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AGRICULTURAL COMPLIANCE STATEMENT FOR THE PROPOSED FRASER FARM DAM, KWAZULU-NATAL

Date
February 2025

Client

The Dartford Farming Trust

SPECIALIST ASSESSMENT DETAILS & DECLARATION OF INDEPENDENCE

Document Title	**AGRICULTURAL COMPLIANCE STATEMENT FOR THE PROPOSED FRASER FARM DAM, KWAZULU-NATAL**	
Report No.	**W200**	
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Date	**18 February 2025**	
Report completed by	**Wayne Jackson** *SACNASP (Registration 119037)*	
Client	**The Dartford Farming Trust**	
Fieldwork and Report Writing	**Wayne Jackson**	

I, Wayne Jackson, hereby declare that this report has been prepared independently of any influence or prejudice as may be specified by the Department of Environmental Affairs.

Wayne Jackson

Wetland & Soils Specialist

Eco-Assist

18 February 2025

Specialist Details

Specialist	Role	Details
Wayne Jackson *SACNASP (Registration 119037)*	**Field work and author (Soils)**	Wayne Jackson graduated from the University of KwaZulu-Natal, Pietermaritzburg, with a BSc. degree in Soil Science & Hydrology. Wayne has 15 years' experience in Wetlands & Soils Scientist with a demonstrated history of working in the environmental services industry. He is skilled in Soil Classification, Wetlands, Hydropedology, and Surface Water Hydrology. He has a strong Environmental mitigation and rehabilitation knowledge. He has also gained experience in large post-mining rehabilitation projects, providing specialist inputs on land capability and soil utilisation. He has extensive exposure to a wide range of projects in many sectors across South Africa, and parts of Africa. He is knowledgeable on how soils, wetlands, and hydrological systems are linked in the landscape and how activities could impact all these aspects. Wayne is a registered Natural Scientist with the South African Council for Natural Scientific Professionals (SACNASP) – Registration No. 119037.

The relevant experience of specialist team members involved in the compilation of this report are briefly summarized above. Curriculum Vitae of the specialist team are available on request.

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1 INTRODUCTION

Eco-Assist Environmental Consultants (here after Eco-Assist) were appointed by The Dartford Farming Trust to conduct an agricultural impact/compliance assessment for the proposed Fraser Farm Dam project, KwaZulu-Natal.

1.1 Project Locality

The project is located 10km south of Underberg in KwaZulu-Natal. The regional and local setting of the project area is shown in Figure 1-1 and Figure 1-2.

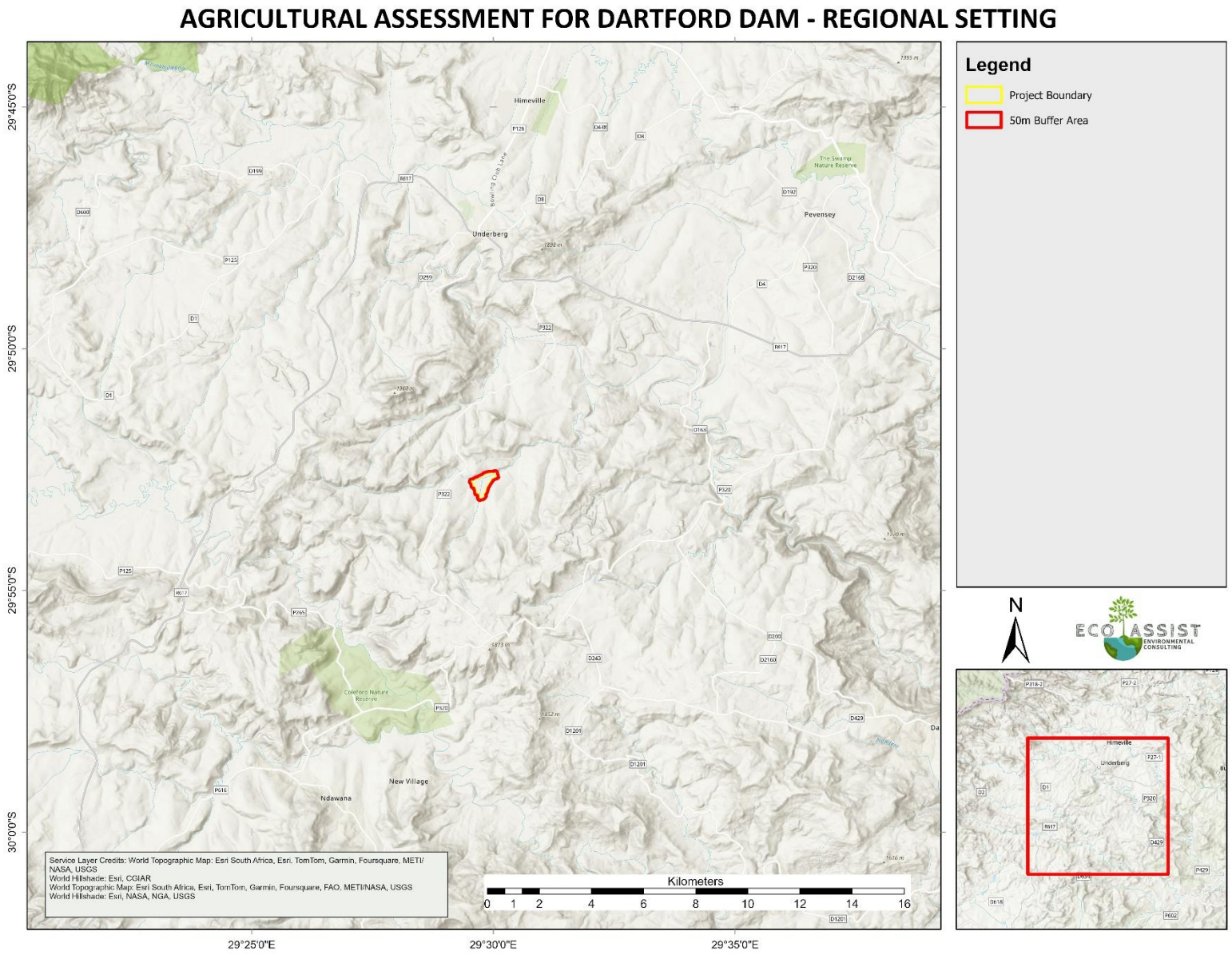

Figure 1-1: Map illustrating the regional setting of the project area.

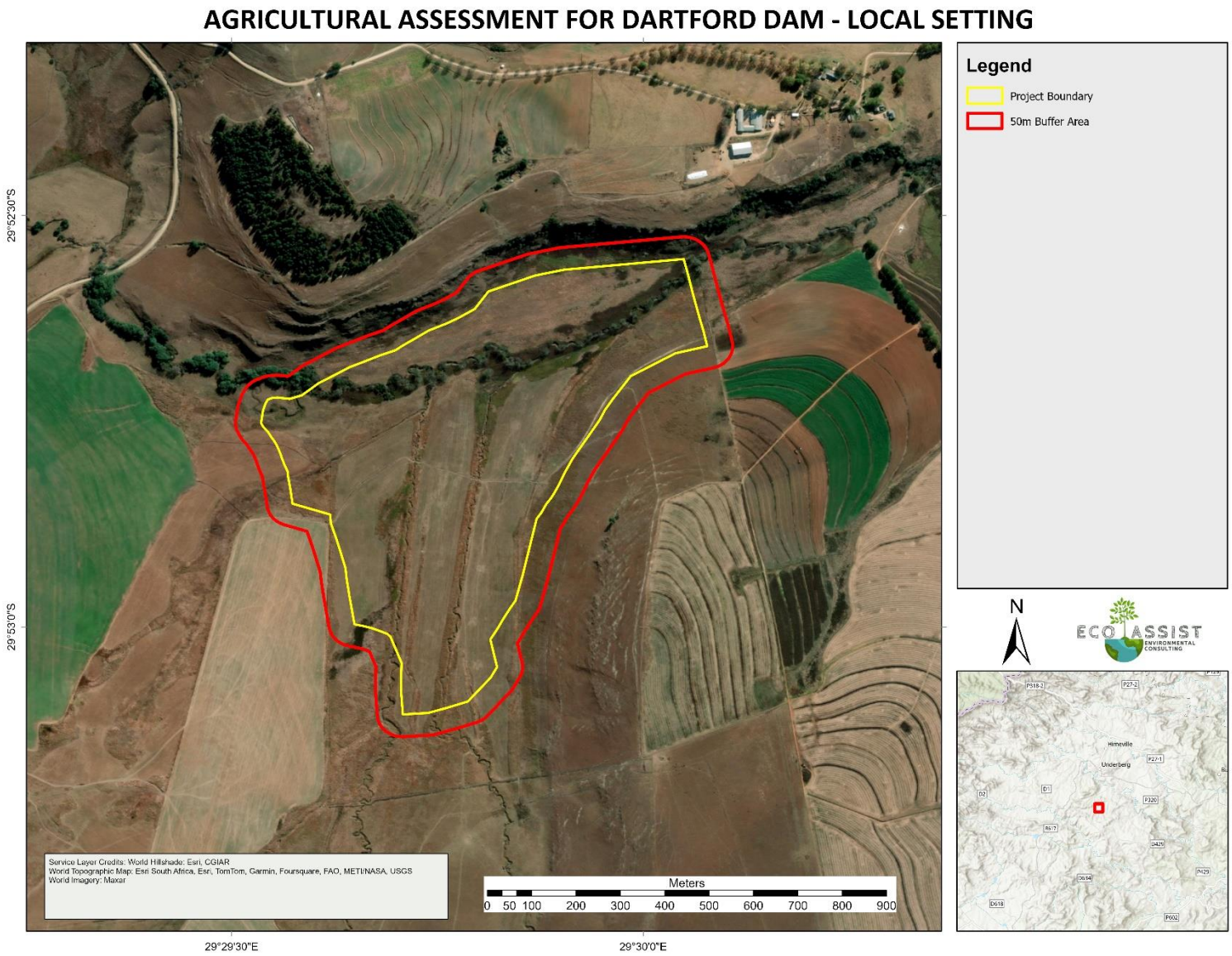

Figure 1-2: Map illustrating the local setting of the project area.

1.2 Terms of Reference

The client requires that prior to commencing with a specialist assessment, the current use of the land and the environmental sensitivity of the site under consideration, identified by the screening tool, will be confirmed by undertaking a site sensitivity verification.

1. The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.
2. The site sensitivity verification must be undertaken through the use of:
    a. a desktop analysis, using satellite imagery;
    b. a preliminary on-site inspection; and
    c. any other available and relevant information.
3. The outcome of the site sensitivity verification will be recorded in the form of a report that:
    a. confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;
    b. contains a motivation and evidence (e.g., photographs) of either the verified or different use of the land and environmental sensitivity; and
    c. is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations.

Based on the findings of the site sensitivity assessment the agricultural specialist will compile the relevant assessment (full agricultural impact assessment or agricultural compliance statement).

