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Agricultural Assessment for the Proposed Cato Ridge Land Development and Release project

Submitted by TerraAfrica Consult cc

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1. Introduction

TerraAfrica Consult CC ('TerraAfrica') was appointed by Zutari (Pty) Ltd (Zutari) to conduct the Agricultural Assessment for the Environmental Authorisation process for the proposed Cato Ridge Land Development and Release project. The Cato Ridge Development Company (CRDC) (the Applicant), a wholly owned subsidiary of Assmang Limited, proposes the rezoning and subdivision of its own and Assmang-owned land north of the N3 highway in Cato Ridge over 3 phases over the next 25 years. The phasing of the development is linked with the provision of bulk services infrastructure in the Cato Ridge area.

The Project Boundary (also referred to as the Study Area), which covers a total area of 1271.90 hectares, is located in Cato Ridge near the western boundary of the eThekwini Metropolitan Municipality, KwaZulu Natal and is situated to the north of the N3 highway (refer to **Figure 1**). Cato Ridge is located approximately 51km west of Durban via the N3 and 29km south east of Pietermaritzburg. The R103, which acts as an alternative route between Durban and Pietermaritzburg (refer to Error! Reference source not found.), bisects the Study Area. A c entral railway line, the Natal Corridor (Natcor), also divides the area and provides general accessibility to the informal and agricultural areas in the north and south.

2. Project description

CRDC intends to develop the site for prospective end users for long-term leases, should authorisation be obtained for the specific activities to be undertaken. The application for Environmental Authorisation (EA) for The Project will include the following land uses:

- Open spaces and conservation areas.
- Mixed-use activities (potentially offices, retail, and commercial facilities).
- Light industry, warehousing, distribution, and logistics.
- Internal roads (7 m wide excluding road reserve, 3.5 m single lane in both directions), road upgrades and new intersections.
- Stormwater infrastructure, including pipelines and attenuation ponds.
- Sewer infrastructure, including pipelines, collection sumps, pump stations and a 2 megalitre (ML) modular wastewater treatment plant (WTP) with an effluent discharge point (to be phased in a modular fashion as the development progresses).
- Water infrastructure, including pipelines and an elevated storage tank.
- Electrical infrastructure, including substations and underground/overhead transmission lines. Two alternative options are being reviewed for Phase 2 (PDA 3). The final electrical designs are subject to approval by Eskom.

The proposed development footprint has been refined based on inputs by the ecological specialist team, discussions with EDTEA, and based on engineering bulk services requirements and costs and financial viability. After the consideration of all environmental sensitivities, it was determined that the total development footprint is up to 352 hectares.

The proposed development and land release project has been phased in line with bulk services provisioning over a 25-year period. The bulk services infrastructure will include:

- An onsite sewerage package plant will be established at the intersection of the R103 and Eddie Hagen (Phase 1), which will have a treatment capacity of appropriately 2 Ml. The effluent will be discharged via a pipeline, leading from Portion 50, across the R103,

into the North eastern corner of Phase 3, in which the treated effluent will be disposed of into the existing wetland. In order to service the sewerage requirements for Phase 3 development area, a collection point and pumpstation will be required to pump the raw sewerage from Phase 3 into Phase 1 development area in which the onsite sewerage treatment plant will be located at the intersection of Eddie Hagen and R103.

- To meet the water requirements for the development, eThekwini Metro will need to construct a 38ML above ground reservoir within the central parts of Phase 2 development area, however, this will be subject to a separate EIA and WULA process.
- Although most of the development will be serviced by underground powerlines, a small section of above ground powerlines will be required along the northern border of Phase 1 development area.
- Stormwater management will be completed per site, with the required infrastructure.
- An internal road reticulation network will also be provided by the engineers.

The position of the bulk services is illustrated in Figure 2.

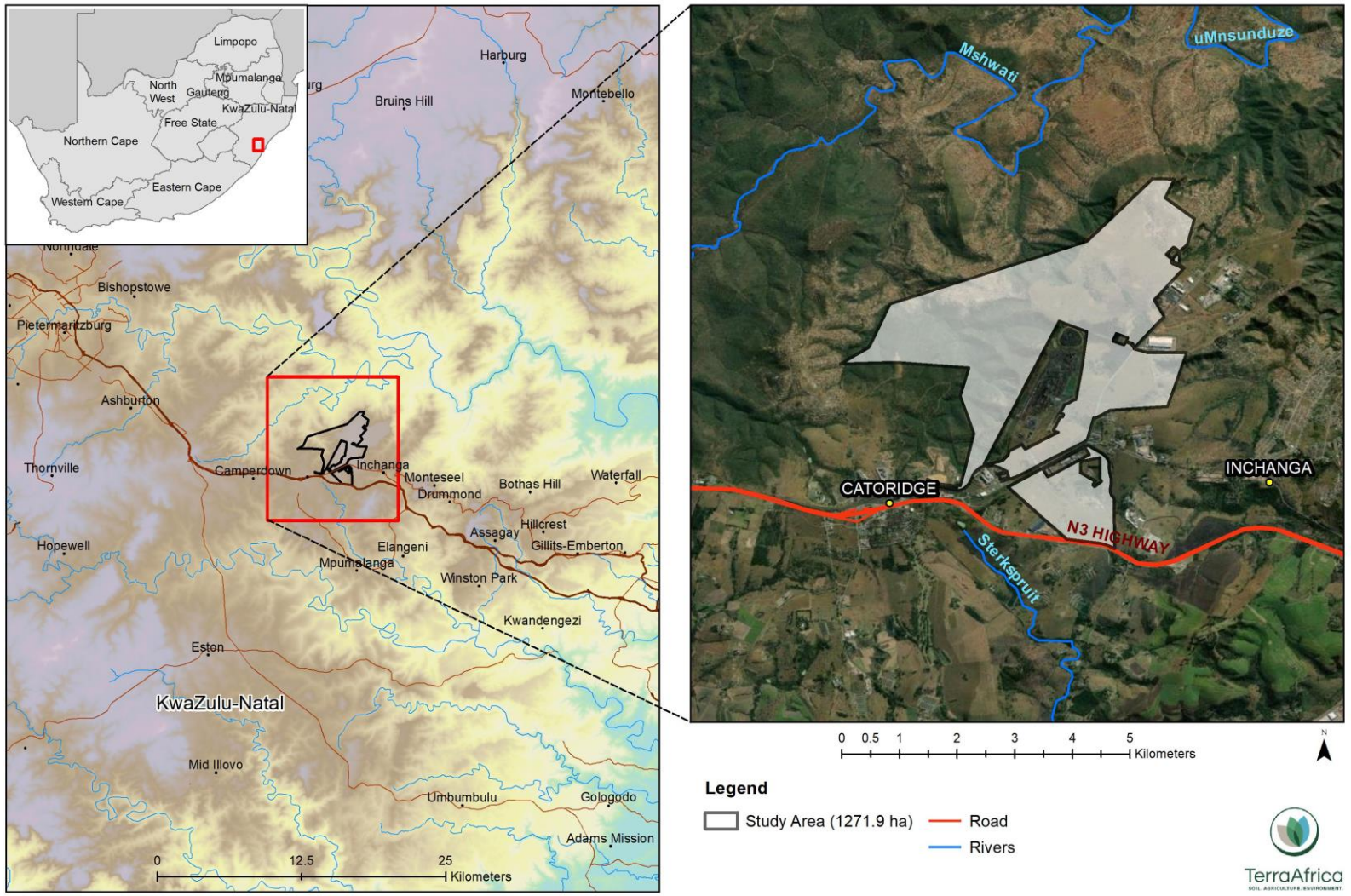

Figure 1: Locality of the proposed Cato Ridge Land Development and Release project's study area

