priority 1	24.3 %	2.5 Ha	10.17
7	225 Terranora Road BANORA POINT 2486	Tweed Regional Art Gallery (Observation Deck)	Static	Priority 1	40.5 %	4.1 Ha	10.17
8	225 Terranora Road BANORA POINT 2486	Jack Evans Boat Harbour	Static	Priority 1	2.7 %	2779.2 m2	10.17
9	225 Terranora Road BANORA POINT 2486	Cabarita Headland	Static	Priority 1	38.4 %	3.9 Ha	10.17
10	225 Terranora Road BANORA POINT 2486	Point Danger	Static	Priority 1	2.6 %	2667.7 m2	10.17

## Priority 2 Viewsheds Applicable

#	Address	Viewshed Name	Viewshed Type	Priority	% land covered by viewshed	Area land covered by viewshed	Area(hectares)
1	225 Terranora Road BANORA POINT 2486	Riverside Drive	Linear	Priority 2	2.7 %	2770.9 m2	10.17
2	225 Terranora Road BANORA POINT 2486	Minjunbal Drive	Linear	Priority 2	3.2 %	3229.5 m2	10.17
3	225 Terranora Road BANORA POINT 2486	Bakers Road	Linear	Priority 2	49.3 %	5.0 Ha	10.17
4	225 Terranora Road BANORA POINT 2486	Cane Road and Tumbulgum Road	Linear	Priority 2	48.4 %	4.9 Ha	10.17
5	225 Terranora Road BANORA POINT 2486	Tweed River Panorama	Linear	Priority 2	88.8 %	9.0 Ha	10.17
6	225 Terranora Road BANORA POINT 2486	Terranora Road	Linear	Priority 2	81.3 %	8.3 Ha	10.17
7	225 Terranora Road BANORA POINT 2486	Bells Boulevard Cycleway	Static	Priority 2	1.5 %	1568.3 m2	10.17
8	225 Terranora Road BANORA POINT 2486	Blackbutt Lookout	Static	Priority 2	4.1 %	4131.8 m2	10.17
9	225 Terranora Road BANORA POINT 2486	Cunningham Park	Static	Priority 2	3.0 %	3057.3 m2	10.17
10	225 Terranora Road BANORA POINT 2486	Cudgera Creek Park	Static	Priority 2	19.3 %	2.0 Ha	10.17
11	225 Terranora Road BANORA POINT 2486	Lions Lookout	Static	Priority 2	31.6 %	3.2 Ha	10.17
12	225 Terranora Road BANORA POINT 2486	Ocean Avenue and Cycleway	Static	Priority 2	14.5 %	1.5 Ha	10.17
13	225 Terranora Road BANORA POINT 2486	Kerosene Bay	Static	Priority 2	1.0 %	1036.3 m2	10.17
14	225 Terranora Road BANORA POINT 2486	Razorback Lookout	Static	Priority 2	3.9 %	3924.7 m2	10.17

### Landscape Character Units

#	Landscape Unit	Area(hectares)
1	Rural Hills & Valleys	3.14
2	Urban	7.03

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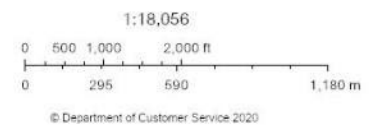


## Draft Scenic Landscape Strategy



26/10/2022, 10:50:51

- Static Viewing Location
- Static VS - Bruce Chick Reserve (Priority 1)
- Roads
- Suburb Boundaries
- ▭ Tweed Shire Boundary



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Draft Scenic Landscape Strategy



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Draft Scenic Landscape Strategy



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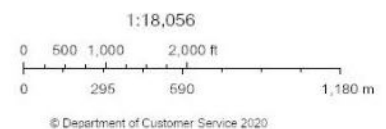


## Draft Scenic Landscape Strategy



26/10/2022, 10:31:07

- Linear Viewing Situations
- VS Tweed Coast Road (Priority 1)
- ◆ Towns
- Roads
- Suburb Boundaries
- Tweed Shire Boundary



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### Draft Scenic Landscape Strategy



26/10/2022, 11:28:53

- Linear Viewing Situations
- VS Tweed River Panorama (Priority 2)
- Roads
- Suburb Boundaries
- Tweed Shire Boundary

1:18,056  
0 500 1,000 2,000 ft  
0 225 450 900 m  
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### Draft Scenic Landscape Strategy



26/10/2022, 10:22:27

- Linear Viewing Situations
- VS Tweed Valley Way (Priority 1)
- Roads
- Suburb Boundaries
- Tweed Shire Boundary

1:18,056  
0 1,000 2,000 4,000 ft  
0 320 640 1,280 m  
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