1.3 Scope of Work

The client requires that a soil survey be conducted and that the following be assessed as per the Provincial and National Departments of Agriculture recommendations:

- Assess and discuss historic climate statistics;
- Assess and discuss geological information;
- Assess and discuss the terrain features using 5m contours;
- Source best recent satellite or aerial imagery and georeferenced;
- Assess and discuss current agricultural land use on site and comment on crop performance and estimated yields (if any);
- Conduct soil assessment as described in the methodology;
- Assess and discuss agricultural land potential (eight class scale);
- Discuss the impact of the proposed land use change on loss of agricultural land production (If any);
- Recommend best location for proposed development to reduce any impacts;
- Compile informative reports and maps on current land use and agricultural land potential;
- Discuss the impact of the proposed land use change on loss of agricultural land production; and

- A basic soil management guideline will be completed.

The results will be mapped in GIS format and will include the following maps:

- A soil distribution map;
- A current land use map; and
- An agricultural potential map.

An Impact/compliance assessment of the proposed project will be conducted.

2 KEY LEGISLATION

Relevant environmental legislation pertaining to the soil/agricultural resources in South Africa is listed below, but is not limited to:

- The Constitution of the Republic of South Africa (Act 108 of 1996);
- Sub-division of Agricultural Land Act (Act 70 of 1970);
- Municipal Structures Act (Act 117 of 1998);
- Municipal Systems Act (Act 32 of 2000); and
- Spatial Planning and Land Use Management Act, 16 of 2013.

The above is supported by additional legislation that aims to manage the impact of development on the environment and the natural resource base of the country. Related legislation to this effect includes:

- Conservation of Agricultural Resources Act (Act 43 of 1983);
- Environment Conservation Act (Act 73 of 1989);
- National Environmental Management Act (Act 107 of 1998); and
- National Water Act (Act 36 of 1998).

3 SENSITIVITY ANALYSIS BASED ON THE ENVIRONMENTAL SCREENING TOOL

The result of the Department of Forestry, Fisheries, and the Environment (DFFE) screening tool for the project area is shown in Figure 3-1.

The screening tool showed that the project area has a Very-High to Medium agricultural sensitivity, with isolated patches of Low sensitivity. The screening tool requires the specialist to verify or dispute the screening tool sensitivities. The verification completed later in the report has confirmed that a compliance statement is sufficient.

The DFFE screening tool is a guideline, and it is up to the specialists to verify these results in the field. The screening tool is based on coarse datasets and the areas may not be accurate.

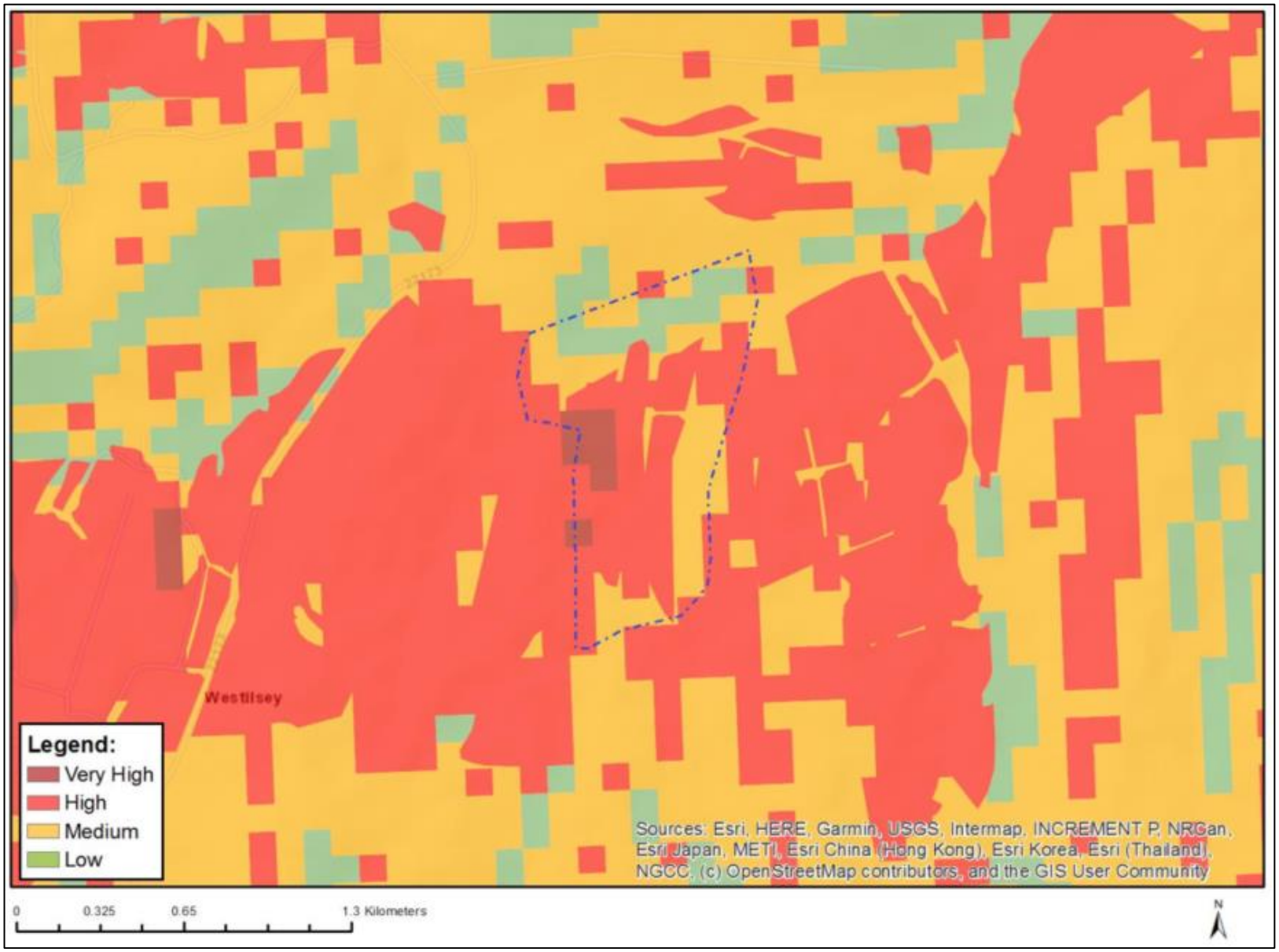

Figure 3-1: DFFE screening tool results for the agricultural sensitivity theme on the project area.

4 METHODOLOGY

4.1 Desktop Assessment

The following data layers were assessed to determine whether the development could have an impact on important national & provincial feature:

- Aerial imagery (Google Earth™);
- Land Type Data (Land Type Survey Staff, 1972 - 2006);
- National land capability evaluation raster data layers (Department of Agriculture, Forestry and Fisheries, 2017);
- Topographical data;
- Contour data (5 m).

4.2 Field Procedure

The site was traversed by vehicle and on foot. A soil auger was used to determine the soil form/family and depth. The soil was hand augured to the first restricting layer or 1.5 m. Soil survey positions were recorded as waypoints using a GPS device.

Soils were identified to the soil family level as per the "Soil Classification: A Natural and Anthropogenic System for South Africa" (Soil Classification Working Group, 2018). Landscape features such as existing open trenches were also helpful in determining soil types and depth.

4.3 Land Capability and Land Potential Assessment

Land capability and agricultural potential is determined by a combination of soil, terrain, and climate features. Land capability is defined by the most intensive long-term sustainable use of land under rain-fed conditions. At the same time an indication is given about the permanent limitations associated with the different land use classes (Smith B. , 2006).

Land capability is divided into eight (8) classes, and these may be divided into three (3) capability groups. Table 4-1 shows how the land classes and groups are arranged in order of decreasing capability and ranges of use. The risk of use increases from class I to class VIII (Smith, 2006).

Table 4-1: Land capability class and intensity of use (Smith, 2006).

Land Capability Class	Increased Intensity of Use									Land Capability Groups
I	W	F	LG	MG	IG	LC	MC	IC	VIC	Arable Land
II	W	F	LG	MG	IG	LC	MC	IC		
III	W	F	LG	MG	IG	LC	MC			
IV	W	F	LG	MG	IG	LC				
V	W	N/A	LG	MG						Grazing Land
VI	W	F	LG	MG						
VII	W	F	LG							
VIII	W									Wildlife

W - Wildlife	MG - Moderate Grazing	MC - Moderate Cultivation
F- Forestry	IG - Intensive Grazing	IC - Intensive Cultivation
LG - Light Grazing	LC - Light Cultivation	VIC - Very Intensive Cultivation

The land potential classes are determined by combining the land capability results and the climate capability of a region as shown in Table 4-2. The final land potential results are then described in Table 4-3.

Table 4-2: The combination table for land potential classification.

Land capability class	**Climate capability class**							
	C1	C2	C3	C4	C5	C6	C7	C8
I	L1	L1	L2	L2	L3	L3	L4	L4
II	L1	L2	L2	L3	L3	L4	L4	L5
III	L2	L2	L3	L3	L4	L4	L5	L6
IV	L2	L3	L3	L4	L4	L5	L5	L6
V	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei
VI	L4	L4	L5	L5	L5	L6	L6	L7
VII	L5	L5	L6	L6	L7	L7	L7	L8
VIII	L6	L6	L7	L7	L8	L8	L8	L8

Table 4-3: The Land Potential Classes.

Land potential	**Description of land potential class**
L1	Very high potential: No limitations. Appropriate contour protection must be implemented and inspected.
L2	High potential: Very infrequent and/or minor limitations due to soil, slope, temperatures, or rainfall. Appropriate contour protection must be implemented and inspected.
L3	Good potential: Infrequent and/or moderate limitations due to soil, slope, temperatures, or rainfall. Appropriate contour protection must be implemented and inspected.
L4	Moderate potential: Moderately regular and/or severe to moderate limitations due to soil, slope, temperatures, or rainfall. Appropriate permission is required before ploughing virgin land.
L5	Restricted potential: Regular and/or severe to moderate limitations due to soil, slope, temperatures, or rainfall.
L6	Very restricted potential: Regular and/or severe limitations due to soil, slope, temperatures, or rainfall. Non-arable
L7	Low potential: Severe limitations due to soil, slope, temperatures, or rainfall. Non-arable
L8	Very low potential: Very severe limitations due to soil, slope, temperatures, or rainfall. Non-arable

5 LIMITATIONS

The following aspects were considered as limitations of the assessment:

- Hand augers were used, and the limiting layer was the depth to which the auger could drill;
- The assessment is based on the design and layout information provided by the client;
- It has been assumed that the extent of the development area provided by the responsible party is accurate; and
- The GPS used for ground truthing is accurate to within five meters. Therefore, the observation site's delineation plotted digitally may be offset by up to five meters to either side.

6 RESPONSES TO INTERESTED AND AFFECTED PARTIES

To this point no concerns have been raised as yet. If any concerns are raised with regards to the agricultural impact assessment it will be address in this report.

