Landscape/Visual Impact Assessment for the Proposed Blikana Dam & Waste Water Treatment Works

Senqu Local Municipality, Joe Gqabi District Municipality, Eastern Cape Province, South Africa

4/24/2026

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Report Title	**Landscape/Visual Impact Assessment for the Proposed Blikana Dam & Waste Water Treatment Works**	
Specialist Theme	Landscape/Visual Theme	
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Declaration	The Biodiversity Company and its associates act as independent consultants in accordance with the requirements of the South African Council for Natural Scientific Professions. We confirm that we have no affiliation with, or vested financial interest in, the proponent, other than remuneration for professional services rendered in terms of the Environmental Impact Assessment Regulations. We have no conflicting interest in the proposed activity or any secondary developments arising from the authorisation of the project, and our work has been undertaken objectively and in accordance with accepted scientific principles.	

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Executive Summary

This report presents a Landscape/Visual Impact Assessment (LVIA) for the proposed Blikana Dam and associated WWTW within the Senqu Local Municipality, Joe Gqabi District Municipality, Eastern Cape Province. The assessment considers the dam and WWTW as two functionally linked project components located within different landscape settings and therefore exhibiting different visual profiles. The dam is situated within a rugged, rocky and visually distinctive valley setting where topography creates a combination of visual enclosure and selective longer-distance exposure from opposing slopes and elevated terrain. The WWTW is located within a broader grassland setting that is comparatively more open in local character, but still partially moderated by surrounding landform and the dispersed pattern of existing rural development. The assessment was informed by a desktop review of supplied mapping, terrain and visibility modelling, receptor identification, locality analysis and field photographs of both project components.

The findings of the LVIA indicate that the proposed development will introduce visual change to the receiving environment, with the most significant effect associated with the operational phase of the dam component. The dam has a broader viewshed, a greater potential to alter existing valley character, and the strongest capacity to influence the sense of place of nearby receptors. By comparison, the WWTW is expected to generate a more localised visual effect associated with utilitarian-built form, ancillary infrastructure and possible lighting, but within a context that already contains some degree of rural modification. Construction-phase impacts for both components are considered temporary and largely reversible, while operational impacts are longer-term and require careful design integration, lighting control, rehabilitation and ongoing maintenance. Before mitigation, the operational visual impact of the dam is considered High and that of the WWTW Medium, while the combined cumulative visual effect is considered Medium. With implementation of the recommended mitigation measures, including footprint refinement, reduction of unnecessary disturbance, use of muted non-reflective finishes, strict control of lighting, progressive rehabilitation and good operational housekeeping, the residual visual impacts are expected to reduce to acceptable levels. On this basis, the project is considered visually manageable and supportable from a landscape/visual perspective, subject to the recommended mitigation measures and conditions of approval, and conditional approval is therefore supported.

1 Introduction

1.1 Project Overview

This report presents a Landscape/Visual Impact Assessment (LVIA) for the proposed Blikana Dam and associated WWTW within the Sencu Local Municipality, Joe Gqabi District Municipality, Eastern Cape Province (Figure 1-1). The assessment treats the dam and WWTW as two linked project components forming part of a single water infrastructure intervention, while recognising that each component occupies a different landscape setting and therefore presents a distinct visual profile.

For the purposes of this draft, a 5 km study area has been applied around each component, with 1 km, 2.5 km and 5 km buffers used to interpret likely visibility, receptor exposure and the broader landscape context. The LVIA focuses on the existing character of the receiving environment, sensitive visual receptors, likely visibility of the proposed infrastructure, and mitigation measures required to reduce adverse visual effects.

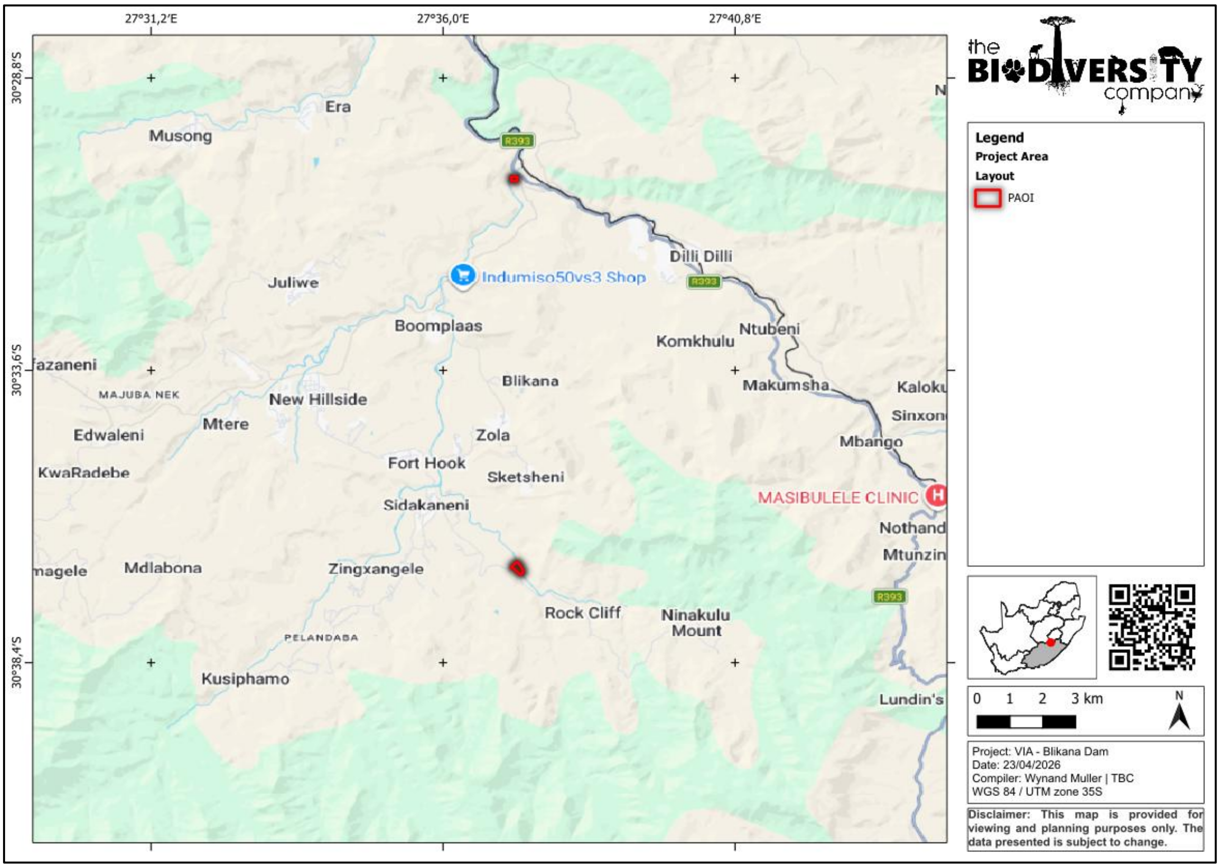


Figure 1-1 Regional locality of the proposed Blikana Dam

1.2 Scope of Work

The following tasks were completed in fulfilment of the terms of reference for this assessment:

- A desktop review of the project information, aerial imagery and mapped spatial context for the proposed Blikana Dam and associated WWTW;
- Interpretation of the locality, project area of influence (PAOI), terrain, slope, aspect, landcover and visibility outputs supplied for both project components;

- Identification of landscape character, existing visual conditions, visual absorption capacity and the principal terrain controls on visibility within each study area;

- Identification of sensitive visual receptors, including mapped schools and places of worship, together with the selection of preliminary Key Observation Points (KOPs); and

- Compilation of a draft LVIA narrative addressing the baseline environment, visibility analysis, likely visual issues and inputs for mitigation and decision-making.

1.3 Project Description

The proposed development comprises two related components, namely the Blikana Dam (Figure 1-2) and an associated WWTW (Figure 1-3). Although these components are functionally linked, they are located at separate sites within the broader project area and must therefore be assessed both individually and collectively from a landscape and visual perspective.

The dam component occupies a rugged upland setting where surrounding ridges, valley sides and open slopes have a strong influence on outward visibility. The WWTW is located within a more contained valley setting, where local topography appears to provide greater screening. The combined project is accordingly assessed as a single development with two distinct visual footprints.

