3. ACQUIRING THE DATA

The collection of the data on which this study was based is described in this section. It describes the photography of the Region, the selection of scenes for the survey, and the development and implementation of the survey instrument.

3.1 PHOTOGRAPHY OF THE REGION

The Region comprised an area of approximately 841 sq km and it would be clearly impractical to photograph every square kilometre of it. Neither was it necessary. Rather a sampling of the Region’s landscapes was undertaken which aimed to ensure that each type of landscape present in the Region was represented.

Photography was based on certain principles:

- Principle of representativeness – the photographs needed to cover the diversity of the Region’s landscapes and the variations within each type;
- Principle of equivalence – two similar scenes of a given type of landscape, e.g. grazing area with scattered red gums should yield similar ratings; thus location is not critical, rather it is the characteristics that are present;
- Principle of typicality – scenes should be selected which typified a particular landscape;
- Principle of simplicity – scenes should be photographed to contain a minimum of components, and complicating and distracting elements should be avoided as far as possible.

Most accessible and navigable roads available in the Region were traversed and photographs taken. Map 2 indicates the location of the roads traversed. Table 3.1 summarises the trips made. Over 1500 km of roads were traveled.

Photographs were taken at 50 mm focal length which is equivalent to the human eye. Composing each photograph sought to minimise extraneous factors such as people, sheep or cattle, wildlife and birds, fences, electricity poles and wires, dead trees, and excavations or other eyesores. Any of these can influence preferences either positively or negatively and as many were of an ephemeral nature and not part of the scene they were excluded as far as possible.

<table>
<thead>
<tr>
<th>Date</th>
<th>Photographs</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 April</td>
<td>247</td>
</tr>
<tr>
<td>22 April</td>
<td>282</td>
</tr>
<tr>
<td>7 May</td>
<td>352</td>
</tr>
<tr>
<td>9 May</td>
<td>297</td>
</tr>
<tr>
<td>10 May</td>
<td>224</td>
</tr>
<tr>
<td>12 May</td>
<td>195</td>
</tr>
<tr>
<td>16 May</td>
<td>107</td>
</tr>
</tbody>
</table>

Total 1704

Photographs were standardised using the landscape view (i.e. horizontal format), not portrait view (i.e. vertical) and extended to the horizon, not a close-up confined view. Photographs were taken in full daylight. Because of the lateness of the season, the sun was comparatively low till mid morning and after mid afternoon. This often produced extensive shadows from trees and strong side lighting which can dramatise scenes. As far as possible these problems were minimised.

Sunny cloud-free conditions were sought throughout to standardise scenes against a blue sky. Clouds can be dramatic or can dampen colours, thereby influencing ratings so photographs were taken only where sunny conditions were present. The extended sunny conditions into May provided excellent conditions.

A Nikon D70 SLR digital camera was used throughout. Its advantage over lesser digital cameras was that it could be set at the correct focal length (50 mm). In digital cameras, the focal length must be multiplied by 1.5 to equate to conventional cameras. Thus a focal length of 35 mm in the Nikon D70 equated approximately to 50 mm in a conventional camera. Digital photographs were recorded at the normal image quality and the medium image size, producing images of 2,240 X 1,488 pixels (3.3 megapixels) which were recorded by 8 – 900 kilobytes. Only a UV filter was used.

Photography at each site considered suitable involved walking to the fenceline along the road to avoid roadside vegetation and grasses. Usually several photographs, including panoramas, were taken at each stop.
For each photograph, notes were taken of its subject and the location recorded using a Magellan 310 geographical positioning system (GPS). The location was also recorded on a map.

3.2 LANDSCAPE UNITS

To provide a basis for the selection of scenes for the rating survey, landscape units were defined for the Barossa Study Region. The aim was to delineate areas of similar characteristics within which a sample of scenes could be identified. The number of regions needed to be sufficient to differentiate areas, but not too small that the number would be overwhelming. Around a dozen was considered a reasonable balance.

Landscapes are the product of the underlying geology, erosional processes, climate, vegetation, and of cultural activities such as clearance, mining and quarrying and the planting of crops and permanent vegetation including vines, orchards and pines. The Barossa region was settled very early in the State's history and is a world famous wine region. The resultant extensive clearance of native vegetation and the establishment of viticulture, cropping and pasture have greatly changed the original character of the region.