7 RESULTS FROM DESKTOP ASSESSMENT

7.1 Climate

This region is characterised by summer rainfall. The mean annual precipitation (MAP) is about 890 mm. Mean annual temperature (MAT) of 14.6°C. there are 26 frost days per year and is indicative of a cooler, submontane form of warm-temperate climate (Mucina & Rutherford, 2006).

The land capability evaluation 2016 data layer is a refined and updated spatial modelled data layer depicting the land capability evaluation values for the country. The climate capability data layer is a sub-set data layer that contributes to the land capability data layer. It includes both the spatial as well as attributes description of the climate capability values (Department of Agriculture, Forestry and Fisheries, 2017). The climate capability as per Figure 7-1 shows a Moderate-High rating for the project area.

The climate class was determined to be C2 (Smith B. , 2006) – Slight limitation – Local climate is favourable for a wide range of adapted crops and a year-round growing season. Moisture stress and lower temperatures increase risk and decrease yields.

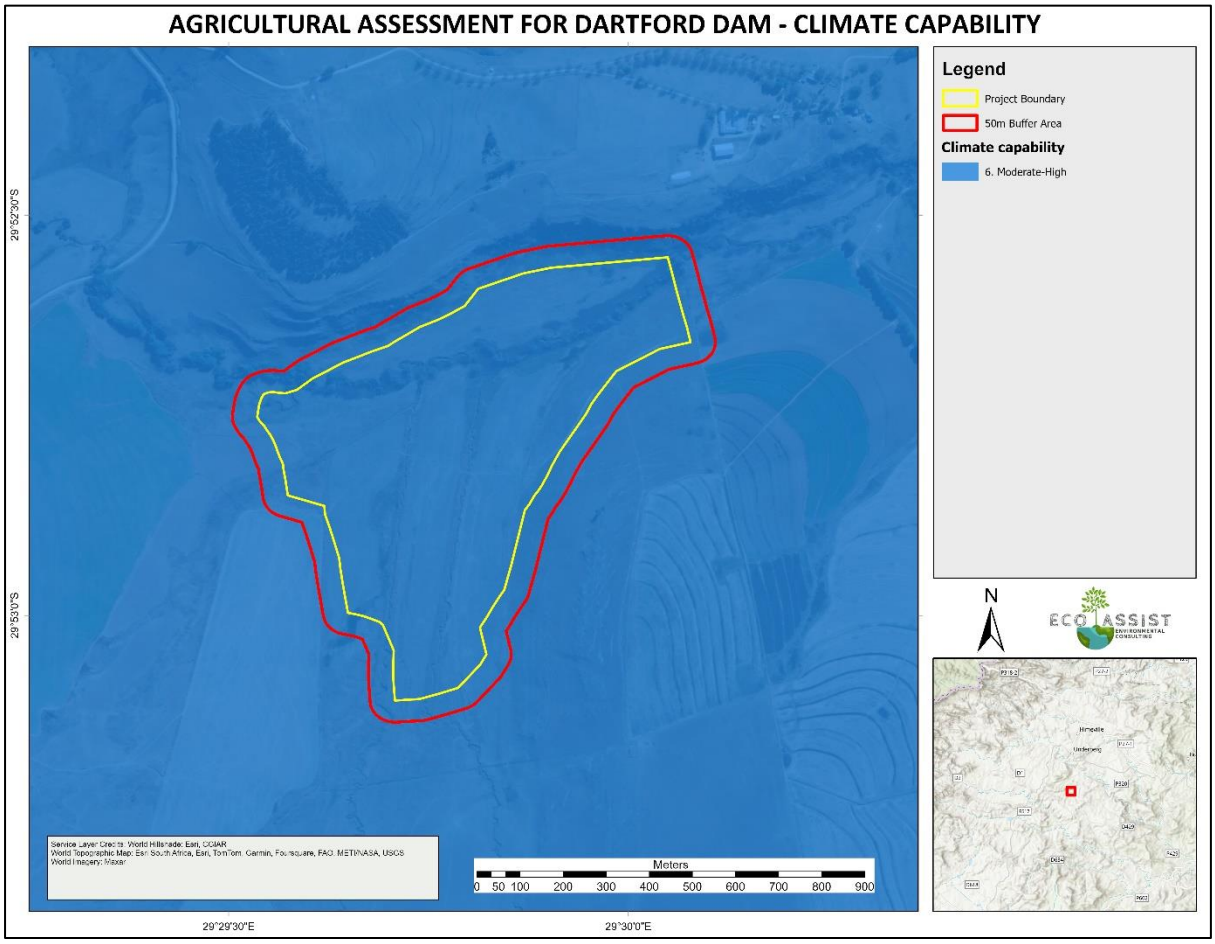

Figure 7-1: Climate capability for the project area.

7.2 Terrain

The terrain analysis was conducted using the processing tools within the ArcGIS mapping software. The spatial analyst terrain analysis tools were used to determine the Digital Elevation Model (DEM) (see Figure 7-2).

The project area drains to the northeast with steep slopes (edge of valley floor) coming off the crest into the scarp landscape position, However the project is in the floodplain with very flat topography (see Figure 7-2). The slopes are flat (0% to 3%) in the flood plain but are steep in the upper slopes to crest landscape positions ranging from 12% to 35% (see Figure 7-3).

In land capability modelling, terrain plays an important role not only from a plants' physiological growth requirements but also from a sensitivity and accessibility perspective (Department of Agriculture, Forestry and Fisheries, 2017). Two main terrain modelling concerns were included in the terrain capability modelling exercise namely:

- Plant physiology; and
- Terrain sensitivity

The terrain capability for the project area ranged from Low (dominant) to Moderate-High (see Figure 7-4).

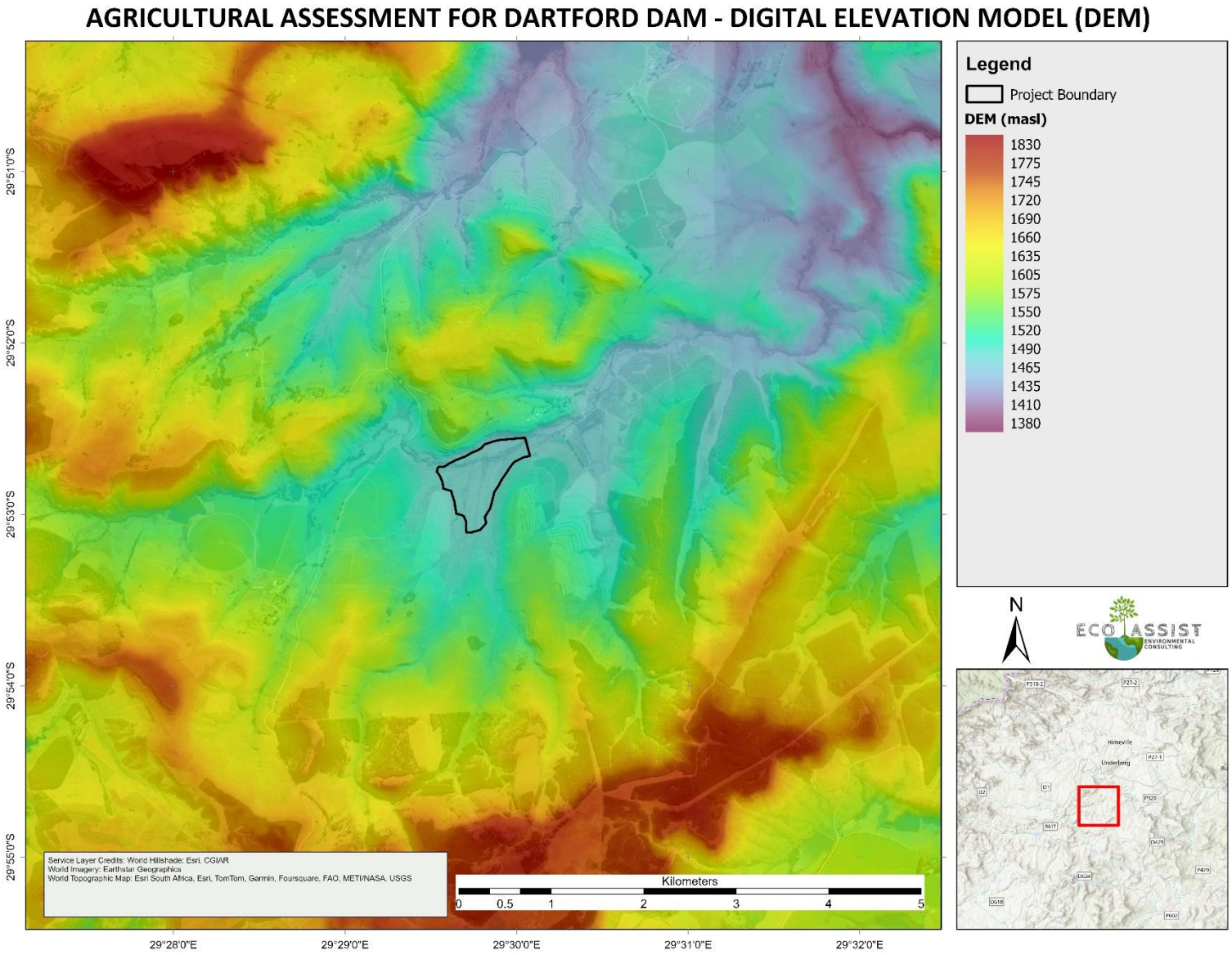

Figure 7-2: The digital elevation model (DEM) for the project area.