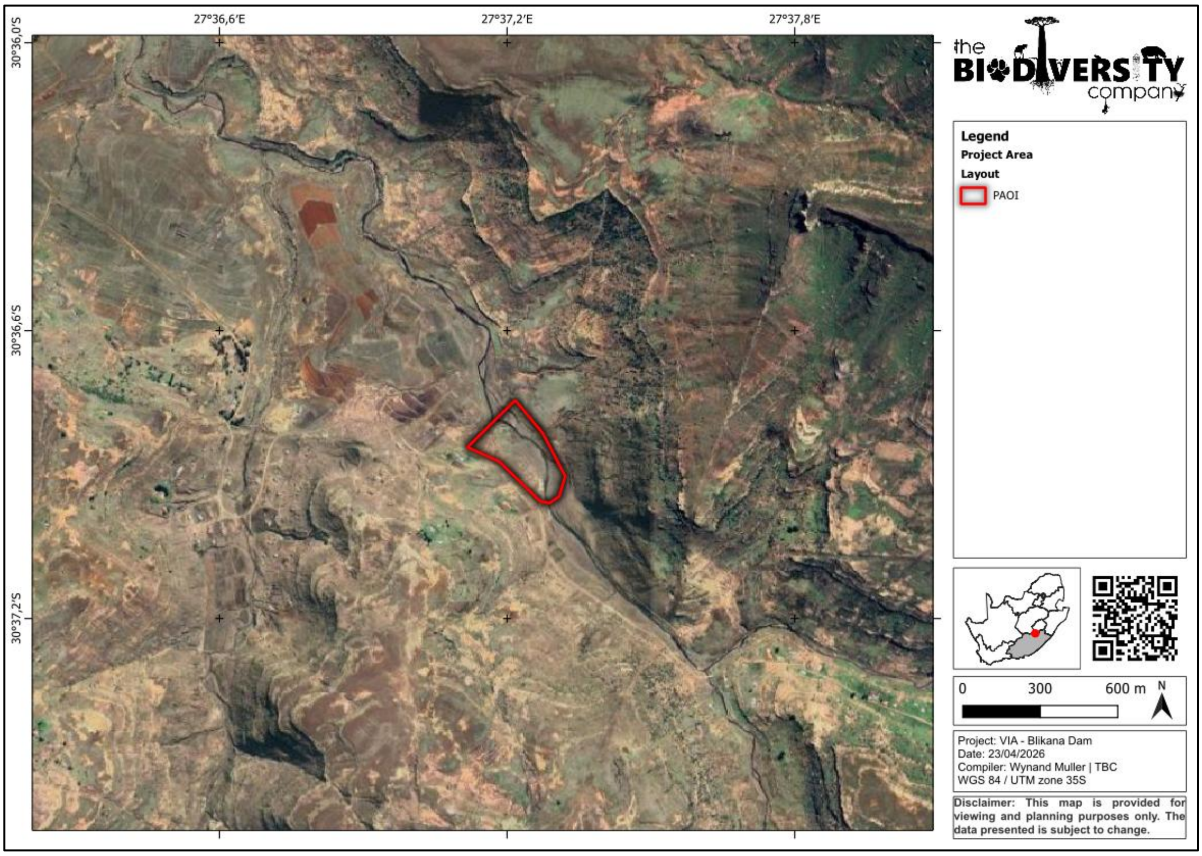


Figure 1-2 Project area of influence (PAOI) for the proposed dam component

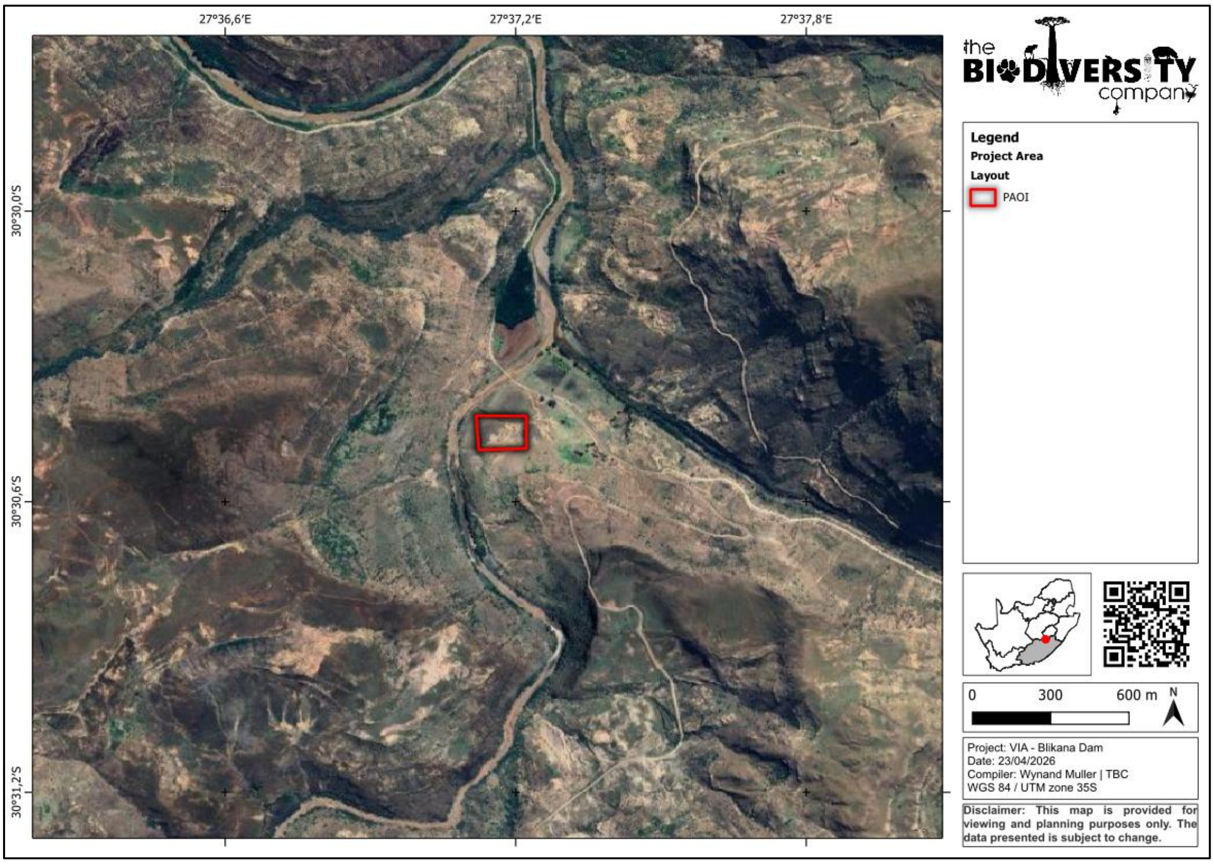


Figure 1-3 Project area of influence (PAOI) for the proposed WWTW component

1.4 Assumptions and Limitations

The following aspects were considered as assumptions and limitations for this draft LVIA:

- It has been assumed that the spatial files, map outputs and project footprints supplied for the proposed dam and WWTW are accurate and suitable for specialist interpretation;
- This draft LVIA is primarily based on supplied desktop information, including locality mapping, PAOI mapping, terrain-based visibility outputs and receptor identification maps. Any future changes to layout, engineering design or component placement may alter the visual findings;
- No detailed architectural drawings, lighting plans, materials schedules, colour specifications or photomontages were available at the time of drafting. The assessment therefore focuses on landscape context, likely visibility and the probable visual implications of the proposed infrastructure;
- The viewshed outputs represent theoretical visibility and may overstate actual visual exposure in some areas, as local vegetation, structures, minor terrain breaks and seasonal conditions can provide additional screening;
- The mapped receptor datasets include schools and places of worship, but additional receptors, such as dispersed homesteads, road users, and informal community viewpoints may also be relevant to the final LVIA; and
- Final confirmation of receptor sensitivity, KOPs and the severity of visual effects should be refined through field verification and photographic recording where required.

1.5 Key Legislative Requirements

The LVIA has been prepared within the framework of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended), particularly Appendix 6 which sets out the content requirements for specialist reports. Government Notice No. 320 of 20 March 2020 is also relevant in that it provides the site sensitivity verification framework applicable where a specialist assessment is required but no dedicated protocol has been prescribed for the theme under consideration.

Additional legislation relevant to the project context and to the receiving landscape includes the National Water Act, 1998; the National Heritage Resources Act, 1999; the Spatial Planning and Land Use Management Act, 2013; the National Environmental Management: Protected Areas Act, 2003; and, where roadside visual amenity or signage may be relevant, the Advertising on Roads and Ribbon Development Act, 1940.

- NEMA and the EIA Regulations require a transparent, evidence-based specialist assessment addressing baseline conditions, impact significance, mitigation and a reasoned opinion regarding acceptability;
- Appendix 6 requires disclosure of specialist independence, methodology, assumptions, findings, maps, sensitive areas, mitigation and monitoring requirements;
- GN 320 requires verification of site sensitivity using desktop information, site observations where available and clear motivation for the specialist findings;
- The NHRA, SPLUMA and Protected Areas legislation are relevant insofar as visual change may affect heritage settings, landscape character, protected environments or municipal spatial planning objectives.

1.6 National Water Act (NWA, 1998)

The National Water Act is directly relevant because the proposed development includes water-related infrastructure in the form of a dam and associated WWTW. While the LVIA does not duplicate water use authorisation or aquatic specialist processes, the Act provides important context for integrated planning, responsible siting and the management of infrastructure that can materially alter the form and perception of the landscape.

From a visual perspective, the Act underscores the need for water infrastructure to be assessed in relation to its landform setting, associated earthworks, embankments, access requirements and the way in which built elements are read within the broader receiving environment.

1.7 National Environmental Management Act (NEMA, 1998)

NEMA provides the overarching environmental management principles for this assessment. Of particular relevance to an LVIA are the principles of sustainable development, integrated environmental management, a risk-averse and cautious approach, recognition of cumulative effects, transparency in decision-making and the need for appropriate public participation.

In practical terms, these principles require that landscape and visual impacts are considered alongside other environmental themes, that visual harm is avoided or minimised where possible, and that the distribution of visual effects across nearby communities and sensitive receptors is properly taken into account.

1.8 Legislative Framework

A Landscape/Visual specialist assessment should address the applicable Appendix 6 requirements for specialist reports and demonstrate alignment with the site sensitivity verification approach contemplated in Government Notice No. 320 of 20 March 2020. Table 1-1 summarises the principal information requirements relevant to this LVIA and indicates where they are, or will be, addressed in the report.

Table 1-1 Landscape and Visual specialist assessment information requirements relevant to this report

Information to be Included (as per Appendix 6 and GN 320, 20 March 2020)	Report Section
Specialist details, expertise and SACNASP registration number	10.3
Signed declaration of independence	10.2
Purpose and scope of the specialist report	1.1 & 1.2
Description of the proposed activity and preferred site / footprint	1.3
Desktop and field methodology, equipment and modelling used	2; 10.1
Date, duration and season of site inspection and relevance to the findings	2
Quality, source and age of base data used in the assessment	1.4; 10.1
Description of the receiving environment and landscape character baseline	3.1–3.5
Site sensitivity verification and motivation for specialist findings	3; 10.1
Identification of sensitive visual receptors and viewpoints	3.3
Identification of Key Observation Points (KOPs)	4.4
Visibility / viewshed analysis and interpretation	4.1
Existing impacts, current condition and acceptable level of change	3.5; 4
Identification of sensitive areas or locations to be avoided where relevant	3.3–3.4; 6
Assessment of construction phase visual impacts	4.5
Assessment of operational phase visual impacts	4.6
Assessment of direct, indirect and cumulative visual impacts	4; 5
Consideration of alternatives or layout refinement where applicable	4.2; 5.1
Assessment criteria, significance framework and professional judgement	10.1 & 2–11.1.4
Assumptions, uncertainties and gaps in knowledge	1.4
Mitigation measures for inclusion in the EMPr	6
Residual and post-mitigation impact assessment	7.1–7.3
Monitoring and adaptive management requirements	7.4
Reasoned opinion regarding the acceptability of the proposed development	8.2–8.5
Any conditions attached to the specialist findings or recommendation	8.4
Relevant inputs arising from consultation or stakeholder issues, where available	EIA process

2 Fieldwork

Field verification photographs (Figure 3-11 to Figure 3-18) were provided for both the proposed dam and the associated WWTW and were used to supplement the desktop interpretation of landscape character, enclosure, scenic quality and likely receptor experience. The photographs confirm that the study area is characterised by a rural highland landscape of open grassland, rocky outcrop, incised drainage lines and broad mountain backdrops, with visual containment varying considerably between the dam and WWTW components.

The dam photographs (Figure 3-11 to Figure 3-14) illustrate a rugged and visually distinctive valley setting with exposed rock faces, sloping grassland and a strongly legible drainage corridor. The WWTW photographs (Figure 3-15 to Figure 3-18) indicate a more open grassland basin with local settlement, utility lines and planted trees, but with the broader landscape still defined by low plateaus and surrounding ridgelines. These photographs are consistent with the terrain-based visibility mapping and provide useful confirmation of the site's existing visual character.

3 Baseline Description

3.1 Study area and Context

The study area for the LVIA comprises a 5 km radius around the proposed dam footprint and a separate 5 km radius around the associated WWTW footprint. This extent is considered appropriate because the supplied mapping and visibility outputs (Figure 1-2, Figure 1-3, Figure 4-1 and Figure 4-2) show that the most meaningful visibility effects are concentrated within the 1 km and 2.5 km buffers, while terrain increasingly controls visibility at greater distances.

The dam component is located within a rugged upland landscape characterised by incised drainage lines, irregular ridges, and open slopes (Figure 1-1 and Figure 1-2). The wider locality reflects a dispersed rural settlement pattern with community facilities distributed across the surrounding landscape. In contrast, the WWTW is located within a more contained valley setting where surrounding landform provides greater enclosure and therefore a more localised visual context (Figure 1-2 and Figure 1-3).

For assessment purposes, the project must therefore be understood as a single development with two different landscape settings: a broader and more visually exposed dam landscape, and a more contained WWTW landscape where visual effects are likely to be experienced primarily at local scale.

3.2 Landscape Character Assessment

At a landscape scale, the project area is characterised by a rural highland setting of dissected valleys, steep-sided ridges, drainage corridors and predominantly open vegetation cover. Within the dam study area the landcover mapping (Figure ***3-4***) indicates grassland as the dominant matrix, with localised shrubland, tree cover along some drainage lines, scattered cultivated areas and limited built form. The landscape is, therefore, visually textured and topographically complex rather than visually uniform.

The dam study area exhibits substantial elevation variation, variable slope and highly mixed aspect across the 5 km buffer (Figure 3-1 to Figure 3-3). This topographic complexity creates alternating zones of exposure and screening. Exposed ridgelines and upper slopes generally have lower visual absorption capacity because infrastructure or earthworks may contrast strongly with the skyline or open landform, whereas lower valleys and broken terrain have a greater capacity to partially absorb development.

The WWTW occurs within a more visually enclosed setting (Figure 3-5 to Figure 3-8). Although the immediate site remains visible from selected local viewpoints, the surrounding valley morphology suggests a moderate visual absorption capacity for a compact utility installation, provided that disturbed surfaces, structural colour treatment and lighting are carefully managed. In overall terms, the dam component is more likely to influence wider landscape character, while the WWTW is primarily a local visual issue.