The delineation of landscape units within the Barossa region was based on detailed analysis of the following aspects:

- **Land form**: flat, undulating, hilly, escarpments, river valleys
- **Land cover**: original vegetation including areas of trees, as well as trees along roadsides, streams and as shelterbelts around fields.
- **Land use**: the cultural uses including vines, orchards, pines, cropping, pasture and grazing
- **The presence of water**: in streams, dams and reservoirs

The resources available for the delineation of landscape units included:

- 1:50,000 maps
- Visibility analysis maps from scenic and main roads
- Map of the visibility of the Barossa Ranges in the region at 1:200,000 scale
- Maps of the floristic vegetation of the region at 1:50,000 scale
- Map of region showing vegetation cover at 1:75,000
- Aerial photographs of the region (dated 5/3/1999) held by DEH Environment Information were examined and vegetation along roadsides and watercourses mapped together with scattered trees and stands of native vegetation. Figure 2.2 records this information.
- The set of 1700 photographs taken throughout the region and were examined in assessing each landscape unit. They were invaluable in defining the characteristics of each unit and particularly in assisting in defining their boundaries.

Map 3 summarises the land use and vegetation for the Study Region.

3.3 DESCRIPTION OF LANDSCAPE UNITS

A total of 14 landscape units were defined (Map 4). These are described below. Each has been given a name reflecting a significant feature or name in the unit; the names are simply for purposes of identification and carry no other status. Figure 2.4 indicates the boundaries of each landscape unit.

(1) **Barossa Valley**

This is the heart of the region and comprises the flat plains filled with vines stretching from the foot of the Barossa Ranges to the North Para River, and, in the north, extending nearly to the region's boundary.

<table>
<thead>
<tr>
<th>Land form</th>
<th>Generally flat though undulating in the north-west and in the Rowland Flat area in the south.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land cover</td>
<td>Trees alongside parts of the many streams flowing down from the Barossa Ranges. Some roadside vegetation present. Virtually no trees among the vines other than along streams and roads.</td>
</tr>
<tr>
<td>Land use</td>
<td>Intensive viticulture throughout most of unit. Large marble and limestone quarry at Penrice. Many working wineries.</td>
</tr>
<tr>
<td>Water</td>
<td>Many streams flow through unit from Barossa Ranges to the North Para River on the western border. Many farm dams, some quite large.</td>
</tr>
<tr>
<td>Other</td>
<td>Significant backdrop of the Barossa Ranges. Many tourism facilities and accommodation facilities.</td>
</tr>
</tbody>
</table>
Five sub-units were defined:

- North of Nuriootpa: scattered vines, extensive areas of trees and roadside vegetation. Golf course. Very extensive car dump near northern boundary.
- West Nuriootpa: Generally flat, intensive viticulture, areas of trees, Nuriootpa’s effluent ponds
- East Nuriootpa: Flat, intensive vines, few trees other than along streams
- Rowland Flat: Relatively narrow area between the Barossa Ranges and the North Para River. Intensive viticulture, Some streams (e.g. Jacob Creek). Few trees other than along streams.
- Lyndoch Valley: intensive viticulture, some trees along roadside and streams but few otherwise.

(2) Barossa Ranges

This unit comprises the western face of the Barossa Ranges overlooking the Barossa Valley. The escarpment is visible for a considerable distance westward, well beyond Freeling which lies just west of the Study Region. The escarpment provides a boundary to the Barossa Valley and provides a strong common feature which links the Region together as a whole. Map 5 indicates the areas in the western part of the Study Region from where the Barossa Ranges are visible.

Land form | Striking range of rounded hills and spurs extending the full length of the Barossa Valley and providing an eastern boundary to the main vine-growing area. Rises about 300 m above Barossa Valley (unit 1). High points; Kaiserstuhl (580 m), Little Kaiserstuhl (560 m) and Mt Menge (620 m), are visible from across much of western part of the Study Region.

Land cover | Partly barren, other parts have extensive scattered trees. Trees line many of the streams flowing out of the Ranges westward. Some of the roads through the escarpment also have roadside vegetation.

Land use | Mainly grazing. Working quarries at Penrice near Angaston. Few vines. Areas of pines in the southern part of the Study Region NE of Williamstown.

Water | Pools in the various streams.

(3) North Para River

The North Para River is the principal watercourse in the region, draining out of the Barossa Ranges and flowing through the center of the Barossa Valley. While historically it was used for the disposal of winery waste, alternative methods are now used and the River is relatively clean, at least in appearance. It flows through Nuriootpa and Tanunda, two of the Valley’s significant towns. Much of its length, between Nuriootpa and Gawler, comprises the boundary of the Light and Barossa Councils.

North Para River marked by trees
Land form | Narrow river valley incised through the plain. In the lower end it widens into a valley.
--- | ---
Land cover | Stream vegetation and extensive tree cover along the river’s length. North of Lyndoch are extensive areas of trees near the river.
Land use | Mainly natural river. In Nuriootpa a public park extends along part the river.
Water | Pools of water are permanent in the River.
Other | The River comprises both a link across the Valley and a barrier to movement.

(4) North Para River Valley
A small area at the River’s lowest reach where the valley widens.