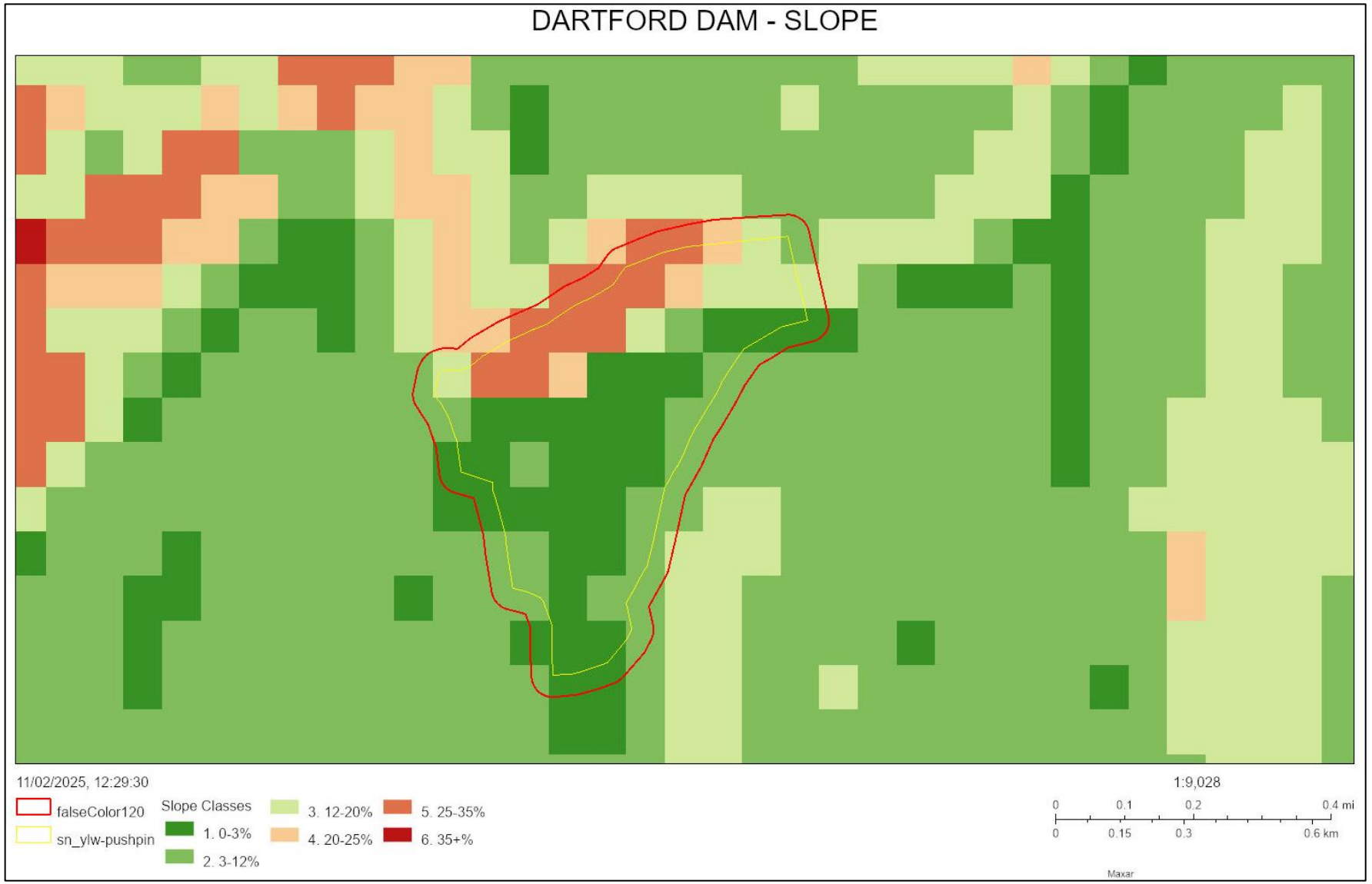

Figure 7-3: The slope analysis for the project area (Department of Agriculture, Forestry and Fisheries, 2017).

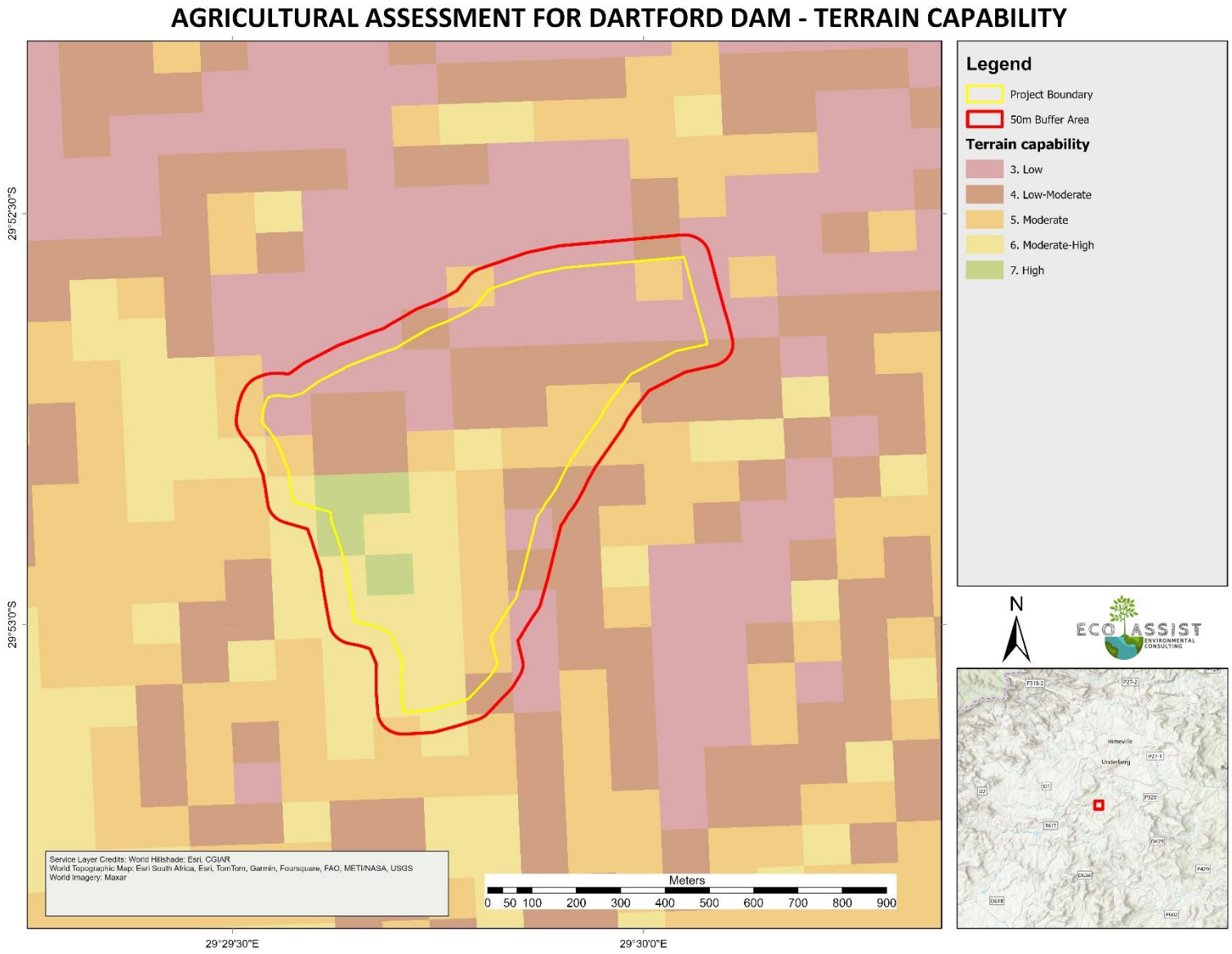

Figure 7-4: The terrain capability for the project area.

7.3 Desktop Soils & Geology

7.3.1 Soils & Geology

Existing land type data was used to obtain generalised soil patterns and terrain types for the site. Land type data exists in the form of published 1:250 000 maps. These maps indicate delineated areas of similar terrain types, pedosystems (uniform terrain and soil pattern) and climate (Land Type Survey Staff, 1972 - 2006).

The project footprint is located within the Ac376 land type unit. The land types are shown in Figure 7-7. The land type is dominated by the footslope (65%) and valley bottom (35%) landscape positions (see Figure 7-5) and consists largely of the Hutton and Griffon soil forms. The valley bottoms are dominated by stream beds and Katspruit soil forms. The slopes vary from 1% to 5% and the clay percentages ranging from 35% to 65%. The geology consists mainly of fine- to medium-grained sandstone, maroon, green and blue mudstone of the Tarkastad Formation, Beaufort Group. (see Figure 7-6).

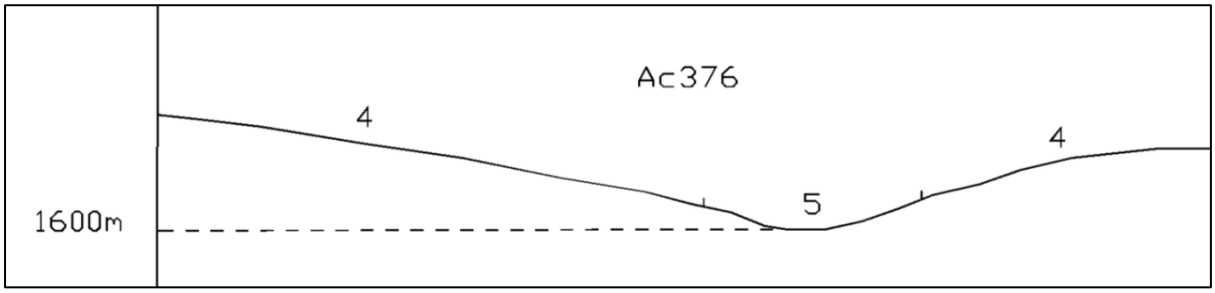

Figure 7-5: Hillslope catena for land type Ac376.

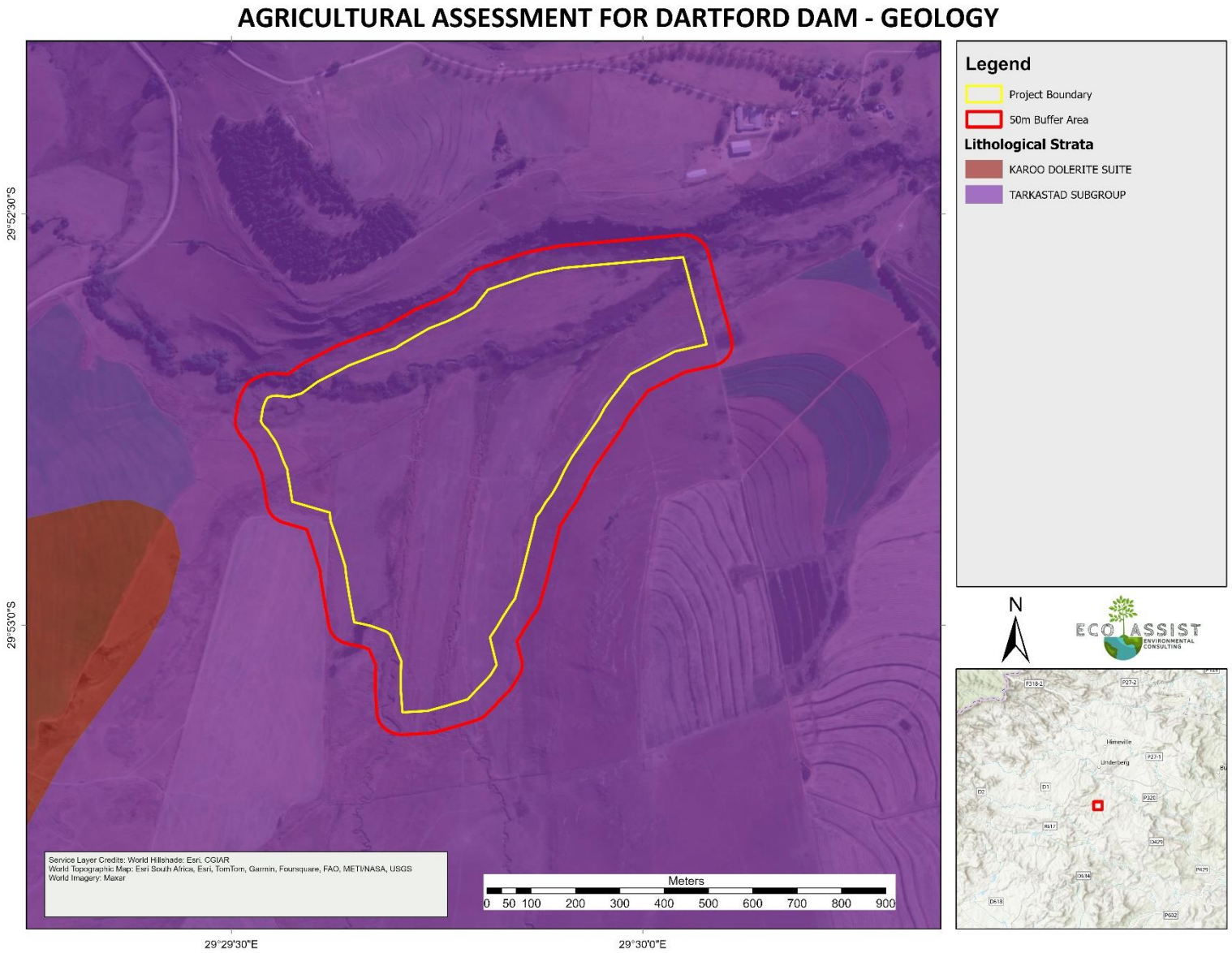

Figure 7-6: Regional geology for the project area.