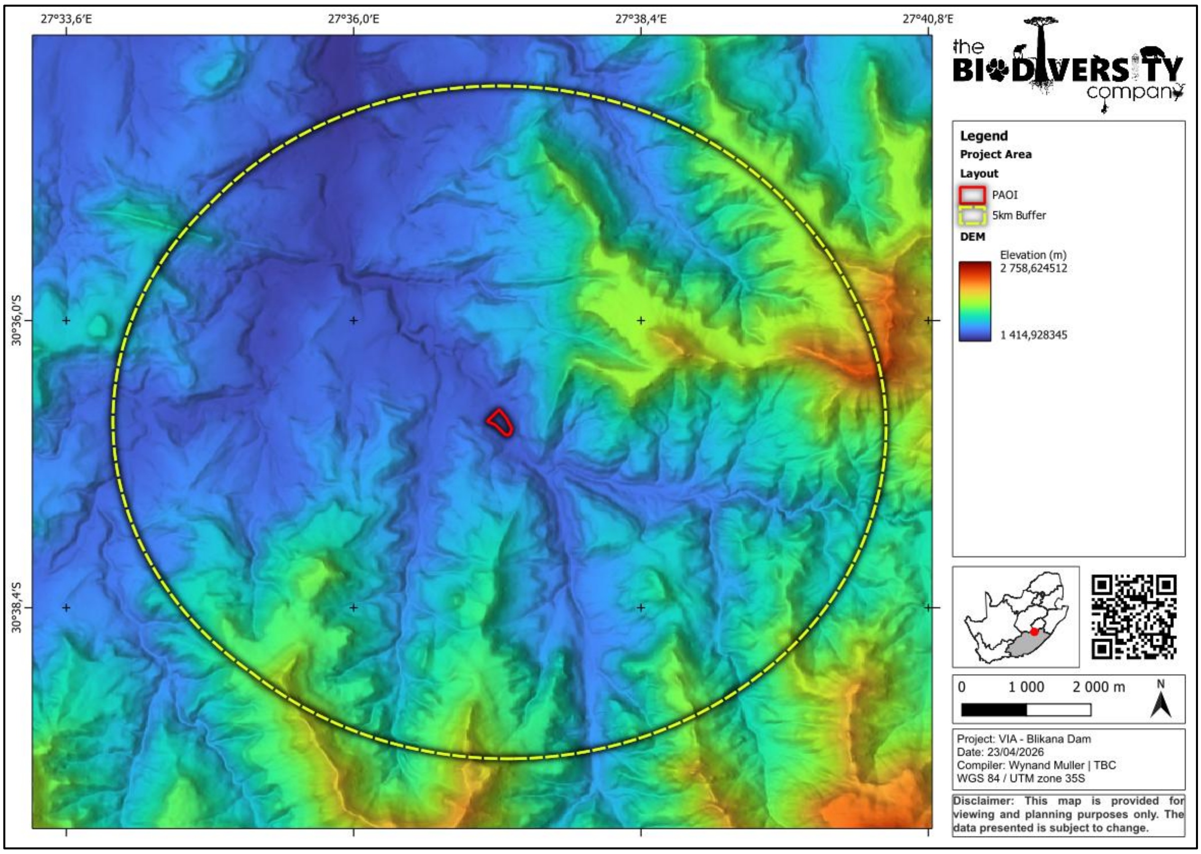


Figure 3-1 DEM context within 5 km of the proposed dam footprint

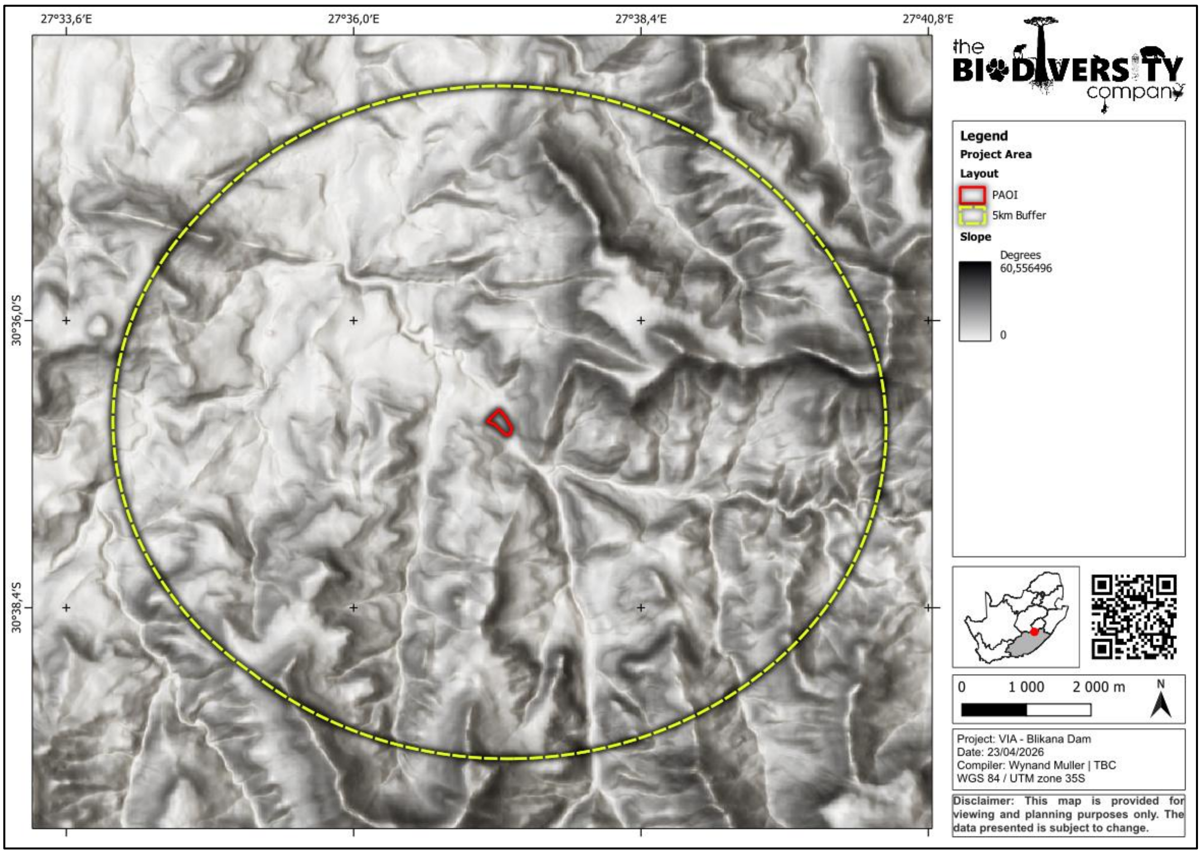


Figure 3-2 Slope context within 5 km of the proposed dam footprint

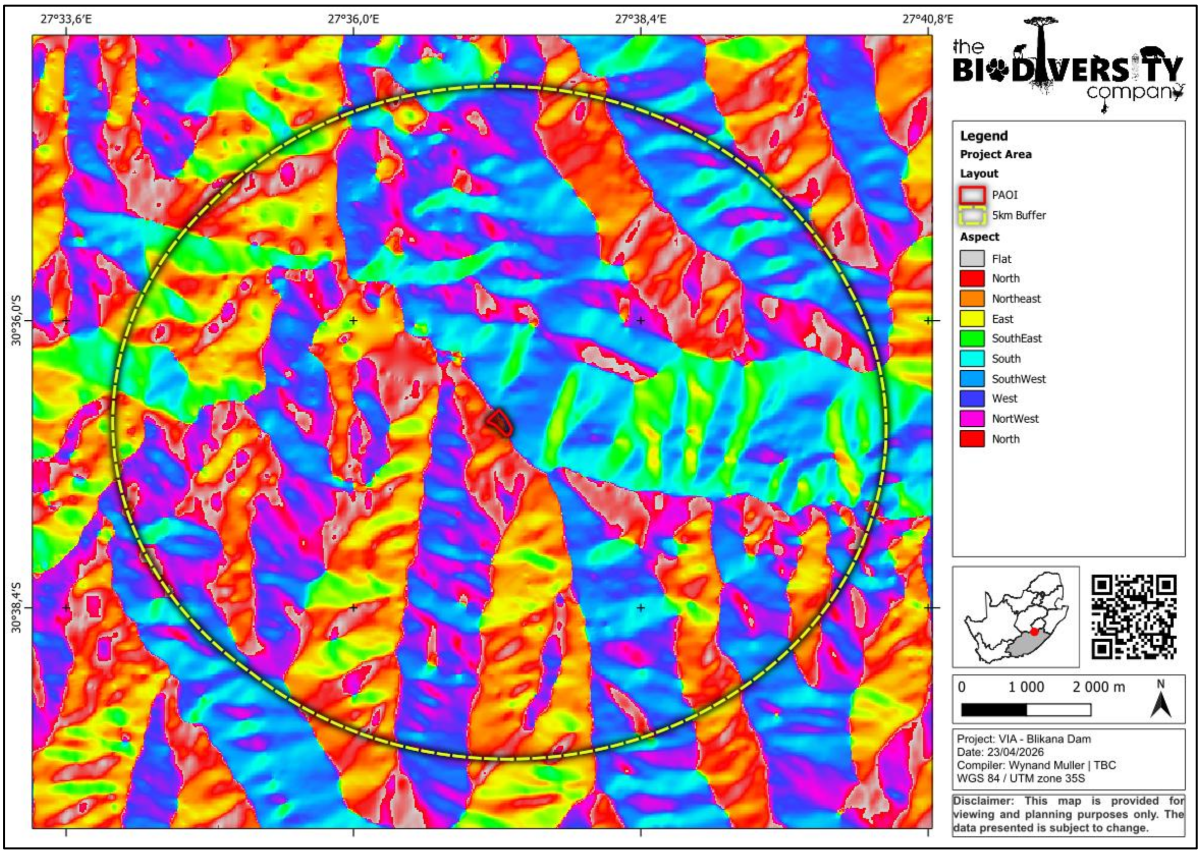


Figure 3-3 Aspect variation within 5 km of the proposed dam footprint

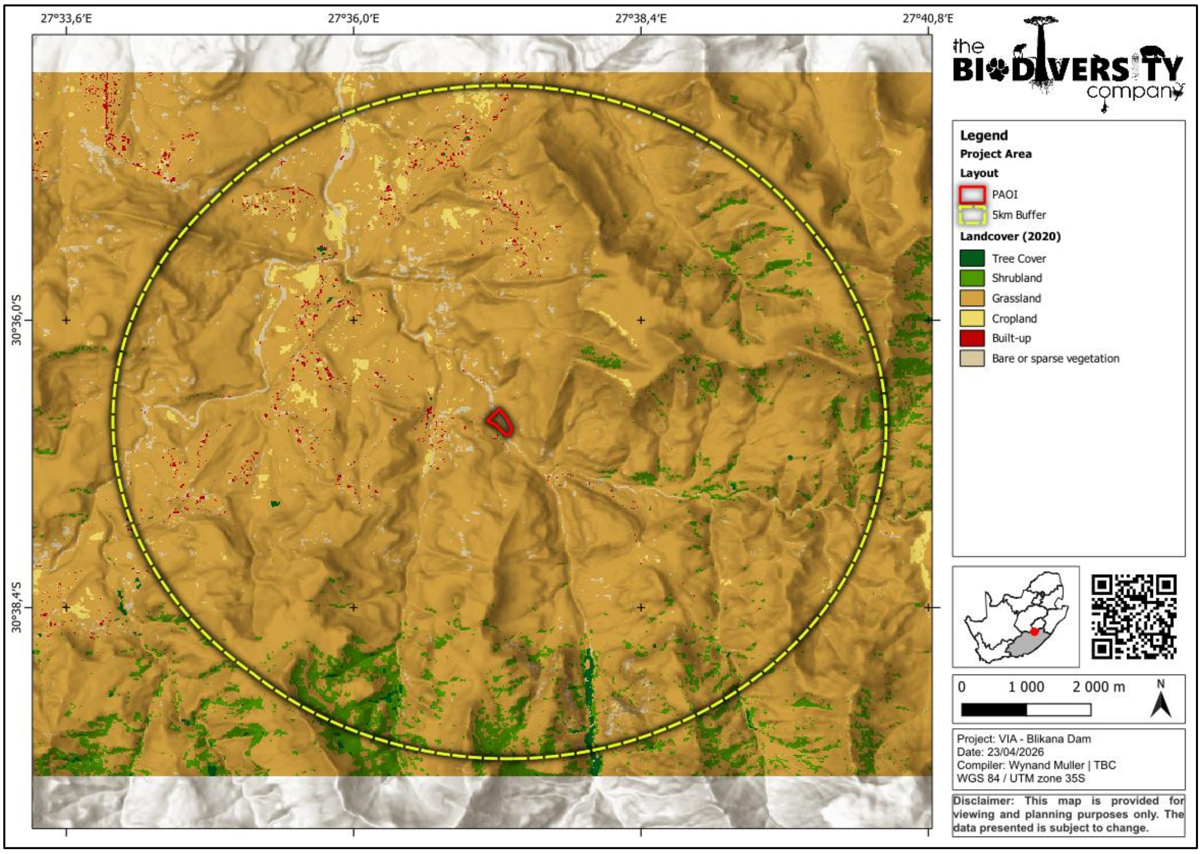


Figure** 3-4 **Landcover context within 5 km of the proposed dam footprint

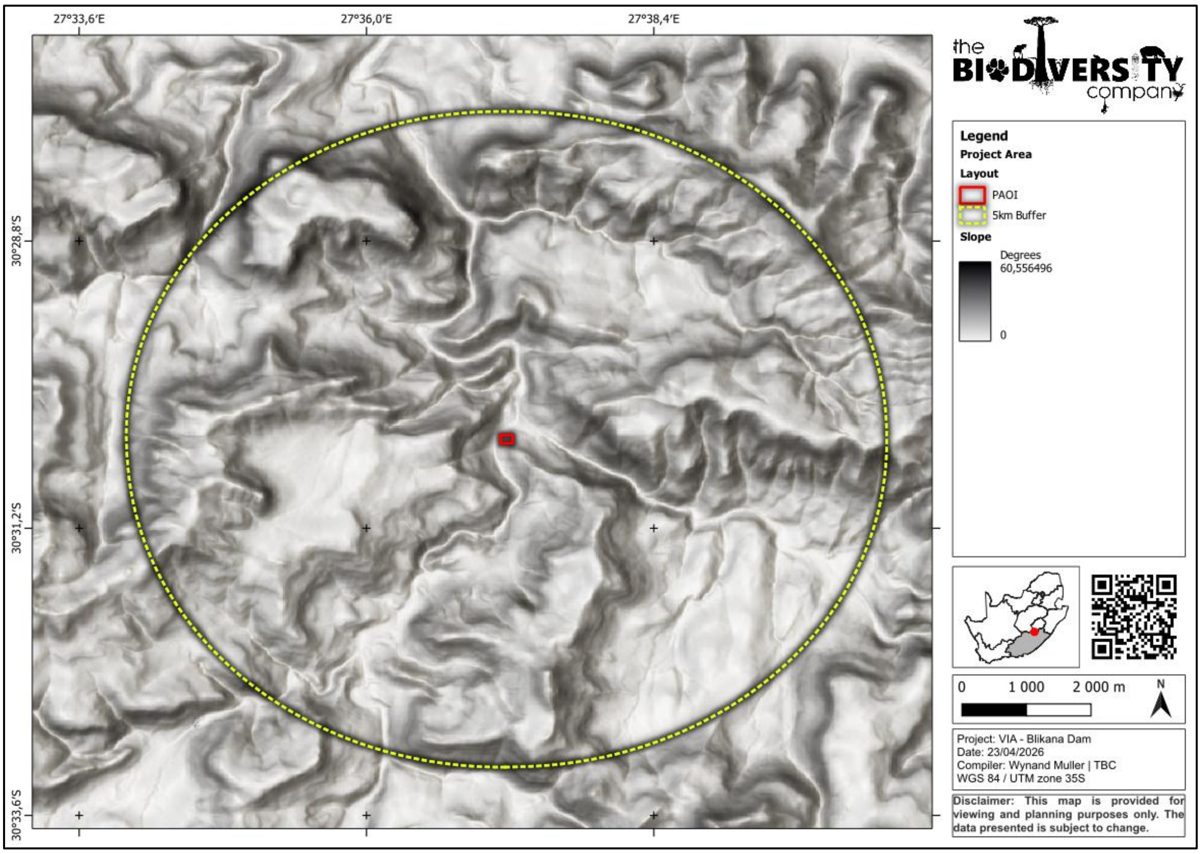


Figure 3-5 Slope context within 5 km of the proposed dam footprint

Additional terrain and landcover mapping for the WWTW (Figure 3-5 to Figure 3-8) confirms that the component is located within a lower-lying and relatively more contained portion of the wider study area, where surrounding ridges, valley shoulders and drainage-incised landform contribute to partial visual enclosure. The DEM indicates that the WWTW occupies a locally depressed terrain position relative to adjacent uplands, while the aspect mapping confirms the complex orientation of surrounding slopes that influences the direction and extent of outward views. The