View across North Para River valley

Land form | Undulating
--- | ---
Land cover | Extensive native vegetation, roadside vegetation and some streamside vegetation
Land use | Grazing. Vines north of Lyndoch Road. Some former quarries.
Water | No streams and few dams
Other | Lyndoch, Williamstown and Sandy Creek towns lie just outside and rural living is adjacent on the SW boundary.

(5) Sandy Creek
Extending from Sandy Creek to Williamstown and adjacent to extensive rural living area, this unit provides a buffer between the agricultural and viticultural uses in the Valley and the more urban and developed areas to the south west.

View of Sandy Creek

Land form | Wider, flatter river valley rising about 50 m and sloping to the River.
--- | ---
Land cover | Some vines. Cropping land Streamside trees, some scattered trees
Land use | Streamside trees, some scattered trees
Water | Pools of water in the River.

(6) Freeling Plains
Extensive flat plains lying along the western border of the Study Region and extending well west of Freeling.

Scene of the Freeling Plains

Land form | Generally flat plains.
--- | ---
Land cover | Generally barren apart from some roadside and streamside trees
Land use | Cropping and grazing. Large intensive piggery. Grain industry silos.
Water | Effluent ponds at piggery and few farm dams.
Other | Barossa Ranges visible in the distance.
(7) **Gomersal**

A transition zone between the viticulture of the Barossa and the conventional arable agriculture of much of South Australia.

| Land form | Low north-south ridges. Shallow wide valleys. |
| Land cover | Trees along some ridgelines. Extensive introduced pines planted along ridgeline east of Seppeltsfield. Trees along streams. Some scattered trees in southern area. |
| Land use | Intensive viticulture, wineries. |
| Water | Many farm dams. |
| Other | Views over ridges to Barossa Ranges |

(8) **Seppeltsfield**

An important viticulture area based on Seppeltsfield winery and other more recent wineries.

| Land form | Series of low parallel ridges trending north-south. Wide valleys and undulating terrain. Nain Range |
| Land cover | Ridgetop trees and vegetation along roads and streams. Nain Range in west. |
| Land use | Extensive viticulture, arable and grazing. |
| Water | Many small streams. Many farm dams. |
| Other | Greenock at the southern area |

(9) **North Greenock**

A mixed use area of hills and valleys extending north-westerly towards Kapunda.

(10) **Light – Truro**

A wide area which comprises the northern-most part of the Study Region. Largely extensive agriculture with little viticulture.
Greenock Range

<table>
<thead>
<tr>
<th>Land form</th>
<th>Low rounded hills, wide shallow vallies. Greenock Range in west.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land cover</td>
<td>Barren in west and some scattered trees in east. Some areas of trees in north-east.</td>
</tr>
<tr>
<td>Land use</td>
<td>Largely arable and grazing. Few vines.</td>
</tr>
<tr>
<td>Water</td>
<td>Light River comprises north-western border. Standing pools of water in Light R. and St Kitts Creek</td>
</tr>
<tr>
<td>Other</td>
<td>Kapunda lies just outside the Study Region north-west of the unit</td>
</tr>
</tbody>
</table>

(11) Moculta

Elevated about 100 m above the Barossa Valley, this area of wide valleys and isolated hills comprises a largely agricultural area extending south of Truro.

<table>
<thead>
<tr>
<th>Land form</th>
<th>Flat valley floor between low north trending ridges.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land cover</td>
<td>Scattered trees, many very large trees across most of area. Considerable vegetation along roads and streams.</td>
</tr>
<tr>
<td>Land use</td>
<td>Arable and grazing. Vines in west and some in south. Famous horse training facilities at Lindsay Park.</td>
</tr>
<tr>
<td>Water</td>
<td>Many farm dams, some large.</td>
</tr>
</tbody>
</table>

(12) Collingrove

Wide treed valley extending south from Angaston and Lindsay Park to Flaxmans Valley Road. Elevated about 200 m above Barossa Valley.

<table>
<thead>
<tr>
<th>Land form</th>
<th>Undulating with wide extensive valleys, some rounded isolated hills. Valleys leading west to Barossa Valley.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land cover</td>
<td>Generally barren apart from south-east where areas of dense low trees (E. odorata) occur. Also some scattered</td>
</tr>
<tr>
<td>Water</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

(13) Kaiserstuhl

Small area adjacent to the highest parts of the Barossa Ranges and including the Kaiserstuhl Conservation Park.
3.4 SELECTION OF PHOTOGRAPHS FOR SURVEY

A total number of 150 scenes was considered appropriate for the survey; more than this can result in participant fatigue while fewer can make it more difficult to cover the features of the region adequately.

The survey needed to include a proportion of scenes from elsewhere in South Australia to provide a benchmark for the Barossa scenes so that their ratings would be regarded as based on a State-wide perspective. Around 20%, 30 scenes were considered adequate, leaving 120 scenes for the Barossa Region.