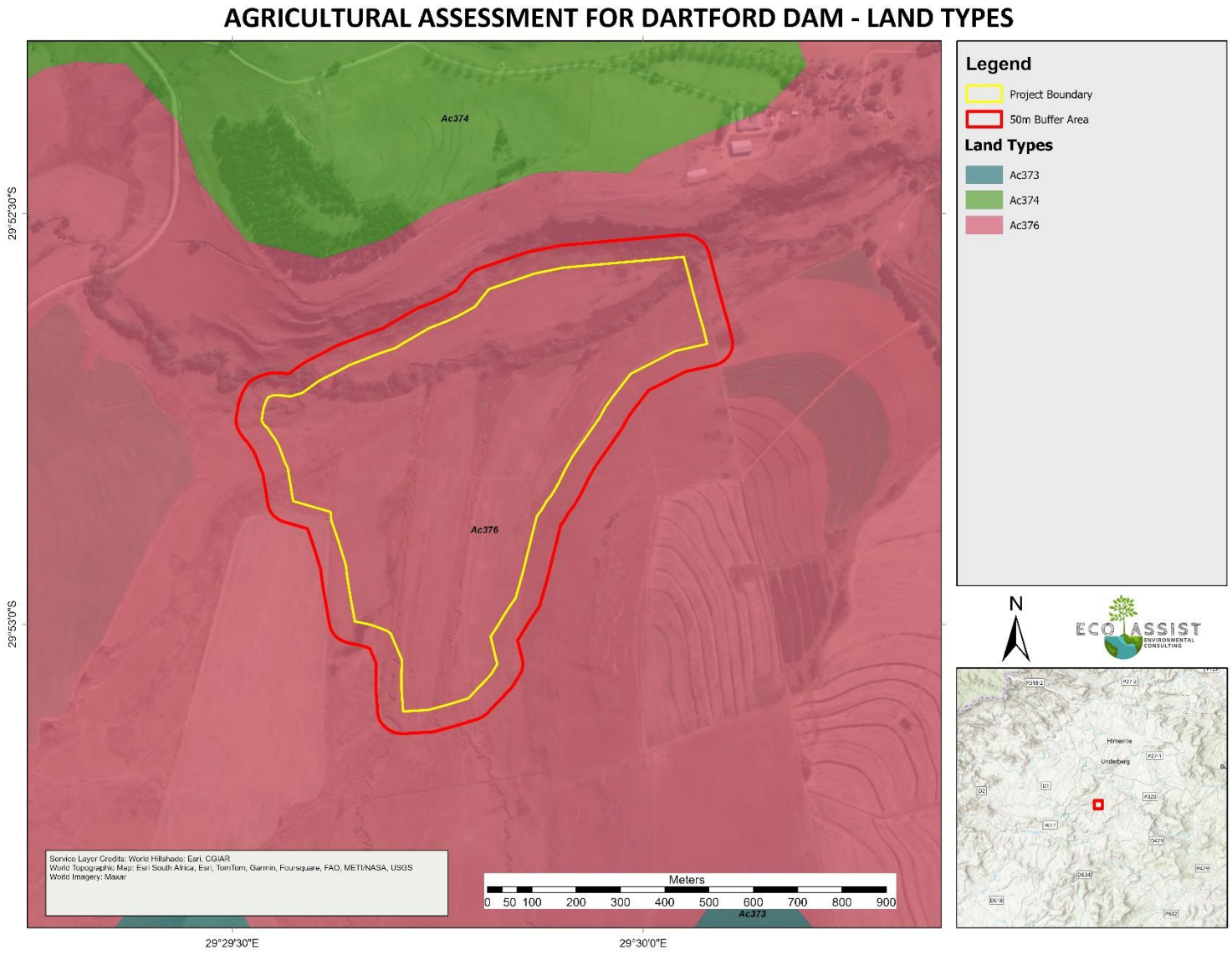

Figure 7-7: Land types for the project area.

7.3.2 Soil Capability

Soil capability takes into consideration all aspects pertaining to the characteristics of the soil and their contributions towards plant production (Department of Agriculture, Forestry and Fisheries, 2017).

Three databases were used a part of the soil capability modelling:

- Land type data modelled and mapped into topographical units (Beukes). The data were modelled and rasterised form the original land type data base and the 90 m SRTM DEM. All the soil attributes are linked to fixed boundary zones. The soil concerns, issues and data are therefore aimed at an attribute rather than a spatial level;
- The land type soil attribute data base (ARC); and
- Soil fertility data (DAFF).

Three main modelling concerns formed part of the soil capability modelling:

- Plant available water;
- Soil sensitivity; and
- Soil fertility.

The soil capability for project area was rated as High with the river areas classified as Moderate (see Figure 7-8).

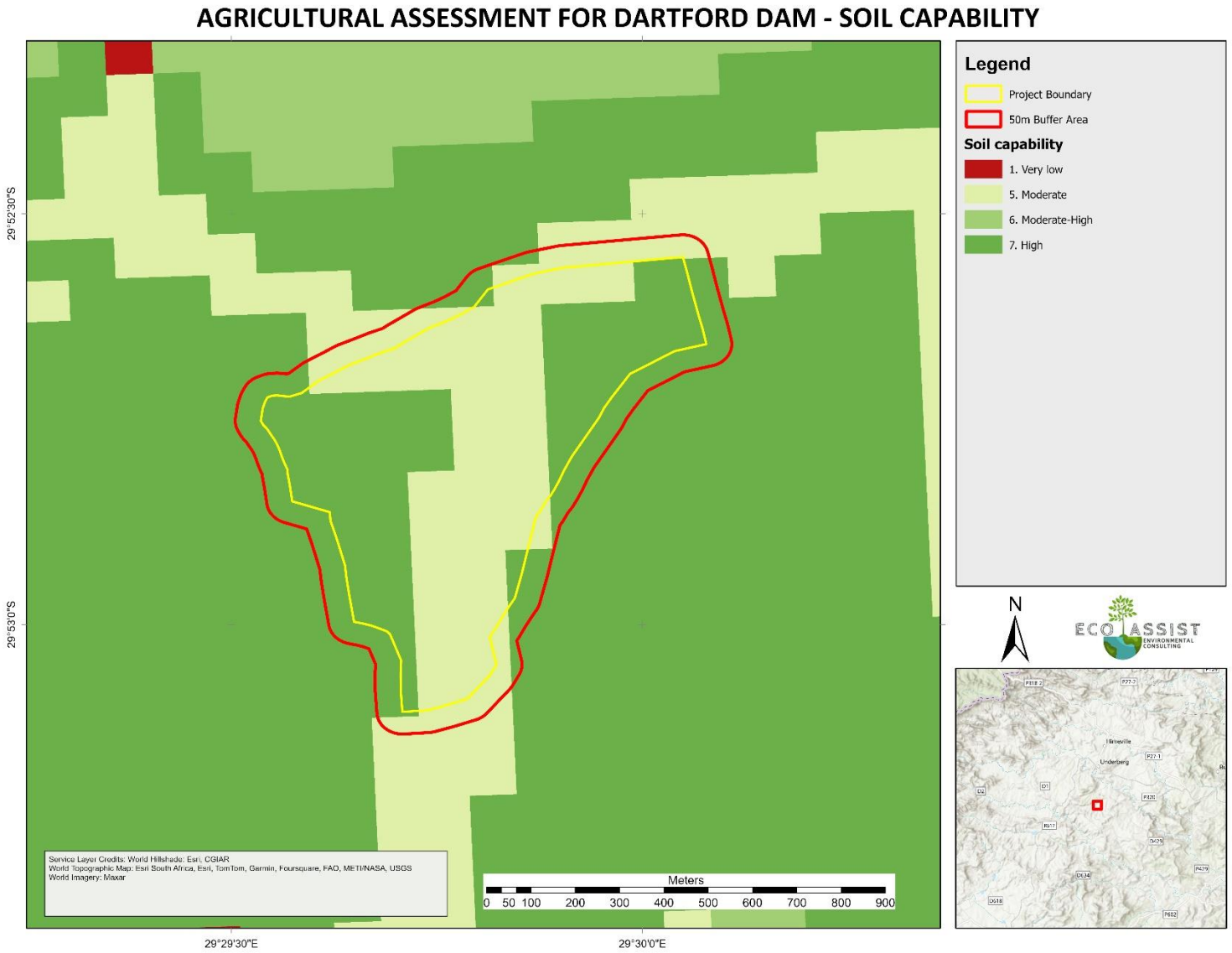

Figure 7-8: Soil capabilities for the project area.

7.4 Land Capability

Land capability is defined as the most intensive long-term use of land for purposes of rainfed farming determined by the interaction of climate, soil, and terrain.

To represent the distribution of the land capability evaluation values in the country, used as one of the input data layers to determine and demarcate all high value agricultural land for ensuring that these areas, pending availability, are preserved for continued agricultural production, thereby ensuring long-term national food security (Department of Agriculture, Forestry and Fisheries, 2017).

The data layer is a seamless data layer and does not exclude permanently transformed areas (built up; waterbodies; mining etc.).

The land capability ratings for the project area show that the overall desktop land capability ranged from Very-Low (in the north) to High in the south-west (see Figure 7-9). The result is based on the combination of the climate capability, the soil capability, and the terrain capabilities described earlier.