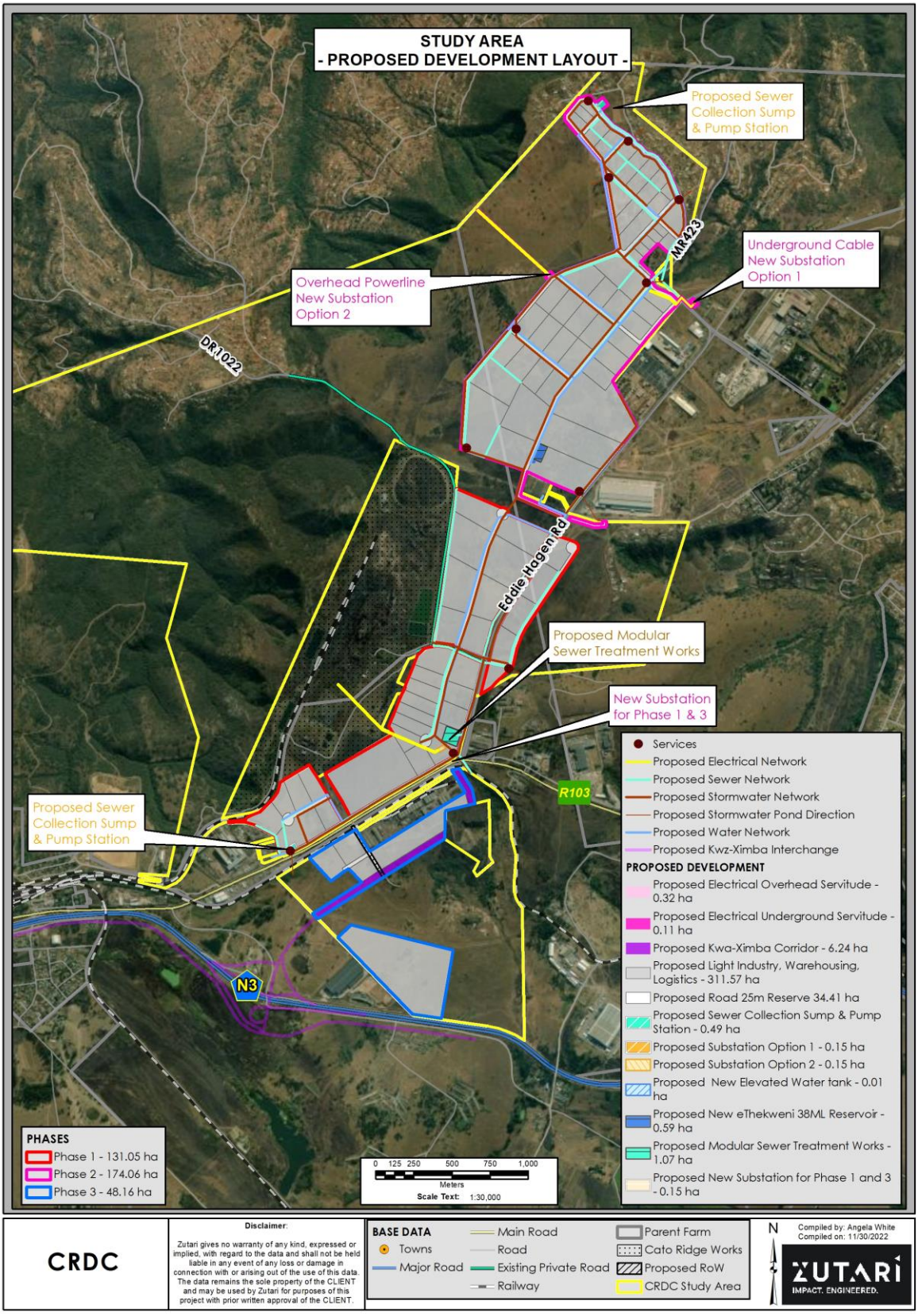

Figure 2: The layout of the three proposed development areas within the Cato Ridge Land Development and Release project's study area

3. Details of the specialist

The report is prepared by Mariné Pienaar of TerraAfrica Consult CC. Mariné is a scientist registered with the South African Council for Natural Scientific Professions (SACNASP) and is specialised in the fields of Agricultural Science and Soil Science. Her SACNASP Registration Number is 400274/10 (see Appendix 2 – Curriculum Vitae of Specialist). Mariné holds a BSc. degree in Agricultural Science (with specialisation in Plant Production) from the University of Pretoria and a MSc. Degree in Environmental Science from the University of the Witwatersrand. She has consulted in the subject fields of soil, agriculture, pollution assessment and land use planning for the environmental sector of several African countries including Botswana, Mozambique, Democratic Republic of Congo, Liberia, Ghana and Angola. She has also consulted on the soil and agricultural assessment of a gas infrastructure project in Afghanistan. The full details and contact details of the specialist is attached as Appendix 1 – Specialist Declaration of Independence.

4. Policy and legislative context

The report follows the protocols as stipulated for agricultural assessment in Government Notice 320 of 2020 (GNR 320). This Notice provides the procedures and minimum criteria for reporting in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (No. 107 of 1998) (NEMA). It replaces the previous requirements of Appendix 6 of the Environmental Impact Assessment Regulations of NEMA.

In addition to the specific requirements of GN320 for this study, the following South African legislation is also considered applicable to the interpretation of the data and conclusions made with regards to environmental sensitivity and the conservation of soil resources of the project area:

- the Conservation of Agricultural Resources Act (No 43 of 1983) (CARA) states that the degradation of the agricultural potential of soil is illegal. CARA requires the protection of land against soil erosion and the prevention of water logging and salinisation of soils by means of suitable soil conservation works to be constructed and maintained. The utilisation of marshes, water sponges and watercourses are also addressed; and
- the National Water Act (No 36 of 1998) (NWA) deals with the protection of water resources (i.e. wetlands and rivers). Hydric soils with wetland land capability are not part of the proposed development area and the NWA is therefore not applicable.
- Section 3 of the Subdivision of Agricultural Land Act 70 of 1970 may also be relevant to the development.

5. Terms of Reference

In addition to the requirements stipulated in GNR 320, the following Terms of Reference, as stipulated by Zutari, apply to the Agricultural Assessment:

- to ensure a thorough assessment, that includes both the desktop assessment of databases and aerial photography; a description of the on-site verification of the agricultural potential of the area; and the soil forms present in the development area;
- identify and assess potential impacts on both agricultural potential and soil resulting from the proposed project;

- identify and describe potential cumulative soil, agricultural potential and land capability impacts resulting from the proposed project in relation to proposed and existing developments in the surrounding area; and
- recommend mitigation, management and monitoring measures, to minimise impacts and/or optimise benefits associated with the proposed project.