The selection of photographs of the Region aimed to cover the following aspects.

1. Various key features
2. Visibility from west of the Barossa Ranges
3. Landscape unit characteristics

(1) Selection of Key Features

Photographs were sorted which included various key features (Table 3.2).

Table 3.2 Photographs of Key Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car dumps</td>
<td>7</td>
</tr>
<tr>
<td>Churches &amp; cemeteries</td>
<td>15</td>
</tr>
<tr>
<td>Farm buildings</td>
<td>74</td>
</tr>
<tr>
<td>Industry</td>
<td>25</td>
</tr>
<tr>
<td>Pines</td>
<td>13</td>
</tr>
<tr>
<td>Powerlines</td>
<td>8</td>
</tr>
<tr>
<td>Roadside vegetation</td>
<td>31</td>
</tr>
<tr>
<td>Ruins</td>
<td>33</td>
</tr>
<tr>
<td>Streams &amp; creeks</td>
<td>80</td>
</tr>
<tr>
<td>Towns</td>
<td>5</td>
</tr>
<tr>
<td>Wineries</td>
<td>48</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>339</strong></td>
</tr>
</tbody>
</table>

All the scenes in each of the above categories were carefully reviewed and a selection made of 39 scenes for inclusion in the survey (Table 3.3).
Table 3.3 Photographs Selected of Key Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car dumps</td>
<td>1</td>
</tr>
<tr>
<td>Churches &amp; cemeteries</td>
<td>2</td>
</tr>
<tr>
<td>Creeks &amp; streams</td>
<td>6</td>
</tr>
<tr>
<td>Farm buildings</td>
<td>8</td>
</tr>
<tr>
<td>Industry</td>
<td>2</td>
</tr>
<tr>
<td>Pines</td>
<td>1</td>
</tr>
<tr>
<td>Powerlines</td>
<td>1</td>
</tr>
<tr>
<td>Roadside vegetation</td>
<td>8</td>
</tr>
<tr>
<td>Ruins</td>
<td>4</td>
</tr>
<tr>
<td>Towns</td>
<td>1</td>
</tr>
<tr>
<td>Wineries</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>39</td>
</tr>
</tbody>
</table>

(2) Visibility of the Barossa Ranges

The visibility of the Barossa Ranges from across the Study Region varies according to distance from the Ranges (Map 5). An assessment of the ratings of scenes varied by distance would help to determine the influence of the view of the Ranges on scenic quality ratings. Scenes of the Ranges were assigned to one of four distance categories: far, middle, near and within the face of the Ranges and a selection made (Table 3.4).

Table 3.4 Photographs Selected of the Barossa Ranges

<table>
<thead>
<tr>
<th>Distance Category</th>
<th>Number available</th>
<th>Number selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Far distance</td>
<td>23</td>
<td>3</td>
</tr>
<tr>
<td>Middle distance</td>
<td>46</td>
<td>5</td>
</tr>
<tr>
<td>Near distance</td>
<td>110</td>
<td>10</td>
</tr>
<tr>
<td>Within hills face</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>185</td>
<td>19</td>
</tr>
</tbody>
</table>

(3) Landscape Characteristics

It would be possible to select scenes representing each of the fourteen landscape units but the total number would probably far exceed the maximum number available for the survey. On the basis of the principle of equivalence, it is not necessary to sample the scenes in this way. The equivalence principle is that two similar scenes of a given type of landscape should yield similar ratings. Location is thus not important, rather it essential that the different characteristics are represented.

The selection of scenes covering the fourteen landscape units was therefore made on the basis of their dominant characteristics of land form, land cover and land use results in eight categories (Table 3.5).

Table 3.5 Categories for Selection of Scenes

<table>
<thead>
<tr>
<th>Land form</th>
<th>Land cover</th>
<th>Land use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat</td>
<td>Lacking trees</td>
<td>Arable/pasture</td>
</tr>
<tr>
<td>Undulating</td>
<td>Scattered trees</td>
<td>Viticulture</td>
</tr>
<tr>
<td>Hilly</td>
<td>Dense trees</td>
<td></td>
</tr>
</tbody>
</table>

This comprises 3 X 3 X 2 combinations or a total of 18 possible combinations; e.g. flat land/scattered trees/arable or undulating land/scattered trees/viticulture.

There is likely to be more in some groupings than others, for example, there are relatively few hilly areas and relatively few areas of dense trees apart from pines. Table 3.6 summarises the major nine combinations.

