5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

5.1 DESCRIPTION OF THE NATURAL PHYSICAL ELEMENTS

The natural physical elements are described according to broad topographical regions (**Figure 2**: Landscape Types). These landscape types correlate closely with the vegetation types as described by Low and Rebelo (1996) as these types take into account the topographical makeup of the area. The proposed project components traverse two distinct landscape types and two biomes.

These landscape types have been used solely for the purpose of defining the landscape components and are not intended to refer to the flora studies.

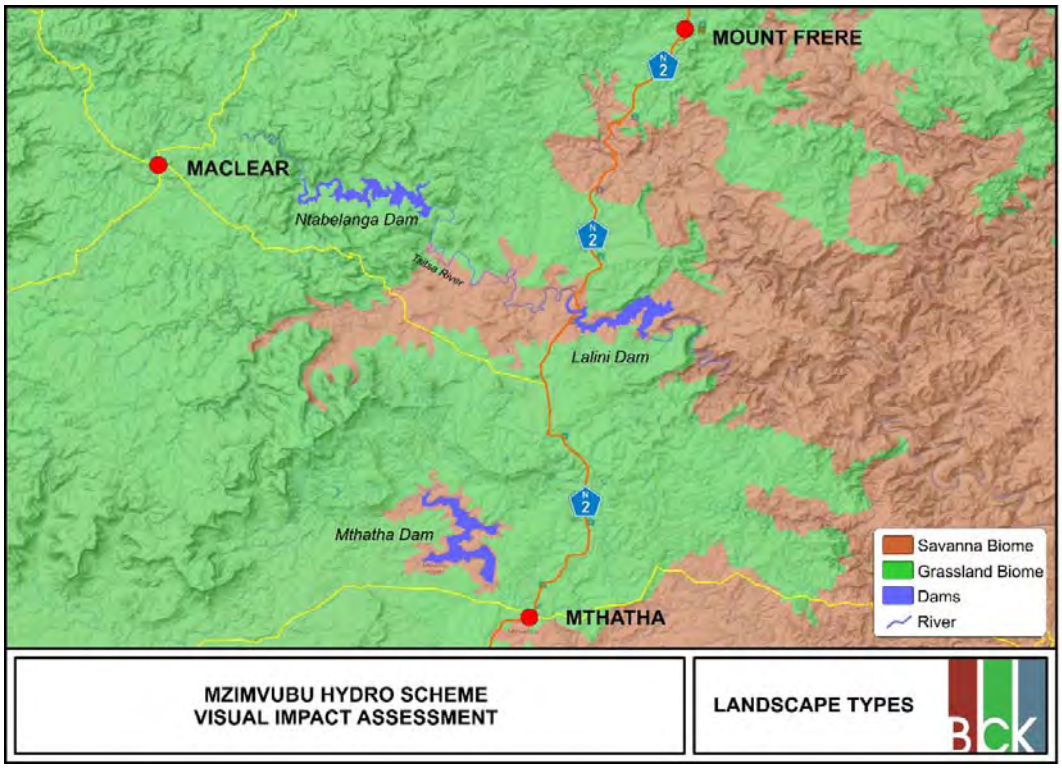


Figure 2: Landscape Types

The landscape types are:

Grassland Biome
Savannah Biome

The extent of the visual impact of the project will depend on the following characteristics of the receiving environment:

Topography

Topography describes the landform that gives rise the physical setting.

Vegetation Cover

Vegetation refers to the vegetation cover in terms of visual diversity and not in terms of botanical characteristics.

Land Use

Land use is described in terms of the visual mix of land uses that is a function of land diversity and character.

Visibility

Visibility is described in terms of the areas that theoretically have direct line of sight in relation to distance the viewer is away from the object. Critical affected views are also described.

Landscape Diversity

Landscape diversity is a function of topography, vegetation and land use. The greater the diversity, the greater is the potential for the proposed development to blend with the surrounding landscape.

Landscape Character

The spirit, or sense of place, is that quality imparted by the aspects of scale, colour, texture, landform, enclosure, and in particular, the land use. According to K. Lynch (1992) 'it is the extent to which a person can recognise or recall a place as being distinct from other places as having a vivid, or unique, or at least a particular character of its own'.

The quality of Genius Loci is a function of attributes such as the scenic beauty or uniqueness and distinctive character of the built and cultural landscape.
The visual quality is the visual significance given to a landscape determined by cultural values and the landscape's intrinsic physical properties (Smardon, et al, 1986). While many factors contribute to a landscape's visual quality, they can ultimately be grouped under three headings: vividness, intactness and unity.

The visual quality can be categorised under relative headings such as high, medium and low visual quality for the study area. High refers to those areas that have a high aesthetic appeal such as mountains, river valleys, unspoilt coastal zones and wilderness areas. The medium areas are those that have high visual diversity, but which have already been modified by human activity comprising the aesthetic appeal such as roads, minor infrastructure and settlements. The low visual quality areas are those that are relatively highly populated and which have been heavily impacted on by human activity such as

industrial and mining areas or which have a low aesthetic appeal due to a lack of landscape diversity or interest.

The study area focuses on a 10 km radius around each of the project components.

5.1.1 Ntabelanga Dam

Topography

The dam basin is located within an east-west valley with rising hills to the north and south. The Tsitsa River, on which the dam is located, flows from west to east to just past the dam wall where it then flows south and then east towards the proposed Lalini Dam.

Deep dongas are evident where the soils are deep and easily erodible.

Implications for the Project

The rising landscape surrounding the site enables this proposed dam to be visually contained to within a 6 km viewshed zone.

The waterline edge will follow the line of the topography which is sympathetic with the landscape and forms a natural blended edge

Vegetation Cover

The vegetation for almost the entire dam basin consists of low grasslands with patches of trees occurring within the valleys, kloofs, sheltered sites, rocky hills and ridges.

The Grassland landscape types are generally open, uniform in texture and start resulting in a visually open landscape. However, most of the vegetation is disturbed, ploughed or heavily overgrazed and degraded

Implications for the Project

The uniformly textured vegetation of the Open Grassland landscape types will visually contrast significantly with the dam making it more visible in the landscape. The low vegetation height does not assist in screening the proposed dam nor does it assist in blending it with the landscape.

However, the lack of a diverse vegetation cover limits the opportunity to blend the dam visually with the landscape and will leave it visually exposed.

Visibility

The visibility is contained within the valleys by the surrounding rising landforms and valley slopes and limits views to approximately 1.5 - 5.0 km. Intermittent views are possible up to 7 km away from the higher landforms. (**Figure 3**: Ntabelanga Dam: Viewshed).