6. Agricultural Sensitivity

The combined Agricultural Sensitivity of the proposed project area was determined by using the National Environmental Screening Tool (www.screening.environment.gov.za). The screening reports of each of the three development areas originally considered were generated by Zutari on 12 August 2021. The requirements of GNR 320 stipulate that a 50m buffered development envelope must be assessed with the screening tool. The maps depicted in Figure 3, Figure 4 and Figure 5, show the agricultural sensitivity of the respective development areas; and a buffered area of at least 1km around each of the proposed development areas. Since the revised development areas are much smaller than the original areas, the screening tool maps meet the requirements of a 50m buffered area.

The results provided by the screening tool indicate that the largest part of Development Phase 3 consists of land with Medium agricultural sensitivity (refer to **Figure 5**). A small area with Low agricultural sensitivity is located along the northern part of the eastern boundary of Development Phase 3. A very small patch of land with High agricultural sensitivity is located in the northern corner of this area, directly south of the R105 (Old Main Road).

Similar to Development Phase 3, Development Phase 1 also consists largely of land with Medium agricultural sensitivity (refer to **Figure 3**). The exceptions to this, are the areas in the north-eastern and south-eastern corners of the area where land is rated as having Low agricultural sensitivity. A few small areas with High agricultural sensitivity are scattered throughout the western, middle and northern sections of Development Phase 1.

Development Phase 2 is mainly land with Medium agricultural sensitivity with land with Low agricultural sensitivity present along the western, north-western and north-eastern boundaries of this area (see **Figure 4**). One small area of land with High sensitivity is present in the middle of the northern half of the site while a very small area of High sensitivity is present directly north of the middle of the southern boundary of the area. A few very small areas are also present along the north-western boundary of Development Phase 2. All three the development areas are surrounded by land mostly of Medium sensitivity.

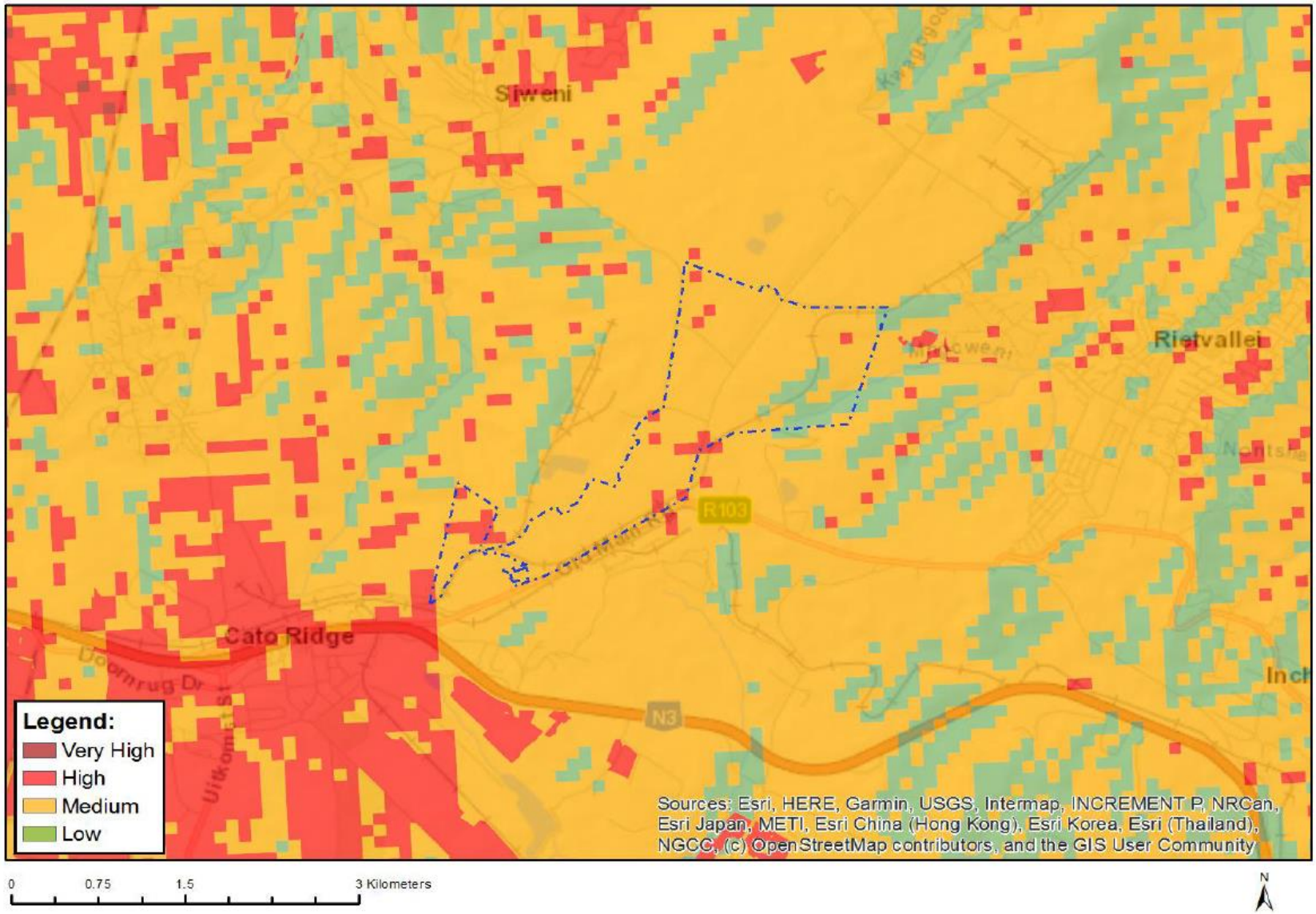

Figure 3: Agricultural Combined Sensitivity of Development Phase 1 of the Cato Ridge Land Development (generated by Zutari, 2021)