Table 3.6 Main Combinations for Selection of Scenes

<table>
<thead>
<tr>
<th>Land form</th>
<th>Land cover</th>
<th>Land use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Flat</td>
<td>Barren/few trees</td>
<td>Arable/pasture</td>
</tr>
<tr>
<td>2 Flat</td>
<td>Scattered/some trees</td>
<td>Arable/pasture</td>
</tr>
<tr>
<td>3 Undulating</td>
<td>Barren</td>
<td>Arable/pasture</td>
</tr>
<tr>
<td>4 Undulating</td>
<td>Scattered</td>
<td>Arable/pasture</td>
</tr>
<tr>
<td>5 Flat</td>
<td>Barren</td>
<td>Viticulture</td>
</tr>
<tr>
<td>6 Flat</td>
<td>Scattered trees</td>
<td>Viticulture</td>
</tr>
<tr>
<td>7 Undulating</td>
<td>Barren</td>
<td>Viticulture</td>
</tr>
<tr>
<td>8 Undulating</td>
<td>Scattered</td>
<td>Viticulture</td>
</tr>
<tr>
<td>9 Any Dense trees</td>
<td>Natural</td>
<td></td>
</tr>
</tbody>
</table>

The description of the land cover has two main grades of tree density: barren or very few trees, and scattered trees or some trees which can include stands of trees.

Photographs were sampled in proportion to their frequency. While it is recognized that the number of photographs in any combination are unlikely to correspond exactly to the areal extent of the combinations, nevertheless it is considered to provide a reasonable indicator of their relative abundance in the Region.

Table 3.7 summarises the number of photographs in each combination and the number of scenes derived.

Small adjustments were made to the number of survey photographs:

- Undulating, few trees, arable: Reduced from 5 to 4
Barossa Region Landscape Assessment Project

- Undulating, some trees, arable: Increased from 14 to 15
- Undulating, some trees, vines: Decreased from 14 to 12
- Dense trees: Increased from 1 to 3

Table 3.7 Photographs per Combination

<table>
<thead>
<tr>
<th>Combination</th>
<th>Photos</th>
<th>% Survey photos</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Flat, few trees, arable</td>
<td>108</td>
</tr>
<tr>
<td>2</td>
<td>Flat, some trees, arable</td>
<td>220</td>
</tr>
<tr>
<td>3</td>
<td>Undulating, few trees, arable</td>
<td>112</td>
</tr>
<tr>
<td>4</td>
<td>Undulating, some trees, arable</td>
<td>352</td>
</tr>
<tr>
<td>5</td>
<td>Flat, few trees, vines</td>
<td>110</td>
</tr>
<tr>
<td>6</td>
<td>Flat, some trees, vines</td>
<td>116</td>
</tr>
<tr>
<td>7</td>
<td>Undulating, few trees, vines</td>
<td>88</td>
</tr>
<tr>
<td>8</td>
<td>Undulating, some trees, vines</td>
<td>332</td>
</tr>
<tr>
<td>9</td>
<td>Dense trees</td>
<td>23</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>1463</td>
</tr>
</tbody>
</table>

The 1700 photographs were sorted into the nine categories – a very laborious process. Then each category was reviewed in turn and a representative number of scenes selected. Again this was a very time consuming and exhausting process. However the alternatives of randomly selecting a photograph or selecting say every 50th photograph were not considered satisfactory in terms of ensuring proper coverage of the characteristics present in the Region.

Table 2.9 summarises the number of photographs in each landscape unit.

Map 6 shows the location of the photographs compared with the landscape units. As the photographs were selected on the basis of various features, visibility of the Barossa Ranges, and the landscape characteristics which were present, the number in each landscape unit varied widely. It was inevitable that some units would be better represented than others.

Appendix 3 describes and lists the location of the survey scenes. Appendix 4 contains images of the 120 scenes of the Barossa Study Region.

### 3.5 SOUTH AUSTRALIAN SCENES

Thirty scenes from across South Australia were selected for inclusion in the survey (Appendix 5). These were sourced from previous studies and provided a wider range of scenic quality than was available in the Study Region. Their inclusion better ensured that the ratings of the scenes in the Study Region would reflect a state-wide perspective.

The scenes included several with green cereals, pasture or vines to provide contrast with the photographs taken of the Study Region which were uniformly brown and dry. Some scenes were similar to those selected for the study and would enable the influence of crop colour on scenic quality ratings to be assessed.

### 3.6 CONDUCT OF THE SURVEY

Members of the Steering Group assembled a list of contacts and possible participants in the Internet survey.

1) **Design of the Internet survey**

Previous experience had shown the efficiency of using the Internet to conduct surveys. To achieve rapid and cost effective results the Internet was relied upon solely for this survey. In 2003, 53% of Australian households had access to the Internet (up from 16% in 1998) & 58% of adults had access to Internet through work and libraries as well as home (ABS, 2005). By extrapolation, by 2005, around 70% of households were likely to have Internet access with a higher percentage having access through work and libraries.
This suggests that reliance on the Internet should not strongly bias participation.