landcover map shows grassland as the dominant matrix, with localised drainage-line vegetation, scattered built form and limited areas of other cover types, indicating a largely open rural receiving environment with moderate capacity to absorb a compact utility facility if carefully designed and screened.

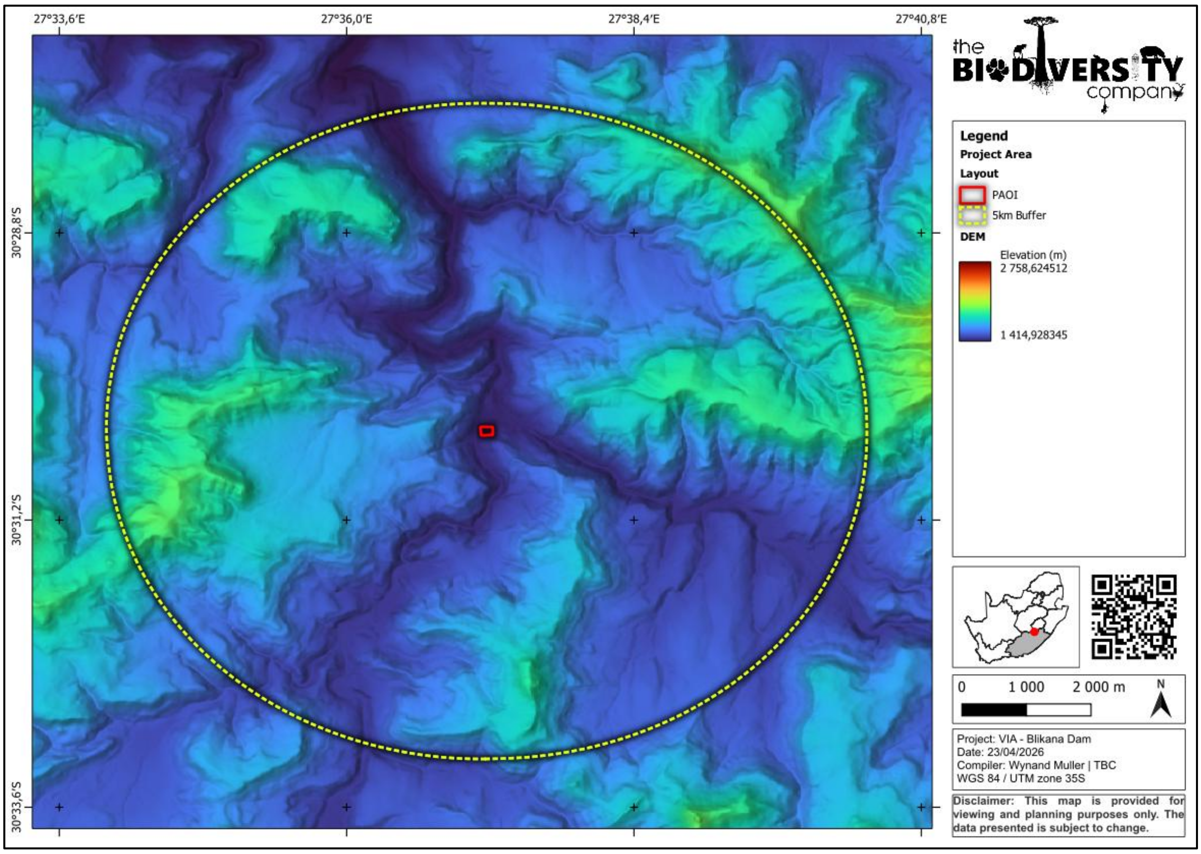


Figure 3-6 DEM context within 5 km of the proposed WWTW footprint

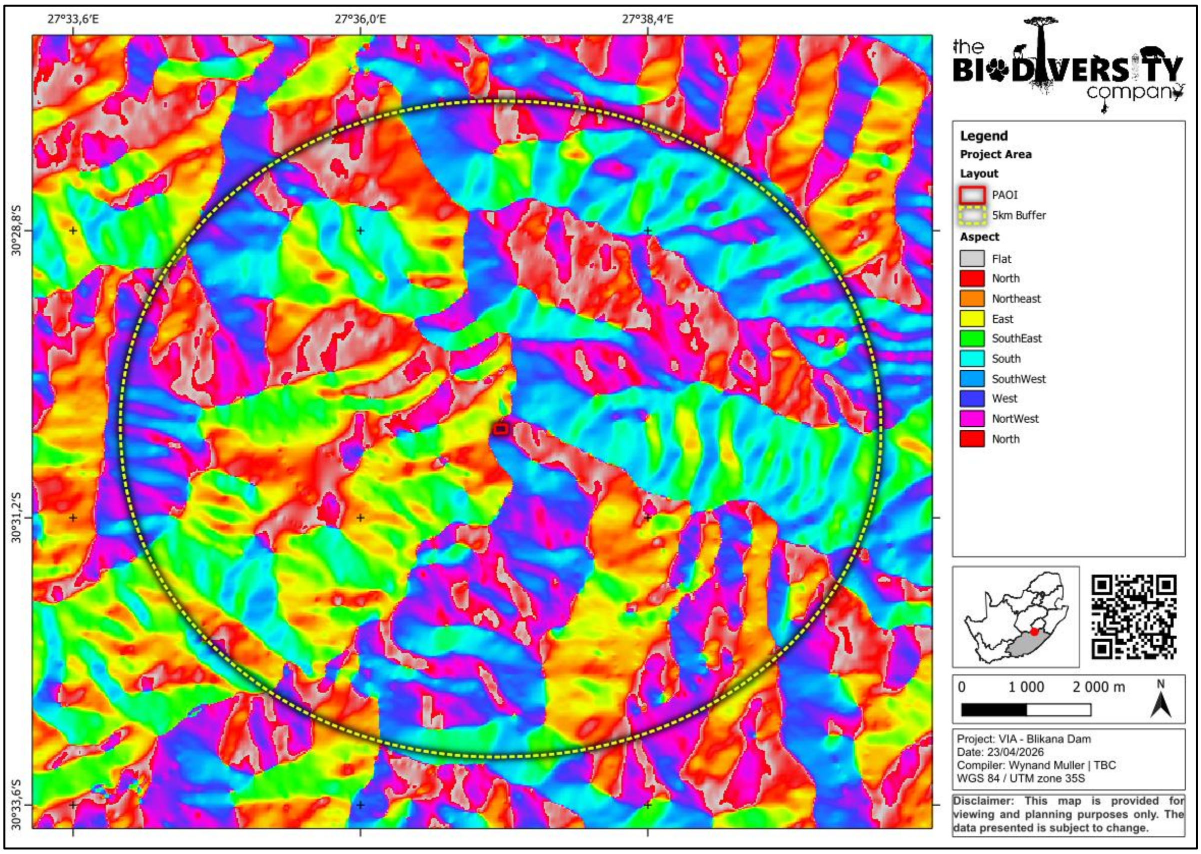


Figure 3-7 Aspect variation within 5 km of the proposed WWTW footprint

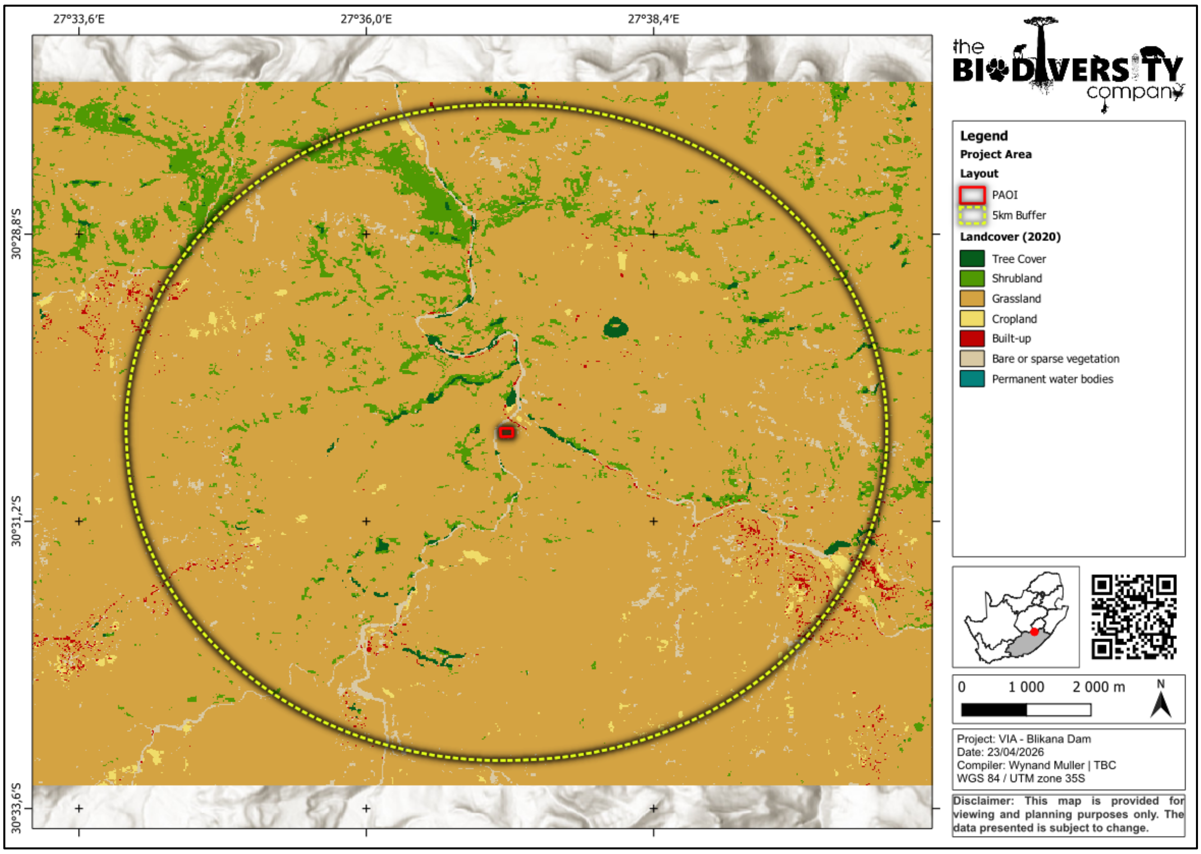


Figure 3-8 Landcover context within 5 km of the proposed WWTW footprint

3.3 Visual Receptors and Sensitive Viewpoints

Sensitive visual receptors identified from the supplied mapping (Figure 3-9 and Figure ***3-10***) include schools and places of worship within the dam study area, and schools within the WWTW study area. These receptor groups are generally regarded as medium-high to high sensitivity receptors because they represent regularly occupied community facilities where users may reasonably expect a landscape setting with limited visual intrusion.