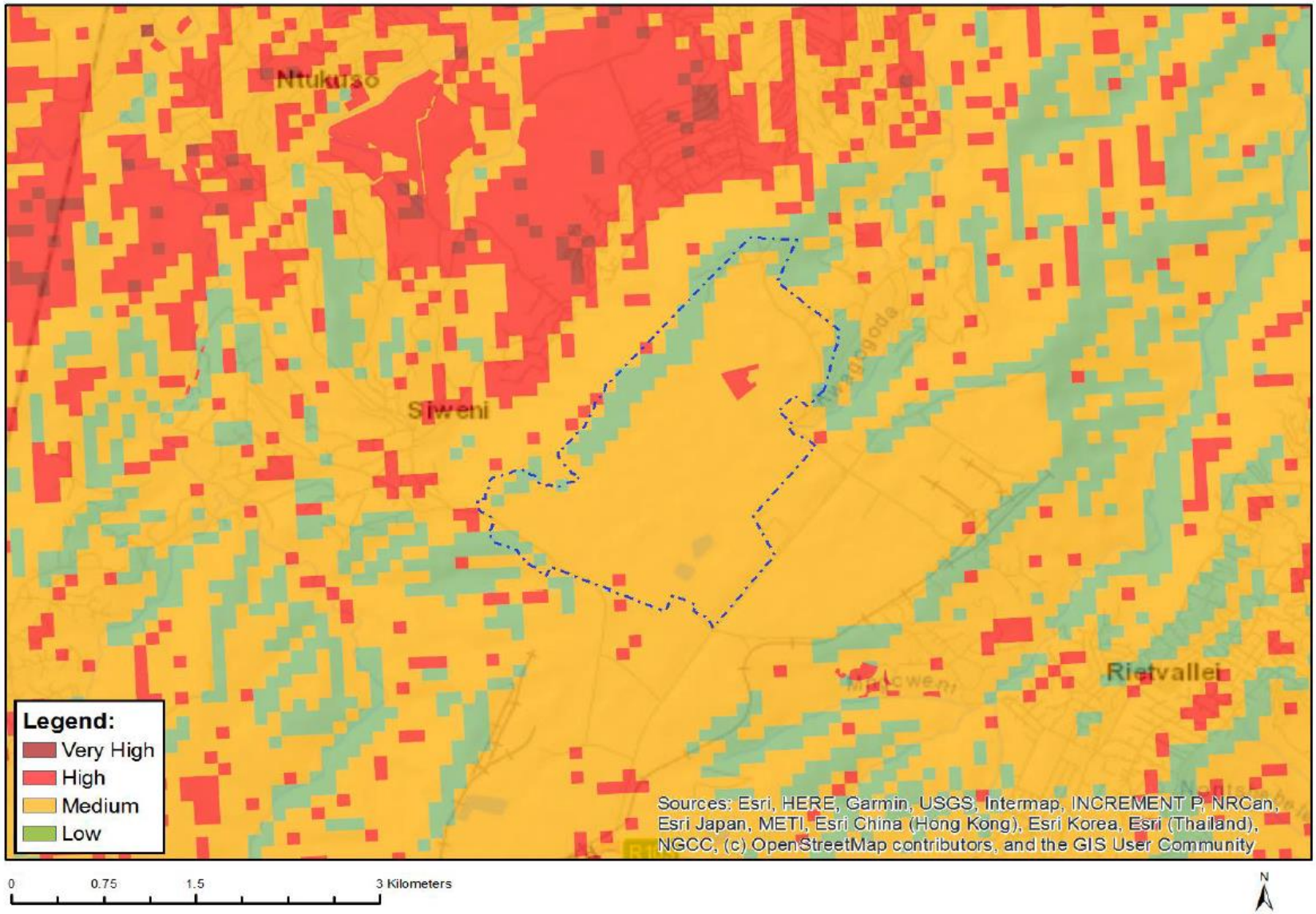

Figure 4: Agricultural Combined Sensitivity of Development Phase 2 of the Cato Ridge Land Development (generated by Zutari, 2021

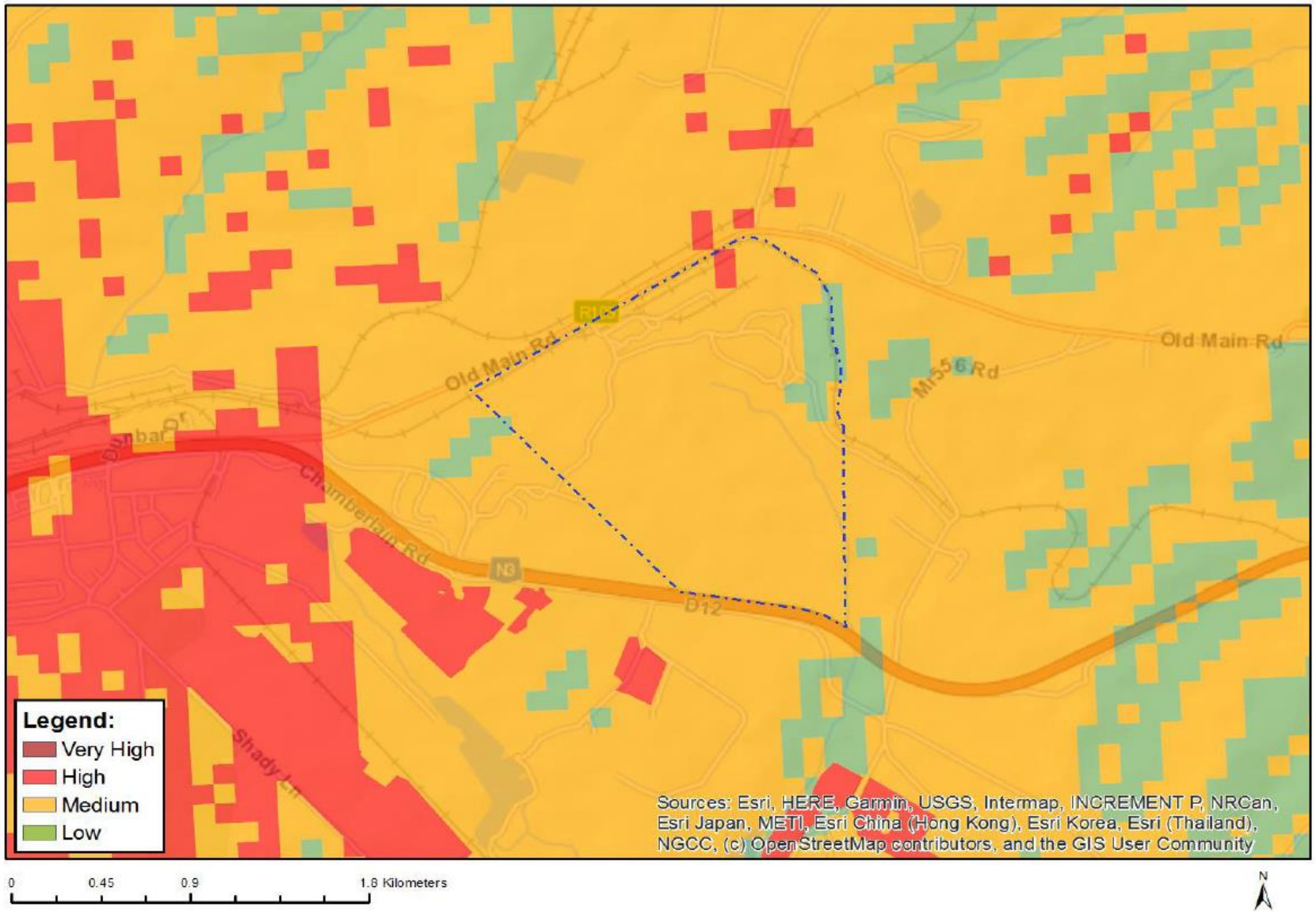

Figure 5: Agricultural Combined Sensitivity of Development Phase 3 of the Cato Ridge Land Development (generated by Zutari, 2021)

7. Purpose and requirements of the compliance statement

The stipulations of GNR 320, the agricultural assessment must meet the requirements of an Agricultural Compliance Statement when land has Medium or Low agricultural sensitivity. Following the description of the development areas in Section 6 above, 95% or more of all three the development areas, have Medium agricultural sensitivity. The report will therefore fulfill the requirements for an Agricultural Compliance Statement

The purpose of the Agricultural Compliance Statement, is to ensure that the sensitivity of the site from the perspective of agricultural production to the proposed development, is sufficiently considered. To meet this objective, site sensitivity verification must be conducted, of which the results must meet the following objectives:

- It must confirm or dispute the current land use and the environmental sensitivity as was indicated by the National Environmental Screening Tool.
- It must contain proof in the form of photographs of the current land use and environmental sensitivity pertaining to the study field.
- All data and conclusions are submitted together with the Environmental Impact Assessment Report (prepared in accordance with the NEMA regulations) for the proposed project.