A sub-consultant, David Whiterod, prepared the survey instrument using the Internet. Mr Whiterod had undertaken similar work previously for Dr Lothian (Lothian, 2003; 2004, 2005).

The use of the Internet to deliver the survey introduced a number of challenges and required certain assumptions to be made about respondents, their web browsers, screen configurations and Internet connection speeds. The survey website was developed to cater for as large an audience as possible (slightly erring on the conservative side when making assumptions about respondents' Internet speed and screen size).

The site and survey application was developed using Macromedia’s ColdFusion™ Application Server.

The landscape assessment survey was an image-intensive process; the cumulative file sizes of the scene images were quite large. This was not generally a problem for respondents with broadband (or faster) connections.

To cater for people with slower Internet connection speeds (such as those with dial-up Internet connections), two sets of scene images were created. Both sets of images were identical in all respects except the level of JPEG compression used. A set (with a compression level of 80) was developed for use by broadband users while another set (compression level 60) was developed for dial-up users. The total file size of the dial-up images was around 60% of that of the broadband images.

The image compression settings were a trade-off between compression and image detail. As the level of JPEG compression increased the general quality of an image decreased. If images were compressed too much this would affect the ability for respondents to see fine details in an image and would result in “blockier” images. The trade-off was that high quality scenes were slower to download.

Each image set was resized to 585x390 pixels. This size fitted well into a screen size near 800 pixels by 600 pixels. The page layout also performed well at larger screen resolutions.

A Microsoft SQL Server was used to record both the demographic details as well as the ratings of each scene.

The survey website was designed to be as self-contained as possible. The front page included details of the survey process, background and contact information. If the respondent chose to proceed to the survey they were prompted to enter some general demographic information. This information was recorded in the database and a unique survey identifier generated for each respondent. This initiated the survey session. The respondent’s session identifier was used to record scene ratings with the correct demographic details. As the participant rated each scene, their rating was automatically recorded in the database. The respondent characteristics used the categories of the Australian Bureau of Statistics and were included to compare the respondents with the community.

As part of the demographic collection stage, respondents were asked to indicate their Internet connection speed: either dial-up or broadband. This information was used to reduce the download requirements for dial-up users as they are shown a more compressed set of scene images during the survey.

Following the introductory four sample scenes, the 150 scenes were then shown, each for as long as the respondent required (up to 30 minutes). The order of these scenes changed for each participant, a new random order being generated automatically as the participant moved to the next scene. Each time a new scene was to be shown the survey application chose a random scene from the list of scenes that the participant had yet to rate. Randomising the order of scenes overcame the issue of the order of the scenes affecting the results – with attention waning towards the end, or one scene being affected by the previous scene.

Following selection of the rating on the 1 to 10 scale at the top of the screen, the next scene automatically appeared. This allowed respondents to move through them at their own pace and not be anxious about completing their rating before it moved to the next scene, or alternatively, being frustrated for waiting the scene to change after they had completed their rating. The design of the rating instrument ensured that scenes loaded rapidly, even on dial up connections although...
delays can and did occur when many hundreds logged in concurrently.

Respondents could temporarily leave the session if interrupted and return to continue it. However there was a cut off time of 30 minutes at which point the survey terminated.

A respondent could exit the survey at any point. They could also leave comments, either at the end of the survey or, if they chose to leave the survey before completion, before rating all scenes.

On completion of the survey the participant was thanked and provided with an opportunity of commenting on the survey. They could then either exit or go back to the first page.

The Internet survey is shown on the following pages.

(2) Conduct of Survey

The survey was launched publicly on Wednesday 15 June, 2005. Over the following two weeks, responses climbed steadily. Advertisements were placed in The Advertiser on Saturday 25 June and in local newspapers in the Barossa area in early July (Figure 3.1).

On Wednesday 29 June a notice was posted on the State Government Intranet advising of the survey and inviting employees to participate (Figure 3.3). Over the next 24 hours, the numbers who had participated in the survey increased from under 200 to over 1200 (Figure 3.2). It increased further over succeeding days.

Because so many logged onto the site concurrently, the scenes took far longer to download and this resulted in considerable frustration, premature terminations, and comments on the surveys. As the notice went out across the State Government it included many regional centres.

The survey was terminated on Wednesday 13 July by which time 2260 had participated in it. The level of interest vindicated the use of the Internet as the vehicle for the survey instrument.

Figure 3.1 Advertisement in The Advertiser 25 June 2005

Figure 3.2 Total Responses to Survey during June-July 2005
Barossa Region Landscape Assessment Project

INTRODUCTORY PAGE

Barossa Landscape Assessment Survey

Purpose of this survey

The Barossa Valley is one of the most popular areas for tourists and is Australia’s leading wine region. The Barossa business community together with the councils and Planning SA want to protect the Barossa landscape and to safeguard the region’s values. They have commissioned a study to measure and map the landscape values of the Barossa Region.

