16. Landscape Character and Visual Amenity

16.1 Existing Landscape Character and Visual Amenity Values

The landscape of the proposed Emu Swamp Dam is complex. There are numerous vineyards, fruit and vegetable farms and cellar doors in the area surrounded by rich tracts of open eucalypt woodland interspersed with visually prominent granite outcrops and boulders. The Severn River dissects these elements and provides an intimate scene for those land holders able to directly access the waters edge.

16.1.1 Elements of the Landscape

A general model for conceptualising and representing the combination of complex landscape elements can be defined as the patch-corridor-matrix model (Forman 1995). These elements when combined help to define a landscape character.

Most landscapes are composed of a mosaic of patches that vary depending upon the investigators point of view. From an ecological perspective patches generally represent homogeneous environmental conditions and associated ecological communities. Patches are dynamic and at the scale being used for this assessment are best described as the land cover elements of the landscape largely defined by remnant native vegetation and ecosystems and also cleared “patches” for agriculture.

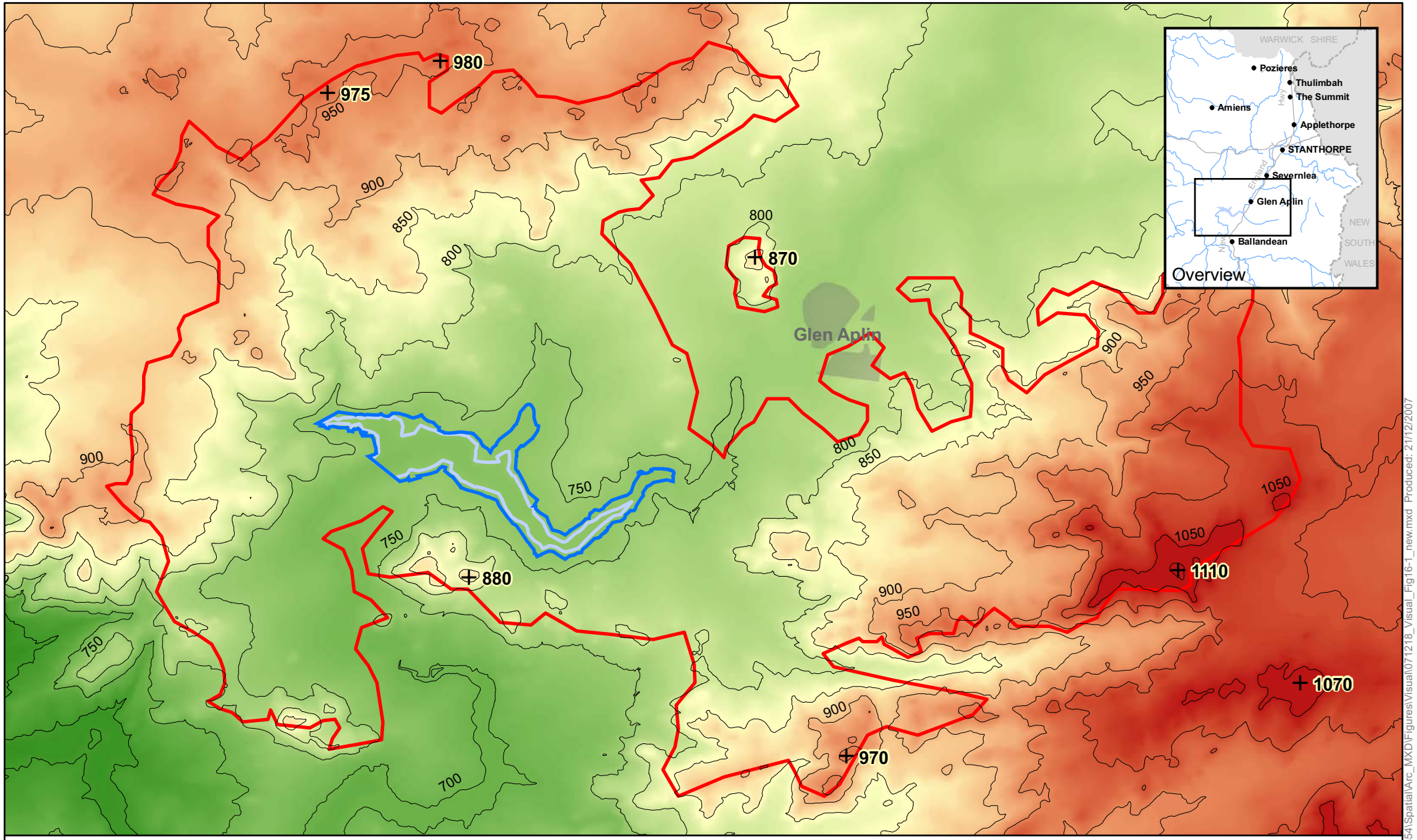
Corridors are linear landscape elements that have largely been focussed on movement corridors between environmental patches. The major linear feature within the proposed Emu Swamp Dam is the Severn River channel which is a very distinctive visual element in the landscape. Broadly these elements have been assessed within the definition of landform.

The concept of matrix plays the dominant role in the functioning of the landscape and is usually the more obvious visual cue to the typical description of a landscape based largely on land use.

The landscape character of the area that will be affected by the Project has been defined by identifying and describing three fundamental elements being: land form, land cover and land use. These elements are analysed and grouped into homogenous components called “landscape character units”.

16.1.1.1 Land Form

Table 16-1 defines the main landforms identified in the visual catchment based on MacDonald *et al* (1990). The general nature of the landform surrounding the proposed Emu Swamp Dam is shown on **Figure 16-1**. The visual catchment shown on the figure is considered the boundary of possible visual impact.



SHIRE OF STANTHORPE

Legend

- Full Supply Level 734.5m AHD
- Full Supply Level 738m AHD
- Height (m AHD)
- 50m Contours
- Visual Catchment

N W E S

0 0.5 1 2

Kilometres

Scale - 1:60,000 (at A4)

Projection: Map Grid of Australia Zone 56

EMU SWAMP DAM EIS

Emu Swamp Dam Site

Figure 16-1
Land Form

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- **Table 16-1 Landform Patterns**

Landform Pattern	Landform Descriptors
Valley flat	Gently inclined to level surface depression of the earth bounded by hills or mountains, a natural trough in the earth's surface that slopes down to a stream.
Swamp	A generally level depression with a seasonal or permanent water table at or above the surface which tends to pond rather than flow
Stream	Linear open channel formed by water flow.
Hills	Landform pattern of high relief with gently inclined to moderately inclined slopes with distinct eroded gullies. The slopes are between 10-20% with some exposed granite rock

The surface of the valley has been excavated by water over time creating the Severn River channel. The Severn River flows from the northeast in a southwest direction before reaching a small cluster of hills causing the channel to change direction. These hills reach 884 m above sea level and are shown on **Figure 16-2** below.

In this area the stream begins to pond in a series of depressions due to the natural granite embankments and man made weirs along its length.

The channel negotiates the hills by flowing west before sweeping around the hill to the south, east and continuing its southwest trajectory towards Sundown National Park.

- **Figure 16-2 Elevated Hill with summit 884 m**

Although public access onto the banks of the stream and channel is limited, intimate scenes of high visual quality are provided for local landholders or those travelling downstream.