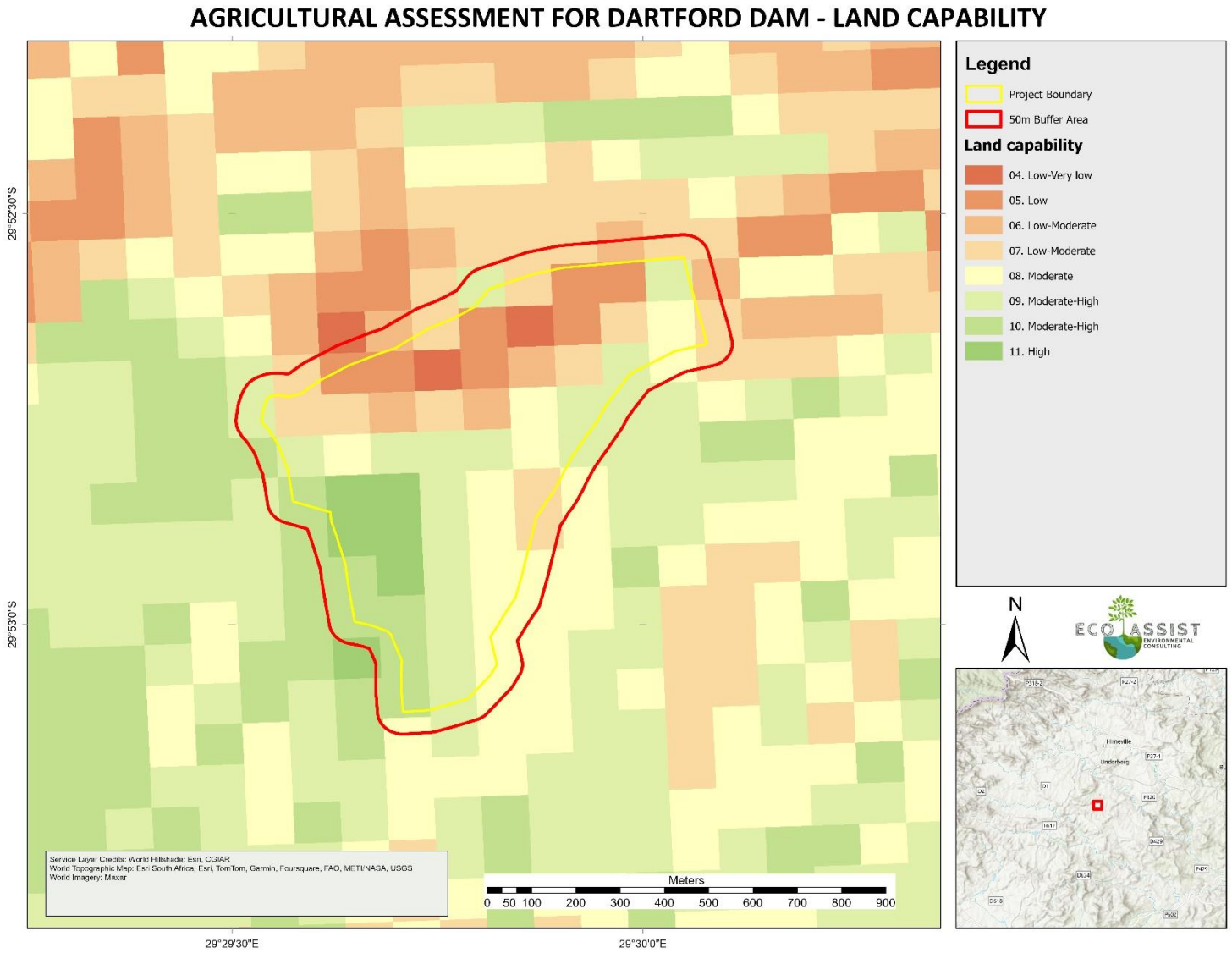

Figure 7-9: Desktop land capabilities for the project area.

7.5 Grazing Capacity

The long-term production potential of the herbaceous layer (grasses and forbs) of an area of vegetation that is required to maintain an animal with a weight of 450 kg (1 Large Stock Unit (*LSU*)) with an average fodder intake of 10 kg dry mass per day over a period that vegetation is suitable for grazing (mostly 1 year) without degrading the natural resources (vegetation and soil) and is measured in “Hectares per Large Stock Unit” (ha/LSU) (South Africa (Republic), 2018).

The long-term sustainable grazing capacity for the project area was rated as 3 ha per large stock unit (see Figure 7-10).

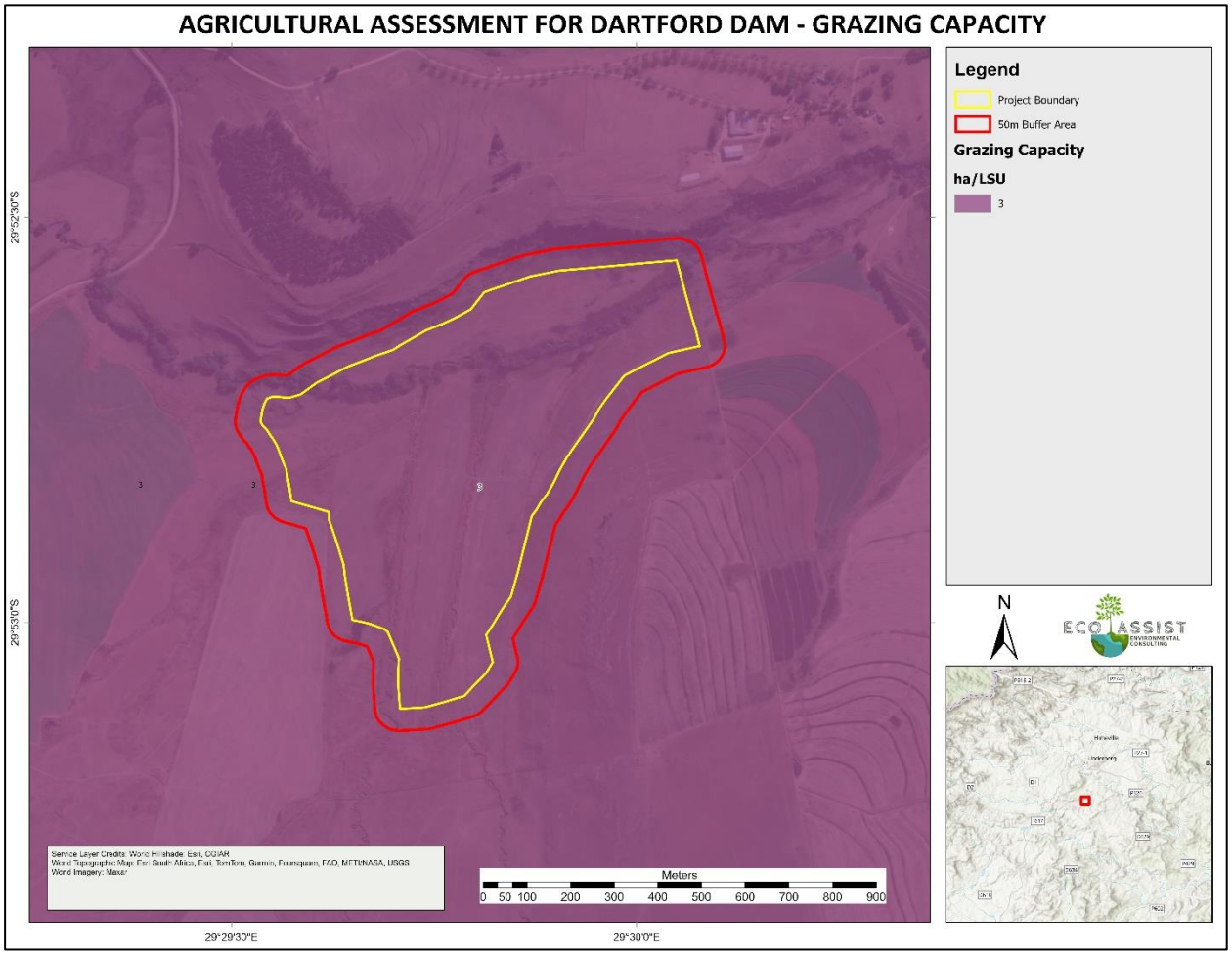

Figure 7-10: The grazing capacity for the project area (South Africa (Republic), 2018).

8 SITE ASSESSMENT RESULTS

A soil survey was conducted for the project on the 18th of December 2024 using a hand-held auger and a GPS to log all information in the field. The field survey and mapping incorporated a 50m assessment buffer to account for any impacts within this buffer. The soils were classified to the family level as per the “Soil Classification: A Natural and Anthropogenic System for South Africa” (Soil Classification Working Group, 2018). The soil forms found are described in the subsequent sections and the extents are shown in Figure 8-3.

8.1 Soil Forms

The project footprint is located within the floodplain. The dominant soil forms were the hydromorphic soils. These soils included the Katspruit, Kroonstad, and Westleigh forms. The steeper midslope landscape positions were dominated by Glenrosa soils. These soils had bleached soil colour properties, indicating later flows. The upper slopes were dominated by Oakleaf soils. The portion to the west where the landscape is slightly raised above the floodplain basin was classified as the Tukulu soil form.

The soil profiles are described as follows:

- Glenrosa (Orthic A-horizon, over a Lithic horizon);
- Oakleaf (Orthic A-horizon, over a Neocutanic B-horizon, over a Lithic horizon);
- Tukulu (Orthic A-horizon, over a Neocutanic B-horizon, over a Gleyic horizon);
- Westleigh (Orthic A-horizon, over a Soft Plinthic B-horizon, over a Gleyic horizon);
- Kroonstad (Orthic A-horizon, over an Albic E-horizon, over a Gley horizon); and
- Katspruit (Orthic A-horizon, over a Gley horizon).

Table 8-1: Soil forms and soil families.

Soil Form	Soil Family
Glenrosa	3110/3130
Oakleaf	2120
Tukulu	2120
Hydromorphic soils (Katspruit/Kroonstad/Westleigh)	2210/2210/3200

Figure 8-1: The gleyed soil properties within the project area.

Figure 8-2: The Neocutanic soil properties within the project area.