Critical views are from the surrounding local villages such as Luxeni on the north bank and Bongweni, Komkulu, KuQulungashe and Siqungqwini on the south bank. Critical views are also those from the surrounding access roads.

Implications for the Project

Visibility is generally uninterrupted throughout the viewshed. None of these views should be negatively impacted as the views will not detract from the existing aesthetic appeal of the area nor will it affect any land-use that relies on the visual environment for it to exist

Landscape Diversity

Landscape diversity within the viewshed is primarily based on the topographical features as the vegetation, namely grasslands, is relatively uniform in texture and height.

The landscape exhibits a great degree of horizontal and vertical scale due to the surrounding hills and ridges that provide a scape in proportion to the scale of the dam.

The study area is already modified by human activity such as the various scattered settlements, roads and ploughed, terraced lands which add to a more diverse landscape.

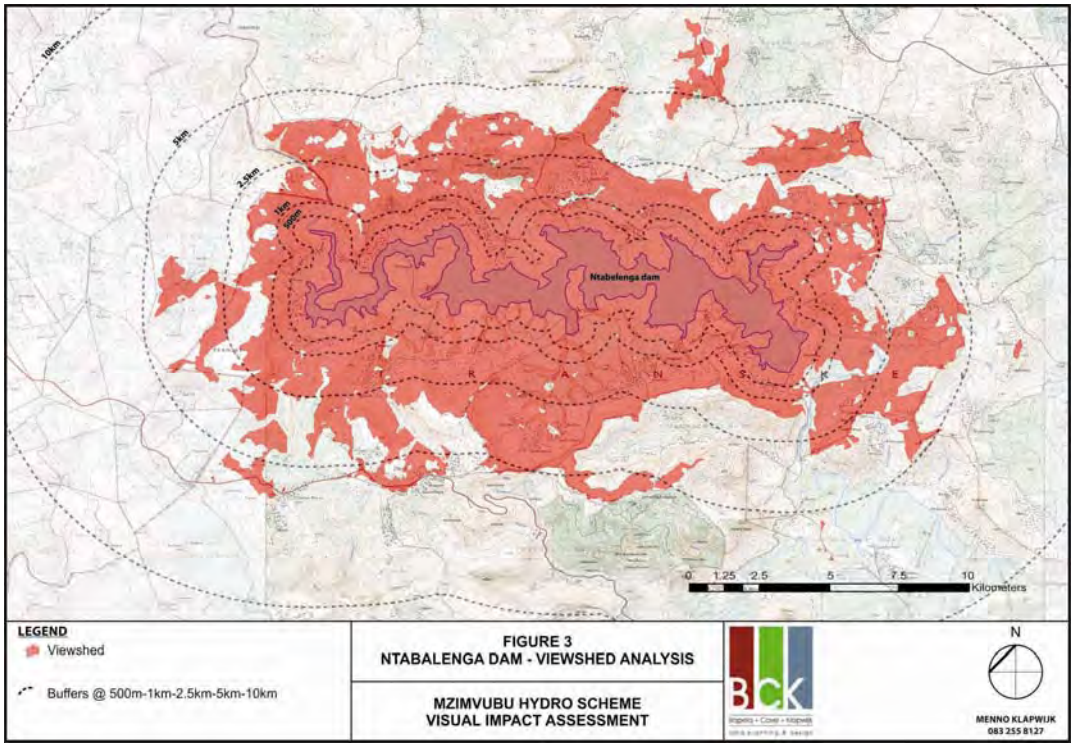


Figure 3: **Ntabelanga Dam: Viewshed**

Implications for the Project

The higher the visual diversity, the greater is the opportunity to visually blend the dam with the environment as these will more readily accept visual change or any structure placed

within them. The higher the diversity, the higher the Visual Absorption Capacity (VAC) or the ability of the environment to accept visual change.

The low diversity of the open and uniform vegetation together with the diversity of the human activity and the rising landforms adds towards a low to moderate diversity

The lack of visual diversity within this Grassveld landscape biome will result in a low VAC and will in turn result in any large scale structure to be highly visible due to the lack of screening and the high visual contrast. The hills and ridges together with the scattered settlements display a slightly higher visual diversity due to the more diverse topography and the odd patches of trees. However, this still does not provide sufficient diversity to raise the VAC to moderate for this area.

Landscape Character

The hills and ridges exhibits a well-defined and vivid sense of spatial definition with a moderate scenic quality due to the combination of low gentle valleys, open grasslands. The character of the landscape can be regarded as rural agriculture predominantly stock grazing and subsistence farming.

Implications for the Project

The introduction of a dam within this landscape will alter the character considerably due to the size and scale of it. The dam will considerably alter the sense of place and Genius Loci of the study area. However, the change in character is not considered to be significantly negative and aesthetically unpleasing.

The introduction of this element in the landscape has the potential to promote tourist-based enterprises that rely on the high scenic quality as the basis for their business.

5.1.2 Lalini Dam

Topography

The dam basin is generally U-shaped in an east-west and north-south direction surrounded by hills mainly to the north, east and south. The dam wall is located in the east of the dam on the Tsitsa River. The dam site is located about 3.5 km upstream of the very scenic Tsitsa Falls.

Soils are shallow on the side slopes of the hills. Deeper soils along the drainage lines have resulted in eroded dongas.

Implications for the Project

The rising landscape surrounding the site enables this proposed dam to be visually contained to within a 5 km viewshed zone.

The waterline edge will follow the line of the topography which is sympathetic with the landscape and forms a natural blended edge

Vegetation Cover

The vegetation, as with most of the study area, for almost the entire dam basin consists of low grasslands with patches of trees occurring within the valleys, kloofs, sheltered sites, rocky hills and ridges.

The Grassland landscape types are generally open, uniform in texture and start resulting in a visually open landscape. However, most of the vegetation is disturbed, ploughed or heavily overgrazed and degraded.

The Tsitsa valley downstream consists of Valley Thicket and is relatively intact in terms of visual quality.

Implications for the Project

The uniformly textured vegetation of the Open Grassland landscape types will visually contrast significantly with the dam making it more visible in the landscape. The low vegetation height does not assist in screening the proposed dam nor does it assist in blending it with the landscape.

The lack of a diverse vegetation cover limits the opportunity to blend the dam visually with the landscape and will leave it visually exposed.