According to GNR 320, the agricultural compliance statement that is submitted must meet the following requirements:

- be applicable to the preferred site and the proposed development footprint;
- confirm that the site is of “low” or “medium” sensitivity for agriculture; and
- indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site.

The following checklist is supplied as per the requirements of GNR 320, detailing where in the report the various requirements have been addressed:

Table 1: GNR 320 requirements of an Agricultural Compliance Statement (Low to Medium Sensitivity)

Requirement	Report reference
3.1. The compliance statement must be prepared by a soil scientist or agricultural specialist registered with the SACNASP.	Page 3 & Appendix 2
3.2. The compliance statement must: 3.2.1. be applicable to the preferred site and proposed development footprint;	Section 9
3.2.2. confirm that the site is of "low" or "medium" sensitivity for agriculture; and	Section 10.5
3.2.3. indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site.	Section 10.4 and Section 13
3.3. The compliance statement must contain, as a minimum, the following information: 3.3.1. contact details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the assessment including a curriculum vitae;	Page 3, Appendices 1, 2 and 3
3.3.2. a signed statement of independence;	Appendix 1

3.3.3. a map showing the proposed development footprint (including supporting infrastructure) with a 50m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool;	Figure 3, 4 and 5
3.3.4. confirmation from the specialist that all reasonable measures have been taken through micro- siting to avoid or minimise fragmentation and disturbance of agricultural activities;	Section 12
3.3.5. a substantiated statement from the soil scientist or agricultural specialist on the acceptability, or not, of the proposed development and a recommendation on the approval, or not, of the proposed development;	Section 12
3.3.6. any conditions to which the statement is subjected;	Section 12
3.3.7. in the case of a linear activity, confirmation from the agricultural specialist or soil scientist, that in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase;	Not applicable
3.3.8. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr; and	Section 11
3.3.9. a description of the assumptions made as well as any uncertainties or gaps in knowledge or data.	Section 8
3.4. A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	Submitted as part of final report

8. Methodology

The different steps that were followed to gather the information used for the compilation of this report is outlined below. The methodology is in alignment with the requirements of GNR 320.

8.1 Assessment of available data

The most recent aerial photography of the area available from Google Earth was obtained. The satellite imagery was used to analyse the terrain of the proposed project area and the surrounding area. The analysis considered the slope, typical terrain units and landscape features, such as existing roads, farm infrastructure and areas where land degradation may be present. The proposed development area was also superimposed on five different raster data sets obtained from the National Department of Agriculture, Land Reform and Rural Development (DALRRD). The data sets are:

- Land type data for the project assessment zone was obtained from the Institute for Soil Climate and Water (ISCW) of the Agricultural Research Council (ARC) (Land Type Survey Staff, 1972 – 2006). The land type data is presented at a scale of 1:250 000 and entails the division of land into land types, typical terrain cross sections for the land type and the presentation of dominant soil types for each of the identified terrain units.
- The Refined Land Capability Evaluation Raster Data for South Africa that was developed using a spatial evaluation modelling approach (DALRRD, 2016).
- The long-term grazing capacity for South Africa 2018 that present the long-term grazing capacity of an area with the understanding that the veld is in a relatively good condition (South Africa, 2018).
- The KwaZulu Natal Field Crop Boundaries show crop production areas may be present within the development area. The field crop boundaries include rainfed annual crops, non-pivot and pivot irrigated annual crops, horticulture, viticulture, old fields, small holdings and subsistence farming (DALRRD, 2019).
- The High Potential Agricultural Areas for Cultivation: KwaZulu Natal Province, 2019 are

large, relatively homogeneous areas of land within the province regarded as having high potential and capability to contribute towards food production in both the province and the country (DALRRD, 2019).

8.2 Site assessment

The site visit was conducted from 18 to 21 October 2021. The soil profiles were examined to a maximum depth of 1.5m using a hand-held auger. Observations on site were made regarding soil texture, structure, colour and soil depth at each survey point. The locality of each survey point is shown in Figure 6. A cold 10% hydrochloric acid solution was used on site to test for the presence of carbonates in the soil. A hand-held Garmin GPS was used to the log the coordinates of each of the survey points. The soils are described using Soil Classification: A Natural and Anthropogenic System for South Africa (Soil Classification Working Group, 2018). Soil was classified at 65 survey points and soil samples collect 11 of these points. The position of the soil survey and sampling points is shown in Figure 6.

The agricultural potential of the study area was derived using the soil classification data and with consideration of the climate of the study area and its suitability for agricultural production.

Other observations made during the site visit include recording the presence of any farm buildings and/or any other agricultural infrastructure. The larger area around the study area was also assessed by driving through the area to gain an understanding of the agro-ecosystem within which the study area functions. Photographic evidence of soil properties, current land uses and farm infrastructure were taken with a digital camera.