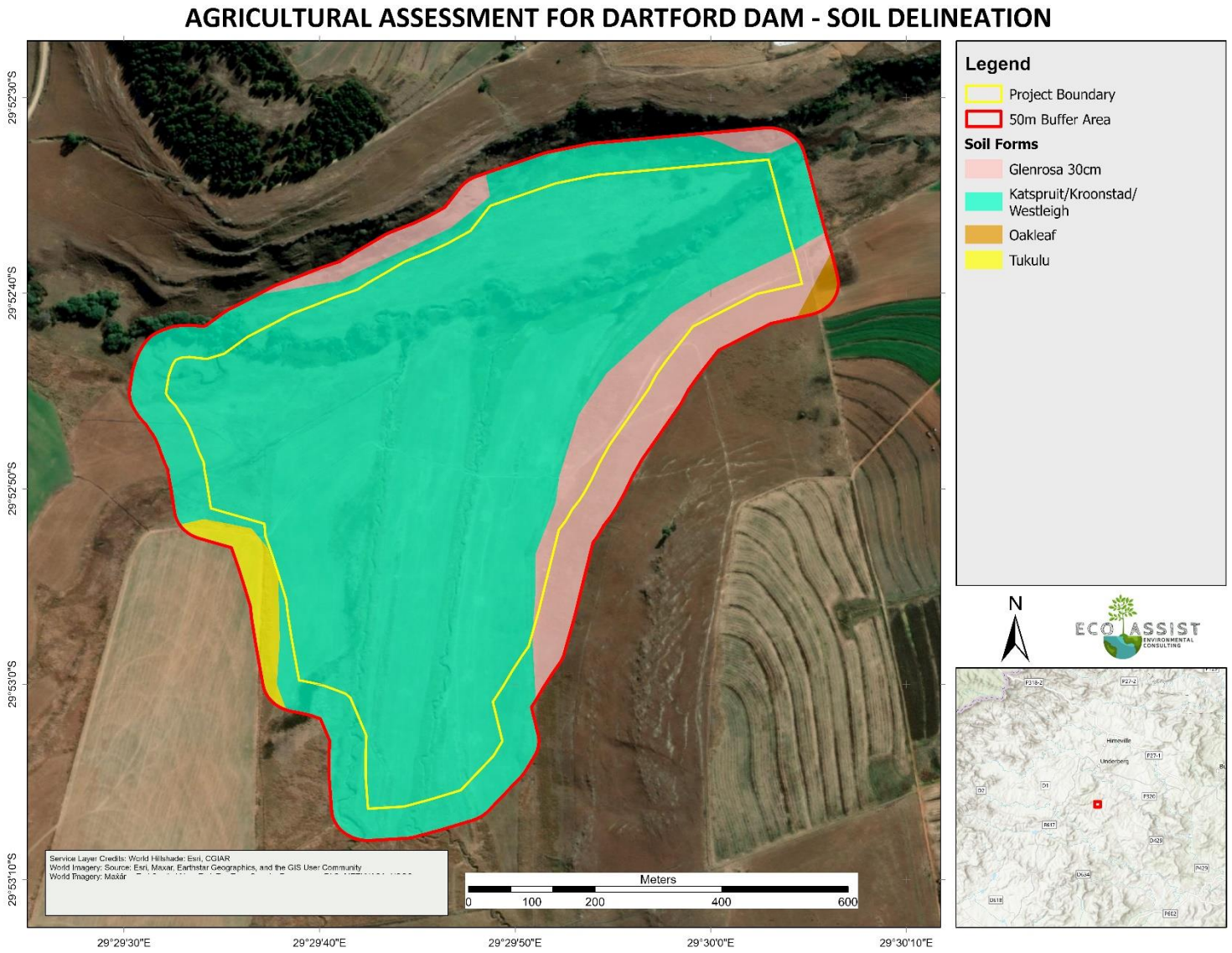

Figure 8-3: The soil delineation for the project area.

8.2 Land Capability Classification

Agricultural potential is determined by a combination of soil, terrain, and climate features. Land capability classes reflect the most intensive long-term use of land under rain-fed conditions.

The land capability is determined by the physical features of the landscape including the soils present. The land potential or agricultural potential is determined by combining the land capability results and the climate capability for the region.

The land capability is determined by using the guidelines described in "The farming handbook" (Smith B. , 2006). A breakdown of the land capability classes is shown in Table 4-1.

The land capability for the assessment area is shown in Figure 8-4. The classification of the soil forms to the associated land capabilities is shown in Table 8-2. The dominant soils within the project footprint area are hydromorphic in nature. These soils are saturated in nature and are prone to flooding. These soils are classified as class V (non-arable) land capability. The Glenrosa soil form was classified as having a class VII (light grazing – non arable) land capability. The Tukulu soils had some limitations due to wetness within the soil profile and was classified as class IV (low arable potential, with severe limitations). The Oakleaf soil form was classified as class III (moderate cultivation), however this is not within the direct project footprint.

Table 8-2: Soil forms and their associated land capability within the project area.

Soil Form	Land Capability
Glenrosa	**Class VII**
Oakleaf	**Class III**
Tukulu	**Class IV**
Hydromorphic soils (Katspruit/Kroonstad/Westleigh)	**Class V**

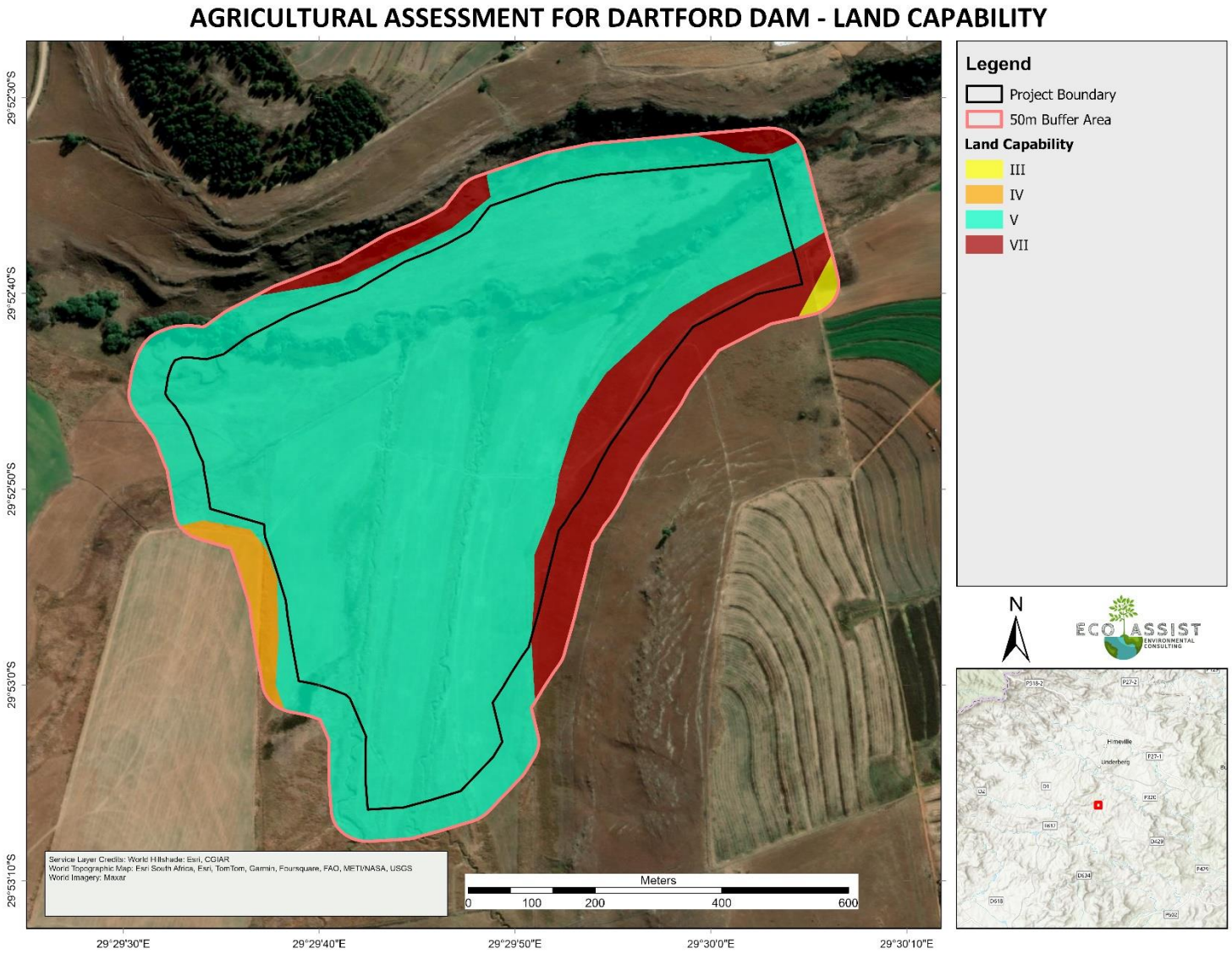

Figure 8-4: The land capability for the project area.

8.3 Land Potential Classification

The climate capability for the project area is determined to be C2 (Smith B. , 2006) – Slight limitation – Local climate is favourable for a wide range of adapted crops and a year-round growing season. Moisture stress and lower temperatures increase risk and decrease yields.

The Land potential / Agricultural potential of the project area is shown in Figure 8-5, with the breakdown of the areas shown in Table 8-3. The dominant land potential was calculated to be the "Vlei" land potential. This is the area dominated by the hydromorphic soils. The class VII (Glenrosa soils) was determined to be L5 (Restricted potential). The class IV land capability was determined to be class L3 (Good potential). The class III land capability was determined to be class L2 (High potential).

Table 8-3: Land potential within the project area.

Land Capability	Land Potential
Class VII	L5
Class IV	L3
Class III	L2
Class V	Vlei

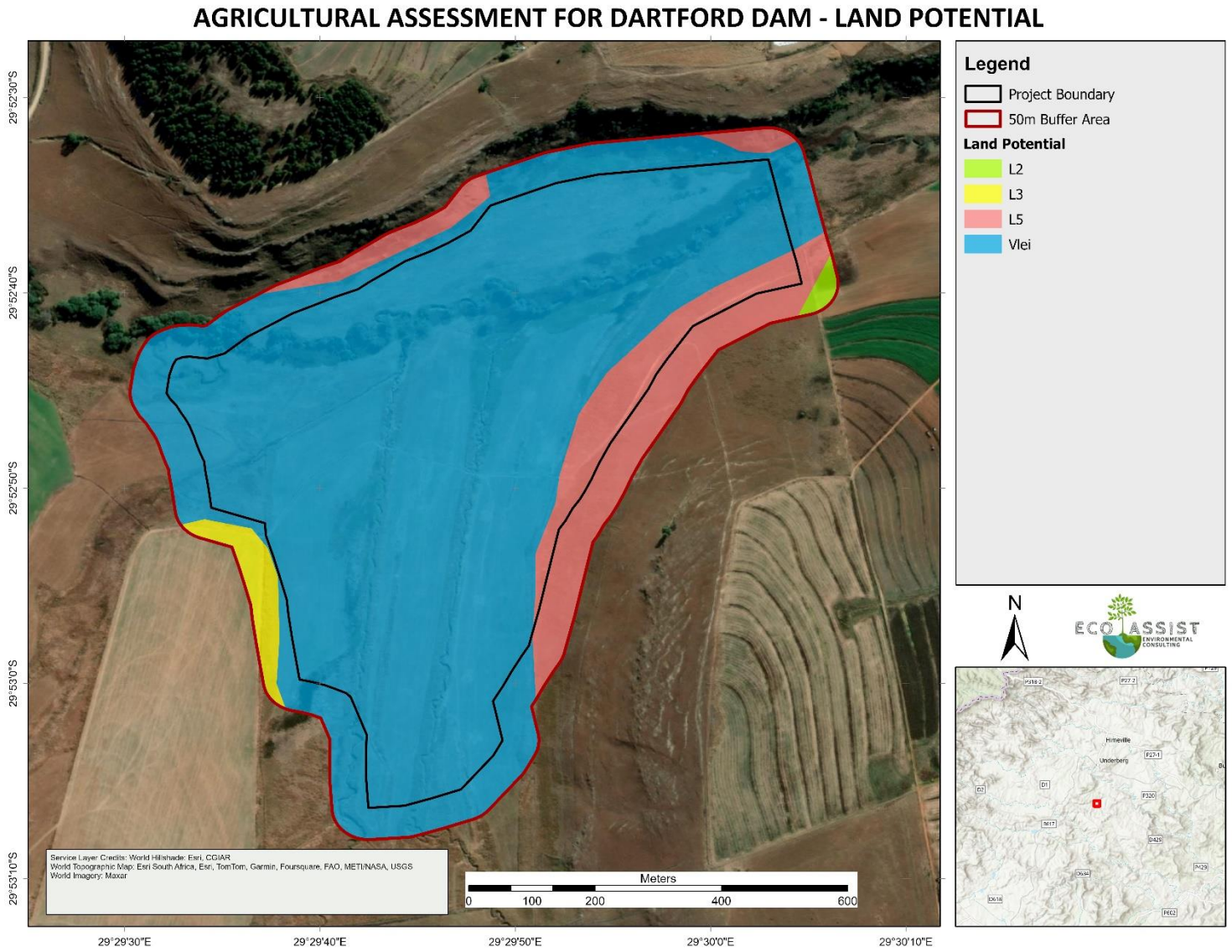

Figure 8-5: The land potential for the project area.