Visibility

The visibility is contained within the valleys by the surrounding rising landforms and valley slopes and limits views to approximately 1.5 - 5.0 km. Intermittent views are possible up to 8 km away from the higher landforms. (**Figure 4**: Lalini Dam: Viewshed).

Critical views are from the surrounding local villages such as Mhlabathi and Upper Rosa to the north, Shawbury and Mtshazi to the northeast, Lolana to the Southeast and Mahoyana to the east of the Tsitsa Falls. Critical views are also those from the surrounding access roads.

Implications for the Project

Visibility is generally uninterrupted throughout the viewshed. None of these views should be negatively impacted as the views will not detract from the existing aesthetic appeal of the area nor will it affect any land-use that relies on the visual environment for it to exist

Landscape Diversity

Landscape diversity within the viewshed is primarily based on the topographical features as the vegetation, namely grasslands, is relatively uniform in texture and height.

The landscape exhibits a great degree of horizontal and vertical scale due to the surrounding hills and ridges that provide a scape in proportion to the scale of the dam

The study area is already modified by human activity such as the various scattered settlements, roads and ploughed, terraced lands which add to a more diverse landscape

Implications for the Project

The low diversity of the open and uniform vegetation together with the diversity of the human activity and the rising landforms adds towards a low to moderate diversity

The lack of visual diversity within this Grassveld landscape biome will result in a low VAC and will in turn result in any large scale structure to be highly visible due to the lack of screening and the high visual contrast. The hills and ridges together with the scattered settlements display a slightly higher visual diversity due to the more diverse topography and the odd patches of trees. However, this still does not provide sufficient diversity to raise the VAC to moderate for this area.

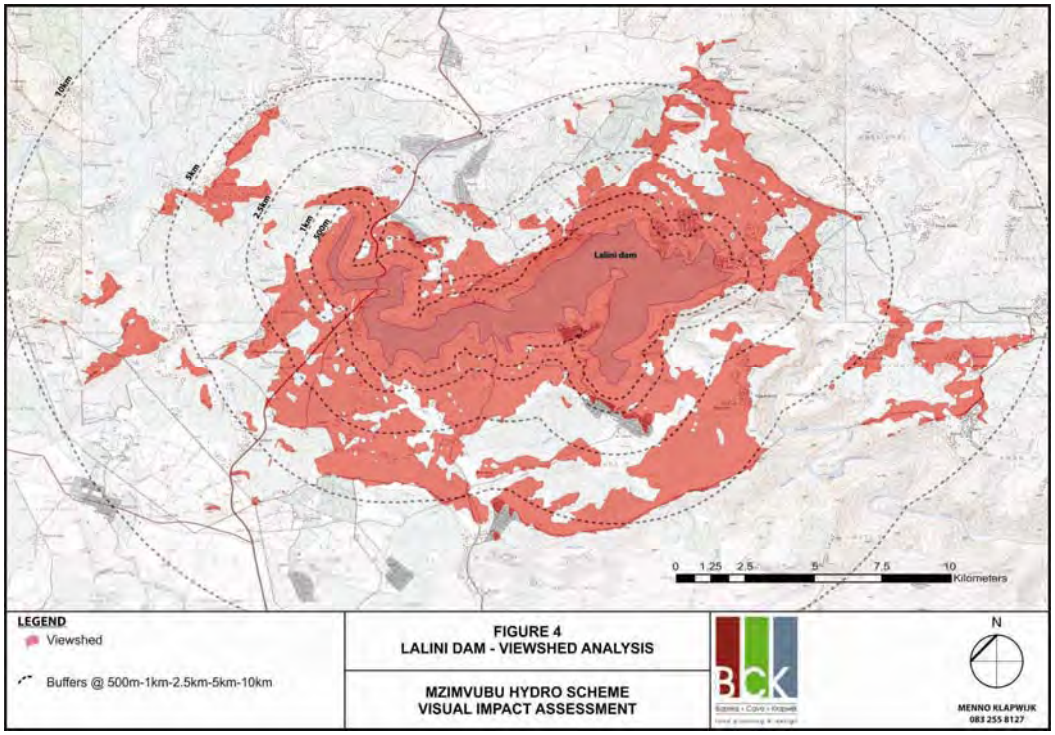


Figure 4: Lalini Dam: Viewshed

Landscape Character

The hills and ridges exhibits a well-defined and vivid sense of spatial definition with a moderate scenic quality due to the combination of low gentle valleys, open grasslands and the scattered settlements. The character of the landscape can be regarded as rural agriculture predominantly stock grazing and subsistence farming.

Implications for the Project

The introduction of a dam within this landscape will alter the character considerably due to the size and scale of it. The dam will considerably alter the sense of place and Genius Loci of the study area. However, the change in character is not considered to be significantly negative and aesthetically unpleasing.

The introduction of this element in the landscape has the potential to promote tourist-based enterprises that rely on the high scenic quality as the basis for their business, especially with the Tsitsa Falls in close proximity.