16.1.1.2 Land Cover

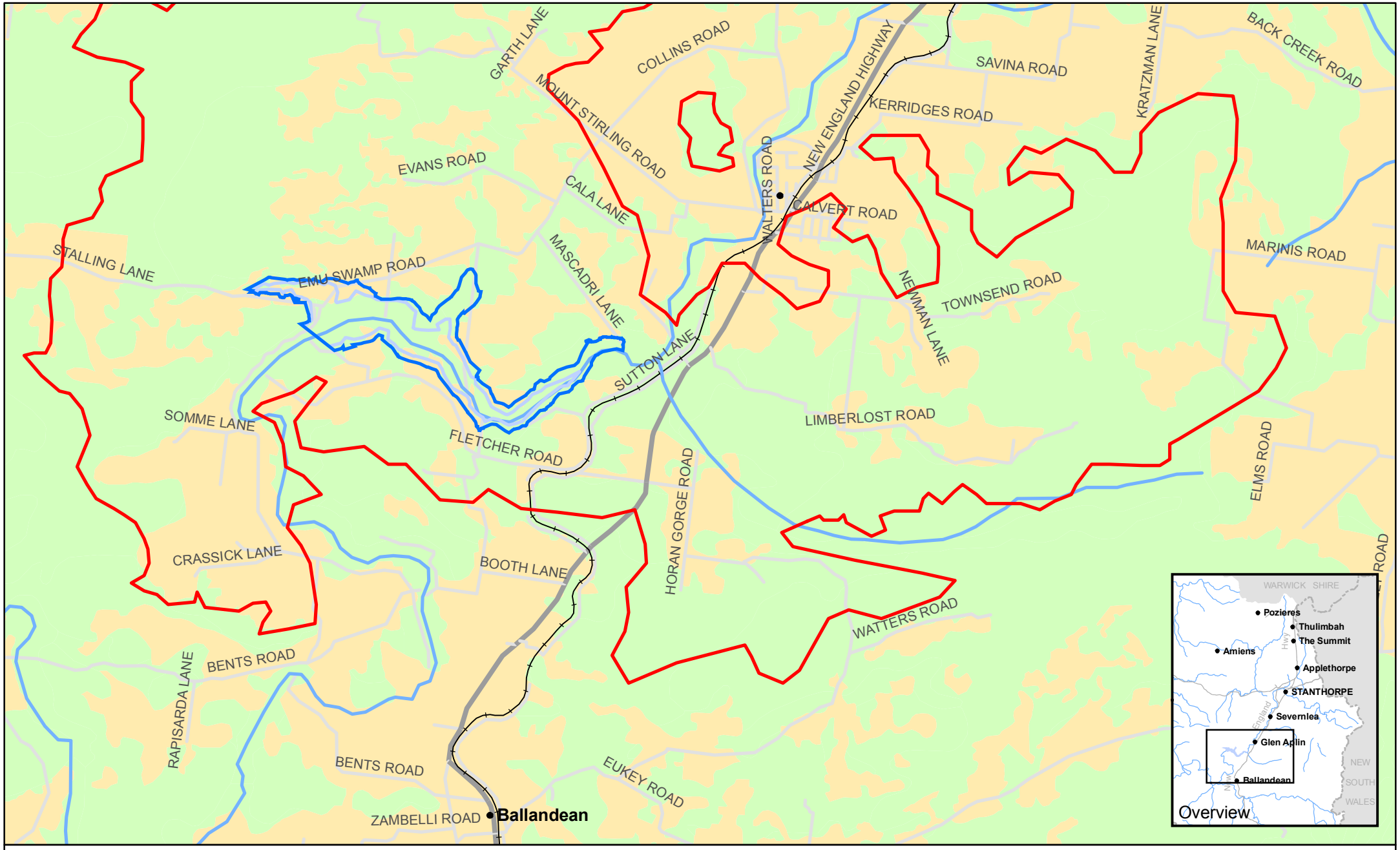
Land cover within the Project area largely consists of:

- native vegetation – characterised by a species rich understorey of grasses, shrubs and trees as shown in **Figure 16-3**; and
- cleared land - native vegetation has been cleared for agricultural purposes as shown in **Figure 16-4**.

A map of land cover in the Project area is presented in **Figure 16-5**. Road and rail infrastructure is also evident with the former providing access to dwelling houses scattered throughout the landscape.

- **Figure 16-3 Typical Native Vegetation Land Cover**

- **Figure 16-4 Typical Agricultural Land Cover**



SHIRE OF STANTHORPE

Legend

- Full Supply Level 734.5m AHD
- Full Supply Level 738m AHD
- Major Creeks
- Visual Catchment

Land Cover

- Native Vegetation
- Cleared Land / Agriculture

N W E S

0 250 500 1,000 1,500 2,000

Metres
Scale - 1:55,000 (at A4)
Projection: Map Grid of Australia Zone 56

EMU SWAMP DAM EIS

Emu Swamp Dam Site

Figure 16-5 Land Cover

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16.1.1.3 Land Use

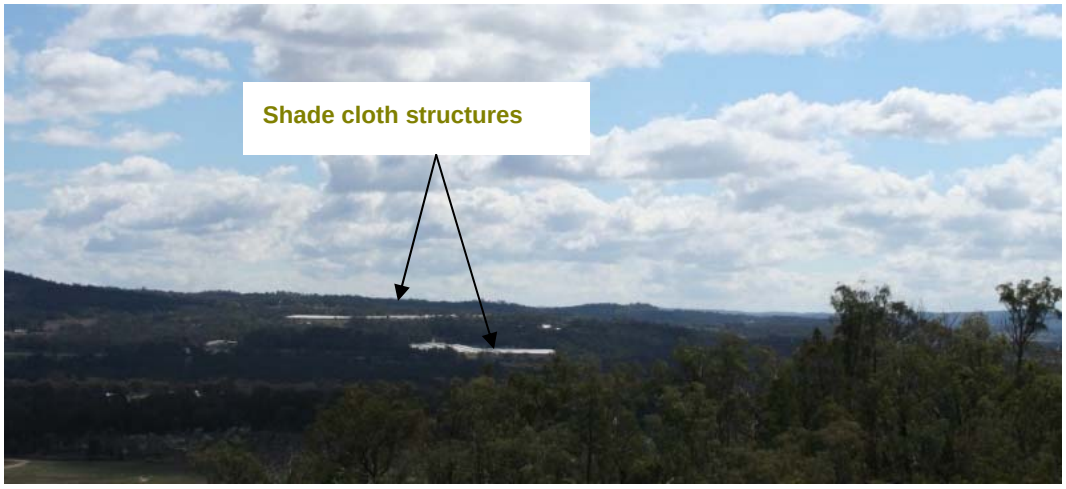
In the areas cleared of natural vegetation the land is used predominately for agricultural cropping of grapes, fruit and capsicums as well as cattle grazing activities. There are also low scale tourist activities in the area. These include cellar door facilities, offering tasting and sale of wine and cheese and guest housing offering short term accommodation. **Figure 16-6** shows a range of features depicting the variety of land uses in the visual catchment.