In addition to the mapped institutional receptors, other likely receptor groups include nearby rural residents, people travelling along local roads and tracks, and community members moving through the wider landscape. Receptor sensitivity is influenced not only by proximity to the development, but also by elevation, duration of view, orientation toward the site and whether the project is seen against landform or skyline.

The dam component has the potential to affect a broader receptor catchment because community facilities are distributed across the wider study area and the visibility model (Figure 4-3) indicates several discontinuous visible zones outside the immediate footprint. By comparison, the WWTW appears to be experienced within a more localised receptor environment, as reflected in Figure 4-4.

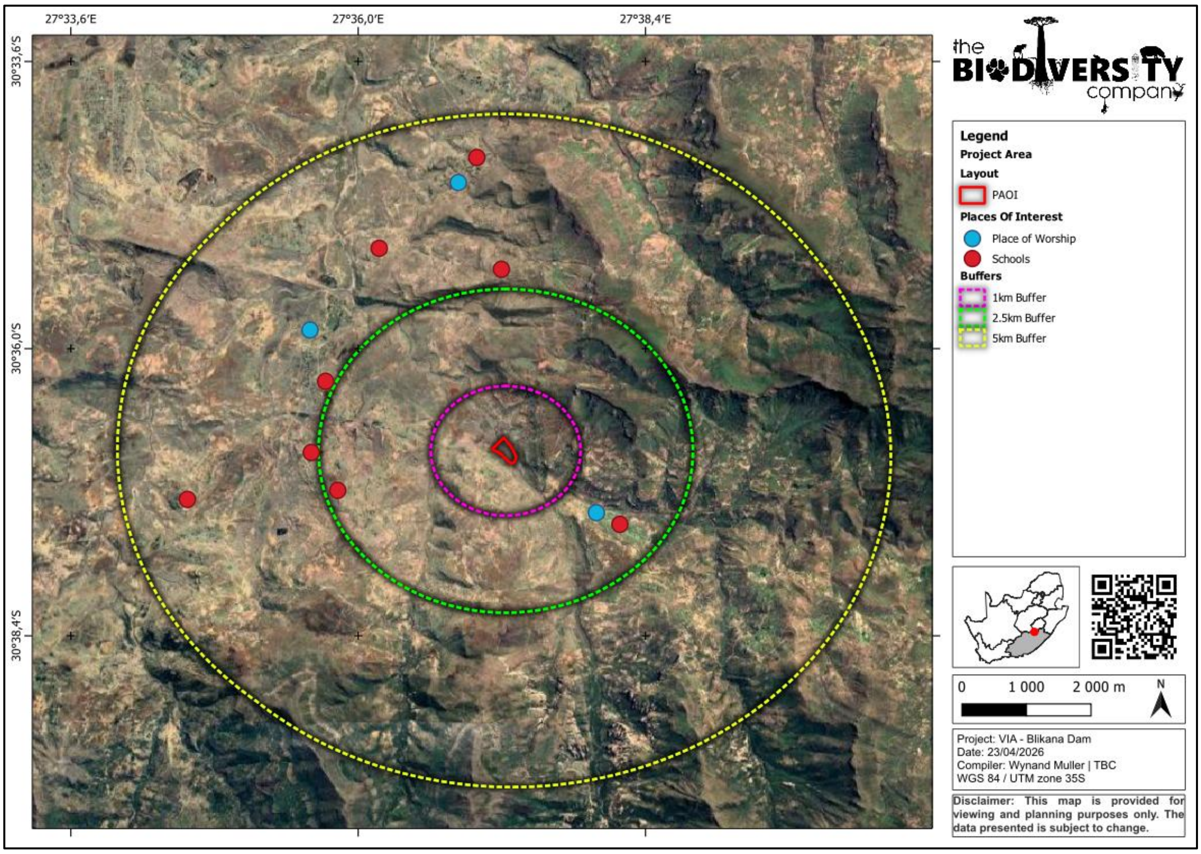
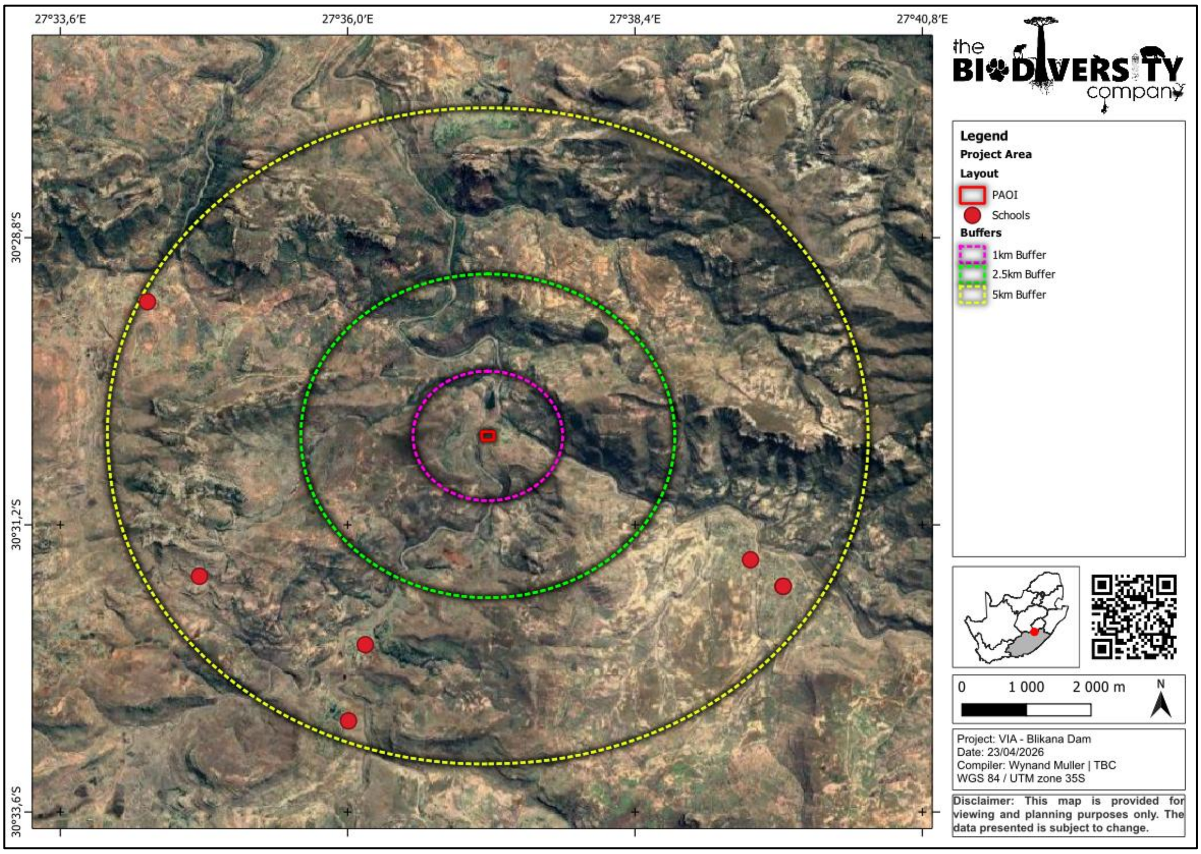


Figure 3-9 Identified visual receptors within the dam study area



3.4 Figure *3-10* Identified visual receptors within the WWTW study areaKey Observation Points (KOPs)

Based on the supplied mapping and visibility interpretation (Figure 3-9, Figure ***3-10***, Figure 4-3 and Figure 4-4), the following KOP categories are considered appropriate for this draft LVIA and for any subsequent field verification:

- Community and institutional receptors within and around the 1 km to 2.5 km zone of the dam component, where direct views are most likely to occur;
- Opposing valley sides and elevated ridgelines overlooking the dam footprint, from which the dam may be read in the broader landscape composition;
- Representative outer receptors within the 5 km dam study area where intermittent but potentially noticeable views occur;
- Local approach routes and nearby community receptors around the WWTW footprint; and
- At least one elevated representative viewpoint for each component to assess landscape fit, skyline interaction and overall visual integration.

The KOPs identified above should be refined during field verification so that photographic records and final impact ratings are based on the most representative and sensitive viewpoints available.

3.5 Existing Visual Conditions

Existing visual conditions within the study area are predominantly rural and natural-seeming, as indicated by the terrain, landcover and photographic evidence (Figure 3-1 to Figure 3-8 and Figure 3-11 to Figure 3-18), although the landscape is not pristine. The area already contains evidence of human modification in the form of cultivated areas, scattered rural settlement, local tracks and other small-scale infrastructure. Notwithstanding these modifications, the surrounding landscape retains a strong sense of open space, topographic relief and a generally subdued rural character.

Within the dam study area, the most visually defining existing features are the ridges, valley sides and drainage patterns that structure medium- and long-distance views (Figure 3-1 to Figure ***3-4*** and Figure 3-11 to Figure 3-14). Within the WWTW study area, visual experience is more intimate and locally contained, with surrounding slopes limiting outward visibility (Figure 3-5 to Figure 3-8 and 4-15 to 4-18). In both areas, the existing visual character would be most susceptible to change where cut-and-fill slopes, exposed engineered surfaces, prominent structures or lighting introduce strong contrast with the muted colours and irregular texture of the receiving landscape.

The field photographs (Figures 4-11 to Figure 3-18) reinforce the distinction between the two project components. The dam is located within a rocky, enclosed valley landscape with a strong landform framework and a comparatively high scenic quality. The WWTW occupies a broader, more open grassland setting where visibility is moderated by gentle relief rather than by steep topographic enclosure. Photographic evidence also indicates that muted earth tones, natural rock outcrops and subdued grassland colours dominate the visual palette, which means that exposed cut slopes, bright construction materials, reflective surfaces and visually prominent structural elements could create noticeable contrast if not carefully managed.

Figure 3-11 View of the proposed dam area looking east, showing rocky terrain, local relief and the visually enclosing landform

Figure 3-12 ***View of the proposed dam area looking north across the valley floor and surrounding ridgelines***

Figure 3-13 ***View of the proposed dam area looking north across the valley floor and surrounding ridgelines***

Figure 3-14 View of the proposed dam area looking south, showing the rocky upper slopes and plateau edge that define the immediate visual setting

Figure 3-15 View from the proposed WWTW area looking north, illustrating the broad and open valley character of the receiving environment

Figure 3-16 View from the proposed WWTW area looking north, illustrating the broad and open valley character of the receiving environment

Figure 3-17 View from the proposed WWTW area looking south, indicating nearby settlement and the interface between rural land use and open grassland

Figure 3-18 ***View from the proposed WWTW area looking west, showing open pasture, a treed boundary and utility infrastructure in the wider setting***

4 Visual Impact Assessment

4.1 Visibility Analysis

Visibility analysis was undertaken using the supplied viewshed outputs for the proposed dam and WWTW, interpreted against the 1 km, 2.5 km and 5 km study buffers and read together with the receptor mapping (Figure 4-3 and Figure 4-4). These outputs represent theoretical visibility derived primarily from terrain and should therefore be regarded as a conservative indication of potential exposure. Actual visibility on the ground may be reduced by vegetation, built structures, minor terrain breaks, and seasonal atmospheric conditions.

The dam component exhibits the broader visual envelope of the two project elements (Figure 4-1 and Figure 4-3). The viewshed indicates extensive visibility within the immediate 1 km zone around the footprint, with additional discontinuous visible areas extending into the 2.5 km and 5 km buffers. This pattern reflects the dissected terrain of the study area: some valley sides and ridgelines obtain clear views toward the dam site, while other sectors are screened by intervening landform. The dam is therefore expected to have a locally to sub-regionally noticeable visual presence, particularly from elevated or opposing slopes.

The WWTW viewshed is materially more contained (Figure 4-2 and Figure 4-4). Visible areas are concentrated around the immediate site and parts of the 2.5 km buffer, with only limited and isolated visibility farther afield. This confirms that the surrounding valley morphology provides meaningful screening and that the WWTW will primarily be experienced as a localised visual element rather than a widely visible landscape feature.

When the viewsheds are considered together with mapped receptors (Figures 5-3 and Figure 4-4), the dam component has the greater potential to affect sensitive community receptors, including schools and places of worship within the broader study area. The WWTW appears to interact with a smaller receptor catchment, although local receptors may still experience direct views where the site is visible from nearby slopes or movement routes. Construction-phase visibility may be more intense than operational visibility where bare ground, stockpiles and machinery increase temporary contrast.

On this basis, and with reference to Figure 4-1 to Figure 4-4, the dam should be treated as the visually dominant component for subsequent impact assessment, whereas the WWTW should be assessed mainly in terms of local visual amenity, site integration and the management of visible built form.