5.1.3 High Voltage Power Transmission Lines

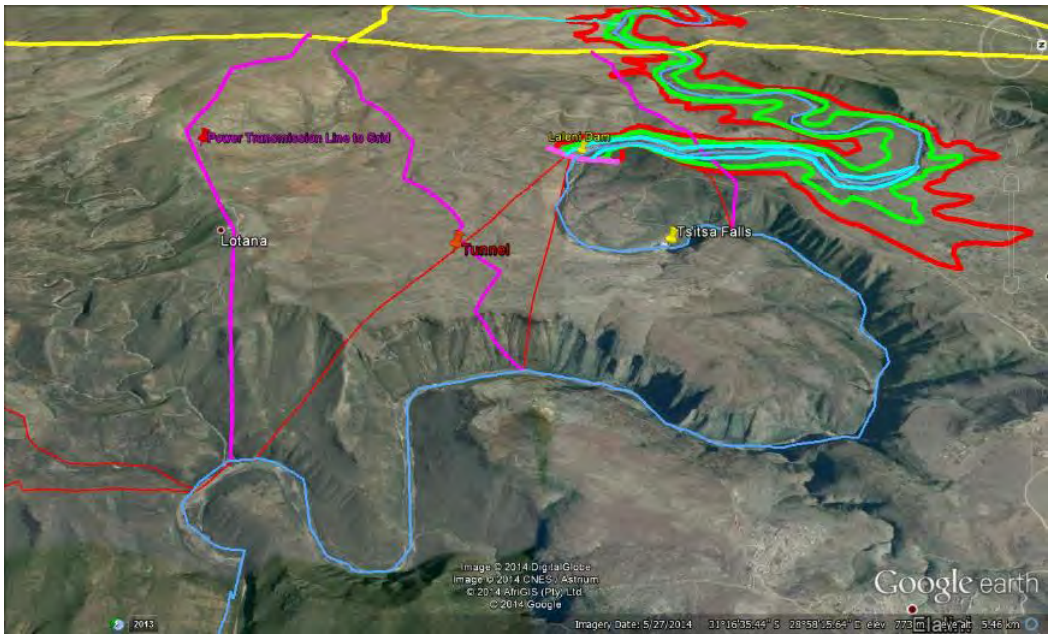
Topography

All three routes run east west across the landscape from the Tsitsa River to the Eskom grid that runs north-south just west of Gwali (**Figure 5**: Powerlines Locality Plan). The routes rise up out of the Tsitsa river valley onto the upper plateau over a rolling open landscape to where it meets the national grid approximately 18 km away. Powerline 1 is fairly close to the Tsitsa Falls which is probably the major scenic attraction in the area. The valley is steep sided from the falls downstream for approximately

Implications for the Projects

The valley sections assist in screening the pylons when viewed in silhouette but once they emerge onto the open plateau they are easily read against the skyline as there are no landforms to assist with screening.

Powerline 3 which lies to the south runs along the top edge of a valley that links up with the Tsitsa River. It is recommended that the route be adjusted to follow the valley bottom all the way to the national grid line rather than on top where it will be far more visible.



(Transmission Lines are in pink)

Figure 5: Transmission Lines Locality Plan

Vegetation Cover

The vegetation, as with most of the study area, consists of low grasslands with patches of trees occurring within the valleys, kloofs, sheltered sites, rocky hills and ridges.

The Grassland landscape types are generally open, uniform in texture and start resulting in a visually open landscape. However, most of the vegetation is disturbed, ploughed or heavily overgrazed and degraded.

The Tsitsa valley consists of Valley Thicket vegetation and is relatively intact in terms of visual quality. The hills around the Tsitsa Falls are covered with trees.

Implications for the Project

The uniformly textured vegetation of the Open Grassland landscape types will visually contrast significantly with the pylons making them more visible in the landscape. The low vegetation height does not assist in screening them nor does it assist in blending them with the landscape. The lack of a diverse vegetation cover limits the opportunity to blend the pylon structures visually with the landscape and will leave them visually exposed.

The sections where the routes traverse the valley slopes, which are fairly densely covered with trees, will become very visible where a servitude will have to be cut. It will be recommended that just the minimum vegetation should be removed especially if Powerlines 1 or 2 are selected.

Visibility

The visibility within the valley is contained by the surrounding rising landforms to approximately 1 km. As the transmission lines rise up out to the valley they become very exposed and are visible for many kilometres. (**Figure 6**, **Figure 7** and **Figure 8**: Powerlines 1, 2 and 3: Viewsheds).

Powerline 1 rises out of the valley further down the river and runs along the edge of the plateau next to a valley where it stands out proud in the open landscape. The visual exposure is uninterruptedly visible northwards for at least 5 km with sporadic views possible up to 10 km. Views to the south are more scattered but also extend to at least 10 km.

Powerline 2 is more contained by the landscape than Powerline 1 and is generally limited as a continuous view to approximately 3 km. Views occurred from the higher lying areas to the north are Intermittent and up to a distance of 10km

Powerline 3 is the closest to the dam wall and the Tsitsa Falls. Although it is the shortest of the routes the visual exposure extends at least 7.5 km to the north east as well as to the south east. The hydro-station will be located is a relative unspoilt treed valley where the slopes of the valley limit views to approximately1.5 - 5.0 km. Although the pylons are well screened within the valley the servitude that will need to be cleared for access will greatly contrast with the surrounding vegetation and be visually obvious. Intermittent views are possible up to 8 km away from the higher landforms.

Critical views are from the surrounding local villages such as Mhlabathi and Upper Rosa to the north, Shawbury and Mtshazi to the northeast, Lolana to the Southeast and Mahoyana to the east of the Tsitsa Falls. Critical views are also those from the surrounding access roads.

Implications for the Project

Although the transmission line routes are very visible and exposed within the open and low vegetation the rolling topography created by the surrounding landscape assists in containing the view impact to generally no more than 5 km.

The valley that runs parallel to Powerline 1 would greatly assist in reducing the visual exposure of the line if places within the valley than rather on top along the edge of the escarpment

Landscape Diversity

Landscape diversity within the viewshed is similar to the dam study sites and is primarily based on the topographical features and human interventions as the vegetation, namely grasslands, is relatively uniform in texture and height.

The landscape exhibits a great degree of horizontal and vertical scale in the vicinity of the Tsitsa River due to the surrounding hills, ridges and steep-sided valley bottom that provide

a scale in proportion to the scale of the pylons. However, once the lines rise out of the valley they traverse an open rolling landscape that is already modified by human activity such as the various scattered rural settlements, roads and ploughed, terraced lands which add to a more diverse landscape.

Implications for the Project

The low diversity of the open and uniform vegetation together with the diversity of the human activity and the rising landforms adds towards a low to moderate diversity

The visual diversity within this Grassveld landscape biome will result in a low to moderate VAC. The hills and ridges together with the scattered settlements display a slightly higher visual diversity due to the more diverse topography and the odd patches of trees. However, this still does not provide sufficient diversity and will still result in any large scale structure to be highly visible due to the lack of screening and the high visual contrast.