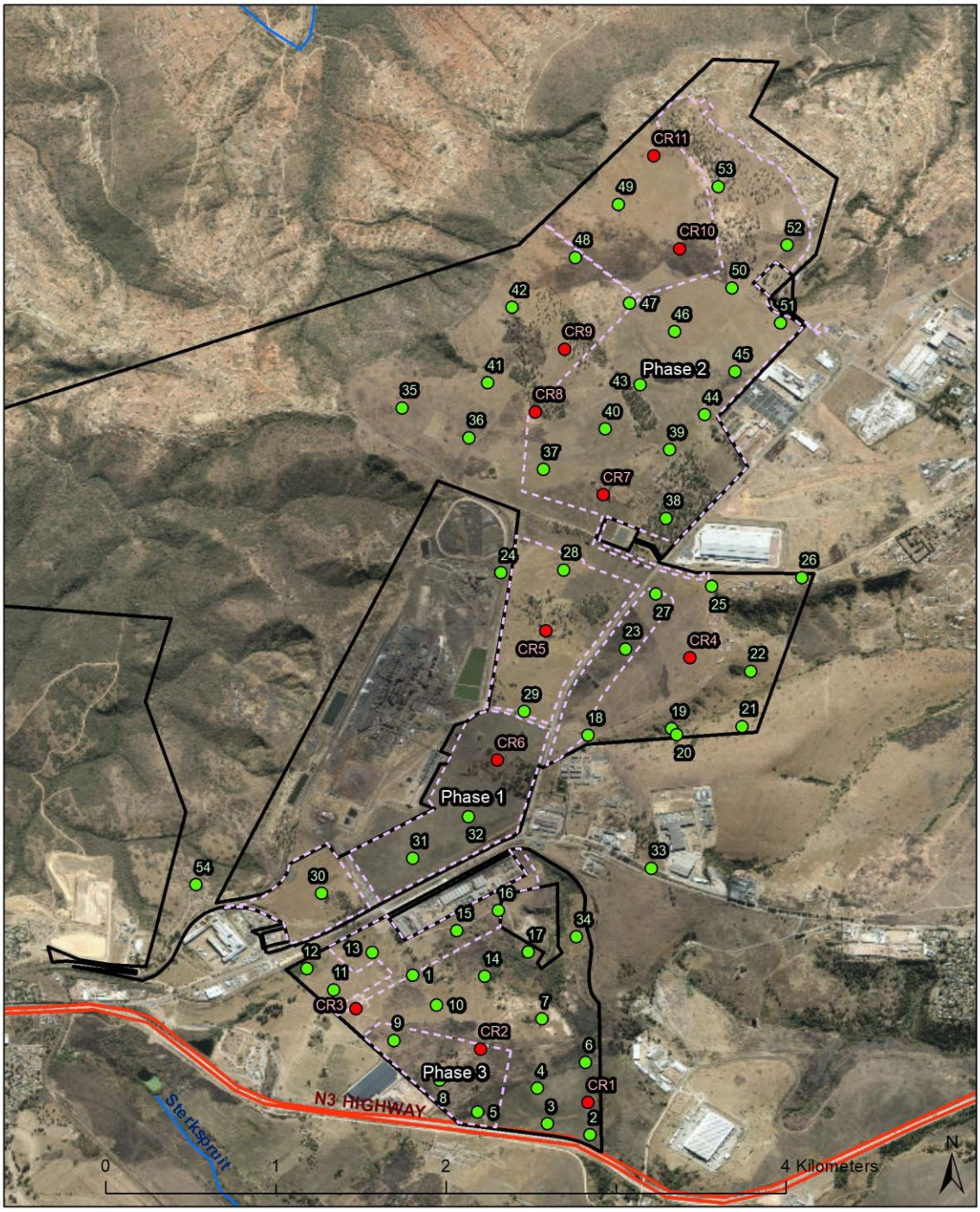

Figure 6 Locality of on-site soil classification and observation points within the study area

8.3 Impact assessment methodology

The following impact assessment methodology is used to ensure that all relevant factors that contribute to significance (avoiding arbitrary assessment), have been addressed. For each predicted impact, criteria are applied to establish the **significance** of the impact based on likelihood and consequence, both without mitigation being applied (pre-mitigation) and with the implementation of the recommended mitigation measure(s) (post-mitigation).

"Significant impact" means an impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as duration, magnitude, intensity and probability of occurrence" (2014 EIA regulations, as amended).

The criteria that contribute to the **consequence** of the impact are:

- **Intensity** (the degree to which pre-development conditions are changed), which also includes the **type** of impact (being either a positive or negative impact); the **duration** (length of time that the impact will continue); and the **extent** (spatial scale) of the impact.
- The sensitivity of the receiving environment and/or sensitive receptors are incorporated into the consideration of consequence by appropriately adjusting the thresholds or scales of the intensity, duration and extent criteria based on expert knowledge.

For each impact, professional judgement is applied to ascribe a numerical rating for each criterion according to the examples provided in Table 1, Table 2 and Table 3 below. The consequence is then established using the formula:

Consequence = type x (intensity + duration + extent)

Depending on the numerical result, the impact's consequence would be extremely, highly, moderately or slightly detrimental; or neutral; or slightly, moderately, highly or extremely beneficial. These categories are provided in Table 5.

To determine the significance of an impact, the probability (or likelihood) of that impact occurring is also considered. In assigning probability, the specialist considers the likelihood of occurrence and takes cognisance of uncertainty and detectability of the impact. The most suitable numerical rating for probability is selected from Table 4 below and applied with the consequence according to the following equation:

Significance = consequence x probability

When assigning a probability to an impact, it is vitally important to distinguish this from the concepts of frequency and confidence, with which it is sometimes confused:

- **Probability** refers to the likelihood that an impact will occur.
- **Frequency** refers to the regularity with which an impact occurs. To illustrate the difference between frequency and probability, it must be considered that something that happens infrequently may still be a certainty (i.e. have a high probability). For

instance, Halley's Comet only comes close to the sun every 75 to 76 years (i.e. it has a very low frequency) but it is still a certainty.

- **Confidence** (see Table 8) refers to the degree of certainty of a prediction. Confidence may be related to impact assessment criteria (extent, intensity, duration or probability) and is not necessarily only related to probability. Confidence may be influenced by any factors that introduce uncertainty into a prediction.

Depending on the numerical result of this calculation, the impact would fall into a significance category of negligible, minor, moderate or major, and the type would be either positive or negative. Examples of these categories are provided in Table 6.

Once the significance of an impact occurring without mitigation has been established, professional judgement is applied to assign ratings for the same impact after the proposed mitigation has been implemented.

The tables on the following pages show the scales used to classify the above variables and define each of the rating categories.

Status of Impact is classified as:

- Positive: + (A benefit to the receiving environment)
- Negative: - (A cost to the receiving environment)
- Neutral: N (No cost or benefit to the receiving environment)

The significance of an impact indicates the level of mitigation measures required to minimise negative impacts and reduce environmental damage during the various project phases. Suitable and appropriate mitigation measures should be identified for each potential impact based on specialist recommendations and expertise.

Table 2: Definition of Intensity Ratings

Rating	**Negative impacts** (Type of impact = -1)	**Positive impacts** (Type of impact = +1)
7	Complete destruction (irreversible and irreplaceable loss) of natural or social systems, resources (e.g., species) and human health. No chance of these processes or resources ever being restored to their pre-impact condition.	Noticeable, sustainable benefits that improve the quality and extent of natural or social systems or resources, including formal protection.
6	Very high degree of damage to natural or social systems or resources. These processes or resources may restore to their pre-project condition over very long periods of time (more than a typical human lifetime).	Great improvement to ecosystem or social processes and services or resources.
5	Serious damage to components of natural or social systems or resources and the contravention of legislated standards.	Ongoing and widespread benefits to natural or social systems or resources.
4	High degree damage to natural or social system components, species or resources.	Average to intense positive benefits for natural or social systems or resources.
3	Moderate damage to natural or social system components, species or resources.	Average, ongoing positive benefits for natural or social systems or resources.
2	Minor damage to natural or social system components, species or resources. Likely to recover over time. Ecosystems and valuable social processes are not affected.	Low positive impacts on natural or social systems or resources.
1	Negligible damage to individual components of natural or social systems or resources, such that it is hardly noticeable.	Limited low-level benefits to natural or social systems or resources.

Table 3: Definition of Duration Ratings

Rating	Criteria
7	**Permanent:** The impact will remain indefinitely.
6	**Beyond project life**: The impact will remain for some time after the life of the project.
5	**Project life:** The impact will cease after the operational life span of the project
4	**Long-term**: The impact will continue for 6-15 years.
3	**Medium-term:** The impact will continue for 2-5 years.
2	**Short-term:** The impact will continue for between 1 month and 2 years.
1	**Immediate**: The impact will continue for less than 1 month.