The outcome of the project will assist State and Local Governments in better planning and management of the Barossa Region.

You are invited to participate in rating the scenic quality of the selection of photographs in this survey and which are representative of the Region.

No qualifications or experience are required to participate and the responses will be anonymous. Participants need to be a minimum of 18 years of age.

The survey closes on Wednesday, 13 July 2005.

The Barossa Study Region extends from near Kapunda and Truro south to Williamstown and Springton. It covers the entire Barossa Valley as well as the Barossa Ranges and the Eden Valley area.

How it works

You will be shown a photograph of a scene and asked to rate its scenic attractiveness. The ratings are on a scale of 1 to 10 - 1 being very low and 10 being very high. The rating scale is located at the top of each scene's page - just click the appropriate number to register your rating for each scene. Once a rating has been recorded you will be automatically shown the next scene.

How long will it take?

- The survey has a total of 150 scenes. How long it takes will depend on how much time you spend rating each scene: it can be completed in less than 15 minutes
- There is no time limit to rate each scene, however, your rating session will end after 30 minutes of inactivity
- Please rate all 150 scenes as this will provide a greater statistical weight to the survey
- None of the scenes for rating is repeated
- The survey includes scenes from elsewhere in South Australia to provide balance
- At the end of the survey, or if you leave before the end, you will be able to provide comments.

Hints

- Use the entire rating scale, don't just sit in the middle around 5
- Judge each scene on its merits
• Trust your initial instinct - don't try and analyse your response
• Try to ensure you have no distractions (phone, callers etc) before you start the survey
• If you feel tired or get interrupted during the survey, take a break, the survey will wait until you return (for a maximum of 30 minutes).

Contact

The project coordinator, Christine Lloyd, is available if you have any questions on email lloyd.christine@saugov.sa.gov.au or by phone on (61 8) 830 30764.

Start Survey

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PAGE 2

Barossa Landscape Assessment Survey

Demographic Information

Please fill in all fields on this form.
This (anonymous) information will be used to help analyse the survey results.

Age Group
Please Indicate Your Age Group

Gender
Please indicate your Gender

Female
Male

Birthplace

Born in Australia
Not born in Australia

Education
Please indicate your highest education level attained

Postcode
Please indicate your Home Postcode (if in Australia)

Internet connection speed

This information will be used to reduce your download requirements.

Broadband (I have a fast Internet connection)
Dial-up (I have a slow Internet connection)
Barossa Landscape Assessment Survey

You are about to start the survey

**Example Landscapes**

- The survey will start with a series of 4 example landscapes. This will give you an example of the types of landscapes you will be asked to rate during the survey.
- During the example landscapes phase you can continue to the next landscape by either clicking the photograph or the rating buttons at the top of the page (these ratings are not recorded), otherwise the page will automatically progress to the next example landscape after a few seconds.

**PAGE 4**

Continue to the next example landscape by clicking the photograph or the rating buttons (above) otherwise this page will automatically progress to the next example landscape.

Example Scene 1
Scene for Rating

Rating scale above scene: 1  2  3  4  5  6  7  8  9  10

Scene 4 of 150

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Barossa Landscape Assessment Survey

ON COMPLETION OF SURVEY

Thank you for completing the survey

Please note: The survey did not contain any repeated scenes. Scenes from outside the Barossa Valley were included to provide a State-wide basis for the rating.

Please feel free to submit any comments you may have about the survey

Submit Comments
Barossa Landscape Assessment Survey

Thank you for adding your comments.

If you want to find out more about the survey and its results please contact:

Dr Andrew Lothian
Scenic Solutions
Tel: 0439 872 226
Email: alothian@aapt.net.au

Back to front page...

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"This message has been authorised by Jim Hallion,

Chief Executive

Department of Primary Industries and Resources SA"

Planning SA together with The Barossa Council, the Light Regional Council and the Barossa Light Regional Development Board, have commissioned a study of the landscape values of the Barossa region.

The outcome of this study will assist State and Local Governments in better planning and managing the Region.

This is an ambitious project and I seek your assistance.

A selection of photographs showing scenes that are representative of the region have been placed in a survey on the Internet: http://www.scenicsurvey.net/

You are invited to participate in rating the scenic quality of the photographs and also to forward this email to others who may be interested in participating.

No qualifications or experience are required to participate and the responses will be anonymous.

Please note that the survey closes on Wednesday 13th July 2005.

The project coordinator, Christine Lloyd, is available if you have any questions on email: lloyd.christine@saugov.sa.gov.au or by phone on (08) 830 30764.