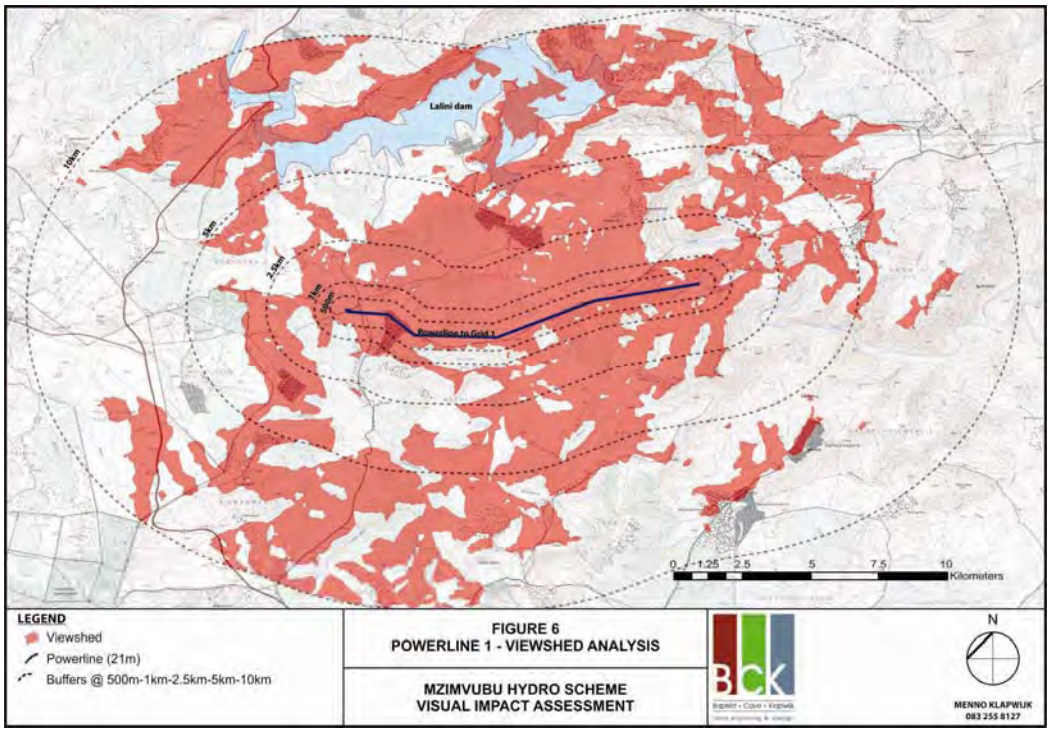


Figure 6: Powerline 1: Viewshed

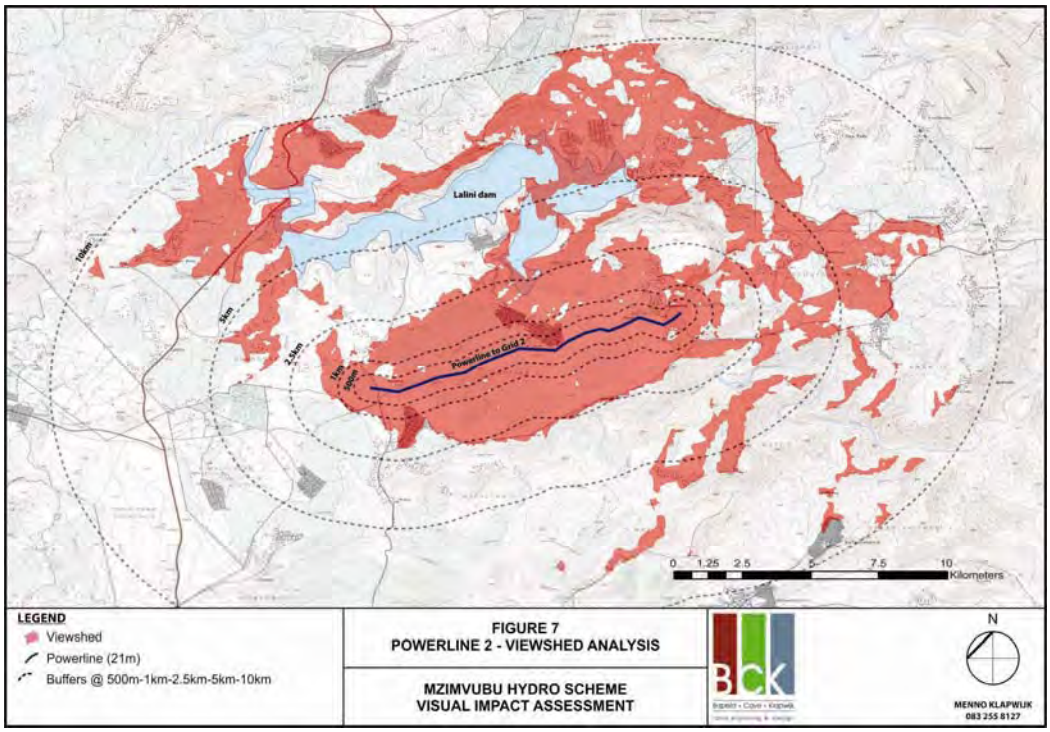


Figure 7: Powerline 2: Viewshed

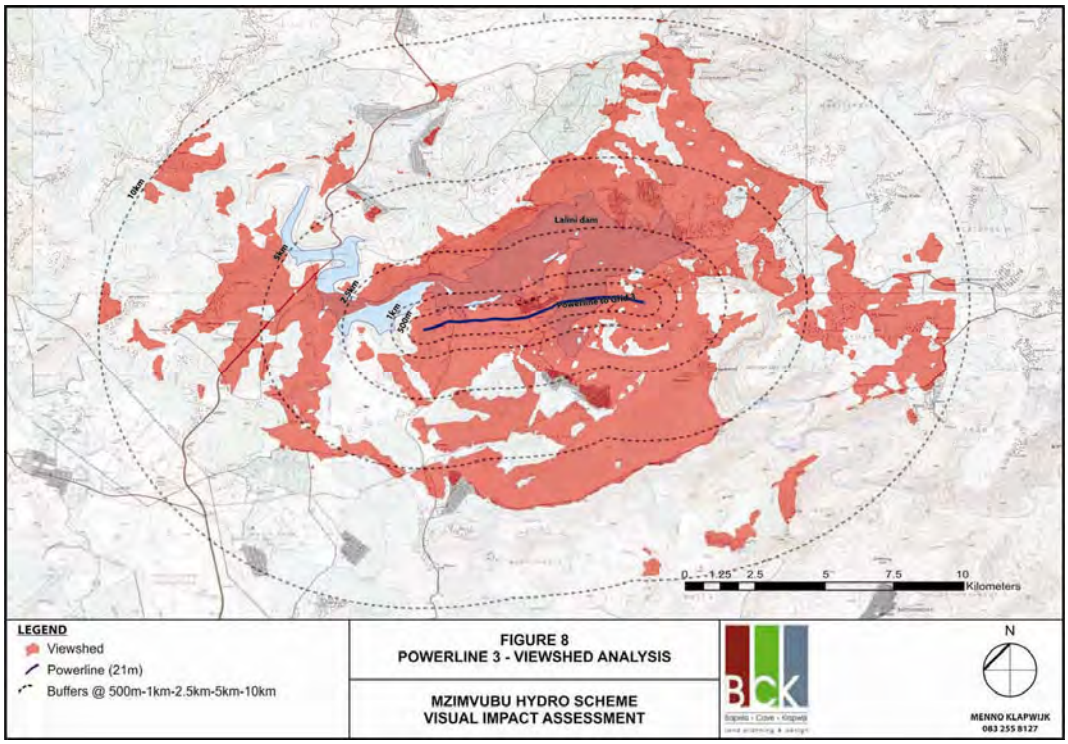


Figure 8: Powerline 3: Viewshed

Notwithstanding the low to moderate VAC, the area has already been modified by human interaction in the form of settlements, roads and arable agriculture and is thus able to visually accommodate the industrial nature of the lines

Landscape Character

The hills and ridges exhibits a well-defined and vivid sense of spatial definition with a moderate scenic quality due to the combination of low gentle valleys, open grasslands and the scattered settlements. The character of the landscape can be regarded as rural agriculture predominantly stock grazing and subsistence farming.