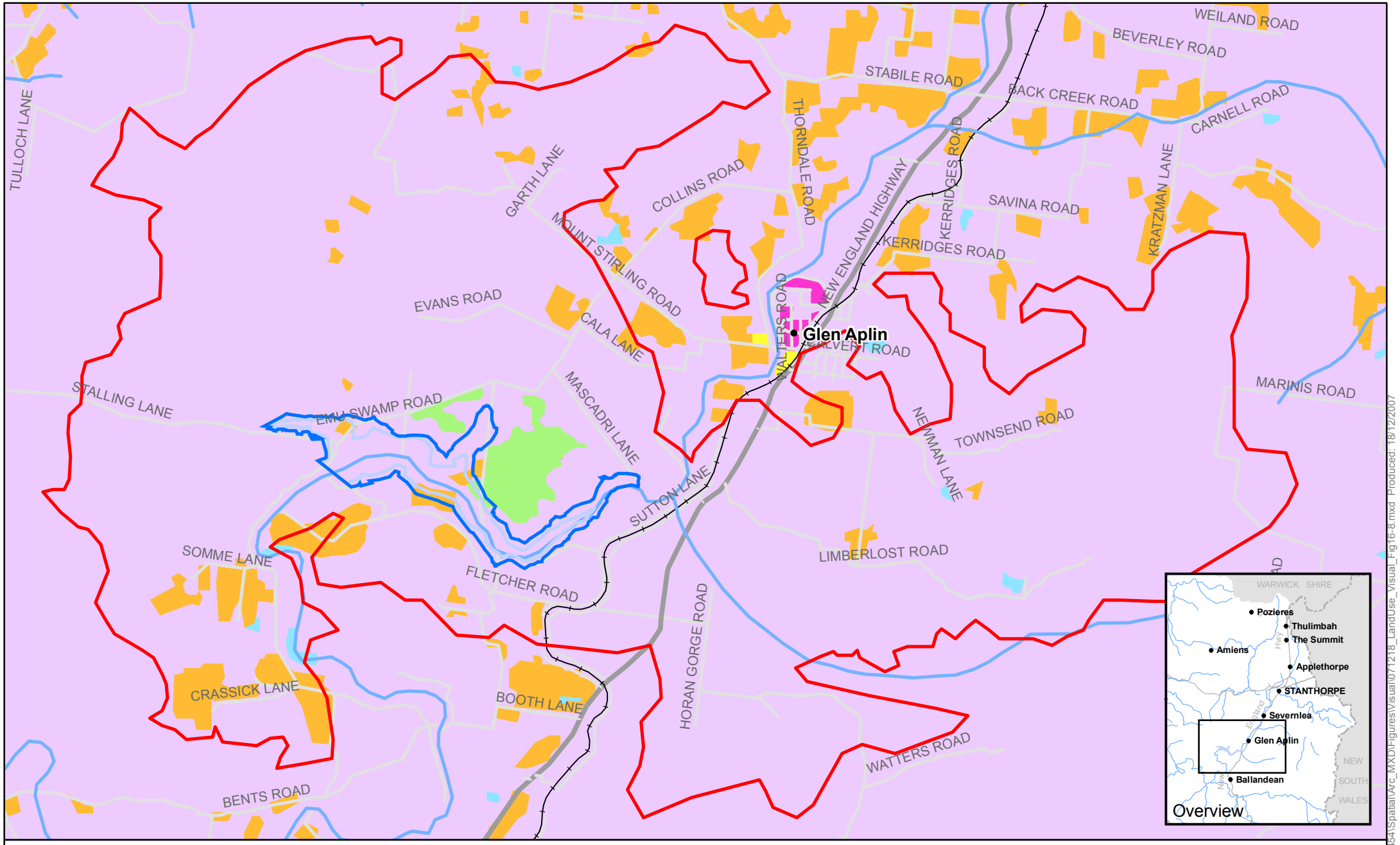
- **Figure 16-6 Land Use Pictorial**

From a visual amenity perspective the structures used to protect fruit from hail storm are the most visually prominent feature of the human land use activities in the landscape and can be seen for some distance from the source (refer to **Figure 16-7**).

Figure 16-8 illustrates the spread of dominant land use across the visual catchment.

- **Figure 16-7 Shade cloth structures as viewed toward the north from Felsberg Winery**





SHIRE OF STANTHORPE

Legend

- Full Supply Level 734.5m AHD
- Full Supply Level 738m AHD
- Major Creeks
- Visual Catchment

Land Use

- Grazing
- Natural Environments / Other Minimal Use
- Horticulture
- Residential
- Services
- Water, Reservoir/Dam

N, W, E, S

0 0.25 0.5 1 1.5 2

Kilometres

Scale - 1:55,000 (at A3)

Projection: Map Grid of Australia Zone 56

EMU SWAMP DAM EIS

Emu Swamp Dam Site

Figure 16-8

Land Use in Visual Catchment

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16.1.2 Landscape Character

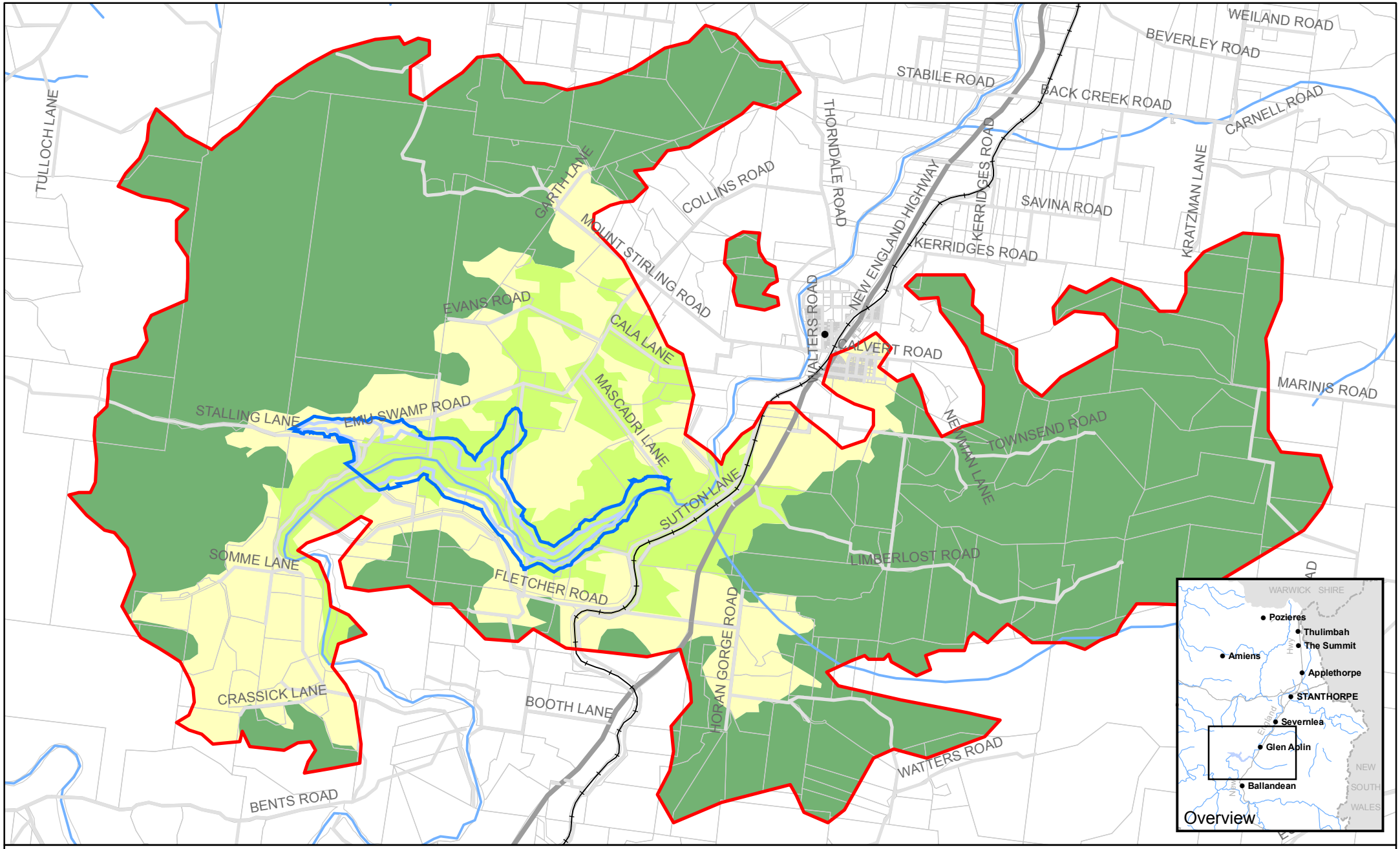
The landscape elements which have broadly similar patterns of land cover, land use and land forms can be classified into landscape character units (LCUs) (Landscape Institute and the Institute of Environmental Management and Assessment 2002). **Table 16-2** below describes the various LCUs of the Project Area.