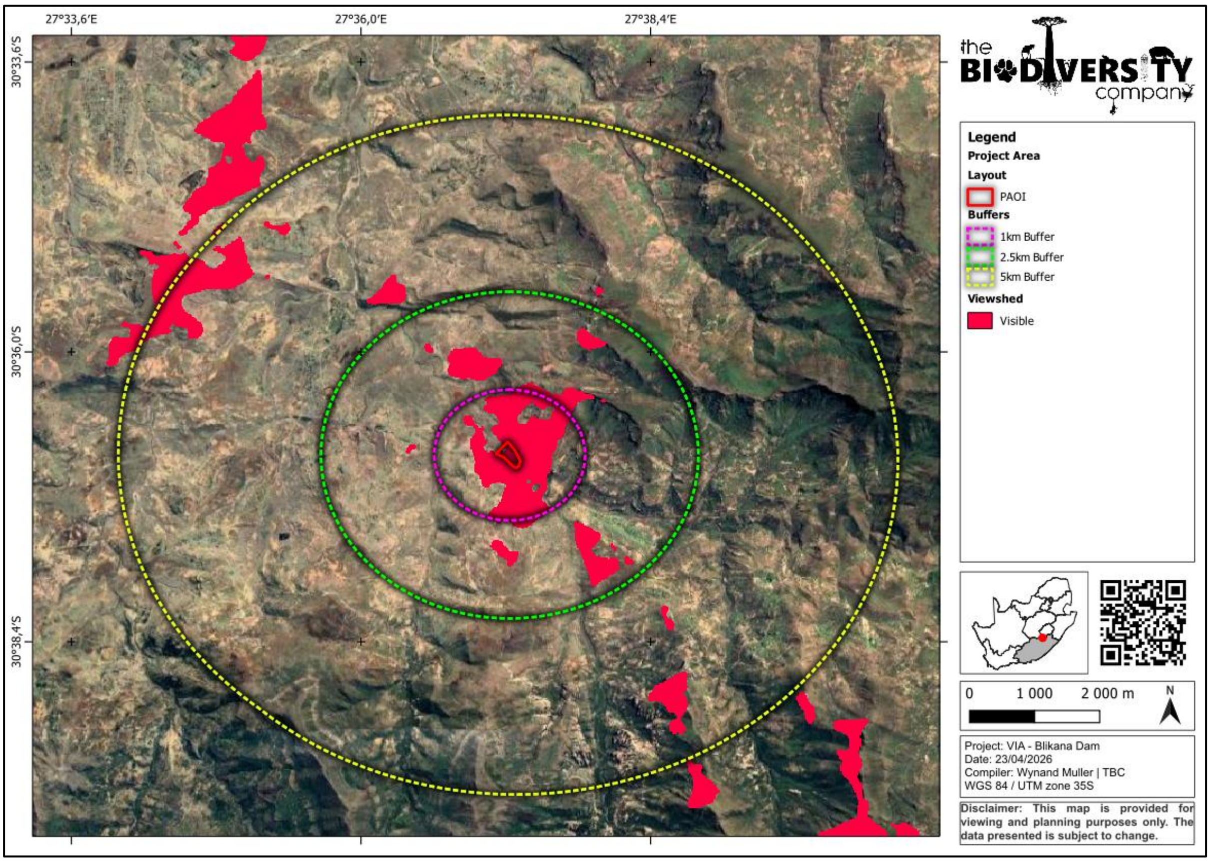


Figure 4-1 Theoretical visibility of the proposed dam component within the study area

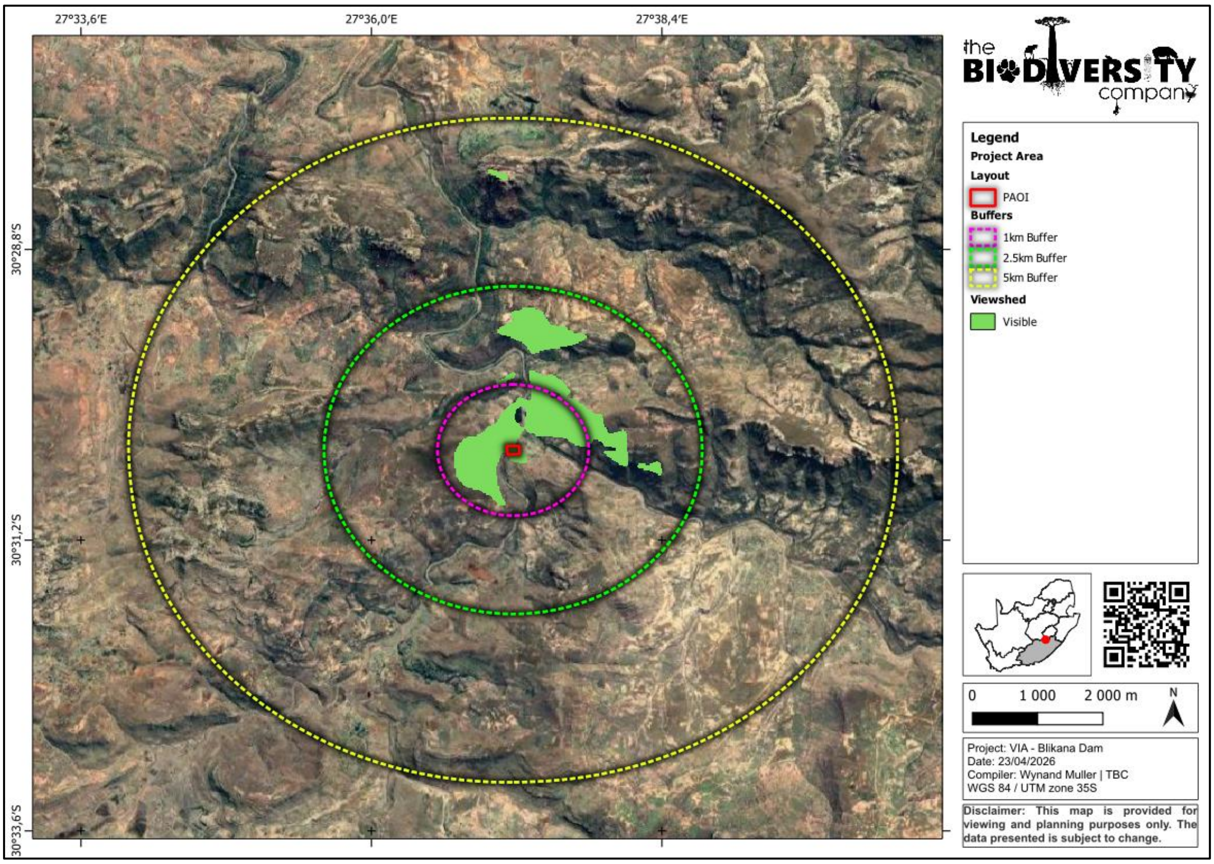


Figure 4-2 Theoretical visibility of the proposed WWTW component within the study area

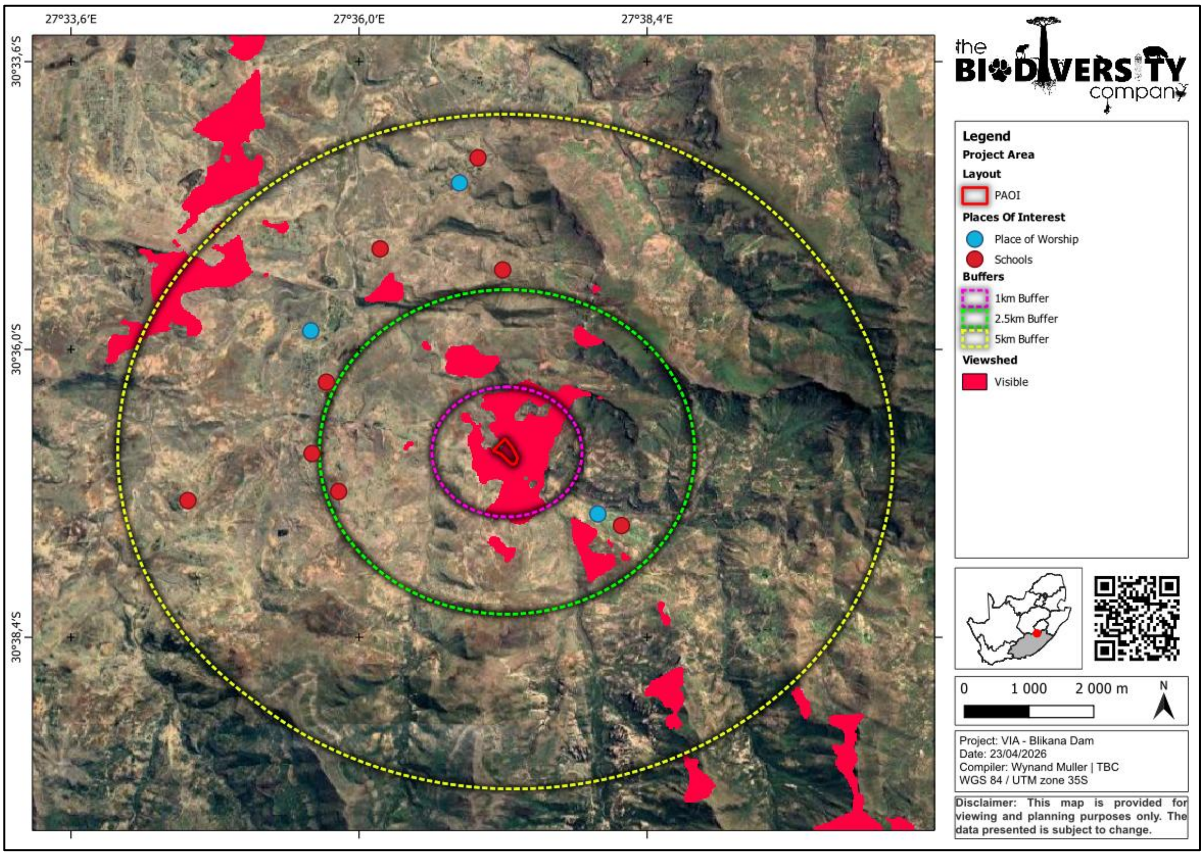


Figure 4-3 Dam visual receptors considered together with the theoretical visibility model

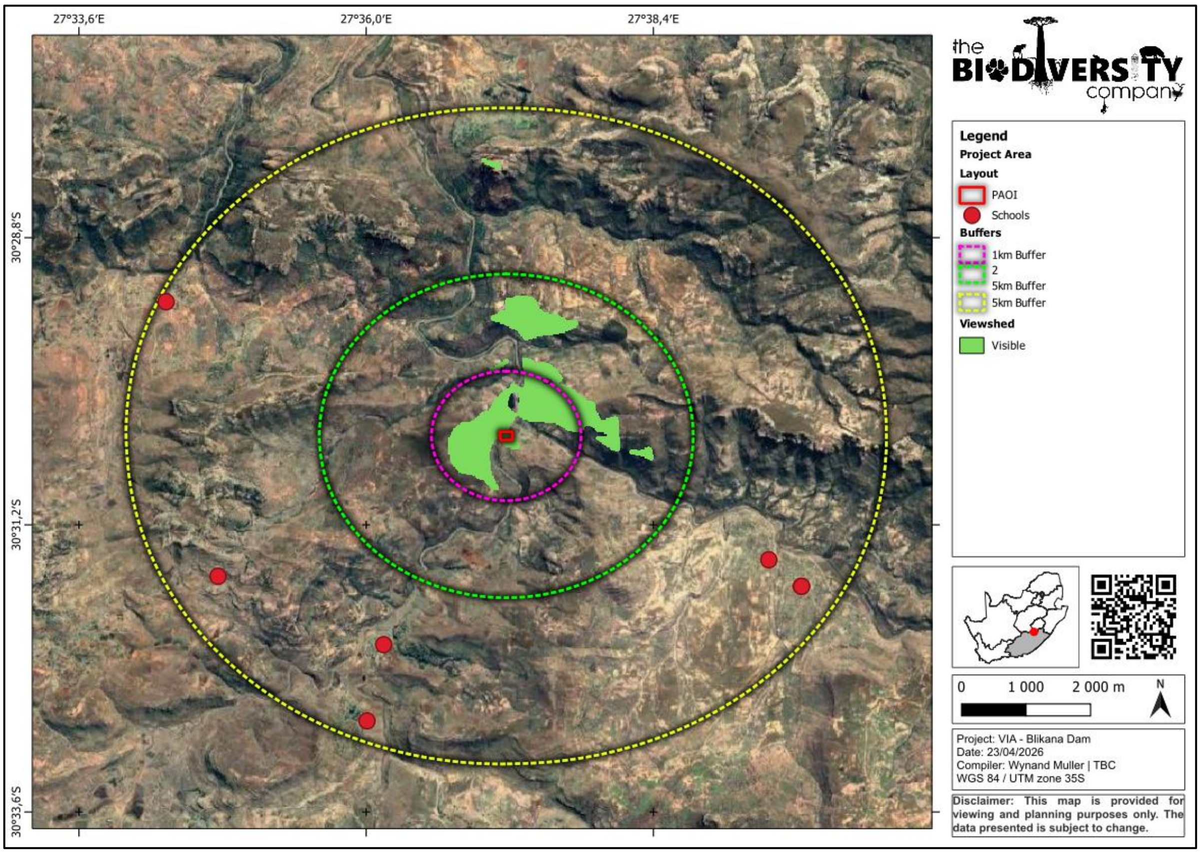


Figure 4-4 WWTW visual receptors considered together with the theoretical visibility model

4.2 Impact Identification and Prediction

The likely visual impacts of the proposed Blikana Dam and associated WWTW were identified through an integrated assessment of the mapped viewsheds (Figure 4-1 and Figure 4-2), receptor mapping (Figure 3-9, Figure ***3-10***, Figure 4-3 and Figure 4-4), aerial imagery and field photographs (Figure 3-11 to Figure 3-18). The assessment considers both direct visual effects on receptors and broader changes to landscape character. As final detailed engineering drawings, material schedules, and lighting layouts were not available at the time of drafting, the predictions below are based on informed specialist judgement and should be refined, where necessary, once the final design is confirmed.