Implications for the Project

The introduction of a dam within this landscape will alter the character considerably due to the size and scale of it. The dam will considerably alter the sense of place and Genius Loci of the study area. However, the change in character is not considered to be significantly negative.

The introduction of this element in the landscape has the potential to promote tourist-based enterprises that rely on the high scenic quality as the basis for their business, especially with the Tsitsa Falls in close proximity.

5.1.4 Irrigation Scheme

Topography

The areas earmarked for irrigation are mainly in the Tsolo area situated roughly between the two dam sites. About 2 450 ha of the 2 900 ha of the high potential land suitable for irrigated agriculture are in the Tsolo area and the rest near the proposed Ntabelanga Dam and along the river, close to the villages of Machibini, Nxotwe, Culunca, Ntshongweni, Caba, Kwatsha and Luxeni.

The area around Tsolo consists of gentle rolling hills much of which has been previously terraced farmed (**Figure 9**: Tsolo Irrigation Scheme). Sections are adjacent to drainage lines while others are on sloped terrain. The areas around the Ntabelanga Dam are mainly on flatter lying land adjacent to the edge of the dam and adjacent to the river downstream of the dam.

Implications for the Project

The flatter lying land proposed for irrigation assists in containing the visibility of the irrigated lands due to the lack to relief and the angle of exposure. The terraced areas are more prone to expose which increases the visual area of influence

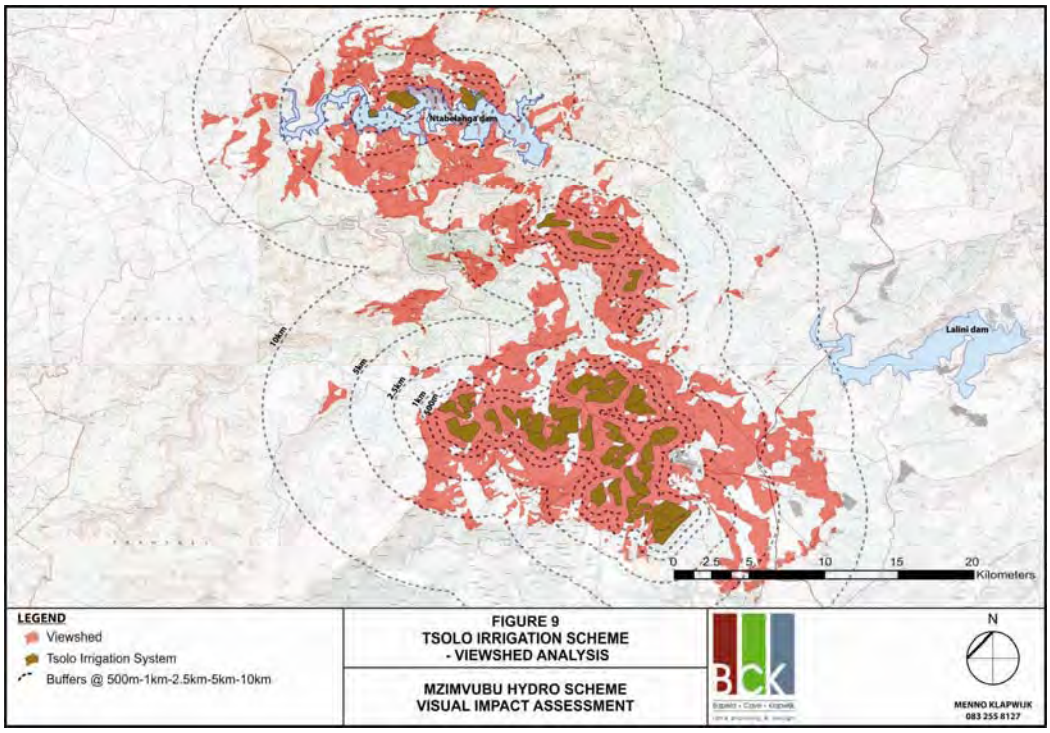


Figure 9: Tsolo Irrigation Scheme

Vegetation Cover

The Open Grassland landscape type vegetation for most of the area has been modified or disturbed by previous farming activities mostly in the form of subsistence farming, ploughing or heavy overgrazing. Some of the areas on slopes have been previously terraced. The vegetation is open, uniform in texture and start resulting in a visually open and exposed landscape.

Implications for the Project

The uniformly textured grassland vegetation will visually contrast significantly with the irrigated lands making them more visible in the landscape. The low vegetation height does not assist in screening them nor does it assist in blending them with the landscape. The lack of a diverse vegetation cover limits the opportunity to blend the lands visually with the landscape and will leave them visually exposed.

Visibility

Views in the Tsolo area are limited in the west to between 500m and 5 km and between 1 and 8 km in the east. Views along the Tsitsa River area are generally between 1 and 2.5 km while the area around the Ntabelanga Dam is visible between 2.5 and 6.5 km (Figure 9: Tsolo Irrigation Scheme: Viewshed).

Critical views are from the R 396 that links the N2 with Maclear through Tsolo. Critical views also include the surrounding local villages such as Tsolo, Bantubabi, Prince, Duka, KuGubengxa, St. Cuthberts and Godini in the Tsolo area; the village of Machibini along the

Tsitsa River area and the villages of eLugolweni. Coba Vale, Coba, Luxeni and Mpetsheni in the Ntabelanga Dam area.

Implications for the Project
Although the irrigated areas are close to critical view from the villages and well within the viewsheds the impact is considered low as these area are mostly existing arable lands then are being converted to irrigation and as such the visual image will not significantly change.