- **Table 16-2 Landscape Character Units**

Landscape Character Units	Description of Character Elements	Typical example of Character Unit
LCU-1 Vegetated Hills & Slopes	Elevated Hills dominated by naturally vegetated slopes and ridges. The LCU generally forms the backdrop of the landscape, it is the visual border in which the landscape is contained. Within the LCU there are pockets of hidden valleys with gentle slopes and cleared land that would not have views of the Project area.	
LCU-2 Cleared Valley Flat	Low lying relatively level to slightly undulating valley flat dominated by human activity including cropping of grapes, fruit trees and capsicums and oats and grass for cattle grazing. This LCU is largely evident from the road when travelling through the landscape.	
LCU – 3 Vegetated valley Flat	Naturally vegetated valley floor and flats accommodating limited human activity. LCU 3 forms a broad corridor on the valley flat linking LCU 1 in the north and south. As the Severn River channel dissect the landscape the vegetation type changes from dense riparian vegetation to more open eucalypt woodland.	

The individual patches of landscape character units combine to produce the broad character of the landscape. **Figure 16-9** illustrates the location and extent of these landscape character units in relation to the proposed dam wall and inundation area.

Specific features of the landscape, panoramas and views are illustrated and described in the following section to depict more of the landscape and visual amenity of the area.



SHIRE OF STANTHORPE

Legend

- Full Supply Level 734.5m AHD
- Full Supply Level 738m AHD
- Major Creeks
- Visual Catchment

Landscape Character Units

- Cleared Valley Flat
- Vegetated Hills and Slopes
- Vegetated Valley Flat

N W E S

0 0.25 0.5 1 1.5 2

Kilometres
Scale - 1:55,000 (at A4)
Projection: Map Grid of Australia Zone 56

EMU SWAMP DAM EIS

Emu Swamp Dam Site

Figure 16-9
Landscape Character Units

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16.1.3 Visual Amenity

This section describes the existing landscape features, panoramas and views that have, or could be expected to have, value to the community.

16.1.3.1 Landscape Values

How people value the landscape is highly subjective depending on their association with it. People who live or work in an area may have different perceptions of the landscape than that held by visitors because of their more regular contact with the landscape and the ongoing changes within it (Landscape Institute and the Institute of Environmental Management and Assessment 2002).

Planning instruments can often provide some indications of commonly held community values due to their consultative framework. The Stanthorpe Planning Scheme 2004 identifies the maintenance of landscape values, scenic qualities and important vistas as a performance measure for development (other than for rural uses in the Rural zone). A description of what these landscape values are, what the scenic qualities are, or where the important vistas are located is not however provided in the Planning Scheme.

There is a high degree of certainty that some landscapes are valued more highly than others. Relevant studies have concluded that highly favoured landscapes are those that are relatively natural and vegetated, especially those with water features, dramatic topography, and contrasting character. The Girraween and Sundown National Parks are specific examples in the region considered as containing landscapes with very high scenic values. Landscapes least preferred are those with a high degree of human disturbance, as well as landscapes with few trees and landforms that are flat and unvaried. (Wright, 1973; State Pollution Control Commission, 1981; and Colleran and Gearing, 1980).

These values taken from such research are described in **Table 16-3** below.

- **Table 16-3 Landscape Values**

Scenic Value	Description
1. - Low scenic value	Settings where the landscape appears heavily fragmented. Human activities alterations strongly dominate the natural-appearing landscape character.
2. - Moderate scenic value	Settings where the landscape appears fragmented. The scenic landscape resulting from human activities dominates the natural-appearing landscape character.
3. - Moderately high scenic value	Settings where the landscape appears slightly fragmented. Discernible deviations remain visually subordinate to the natural-appearing landscape character viewed.
4. - High scenic value	Settings where the landscape appears intact. Scenic deviations resulting from human activities may be present but are sympathetic in scale and form to the natural appearing character of the landscape so completely and at such a scale that they are not evident.
5. - Very high scenic value	Settings where the natural landscape is visually intact with very few discernable human alterations.

16.1.3.2 Scenic Value of the Severn River Valley

The visual quality of the Project landscape, within the visual catchment of the dam, has been classified based on the rankings defined in **Table 16-3**.

- The skyline within the Project area is characterised by predominately vegetated hills and slopes of LCU 1 which contain few signs of human alteration. The scenic value of this landscape character unit is considered to be *5 – Very high*.
- There is a relatively high distribution of natural vegetation on the valley flat characterised by rich tracts of open eucalypt woodland and heath with visually prominent granite outcrops and boulders. Some areas within

this LCU 3 show signs of human activity however they remain visually subordinate to the overall vegetated character. The scenic value of LCU 3 is *4 – High*.

- The agricultural landscape character of LCU 2 provides a strong visual contrast with the natural landscapes identifiable by the visible patches. These patches contribute to the fragmented appearance of the landscape. Overall the land cover and elements of land use are generally sympathetic to the naturally occurring vegetation in the area and therefore the scenic value could be described as *3. - Moderately high*.

The Severn River Valley is consistent with the visual values of Stanthorpe as a region with a range of landscape qualities, both rural and natural. The landscape contributes to this regional impression and is therefore considered likely to be valued by the residents and visitors to Stanthorpe and the Granite Belt. Utilising the above system to classify the scenic value the landscape is considered to be moderate, to moderately high with a strong presence of natural character fragmented by visually prominent land use and human altered land cover.

16.1.3.3 Panoramas and Views

The visual catchment is considered the boundary of possible visual exposure of the Project. The mapping of visual exposure on **Figure 16-10** has been generated by applying a digital elevation model (DEM) and identifying the extent of visibility for both the inundation area (as the major change to the landscape) and the dam wall.