For the dam component, the primary predicted visual impacts arise from the introduction of permanent engineered infrastructure into a rugged valley setting, alteration of the existing landform pattern, exposure of cut-and-fill slopes, and the long-term transformation of a visually distinctive drainage corridor and valley floor, as reflected in Figure 3-11 to Figure 3-14 and Figure 4-1 and Figure 4-3. The dam is expected to be the visually dominant component of the project due to its scale, permanence and broader visibility envelope.

For the WWTW, the principal visual impacts are associated with the introduction of compact but utilitarian built form, including tanks, buildings, fencing, surfaced areas and service infrastructure, as well as possible lighting and maintenance activity, as reflected in Figure 3-15 to Figure 3-18 and Figure 4-2 and Figure 4-4. Although the WWTW occurs within a more open local setting, its visual influence is expected to remain relatively contained compared to the dam because of terrain moderation and the smaller scale of the infrastructure.

Across both components, the greatest visual magnitude is expected within the 1 km and 2.5 km zones where direct views, higher detail visibility and stronger contrast are more likely. Beyond this range, visibility becomes more intermittent and increasingly influenced by topographic screening, slope orientation and the position of individual receptors.

4.3 Pre-Mitigation Significance Assessment

Applying the assessment criteria set out in Appendix A, and taking into account extent, duration, magnitude, probability and reversibility, the following indicative pre-mitigation significance ratings are considered appropriate for the project:

- Construction-phase visual disturbance associated with the dam footprint, earthworks and site activity: Medium;
- Operational-phase visual impact associated with the permanent dam infrastructure and altered valley character: High;
- Construction-phase visual disturbance associated with the WWTW footprint and associated infrastructure: Medium;
- Operational-phase visual impact associated with the WWTW built form, ancillary features and operational presence: Medium;
- Potential night-time visual impact associated with poorly controlled security or operational lighting: Medium;
- Combined cumulative visual effect of both project components and their ancillary infrastructure: Medium.

The most significant pre-mitigation effect is the permanent operational impact of the dam because it combines a high degree of visual change with long-term to permanent duration and partial irreversibility. The WWTW is of lower magnitude and more spatially contained, but it may still result in a noticeable localised visual change if not effectively integrated with the receiving environment.

4.4 Impact Assessment by Receptor Group

The significance of visual change varies according to receptor type, distance, duration of view, angle of view and the extent to which the project is perceived against natural landform or skyline. The principal receptor groups are assessed as follows:

- Nearby rural residents and dispersed homesteads are considered medium-high sensitivity receptors because visual amenity forms part of their everyday living environment and repeated exposure to visual change is likely;
- Schools and places of worship are regarded as high sensitivity receptors because they are regularly occupied community facilities where expectations of limited visual intrusion are relatively high;
- Road users and people moving through the wider area are generally medium sensitivity receptors. Their views are transient, but construction disturbance, exposed soils and lighting may still be highly noticeable where direct views occur;
- Agricultural users, landowners and workers in the surrounding landscape are generally medium sensitivity receptors. Although they may be more accustomed to working landscapes, they may still be affected by visually discordant or poorly rehabilitated development.

Overall, receptors associated with the dam study area are expected to experience the greater level of visual change because of the wider viewshed and the stronger effect on landscape character. Receptors associated with the WWTW are expected to experience a more localised but still potentially noticeable visual effect where direct views are available from nearby properties, facilities or approach routes.

4.5 Construction Phase Impacts

Construction-phase visual impacts will arise from vegetation clearance, topsoil stripping, excavation, cut-and-fill operations, stockpiles, construction plant, temporary structures, access movement and the general presence of workers and equipment. These impacts are temporary in duration but may be visually prominent due to the contrast created by exposed soils and active disturbance within an otherwise subdued rural landscape.

- At the dam site, construction impacts are expected to be more pronounced because of the likely extent of earthworks and the visually sensitive rocky valley setting;
- At the WWTW site, construction disturbance is likely to be more compact and locally contained, but may still be evident from nearby receptors and movement routes;
- Poor housekeeping, unmanaged stockpiles, erosion scars, temporary fencing, waste accumulation and uncontrolled dust could materially increase short-term visual intrusion;
- Unnecessary night-time lighting during construction could extend the period of visual effect and increase nuisance to nearby receptors.

Before mitigation, construction-phase visual impacts for both components are considered Medium. These impacts are however temporary and largely reversible, provided that disturbance is controlled and progressive rehabilitation is implemented.

4.6 Operational Phase Impacts

Operational visual impacts are those that remain after construction and continue for the life of the project. These impacts are generally of greater significance than construction impacts because they are long-term to permanent and directly related to how well the final development is integrated with the receiving landscape.

- For the dam, the main operational impacts are expected to include permanent change to the existing valley character, the visual presence of engineered infrastructure, associated access elements and long-term alteration of the valley floor and drainage corridor;
- For the WWTW, the main operational impacts relate to the visibility of tanks, buildings, fencing, hardstand areas, signage and associated utility infrastructure within the open grassland setting;
- Lighting, if not appropriately shielded and limited to essential functions, could become a disproportionate source of night-time visual intrusion in a landscape that currently appears to have relatively low lighting intensity;
- Poor maintenance, visible staining, corrosion, damaged fencing, visual clutter or failed rehabilitation could increase residual operational visual impacts over time.

The dam remains the primary driver of operational significance and is assessed as High before mitigation. The WWTW is assessed as Medium before mitigation and is expected to remain more localised in extent.

5 Cumulative Impact Assessment

5.1 Identification of Other Developments

No other major industrial or infrastructure developments were identified from the information supplied to this draft LVIA that would clearly dominate the cumulative visual context of the study area. The wider receiving environment is, however, not entirely undeveloped and already contains dispersed rural settlement, community facilities, local roads and tracks, utility lines and other small-scale human influences.

For cumulative visual assessment purposes, the most relevant interactions are therefore those between the proposed dam and the proposed WWTW themselves, together with their ancillary infrastructure such as access improvements, service connections, fencing, lighting and related operational features.

5.2 Cumulative Impact Assessment

The cumulative visual effect of the project arises from the combined presence of both development components within the same broader rural landscape. In practice, however, the cumulative effect is moderated by the spatial separation of the dam and WWTW, the different receptor catchments associated with each site, and the screening effect of topography which limits simultaneous visibility from many viewpoints.

The dam and WWTW do not appear to form a single continuous visual envelope across most of the study area. Rather, cumulative effects are more likely to be experienced as a broader perception of infrastructure intensification and incremental landscape change within the same rural area. The strongest cumulative effect is therefore likely to be experienced by receptors who move repeatedly through the wider area or who are functionally linked to both project components.

5.3 Cumulative Significance Rating

The cumulative visual significance of the project is assessed as Medium before mitigation. This reflects the combined presence of two related infrastructure components in the same broader landscape, but also recognises the moderating influence of terrain screening, localised visibility and limited direct receptor overlap.

With effective implementation of the recommended mitigation measures, including careful siting, muted finishes, lighting control, rehabilitation and ongoing maintenance, the residual cumulative visual effect is expected to reduce to Low and remain acceptable from a landscape/visual perspective.

6 Mitigation Measures

6.1 Mitigation Hierarchy

Mitigation should be applied in accordance with the mitigation hierarchy, prioritising avoidance of unnecessary visual harm before minimisation, rehabilitation and management measures are relied upon. In landscape/visual terms, this means first refining siting and layout to avoid the most visually sensitive or exposed positions; then reducing visual contrast through design, material and lighting choices; and finally rehabilitating disturbed areas so that long-term scarring is minimised.

6.2 Design Phase Mitigation

The following design-phase mitigation measures are recommended:

- Refine the final footprint and layout so that structures, roads and disturbed areas are located as low in the landscape as practicable and do not unnecessarily break skylines or prominent landform edges;

- Minimise cut-and-fill, especially on exposed upper slopes, valley sides and plateau margins;
- Keep the WWTW layout compact and avoid the scattered placement of visually unrelated structures;
- Use muted, recessive and non-reflective colours and finishes that respond to the dominant local palette of rock, grassland, and earth tones;
- Design all lighting as low-intensity, fully shielded and directed downward, and limit lighting to operationally necessary locations;
- Limit signage to essential safety and identification purposes only and avoid visually intrusive branding or oversized signboards.

6.3 Construction Phase Mitigation

The following construction-phase mitigation measures are recommended:

- Clearly demarcate the approved disturbance footprint and prevent unnecessary spread of construction activity into surrounding undisturbed areas;
- Locate laydown areas, stockpiles, parking and temporary facilities within the least visible and already disturbed portions of the site where possible;
- Strip, stockpile and replace topsoil appropriately and implement progressive rehabilitation as soon as areas become available;
- Stabilise exposed slopes and disturbed surfaces promptly to avoid long-lived erosion scars and prominent raw soil exposure;
- Maintain good housekeeping and ensure that temporary materials, waste and redundant equipment do not remain unnecessarily visible;
- Use temporary lighting only where operationally required and ensure all lights are hooded and down-directed.

6.4 Operational Phase Mitigation

The following operational mitigation measures are recommended:

- Maintain all rehabilitated areas until stable vegetative cover has been achieved and re-establish failed areas promptly;
- Ensure that buildings, tanks, walls, fencing and ancillary elements retain muted, recessive finishes and do not weather into highly reflective or visually discordant surfaces;
- Keep all external lighting to the minimum required for safety and operation and maintain shielded fittings to prevent glare and light spill;
- Maintain good housekeeping within the WWTW and dam-related operational areas so that litter, staining, corrosion, exposed stored materials and neglected infrastructure do not increase visual clutter;

- Maintain any approved visual screening or landscape planting where ecologically appropriate and avoid the introduction of alien invasive species;
- Review any future additions, expansions or signage against the visual objectives of this LVIA before implementation.

6.5 Decommissioning Phase Mitigation

Should any components or temporary works be decommissioned, the following measures are recommended:

- Remove all redundant temporary structures, waste material, equipment, hard surfacing and infrastructure that are not required for ongoing use;
- Rework unnecessary hardstand areas where feasible so that they can be re-profiled and revegetated;
- Recontour disturbed areas to stable landforms that tie into the surrounding topography and avoid abrupt artificial edges;
- Rehabilitate disturbed surfaces with an appropriate indigenous species mix suited to the local grassland environment;
- Undertake post-decommissioning monitoring until disturbed areas are visually stable and re-integrated with the surrounding landscape.

6.6 Mitigation Measure Table

A summary of the principal visual mitigation measures is provided in Table 6-1 below.

Table 6-1 Summary of principal visual mitigation measures recommended for the project

Phase	Primary visual issue	Key mitigation measures	Expected outcome
Design	Dam siting, embankment form and exposed landform change	Refine footprint, avoid prominent skyline positions, minimise cut-and-fill, align disturbed areas with natural terrain lines and use muted non-reflective finishes.	Reduced visual contrast and improved landscape fit.
Design	WWTW built form, layout and lighting	Keep the facility compact, apply recessive colours, minimise signage and specify fully shielded lighting.	Lower local visual intrusion and improved integration.
Construction	Temporary disturbance, exposed soils, stockpiles and site clutter	Contain the disturbance footprint, manage laydown areas, progressively rehabilitate disturbed areas, stabilise slopes and maintain housekeeping.	Reduced short-term visual disturbance and faster recovery.
Operation	Permanent dam-related visual change	Maintain rehabilitated areas, treat exposed surfaces, manage lighting and signage, and keep ancillary structures visually recessive.	Residual impact reduced but not eliminated; permanent change becomes more visually assimilated over time.

Operation	WWTW visibility and utilitarian appearance	Maintain finishes, screening, housekeeping and low-intensity lighting; prevent clutter and neglected infrastructure.	Low residual visual impact where mitigation is sustained.
Decommissioning	Residual scarring from redundant infrastructure or temporary works	Remove obsolete works, recontour disturbed land, replace topsoil and revegetate using suitable indigenous species.	Long-term restoration of visual quality.