Landscape Diversity
Landscape diversity within the viewshed is similar to the dam study sites and is primarily based on the topographical features and human interventions as the vegetation, namely grasslands, is relatively uniform in texture and height.

The landscape exhibits a great degree of horizontal and vertical scale in the vicinity of the Tsitsa River due to the surrounding hills, ridges and steep-sided valley bottom that provide a scale in proportion to the scale of the pylons. However, once the lines rise out of the valley they traverse an open rolling landscape that is already modified by human activity such as the various scattered rural settlements, roads and ploughed, terraced lands which add to a more diverse landscape.

Implications for the Project
The low diversity of the open and uniform vegetation together with the diversity of the human activity and the rising landforms adds towards a low to moderate diversity

The visual diversity within this Grassveld landscape biome will result in a low to moderate VAC. The hills and ridges together with the scattered settlements display a slightly higher visual diversity due to the more diverse topography and the odd patches of trees. However, this still does not provide sufficient diversity and will still result in any large scale structure to be highly visible due to the lack of screening and the high visual contrast.

Notwithstanding the low to moderate VAC, the area has already been modified by human interaction in the form of settlements, roads and arable agriculture and is thus able to visually accommodate the industrial nature of the lines

Landscape Character
The hills and ridges exhibits a well-defined and vivid sense of spatial definition with a moderate scenic quality due to the combination of low gentle valleys, open grasslands and the scattered settlements. The character of the landscape can be regarded as rural agriculture predominantly stock grazing and subsistence farming.

Implications for the Project
The introduction of a dam within this landscape will alter the character considerably due to the size and scale of it. The dam will considerably alter the sense of place and Genius Loci

of the study area. However, the change in character is not considered to be significantly negative.

The introduction of this element in the landscape has the potential to promote tourist-based enterprises that rely on the high scenic quality as the basis for their business, especially with the Tsitsa Falls in close proximity.

5.1.5 Access Roads

Topography

Access roads in and around the dam sites will require re-alignment due to inundation by the proposed dams. The roads traverse mostly open rolling and undulating topography which is formed by the lower foothills of the Eastern Cape Drakensberg.