The visual catchment is defined by two distinct corridors of hills, one in the northwest and another in the southeast. The space between these elevated sections is characterised by a relatively narrow yet gently inclined valley flat. This is known locally as the Severn River Valley

The visual catchment is considered the boundary of possible visual impact. The identification does not consider the screening effects of existing vegetation, building and other structures or distance.

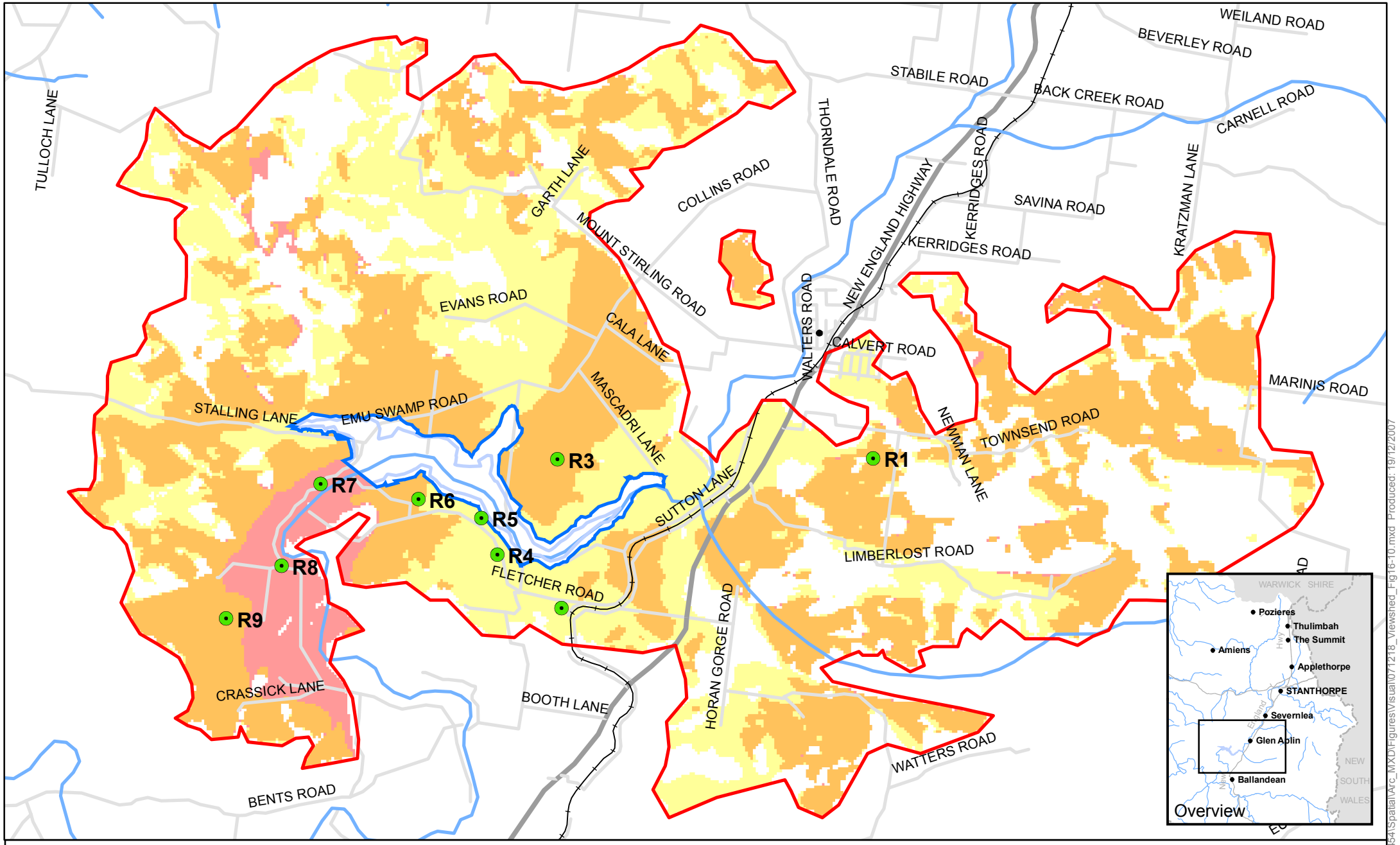
16.1.3.4 Identification of Sensitive Receptors

Key vantage points within the viewshed boundary are identified as “sensitive receptors”. They may include views from lookouts, private residences, tourist attractions and gateways to the Project site.

The sensitive receptors identified for the Project include:

- Felsberg Winery, Townsend Road (R1);
- Rumbalara Estate Wines, Fletcher Road (R2);
- mixed Grazing and Horticulture, Emu Swamp Road (R3);
- hobby Farm, Fletcher Road (R4);
- horticulture Farm, Fletcher Road (R5);
- rural Residence, Fletcher Road (R6);
- Road Reserve between vegetated State Land (R7);
- Road Reserve, Corner Emu Swamp Road and Somme Lane (R8); and
- mixed Grazing and Horticulture, Somme Lane (R9).

Sensitive receptor locations in relation to the Project are illustrated in **Figure 16-10**. **Table 16-4**below describes the views available from the receptors with photographs provided to illustrate those views.



EMU SWAMP DAM EIS

Emu Swamp Dam Site

Figure 16-10 Viewshed with Sensitive Receptors

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Table 16-4 Views toward Project Area from Sensitive Receptors

R1 Felsberg Winery, Townsend Road

View from Felsberg Winery looking west

Description of Viewing Outlook

The Felsberg Winery is located on the hills forming the southern boundary of the Severn River Valley with extensive views to the west. The hills visible in the distance are a part of LCU 1 and form the northern boundary of the Valley. The dominant hill just south of the Severn River and the proposed dam wall site is visible on the left hand side of the photo. This is some 5 km from the viewer. Glimpses of the dam wall and the inundation area may be available between this hill and the middle ground ridgeline that cuts through from the right hand side of the photo depending on the screening effect of the vegetation along the ridgline. The valley floor consists of a patchwork of both highly altered human environments (LCU 2) and naturally vegetated spaces (LCU 3).

The diversity of the landscape is particularly evident from this receptor with LCU 2 providing a strong visual contrast with the uniformed appearance of LCU 3.

R2 Rumbalara Estate Wines, Fletcher Road

View from the rear deck at Rumbalara looking west

Description of Viewing Outlook

The view from the balcony of the Rumbalra cellar door on Fletcher Road shows all three landscape character units:

The winery itself forms part of LCU 2 and dominates the foreground.

The edge of LCU 3 is evident in the middle ground formed by the tree line just beyond the vineyard and extending to the vegetated rise in the middle of the view. The land depression between the middle ground and the foreground is the location of the southern arm of the inundation zone and is presently part of the corridor of vegetation forming LCU 3.

The hills in the north are LCU 1 and form the northern boundary of the Severn River Valley and the background view.

R3 Mixed Grazing and Horticulture, Emu Swamp Road

View driveway looking southwest

Description of Viewing Outlook

This farm is currently used for a range of agricultural purposes including cropping, grazing and horses. The majority of the landscape is cleared which is consistent with the characteristics of LCU 2. The tree line in the middle of the photo represents the thin riparian zone of the Severn River and Emu Gully. The inundation zone will be evident on the slightly sloping fields in the middle ground.

The cluster of hills on the southern side of Fletcher Road characterised within LCU 1 is visible at the back of the left hand portion of the view. The hills in the centre and to the right form the northern boundary of the visual catchment.