8.4 Current Land Use

The project area had a combination of the following land uses namely;

- Floodplain; and
- Grazing lands.

The national agricultural database shows that the area has cultivated fields located within the project area (see Figure 8-6). these areas are used for planted pasture and the grass is baled.

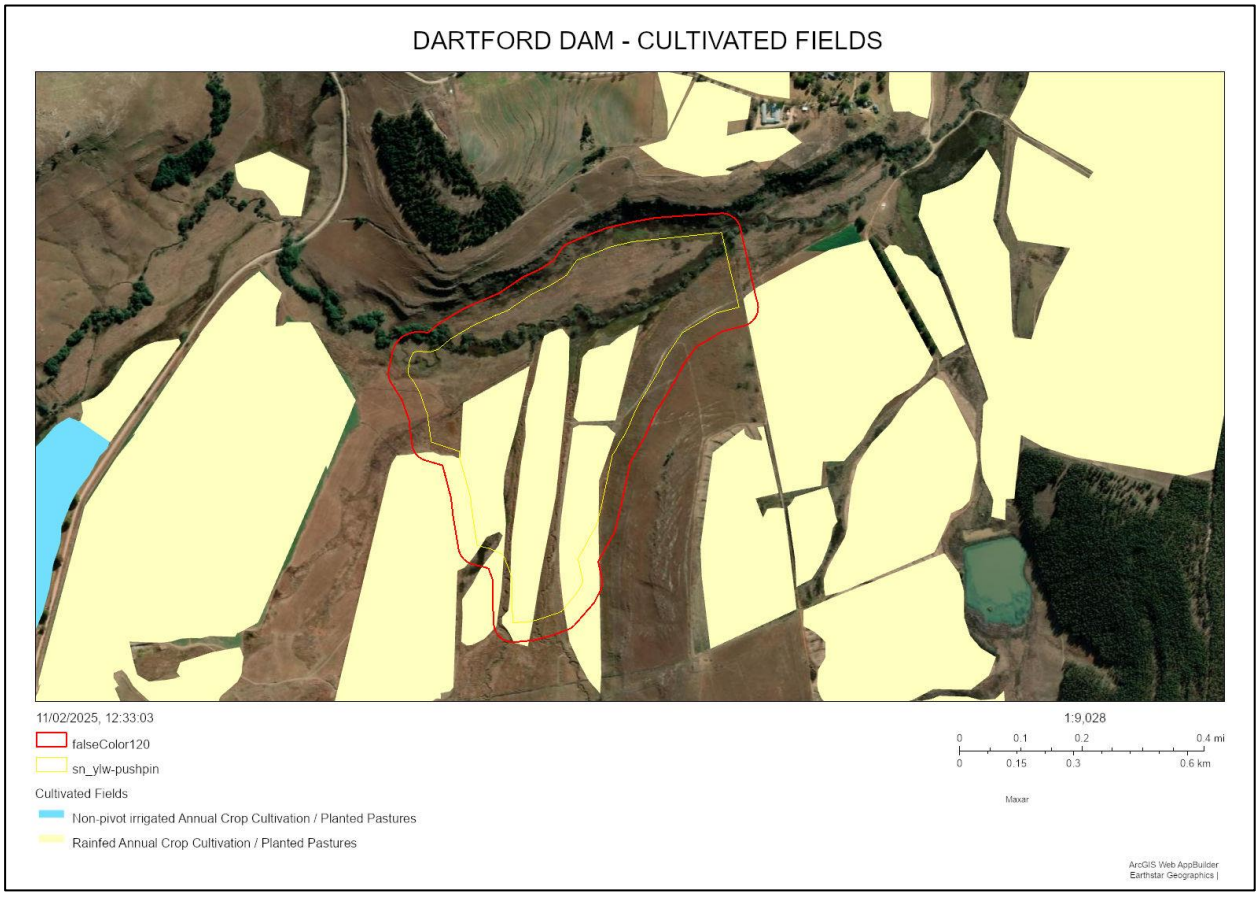

Figure 8-6: The national cultivated field layer.

8.5 Verified Site Sensitivity

The screening assessment rated the agricultural sensitivity as dominated by Very-High to Medium agricultural sensitivity, with isolated patches of Low sensitivity. The areas identified as High in the DFFE screening tool were assessed to have a Low sensitivity (see Figure 8-7). These areas are considered wet.

The specialist therefore disputes the DFFE screening tool value of the High ratings and therefore, an agricultural compliance statement will be sufficient for project area.

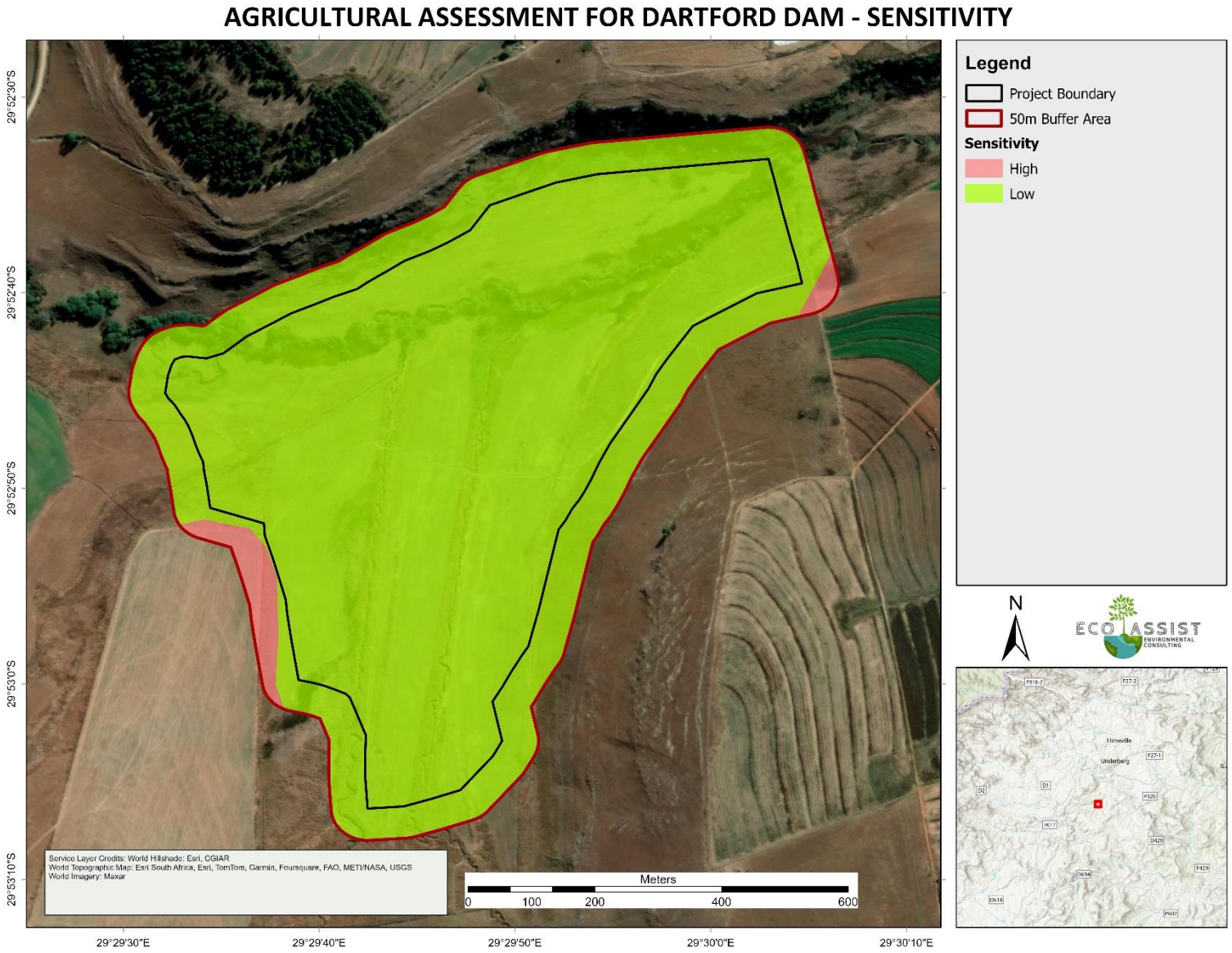

Figure 8-7: The agricultural sensitivity analysis for the project area.

9 AGRICULTURAL COMPLAINCE STATEMENT

The sensitivity analysis has identified that the project area has a Low sensitivity and as such an Agricultural Compliance Statement is sufficient.

The desktop results as well as the field verification and detailed soils assessment have determined that the agricultural potential is rated as dominated by non-arable soils. The following supports the above-mentioned findings:

- Desktop Results;
  - DFFE screening assessment determined the agricultural sensitivity to be High sensitivity;
  - The project is within a crop field boundary, however these are planted pastures used for baling; and
  - The desktop land capability rated the project area as Very-Low (in the north) to High in the south-west.

- Site Assessment Results;
  - The soils were dominated by hydromorphic soils with wetness limitations for crop production; and
  - Land capability was determined as non-arable with severe limitations.

10 RECOMMENDATIONS

The potential impacts from the project area include;

- Erosion of exposed soil surfaces;
- Hydrocarbon contamination by heavy machinery;
- Contamination from human waste, both organic and inorganic;
- Proliferation of alien vegetation in disturbed areas; and
- Increased runoff and altered surface and sub-surface flow dynamics.

These aspects are to be managed to minimise any potential impacts;

- Erosion control during the construction phase as well as operational phase;
- Ablution blocks;
- Stormwater management; and
- Risks from oil/hydrocarbon spills from vehicles should be mitigated.

11 ACCEPTABILITY STATEMENT

The specialist opinion is that the proposed project be considered favourably as the DFFE screening tool value of High sensitivity was disputed to be Low for the project area.

12 REFERENCES

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