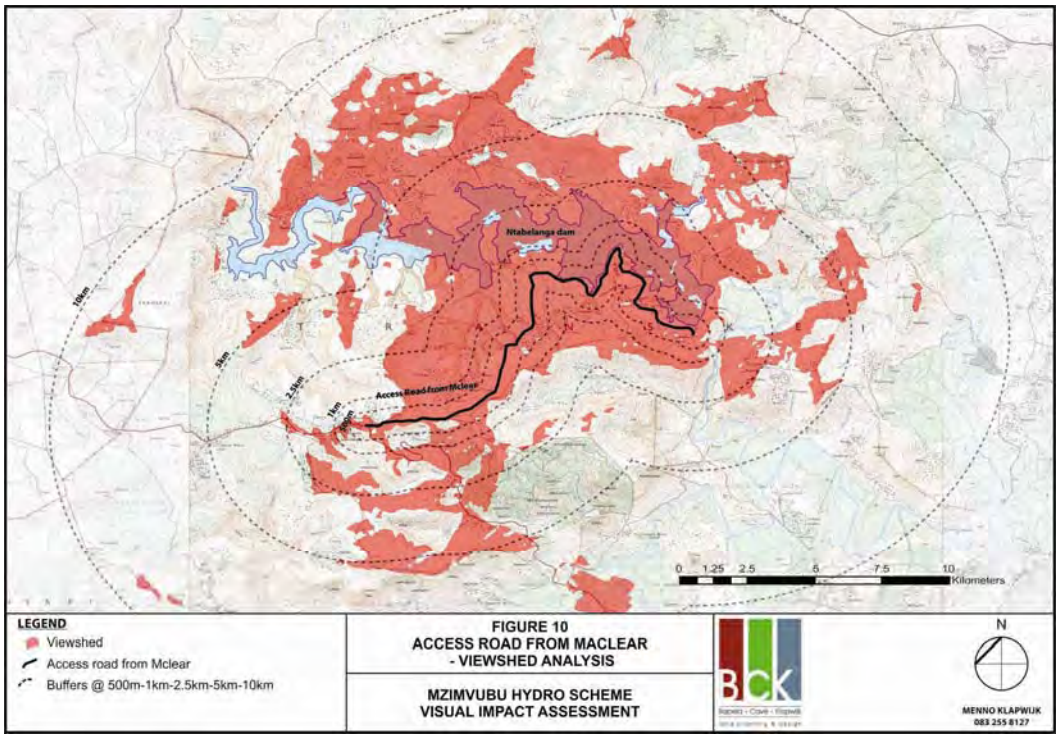


Figure 10: Access road from Maclear

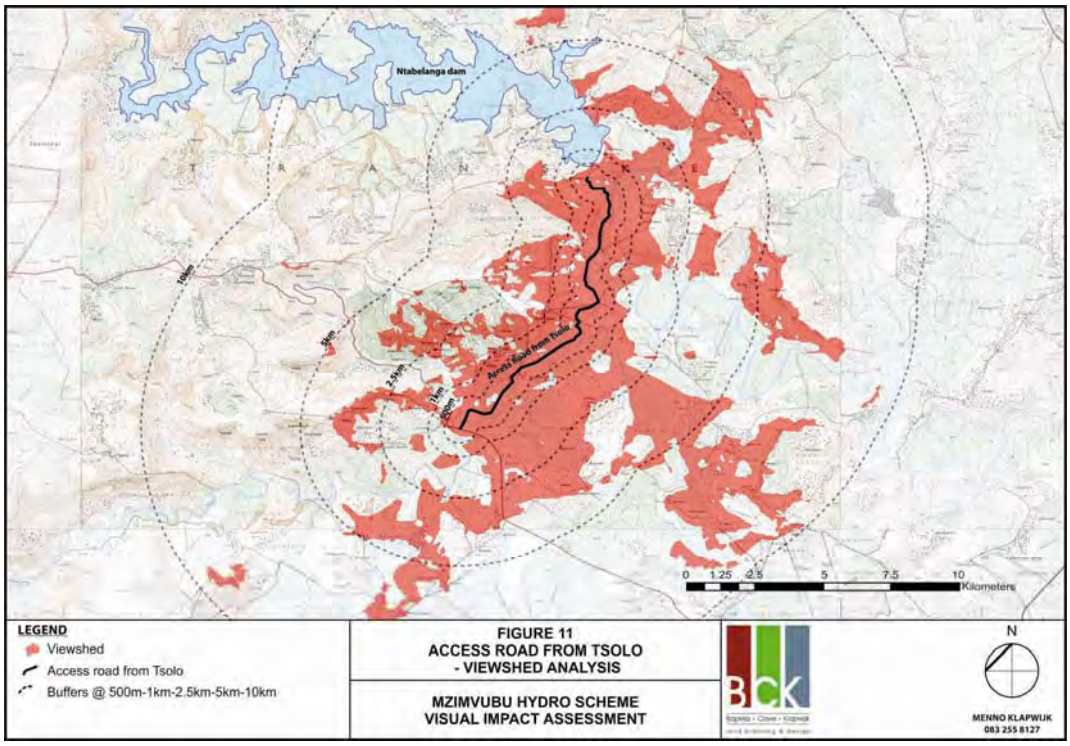


Figure 11: Access Road from Tsolo

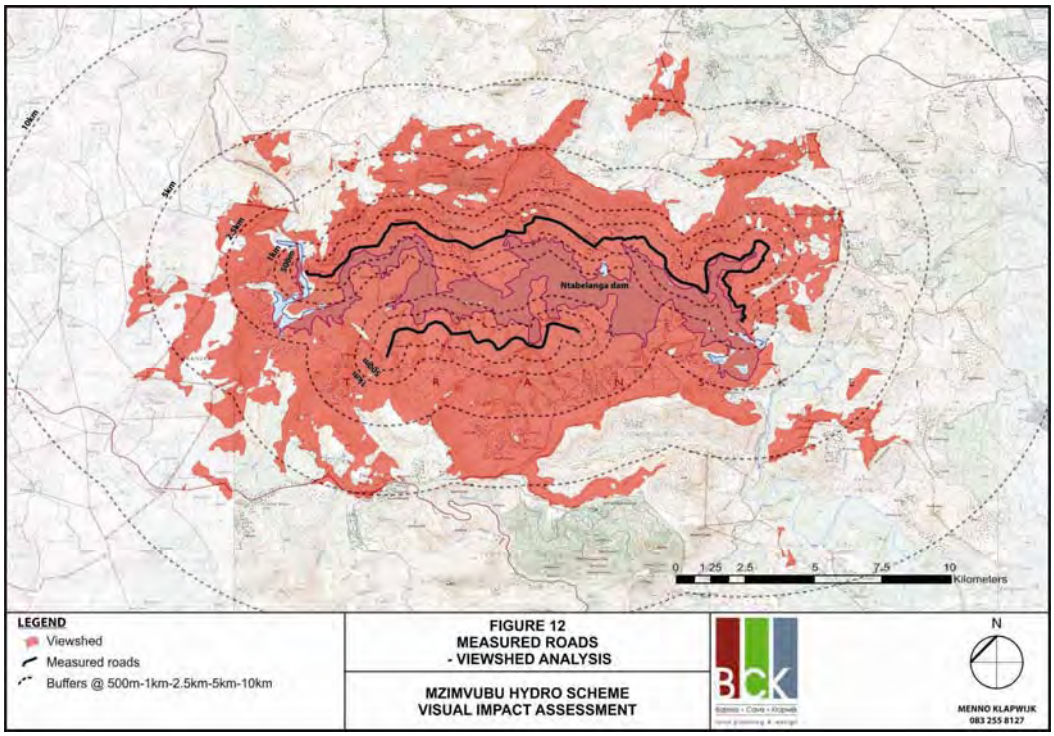


Figure 12: Measured Roads

Implications for the Project

Due to the nature of the landscape the roads rise up over hills and ridges from where they are visible in the landscape from the surrounding hills. The form of the landscape does not allow for long stretches of road that are straight and angular but introduces mostly curves which blend visually and are sympathetic with the environment.

Vegetation Cover

The vegetation for most of the area is open grassland or has been modified or disturbed by previous farming activities mostly in the form of subsistence farming, ploughing or heavy overgrazing. Some of the areas on slopes have been previously terraced. The cover is open and uniform in texture resulting in a visually open and exposed landscape.

Implications for the Project

The uniformly textured grassland vegetation will visually contrast significantly with the roads making them more visible in the landscape. The low vegetation height does not assist in screening them nor does it assist in blending them with the landscape. The lack of a diverse vegetation cover limits the opportunity to blend the lands visually with the landscape and will leave them visually exposed.

Visibility

Views in the Maclear road extend northwards for up to 9 km and 1.5 km to te south with intermittent views up to 5 km. (Figure 10: Access Road from Maclear Scheme: Viewshed).The road from Tsolo will be visible northwards up to 1 km with intermittent views up to 4 km. (**Figure 11**: Access Road from Tsolo: Viewshed).The measured roads around the Ntabelanga dam are visible up to 2.5 km to the north and up to 5 km to the south. (**Figure 12**: Measured Roads: Viewshed).

Critical views are from the R 396 that links the N2 with Maclear through Tsolo. Critical views also include the surrounding local villages such as KwaNogemani, Zilandana, KwaMsobomva, Kombulu, Bongweni, Sinxago, KuQulungashe, Sinqungweni, Sinqungini and Mcedu.

Implications for the Project

It will not be possible to adequately screen the roads from the surrounding areas due to the short grasslands that do not offer a screening function.

Landscape Diversity

Landscape diversity within the viewsheds is based primarily on the topographical features and human interventions such as rural settlements, ploughed and terraced lands and a network of access roads. This diversity is tempered by the vegetation, namely grasslands that is relatively uniform in texture and height.

lines rise out of the valley they traverse an open rolling landscape that is already modified by human activity such as the various scattered rural settlements, roads and ploughed, terraced lands which add to a more diverse landscape.

Implications for the Project

The low diversity of the open and uniform vegetation together with the diversity of the human activity and the rising landforms adds towards a low to moderate diversity.

This diversity does allow some form of visual compatibility which incorporates the roads in the landscape as the introduction of new roads is not visually out of place and in contrast with the existing sense of place

Notwithstanding the low to moderate VAC, the area has already been modified by human interaction in the form of settlements, existing roads and arable agriculture and is thus able to visually accommodate the roads.

Landscape Character

The hills and ridges exhibits a well-defined and vivid sense of spatial definition with a moderate scenic quality due to the combination of low gentle valleys, open grasslands and the scattered settlements. The character of the landscape can be regarded as rural agriculture predominantly stock grazing and subsistence farming.

Implications for the Project

The introduction of new access roads will not detract from this sense of place as images of roads already exist within this landscape.