R4 Hobby Farm, Fletcher Road

View from residence looking west to north

Description of Viewing Outlook

The cleared landscape is the dominant view from this location. Vegetation cover is limited to grasses and small patches of trees. The hills in the background are part of LCU 1 and form the northern boundary of the visual catchment.

Fletcher Road is visible along the edge of the cleared land passed the shed on the right hand side of the image, and then it passes behind the trees along the middle ground of the image towards the dominant cluster of hills south of the dam wall (just behind the telegraph pole) on the left hand side of the image. The Full Supply Level (FSL) rises very close to Fletcher Road in this area.

R5 Horticulture Farm, Fletcher Road

View from the residence looking north.

Description of Viewing Outlook

The land slopes gently down toward the Severn River marked by the first row of trees. The riparian vegetation is thinnest in this part of the river so the agricultural land use and LCU 2 dominates the foreground of the view. The middle ground appears heavily vegetated reinforced by the vegetated slopes of the hills in the background.

The FSL will dominate this foreground view and will extend just beyond the small garden seen in the foreground. incorporating both the urban and irrigation water supply inundates the dwelling house including the location from where this picture was taken.

R6 Rural Residence, Fletcher Road

View from residence looking east

The vineyards visible behind the foreground garden and screen planting will be largely inundated at FSL. The gentle rise of vegetation in the middle ground forms part of LCU 3 which follows the meandering Severn River. The vegetated hills in the background (LCU 1) form the southern hills of the Severn River Valley and accommodate the Felsberg Winery (R1) which can be seen over 5 km away as a flash of red near the top of the third tree from the left. The ridgeline that R1 sits just beyond is the same ridgeline that would screen most of the inundation area when looking back this way from R1.

R7 Road Reserve between vegetated State Land

View from Emu Swamp Road downstream of proposed wall looking east and south east respectively.

Description of Viewing Outlook

This location is along the road to represent views of travellers passing through the landscape. The landscape character consists of relatively dense woodland consistent with LCU 3. The large trees visible within the skyline are approximately 15-18 m in height.

R8 Road Reserve, Corner Emu Swamp Road and Somme Lane

View from Emu Swamp Road looking south

Description of Viewing Outlook

The dominant feature of this view is the water body of the Severn River visible from the road reserve of Emu Swamp Road. This area of the river is ponding due to a weir located downstream. The natural state of the river has been further altered with the riparian vegetation cleared of trees and shrubs evident in LCU 3 further upstream. Fields surround the view so human activity dominates this area.

R9 Mixed Grazing and Horticulture, Somme Lane

View from the farm looking northeast

Description of Viewing Outlook

This is one of the larger farms within the visual catchment located downstream of the proposed dam wall. The foreground is dominated by the agricultural activities of the farm with the shade cloth structure providing a strong visual contrast with the vegetation on the dominant cluster of hills located south of the dam wall and Fletcher road. The dam wall would be located almost in the middle of the image and to the left of the foot slope of the dominant hill and including part of the protective orchard covering.

16.1.4 Visual Absorption Capacity

Landscapes which have the capacity to absorb land use changes without detrimental impacts to the existing quality and landscape character have a high visual absorption capacity. Visual absorption capacity is affected by a range of factors including vegetation cover, topography and visual pattern (Amir & Gidalizon 1990). Landscapes with high visual absorption capacity are able to easily accept objects such as water bodies and infrastructure with their visual impacts less noticeable. Conversely changes in the landscape with low visual absorption capacity will be highly visible over a long period of time. **Table 16-5** identifies the visual absorption capacity factors and their numerical values used in this landscape and visual amenities assessment.

- **Table 16-5 Visual Absorption Capacity Factors and their Numerical Values**

VAC Factor	Categories	Low	Moderate	High
Slope	Range	0-3%	3-10%	>10%
	Numerical Value	1	2	3
Vegetation Height	Range	<5 m	5-10 m	>10 m
	Numerical Value	1	2	3
Visual Pattern	Range	Uniform	Moderate	Diverse
	Numerical Value	1	2	3

Criteria for visual absorption capacity are applied to identified landscape characteristics of the Project area in **Table 16-6** and at the bottom of the table the VAC is calculated.

- **Table 16-6 Visual Absorption Capacity of the Project Area**

VAC Factor	Landscape Characteristics
Slope	The Severn River valley and surrounding areas are undulating to relatively flat with slopes in the order of 2.5 degrees or 5%. These slopes are categorised as Moderate VAC value of 2.
Vegetation Height	The vegetation height of the majority of the tree species which will form significant screening elements in the Project area are between 14 to 25 m in height. Vegetation above 10 m is categorised as High VAC with a value of 3.
Visual Pattern	When viewed from the majority of the sensitive receptors the visual pattern of the Project area is dominated by dense vegetation communities. When driving through and around the landscape however the human patterns are more prevalent with a number of buildings, roads and crop land. This appearance provides a mixed pattern across the landscape which is categorised as Moderate VAC with a numerical value of 2.
Visual Absorption Capacity	VAC = Slope + Vegetation Height + Visual Pattern divided by 3 VAC of the Project Landscape = 2 + 3 + 2 = 7 divided by 3 = 2.3 Moderate to High

In accordance with these parameters the visual catchment may be described as having a moderate to high capacity to accommodate change within it. The undulating to flat surface of the valley floor from where the majority of the views within the landscape are located allows for possible screening through vegetation and changes in landform. There are fewer receptors and fewer views available from the more elevated sections of the visual catchment but the relatively fragmented visual pattern of the valley floor enables changes to be absorbed into the landscape patchwork.

16.2 Potential Impacts

The activities which are likely to cause changes to landscape and visual amenity during the construction and operation phases are identified below.

16.2.1 Construction

The Project will occur in stages so the potential impacts of the construction phase will vary accordingly. The likely sources of impacts on landscape character and visual amenity include:

- inundation area preparation including staged vegetation clearing;
- landforming (including blasting and rock cutting) and spoil distribution required for general material recovery and the dam foundation and spillway;
- construction of the RCC Wall across the Severn River valley floor;
- construction of temporary works and other activities within the inundation area (including the effects from lighting during nominal periods of RCC Wall construction);
- construction worksites; and
- infrastructure works including the relocation of services (including electricity and telecommunications, sewage and water), demolition of buildings and construction of roads.

16.2.2 Operation

- The nominal engineering design life of the Project is 100 years, though it is likely to continue past this time on the basis the dam continues to meet safety requirements and remains an integral part of the regional water supply strategy.
- Factors most relevant to impact on the landscape character and visual amenity include:

- built structures and changes to landform particularly the scale of the dam wall and spillway setting and also the built form of realigned roads and new local access layouts;
- vegetation changes particularly associated with the gradual loss of vegetation within the inundation area and specifically along the riparian lands of the affected watercourses;
- the effect of the expanse of open water within the landscape setting; and
- land use changes including new recreation activities, greater public accessibility to the waters edge and potentially new tourist activities on nearby land.

16.2.3 The Measurement of Impacts

The measurement of the impact of the Project on the landscape character and visual qualities of the site and the surrounding area has been considered with respect to two critical aspects:

1) the magnitude of change on the identified landscape character units involved (Wood 2007); and,
2) the visual sensitivity of the receptor.