Figure 3.3 Notice Publicising Barossa Survey on State Government Intranet
3.7 IDENTIFICATION AND SCORING OF LANDSCAPE FACTORS

The scenic quality of scenes derives from their content and particular features they contain which trigger responses in participants. The presence of water for example almost invariably enhances scenic quality as also does the naturalness of the scene, the presence of trees and high landforms.

The purpose of identifying these landscape factors is to enable the analysis of the ratings to proceed beyond the mere description of the ratings to understand why scenes gain the ratings they do. What are the factors which contribute to the ratings they received?

Multiple regression analysis allows these landscape factors to be compared with the ratings and to both identify and quantify which factors contributed to the ratings and their relative importance.

In an earlier study of the amenity value of trees (Lothian, 2004) it was found that the spacing and number of trees, their health and their height were the most important factors. In the study of coastal scenic quality (Lothian, 2005), the sense of tranquility or awe, the quality of the beach, the degree of naturalness, the height of landforms and the diversity in the scene were all found to be important contributors.

In examining the scenes used in the survey, the following possible landscape factors were identified as possibly contributing to scenic quality:

Predominant colour. Most of the scenes were photographed during a long dry spell and consequently the ground was bare and brown. Some scenes from earlier surveys which included green ground cover were included to help assess this effect on ratings. The colours brown or green may be regarded by participants as surrogates representing dead or alive, barren or lush, unproductive or productive.

Colour is a difficult factor to analyse as colours vary across a scene, and the dominant colour is hard to assess, particularly where there are several such as straw and green. The influence of colour was therefore assessed more directly through analysis of the scenes.

Visibility of the Barossa Ranges as a backdrop. A unique feature of the Barossa Valley is the backdrop provided by the western escarpment or hills face of the Barossa Ranges which rise about 300 metres above the floor of the Valley (See Map 5). This provides a sense of enclosure and boundary to the Valley and a landmark which is visible through much of the Valley. It is visible well to the west, as far as Freeling (23 km), Tarlee (42 km) and beyond.

Land use As an important wine producing region, vines are found across much of the region. Where vines are not present, most of the land is used for grazing or cropping. In addition in some areas, pines have been planted. Scoring the presence of vines in the scene would provide a gauge of the influence of vines on scenic quality.

Trees. Previous studies have indicated the positive contribution that trees in the landscape can make to scenic quality. The trees are present along roadsides and streams, and, in the highland area, scattered across the paddocks.

Scattered trees amidst grassland is reminiscent of pastoral landscapes which have a long history of providing pleasing environments for people. The landscaped English gardens of Capability Brown and today’s public parks and gardens provide this image.

Both the presence or absence of the trees and their distribution – whether scattered or linear (e.g. shelterbelts, roadside vegetation) may require assessment. Additional aspects such as the species, the form and size of the tree, whether found singly or in clumps could be assessed but are probably unnecessary complications.

The absence of trees in vineyards and in farmland would be assessed in this factor.

Buildings and structures The Barossa Region is a cultural landscape, one where the imprint of humans is apparent throughout much of its area. Only in some of the deeper valleys in the Barossa Ranges is this less apparent. Cultural land uses include vineyards, pine forests, orchards, horsestuds and farmland. Cultural artefacts include churches and housing, ruins, industry, wineries, farm sheds, buildings and farm machinery, fences, towers, powerlines, roads and bridges. The planting of roses alongside vines is a cultural feature.
The assessment of cultural features focused on buildings and structures, which is considered sufficiently inclusive to cover the majority of these cultural imprints. Scoring their presence in the scenes would provide an indication of their effect on scenic quality.

**Terrain** Previous studies have found that scenic quality ratings correlated with landform, being lowest for flat land, higher for hilly land and highest for mountainous land. Land in the survey’s scenes is flat, undulating or hilly. A complicating factor is the Barossa Ranges viewed over flat or undulating land. As the presence of the Ranges would be assessed separately, the scorers could be instructed to ignore the Ranges when scoring the terrain in the foreground.

**Water** Water almost invariably enhances scenic quality, the exception being where it is discoloured or polluted. The water does not need to be extensive, just a glimpse of a farm dam is sufficient.

**Naturalness** In the coastal viewscapes project, naturalness was found to play a significant role in determining scenic quality. It is a measure of the perceived naturalness, not necessarily its ecological naturalness. Much of the Australian landscape has been affected by human influence, including grazing and the clearance of native vegetation. In addition to housing and other developments, roads, powerlines and other infrastructure, farm structures and fences have been constructed. The presence of stock, vines, pines and other artificial features all detract from the appearance of naturalness.

Scoring of most of these landscape factors was on the basis of their significance – e.g. the significance of trees in the scene. Naturalness was assessed on the basis of a continuum: not natural – very natural. Terrain was scored on five grades: flat, undulating, hilly, fairly rugged, mountainous.