Table 4: Definition of Extent Ratings

Rating	Criteria
7	**International:** The effect will occur across international borders.
6	**National:** The impact will affect the entire country.
5	**Province/ Region:** The impact will affect the entire province or region
4	**Municipal Area:** The impact will affect the whole municipal area.
3	**Local:** The impact will extend across the study area and the LAP area.
2	**Limited:** The impact will be limited to the study area.
1	**Very limited:** The impact will be limited to the footprint of the development and will not extend

Table 5: Definition of Probability Ratings

Rating	Criteria
7	**Certain/ Definite:** There are sound scientific reasons to expect that the impact will definitely occur.
6	**Almost certain/Highly probable:** It is most likely that the impact will occur.
5	**Likely:** This impact has occurred numerous times here or elsewhere in a similar environment
4	**Probable:** This impact has occurred here or elsewhere in a similar environment and with a similar type of development and could conceivably occur.
3	**Unlikely:** This impact has not happened yet but could happen.
2	**Rare/ improbable:** The impact is conceivable, but only in extreme circumstances. The possibility of the impact manifesting is very low due to the design, experience or implementation of adequate mitigation measures.
1	**Highly unlikely/None:** The impact is expected never to happen or has a very low chance of occurring.

Table 6: Application of Consequence Ratings

Range		Significance rating
-21	-18	Extremely detrimental
-17	-14	Highly detrimental
-13	-10	Moderately detrimental
-9	-6	Slightly detrimental
-5	5	Negligible
6	9	Slightly beneficial
10	13	Moderately beneficial
14	17	Highly beneficial
18	21	Extremely beneficial

Table 7: Definition of Significance Ratings

Range		Significance rating
-147	-109	Major - negative
-108	-73	Moderate - negative
-72	-36	Minor - negative
-35	-1	Negligible - negative
0	0	Neutral
1	35	Negligible - positive
36	72	Minor - positive
73	108	Moderate - positive
109	147	Major - positive

Table 8: Definition of Confidence Ratings

Rating	Criteria
Low	Judgement is based on intuition, and some major assumptions are used to assess the impact
Medium	Determination is based on common sense and general knowledge. The assumptions made, whilst having a degree of uncertainty, are fairly robust.
High	Substantive supportive data or evidence exists to verify the assessment.

9. Study gaps, limitations and assumptions

All assumptions made with the interpretation of the baseline results and anticipated impacts, are listed below:

- it is assumed that the development footprint will be within the study area that was assessed in this report;
- it is assumed that the areas where surface infrastructure will be developed, will be fenced off and excluded as land available for any future farming activities; and
- it is further assumed that the activities for the construction and operation of the infrastructure are limited to that typical for the construction and operation of land development for light industrial areas, including bulk services.

The following limitations is part of the assessment:

- the anticipation and rating of impacts are based on the report author's knowledge and experience on the nature of construction and operation of infrastructure for light industrial areas. Therefore, it is done as accurately as possible but must not be considered as absolute measures.

No other information gaps, limitations and assumptions have been identified.

10. Baseline description

10.1 Land types

The larger study area around the development areas consists of five different land types. The western part of the study area consists mainly of the Fa land types i.e., Fa468, Fa461, Fa467 with a smaller section of Land Type Bd50 located along the southern boundary of the study area (Figure 8). The three development areas fall entirely on Land Type Bd49. This terrain unit consists of about 75% mid-slopes (Terrain unit 3) that has slope between of 1 to 6% that consists of Wasbank, Cartref, Mispah, Glenrosa, Westleigh and Longlands soils. The valley bottoms and foot slopes (Terrain units 5 and 4), consist of 35% Kroonstad soils, 25% Katspruit soils and 40% stream beds. The hill tops (Terrain unit 1) consist mostly of shallower soil profiles of the same soil form combinations as the mid-slopes.