16.2.3.1 The Magnitude of Change to Landscape Character

The magnitude of change can be measured by a number of factors which affect the degree of impacts on the landscape. These include elements such as the:

- scale of change or the degree of visibility – which can be affected by distance from the viewer;
- degree of existing view obstruction;
- consistency or character of the change – the sense of "fitness" within the scene;
- contrast with the existing scene;
- effect on scenic composition such as changes to the skyline, colour, etc.; and
- duration of changes in the landscape, ranging from long term changes to temporary changes;

In **Table 16-7** below, these factors are combined to help classify or categorise the magnitude of change from high to negligible.

Table 16-7 Visual Magnitude or Scale of Change (Wood, 2007)

Magnitude of Change in the Landscape	
High	▪ The change is a clearly visible and is a dominant visual element in the skyline. ▪ The development obstructs views from the sensitive landscapes. ▪ Broad scale changes to landform and vegetation character are clearly visible as a result of the proximity, size, absence of intervening vegetation, topography, or structures.
Medium	▪ The change is visible and changes to the skyline are unsympathetic to the existing skyline. ▪ Material changes to landform and vegetation character or land cover are visible but moderated by visual absorption capacity, distance, scale or other design and mitigation measures.
Low	▪ The change is partly visible and represents a small change to views available from the receptor. ▪ The principal characteristics of the view are not dominated by the change. ▪ The change is sympathetic to the existing character of the landscape.
Negligible	▪ The change is insignificant and consistent with the existing scene

16.2.3.2 Visual Sensitivity and Importance of the view (from Receptors)

The visual sensitivity and importance of the view from the identified receptors can be classified from high to negligible based on general conditions outlined in **Table 16-8** below.

- **Table 16-8 Visual Sensitivity and Importance of Receptors**

Receptor Sensitivity & Importance of Receptors	
High	Public lookouts and residential properties where the potentially impacted landscape dominates the view of the receptor.
Medium	Residential properties and public lookouts where the landscape is visible to the receptor but is not the dominant view and/or which has broken or partially screened views.
Low	Views from roads, rail and aircraft that have rapidly changing views.
	Residential properties where the landscape forms a relatively small amount of the receptors overall view or is mostly screened from view.
Negligible	Where the landscape is barely visible to the receptor.

16.2.3.3 Impact Significance Threshold

These classifications (magnitude of change and sensitivity) are then utilised to determine the significance of potential changes utilising a risk assessment matrix model as shown in **Table 16-9** adapted from Australian Standard *AS4360 Risk Management*.

- **Table 16-9 Impact Significance Threshold Matrix**

	Magnitude of Change				
Receptor Sensitivity		**High**	**Medium**	**Low**	**Negligible**
	High	Substantial	Substantial	Moderate	Slight
	Medium	Substantial	Moderate	Moderate	Slight
	Low	Moderate	Moderate	Slight	None
	Negligible	Slight	Slight	None	None

Significance of Change	
Substantial	Significant aspects of the proposal dominate the views of high or moderately high sensitive receptors.
Moderate	Some parts of the proposal are visible and present material changes to views from high or moderately high sensitive receptors.
Slight	Some parts of the proposal remain visible and represent a small change to the views of the least sensitive receptors.
None	Where the visible changes to the landscape are barely visible to the receptor.

16.2.4 Impacts on Landscape Character

The corridor of vegetation within the valley flat (LCU 3) will be extensively cleared to accommodate the inundation area. This body of water will be visually conspicuous where it adjoins the largely cleared areas of LCU 1. This is generally between the dam wall and the area along Fletcher Road to R4 on the southern side and the inundation arm up Stalling lane and a small section around R3 on the northern side. Much of the inundation area will remain largely hidden within the surrounding vegetation. The proposed buffer areas may be able to extend the area of screening although this is not considered to be required from a landscape impact aspect of the Project.

The additional water area will create a distinct landscape element revealing the valley landform. This will provide greater visual diversity to the existing landscape adding value to views when travelling around and through the landscape. The expanded area of water will have the effect of making the waters edge more available to the public both visually and potentially for physical access and enjoyment.

There will be a loss of existing riparian vegetation and intimate local landscape settings centered on the current alignment of the watercourse and its changing form during local floods. These more local and private aspects of the current setting will be lost within the affected area.

From a construction perspective short term intensification of human activity will occur as earth material is extracted, spoil is distributed, and construction of the dam wall is undertaken throughout the day and night. Support developments are also required such as concrete batching, road works, site offices and workshops.

In the long term a range of tourist and recreation uses may become available on the water and the surrounding land. These additional land uses could be considered beneficial in adding to the variety and interest in the landscape increasing public access to elements that are currently largely unseen, inaccessable and private.

The capacity of the landscape to accommodate the change will result in a moderate and overall beneficial change in the landscape.

16.2.5 Visual Impact on particular Panoramas and Outlooks

In terms of extent and significance of the Project on visual amenity an assessment in relation to the identified sensitive receptors is undertaken in the following pages based on the classifications identified in **Section 16.2.3** above.

- **Table 16-10 Potential Impacts on Sensitive Receivers**

Sensitive Receptor	Distance from Emu Swamp Dam	Receptor Sensitivity	Magnitude of the Proposed Changes on the viewing outlook	Significance of Change
R1 Felsberg Winery, Townsend Road.	>5 km to the dam wall and approximately 2km to the eastern edge of the inundation area	Medium	Low: Potential long term views of the Project would be limited to the eastern portion of the inundation area. The water may be visible however it is considered that the most obvious effect would occur due to the loss of trees on the riparian banks. Views of the dam wall would likely be screened by the vegetation along the ridge in the middle of the shot.	Moderate: The eastern portion of the inundation area comprises a small component of the overall landscape visible from this location. The landscape already appears patchy from the receptor so the slight change would represent a relatively minor change in the overall visual landscape
R2 Rumbalara Estate Wines, Fletcher Road.	>500 m from Urban Water Supply Dam FSL >400 m from Combined Water and Irrigation Dam FSL approximately 2 km from the dam wall	Medium	Low: The inundation area includes the depression in the middle of the view. The trees located in this vicinity will be lost either in preparation for the dam operation or as a result of inundation. The location of the dam wall is screened from view by the cluster of hills west of Rumbalara.	Moderate: Loss of vegetation along the riparian zone would form the most significant visual change in the middle ground of the visible landscape. The vineyards in the foreground will remain the most dominant visual element in the landscape.
R3 Mixed Grazing and Horticulture, Emu Swamp Road.	>700 m from Urban Water Supply Dam FSL >500 m from Combined Water and Irrigation Dam FSL	Medium	High: The dominant foreground view from this location will include the water body. The dam wall is also likely to become visible at some stage during the construction phase depending on the loss of screening vegetation. During the dam operation the wall would be visible across the	Substantial: Local on site vegetation is clustered on the bank of the Severn River. The loss of this vegetation will remove the local screening enabling views across the water body extending to the dam wall in the west. Views to the southern side of the inundation zone and