7 Post-Mitigation Assessment

7.1 Residual Impact Assessment

Following implementation of the recommended mitigation measures, a reduction in visual impact magnitude is expected for both project components. Residual construction impacts are expected to reduce substantially once temporary disturbance is rehabilitated and temporary works are removed.

- Residual construction-phase visual impact at the dam: Low to Medium, reducing further as rehabilitation establishes;
- Residual operational visual impact at the dam: Medium, due to the permanence of the altered valley form and associated infrastructure;
- Residual operational visual impact at the WWTW: Low, provided that built form, finishes, lighting and housekeeping are carefully controlled;
- Residual night-time visual impact: Low, provided that lighting remains limited, shielded and operationally necessary only.

7.2 Effectiveness of Mitigation Measures

The most effective visual mitigation measures for this project are those implemented early in the design process, particularly footprint refinement, reduction of unnecessary disturbance, slope shaping, selection of recessive colours and strict lighting control. Construction-phase site management and rehabilitation are also expected to be effective in reducing temporary visual intrusion.

Mitigation is likely to be particularly effective at the WWTW, as the facility is relatively compact and the overall visibility footprint is contained. At the dam, mitigation can reduce the harshness of visual contrast and improve landscape fit, but it cannot entirely eliminate the fact of permanent change to the valley landscape. Effectiveness will therefore depend on disciplined implementation and ongoing maintenance.

7.3 Residual Cumulative Impacts

Post-mitigation cumulative impacts are expected to remain limited by the spatial separation of the project components, the differing receptor groups affected by each component and the screening effect of topography. Provided that the recommended mitigation measures are implemented for both the dam and WWTW, the residual cumulative visual effect is expected to be Low and acceptable from a landscape/visual perspective.

7.4 Monitoring and Adaptive Management

Monitoring should be incorporated into the EMPr so that visual mitigation is checked during both construction and operation, and so that corrective actions can be implemented where required. The following monitoring measures are recommended:

- Compile a pre-construction photographic baseline for the key viewpoints and receptor locations identified in the LVIA;
- Confirm final colours, finishes, lighting specifications and signage details prior to construction;
- Undertake routine construction-phase visual compliance inspections to verify footprint control, housekeeping, rehabilitation progress and lighting management;
- Inspect rehabilitated areas after major rainfall events and at the end of the wet season to identify erosion, vegetation failure or exposed scarring;
- Undertake periodic operational visual audits of the dam and WWTW to assess maintenance, lighting, screening and any new visually intrusive additions;
- Maintain complaints register for visual and lighting issues raised by stakeholders and address verified issues through adaptive management.

8 Recommendation and Conclusion

8.1 Key Findings

The key findings of this LVIA may be summarised as follows:

- The project comprises two related components in different visual settings, namely a more visually prominent dam component and a more localised WWTW component;
- The dam is the principal driver of landscape and visual significance due to its rugged valley setting, greater potential for landform change and broader theoretical visibility envelope;
- The WWTW is visually more contained and occurs in a receiving environment that already shows some degree of rural modification, thereby moderating its significance;
- Sensitive receptors include nearby rural residents, schools, places of worship and local road users, with the greatest effects expected within the closer buffer zones and from selected elevated viewpoints;
- Construction impacts are temporary and largely reversible, while operational impacts are longer-term to permanent and therefore more significant;
- With appropriate design, lighting control, rehabilitation and ongoing maintenance, the project's residual visual impacts are considered manageable.

8.2 Overall Assessment

From a landscape and visual perspective, the proposed development is not considered fatally flawed. The project will, however, introduce permanent visual change to the receiving environment, particularly in relation to the dam component, and therefore requires careful mitigation and strong visual management throughout design, construction and operation.

Taking account of the mapped visibility, receptor distribution, terrain context and photographic evidence, the overall visual acceptability of the project is considered to be conditional rather than unconditional. In visual terms, the project can be supported provided that the recommended mitigation measures and approval conditions are implemented in full.

8.3 Recommendations

It is recommended that the project be considered for approval from a landscape/visual perspective, subject to the following recommendations:

- The final design should prioritise minimisation of disturbance, reduction of unnecessary built form and avoidance of visually prominent landform positions;
- All external materials, structures, boundary treatments and operational elements should utilise muted, non-reflective finishes suited to the surrounding landscape palette;
- Lighting should be strictly controlled, shielded and limited to essential safety and operational requirements;
- Construction disturbance should be progressively rehabilitated and all temporary works removed as soon as practicable;
- The WWTW should remain compact and visually orderly, with ongoing housekeeping and maintenance to prevent cumulative visual clutter;
- Any future expansion, redesign or addition of visibly prominent infrastructure should be reviewed against the findings of this LVIA.

8.4 Conditions of Approval

Should the project be authorised, the following conditions of approval are recommended from a landscape/visual perspective:

- A visual management specification should be included in the EMPr, covering colours, finishes, lighting, signage, rehabilitation and site housekeeping;
- Final detailed design drawings for visible above-ground infrastructure should be reviewed to ensure consistency with the mitigation principles set out in this report;
- No high mast lighting, unshielded floodlights or unnecessary decorative lighting should be permitted at the dam or WWTW;
- All disturbed areas not required for long-term operation must be rehabilitated to a stable landform and vegetated as soon as practicable;
- A photographic monitoring record should be maintained for the key viewpoints identified in the LVIA throughout construction and early operation;
- Any stakeholder complaints relating to visual intrusion or lighting nuisance must be recorded, investigated and addressed through adaptive management.

8.5 Conclusion

The proposed Blikana Dam and associated WWTW will result in visual change within the receiving landscape, with the dam representing the more substantial and permanent source of impact and the WWTW presenting a more localised effect. On the basis of the information currently available, the project is considered visually manageable and capable of being accommodated within the broader rural landscape, provided that the recommended mitigation and approval conditions are implemented.

Accordingly, this LVIA supports conditional approval of the project from a landscape and visual perspective. The final significance of the development should be confirmed once detailed design information is available and, if necessary, after field verification of the most sensitive receptor viewpoints.

9 References

Bureau of Land Management (BLM). 1986. Visual Resource Management. U.S. Department of the Interior, Bureau of Land Management, Washington, D.C.

Landscape Institute and Institute of Environmental Management and Assessment (IEMA). 2013. Guidelines for Landscape and Visual Impact Assessment. 3rd ed. Routledge, London.

Oberholzer, B. 2005. Guideline for Involving Visual and Aesthetic Specialists in EIA Processes.

10 Appendices

10.1 Appendix A – Methodology

10.1.1 Assessment Approach

The Landscape and Visual Impact Assessment (LVIA) was undertaken using a structured, integrated and professional assessment approach combining desktop analysis, spatial interpretation, field photographic review and specialist evaluation. The method was selected to provide a transparent, repeatable, and defensible basis for identifying and assessing the potential landscape and visual impacts associated with the proposed Blikana Dam and associated WWTW.

- Desktop analysis was undertaken using GIS-based mapping, aerial and satellite imagery, topographic information, project layout data, visibility outputs and environmental spatial datasets to understand the receiving visual environment and likely extent of visibility;
- Field verification photographs were used to confirm desktop interpretations of landscape character, scenic quality, visual enclosure, disturbance and the influence of landform, vegetation and existing infrastructure on available views;
- Sensitive visual receptors were identified from the supplied spatial information, including community facilities and likely residential and movement-based receptors, with due regard to the broader EIA process and any available stakeholder context;
- Viewshed and visibility analysis was undertaken to identify areas from which the proposed infrastructure may theoretically be visible, taking into account terrain controls and receptor distribution;
- The assessment integrates spatial modelling with qualitative specialist judgement so that both landscape effects and receptor-based visual effects can be considered together.

10.1.2 Methodology Selection and Justification

The methodology adopted for this LVIA is considered appropriate for the nature of the proposed development, the character of the receiving environment and the applicable regulatory framework. It is based on a combination of South African specialist guidance, recognised international best practice and the practical requirements of visual assessment in a development context.

- The assessment is aligned with the Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (Oberholzer, 2005) and Government Notice No. 320 of 2020, which together support the description of the receiving environment, identification of sensitive receptors, verification of site sensitivity and transparent specialist motivation;
- International best practice, including guidance from the Institute of Environmental Management and Assessment (IEMA), the Landscape Institute and the Bureau of Land Management Visual Resource Management (BLM VRM) System, informed the structured assessment of visibility, receptor sensitivity and landscape change;
- The selected methodology is suitable for a project that may introduce visually prominent landform alteration, utility infrastructure, associated movement, lighting and cumulative change into a rural receiving environment;

- The approach enables both quantitative visibility interpretation and qualitative professional judgement, which is necessary in a visually sensitive but topographically varied landscape such as the present study area;

- The methodology also supports compliance with Appendix 6 specialist reporting requirements by clearly documenting assumptions, methods, assessment criteria, limitations, mitigation and professional conclusions.

10.1.3 Assessment Criteria and Significance Framework

Visual impacts were assessed using a structured significance framework based on the principal criteria commonly applied in specialist environmental assessment. These criteria are summarised in Table 10-1 below.

Table 10-1 Landscape/Visual assessment criteria and significance framework

Criterion	Definition and Scale
Extent	Site-specific | Local | Regional | National | International
Duration	Temporary | Short-term | Medium-term | Long-term | Permanent
Magnitude / Intensity	Low | Medium | High | Very High
Probability	Unlikely | Possible | Probable | Definite
Reversibility	Reversible | Partially Reversible | Irreversible

Significance Rating Scale:

- Low: Minor visual change, limited receptor exposure and readily mitigated effect;

- Medium: Moderate visual change, moderate receptor exposure and an impact that can be mitigated with effort;

- High: Significant visual change, wider receptor exposure and an effect that is difficult to mitigate fully;

- Very High: Major visual change, extensive receptor exposure and a highly challenging impact to mitigate.

10.1.4 Significance Calculation

In this LVIA, significance was determined through a structured professional judgement process rather than a rigid purely mathematical formula. Extent, duration, magnitude/intensity, probability and reversibility were considered together in order to derive an overall significance rating for each impact. Particular emphasis was placed on the sensitivity of the receiving environment, the likely exposure of receptors, the permanence of the change and the degree to which mitigation could realistically reduce contrast or visibility.

This approach is appropriate because visual impact assessment is inherently interpretive and relies on the specialist's understanding of landscape character, receptor experience and the likely prominence of development in view. Pre-mitigation significance ratings therefore reflect the expected impact before visual controls are applied, while post-mitigation ratings reflect the residual effect once recommended measures have been implemented.

10.2 Appendix B – Specialist Declaration of Independence

Declaration

I, Divan van Rooyen, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.

Divan van Rooyen

Ecologist

The Biodiversity Company

April 2026

10.3 Appendix C – Specialist CVs

Divan Van Rooyen

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PROFILE SUMMARY

Divan van Rooyen is an aquatic ecologist (Pri. Sci. Nat. 151272) with 4 years of experience in wetland identification and delineations. Divan completed his Ph.D. in environmental science at the North-West University Potchefstroom Campus. Divan has been part of wetland studies for seismic surveys, battery energy storage systems, renewable energy (wind and solar) and bulk services infrastructure development and part of aquatic biomonitoring studies for WWTW's and Mines.

PERSONAL INFO

Nationality: South African

Date of birth: 20 December 1993

EXPERIENCE

Environmental Impact Assessments (EIA)

Environmental Management Programmes (EMP)

Project Management

SKILLS

- ✓ Wetland functional assessments
- ✓ Ecology
- ✓ Rehabilitation
- ✓ Aquatic Biomonitoring
- ✓ Monitoring & Management Plans

LANGUAGES

English – Proficient

Afrikaans – Proficient

Signed: Divan van Rooyen

ACADEMIC QUALIFICATIONS

North-West University of Potchefstroom (2022): DOCTOR OF PHILOSPHY (PhD) – Environmental Science (Aquatic Ecosystem Health):
Title: The role of the Usuthu River as refuge for the aquatic biodiversity of the lower Phongolo floodplain system

North-West University of Potchefstroom (2018): MASTER OF SCIENCE (MSc) – Environmental Science:
Title: Ecotoxicity of CdTe and its functional groups on *Enchytraeus albidus*

North-West University of Potchefstroom (2015): HONOURS BACHELOR OF SCIENCE (Hons) – Environmental Science (Ecological Remediation and Sustainable Management)

PROFESSIONAL EXPERIENCE

Mar 2024 – Present	**The Biodiversity Company** Freshwater Ecologist
Dec 2022 – Feb 2024	**Nitai Consulting** Aquatic and Environmental Consultant
Mar 2022 – Nov 2022	**Enviroworks** Aquatic and Environmental Consultant
Jan 2022 – Feb 2022	**ABS-Africa** Environmental Intern
Jan 2017 – Apr 2021	**North-West University** Research Assistant

INTERNATIONAL EXPERIENCE

South Africa