Sensitive Receptor	Distance from Emu Swamp Dam	Receptor Sensitivity	Magnitude of the Proposed Changes on the viewing outlook	Significance of Change
			level surface of the water.	Fletcher Road will also be possible. In the absence of new local screening measures these changes present a substantial change in the present landscape. These may be perceived as a positive or beneficial impact
R4 Hobby Farm, Flethcher Road	>200 m from Urban Water Supply Dam FSL >100 m from Combined Water and Irrigation Dam FSL	Medium	Low: There would be few noticeable changes from the receptor's view provided the existing on site screening devices are retained. If these conditions change the landscape changes may be more evident. The changes would be limited to loss of vegetation and potentially glimpses of the water body. The dam wall would be screened by existing vegetation if retained.	Moderate: Views to the Project landscape are possible but are moderated by existing design features of the receptor including the orientation of the house, on site screening and distance to the changes.
R5 Horticulture Farm, Fletcher Road	>80 m from Urban Water Supply Dam FSL >30 m from Combined Water and Irrigation Dam FSL	Medium	High: The FSL for the urban water supply will dominate the foreground view. The grape vines will be removed as the water level is expected to inundate this land. If the irrigation water proposal proceeds, the water level will include the existing dwelling and habitation will be lost. This area would likely form part of the buffer zone.	Substantial: The water level would dominate the view from the receptor. This could be perceived as a positive impact from any dwelling that was able to be retained on site. The middle ground will also experience change as the large tracts of vegetation would need to be removed and/or destroyed.
R6 Rural Residence 0-500m from the FSL	>300 m from Urban Water Supply Dam FSL >200 from Combined Water and Irrigation Dam FSL	Medium	High: Construction activities and associated landscape change is likely to be clearly visible and proximate. Operational changes to the landscape will be clearly visible for both urban and irrigation water to the east from the rural household.	Substantial: The water level would potentially dominate the view from the receptor without the addition of local screening or re-vegetation. Views of the water body and the diversity it brings to the landscape setting could be perceived as a positive or beneficial impact. The loss of vegetation would also be evident from the receptor however the hills in the background forming the contrast with the skyline would remain

Sensitive Receptor	Distance from Emu Swamp Dam	Receptor Sensitivity	Magnitude of the Proposed Changes on the viewing outlook	Significance of Change
				unchanged.
R7 Road Reserve, Downstream of wall, Emu Swamp Road 0-500m from the dam wall	300 m from the dam wall	Low	Low: The dam wall may be partly visible in the landscape however the existing vegetation which is the principle element within the view would provide a substantial screen.	Slight: Glimpses of the dam wall through the existing vegetation may be possible. Provided the existing vegetation is retained the vegetation will dominate the view. There is unlikely to be any changes to the skyline.
R8 Road Reserve, Cnr Emu Swamp Road & Somme Lane	Approximately 1.5 km from the dam wall	Low	Low: The Severn River is an intermittent river with the water lever in a constant state of flux. Environmental flows will be maintained so the natural state of water flow should not be evident. Vegetation loss in the valley may be evident however these changes are minimal due to local screening elements including the existing riparian trees and shrubland.	Slight: Glimpses of the dam wall through the existing vegetation may be possible but provided the vegetation of sufficient height is maintained downstream the vegetation would dominate the middle ground view.
R9 Mixed Grazing and Crop Farm, Somme Lane	>2km from the dam wall	Medium	Low: The dam wall may be partly visible in the landscape however the existing vegetation downstream of the wall is proposed to be retained which would continue to form a principal element of the view and provide a substantial screen. The heights of the mature eucalypt trees are commensurate with the height of the proposed dam wall. Therefore the wall should not appear above the canopy height nor alter the skyline. The most noticeable change in the landscape would be expected to come from the loss of vegetation within the inundation area.	Slight: Glimpses of the dam wall through the existing vegetation may be possible but provided the vegetation of sufficient height is maintained downstream the vegetation would dominate the middle ground view.

16.2.6 Summary of Impacts on Landscape Character and Visual Amenity

Overall the significance of the changes to the landscape and visual amenity of the surrounding catchment is considered moderate to low. While the significance of the change is considered in part substantial, much of this change, from a landscape perspective could be considered beneficial.

These beneficial aspects relate purely to the increase in variety and interest presented by the new waterbody within the landscape and potential increase in access to the waters edge. The additional water element creates a distinct

edge in the landscape as it follows the contours revealing the valley landform and providing new and diverse vistas over and surrounding the water body.

There will be aspects however of the Project that may adversely affect the landscape and visual amenity, including:

- the visually obtrusive elements of construction - such as clearing, material extraction, rock cutting for the spillway, spoil distribution, construction work sites and accommodation, night lighting, and support developments such as concrete batching and road works;
- the physical elements and scale of the dam wall and associated engineering infrastructure, particularly viewed from close proximity downstream;
- elements of the upstream landscape which do not particularly benefit from the visual amenity of large bodies of open water where local creek inundation causes the loss of exiting riparian vegetation and intimate local creek landscapes; and
- the localised impacts of forming the Stalling Lane Access.

The impact of these elements will require specific mitigation and management measures to rehabilitate and help restore the new landscape to a sustainable level.

The following mitigation measures are proposed for both construction and operational phases of the Project.

16.2.7 Mitigation Measures

The Environmental Management Plan (Construction) should identify specific performance criteria and management actions (including landscape design plans and management plans) addressing:

- management of night lighting to ensure lights are focussed on the affected construction areas and to limit extraneous light where necessary; and
- protection and management of native vegetation within the construction area with particular emphasis on conserving vegetation downstream of the dam wall to act as a visual screen.

Particular attention should be given to the early establishment of suitable vegetation and the creation of special areas suitable for waterbased recreation and enjoyment.

No mitigation measures are recommended for the operation of Emu Swamp Dam.

16.3 Summary

The potential impact of the proposed Dam on the landscape character and visual amenity within the Severn River Valley has been considered for the construction and operation of the Project.

The visual catchment is largely within 5 km from the affected area of the Project beyond which, visual sensitivity is regarded as low for all typical landscape settings. The visual catchment includes:

- part of the township of Glen Aplin;
- rural areas consisting of a cropping, grazing and small scale tourist facilities and accommodation;
- two distinct corridors of hills, one in the north west and another in the southeast and a cluster of hills with granite outcrops south of the Project area; and
- the relatively narrow gently inclined valley flat characterised by a mixture of vegetated land and agriculture.

Overall, the visual catchment portrays clear evidence of human occupation with large areas of the landscape cleared of native vegetation, particularly in the lower lying parts of the valley whilst the steeper mountain slopes in the north and south of the catchment appear natural. Fragmentation of the rural landscape on the valley floor has occurred throughout the catchment and large patches of native vegetation provide a distinct visual contrast with human activity.

The Project will be visible from the scenic ridgelines and slopes however there are a low number of receptors on these elevated areas, the distance is significant and the views are largely screened by topography and local vegetation. There are a number of local receptors in close proximity to the Project particularly along Fletcher Road and downstream of the dam wall.

Overall the significance of the changes to the landscape and visual amenity of the surrounding catchment for these local receptors is considered moderate to low. While the significance of the change is considered in part substantial, with the loss of native vegetation, much of the change, from a landscape perspective could be considered beneficial.

These beneficial aspects relate purely to the increase in variety and interest presented by the new waterbody within the landscape. The added visual element of water and its associated horizon or edge with the land as it follows the contours and reveals the form of the valley will be considered by most to increase the visual amenity of this section of the valley for both surrounding residents and passing travellers.