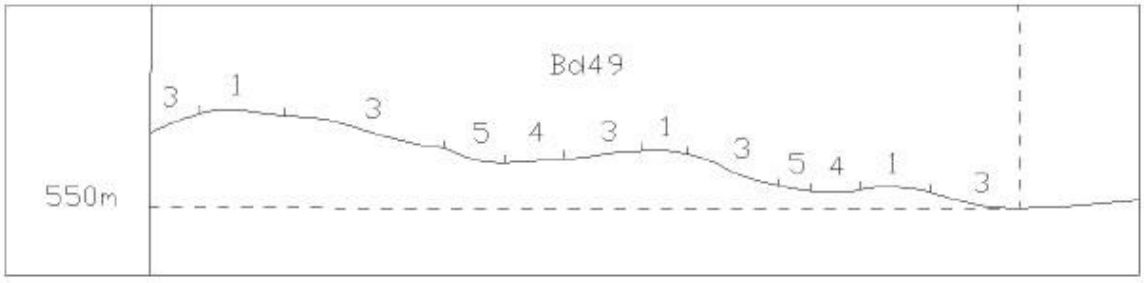

Figure 7 Terrain form sketch of Land Type Bd49

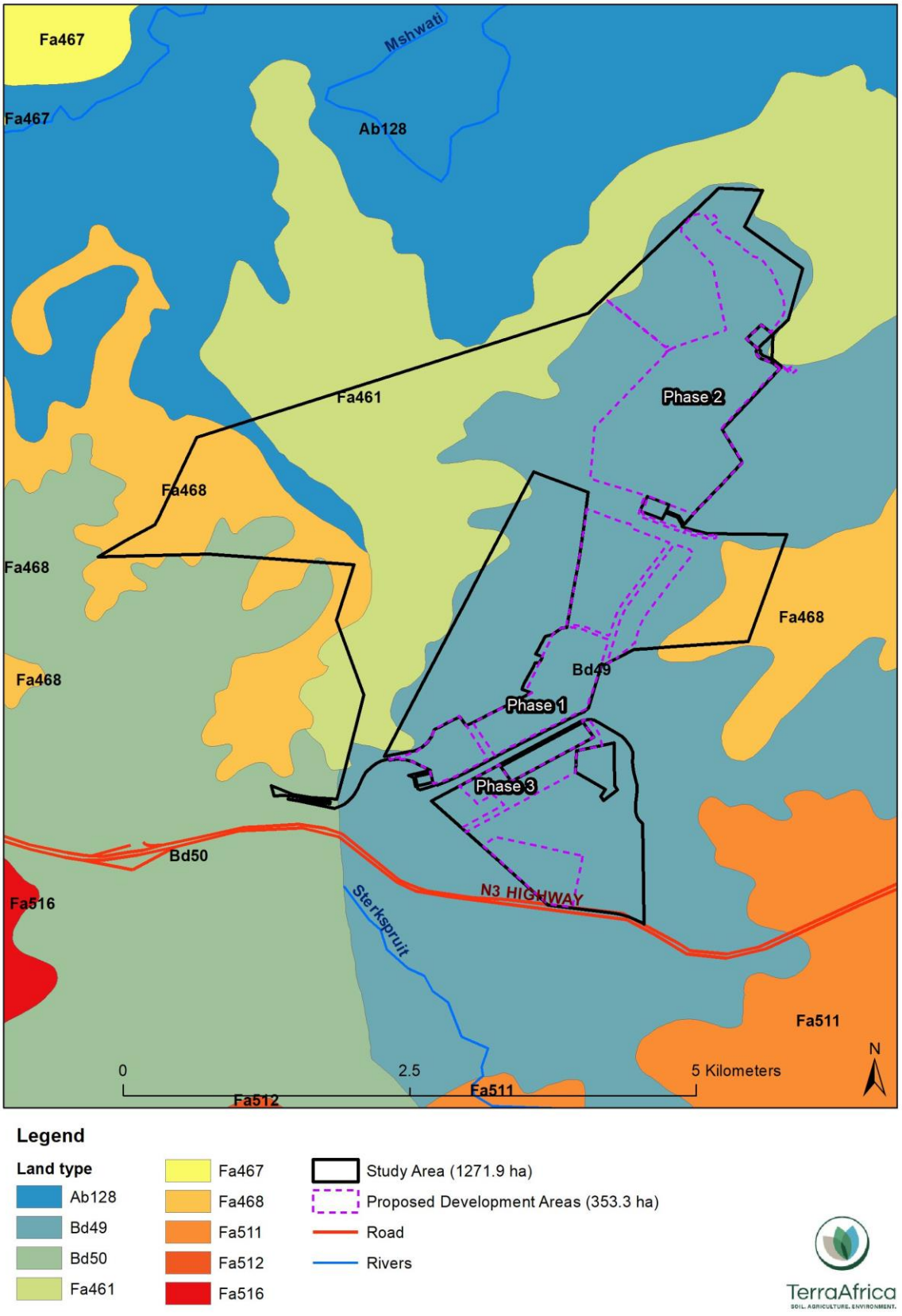

Figure 8 Land type classification of the Cato Ridge Land Development study area

10.2 Soil properties

Twelve different soil forms were identified within the boundaries of the three proposed development areas. The position of the soil forms as well as the approximate area of each within the three development areas, is shown in Figure 9.

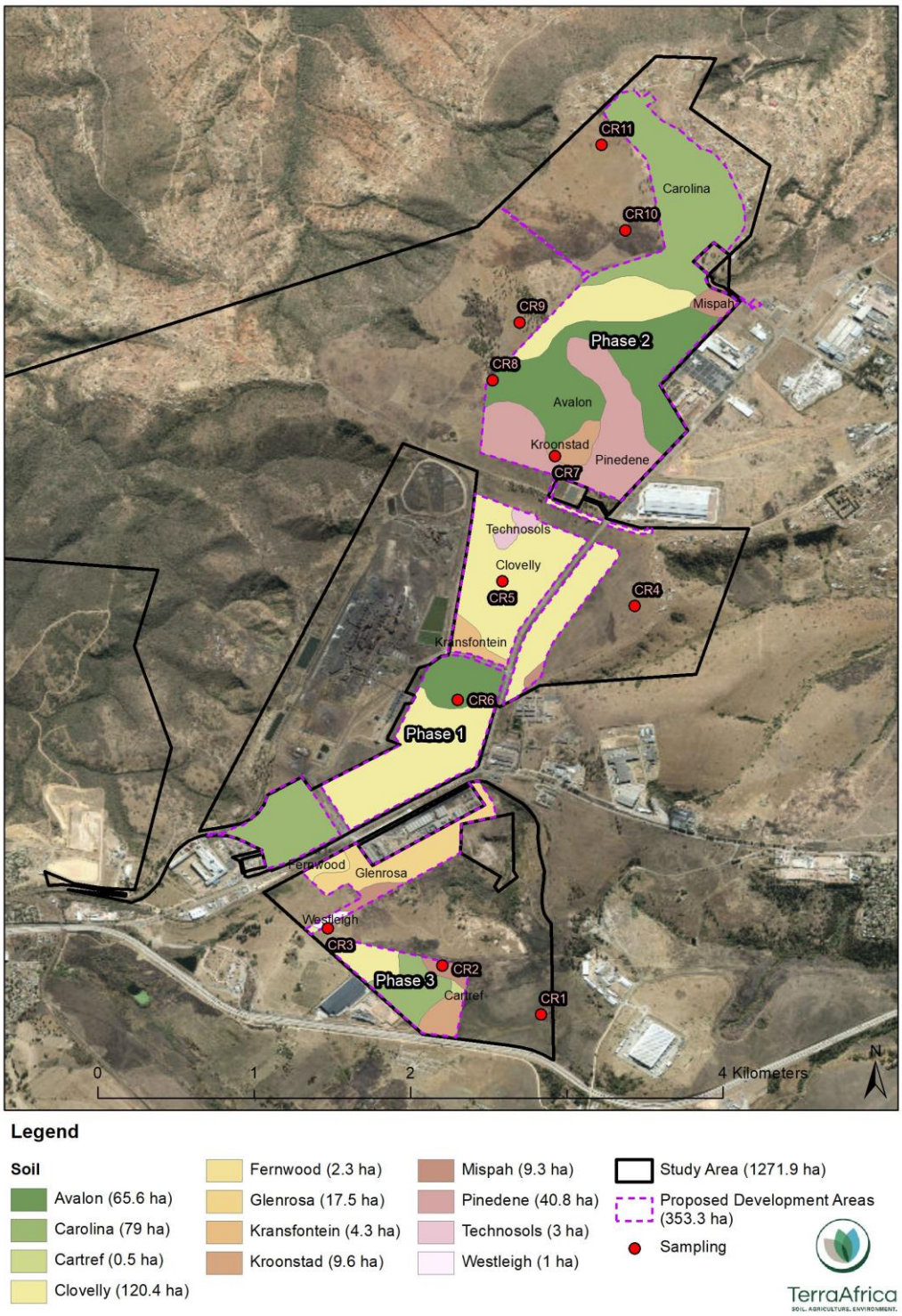

Figure 9 Soil classification map of the three proposed development areas of the Cato Ridge Land Development and Release project

Of the twelve soil forms, eleven are natural soils that have not significantly been altered by anthropogenic activities. The natural soils consist of the following soil forms: Avalon, Carolina,

Cartref, Clovelly, Fernwood, Glenrosa, Kransfontein, Kroonstad, Mispah, Pinedene and Westleigh. The Glenrosa and Mispah soils are shallow, rocky soils that are limited in depth by fractured rock, solid rock or lithic materials. Solid rock was visible on the surface of the Mispah soils (see Figure 10).

Figure 10 Solid rock visible on the surface of the Mispah soils

The Kroonstad form has a gleyed B2 horizon that have high water-holding capacity and the capability to support wetland vegetation. The gleyed horizon has grey colours and light orange mottling.

Figure 11 Soils from a Kroonstad profile with mottled gley in the middle

The Fernwood and Cartref forms have bleached, albic subsoil horizons with sandy texture and low water-holding capacity. The remaining soil forms are characterised by yellow-brown apedal

subsoil horizons with underlying materials that include fractured rock, soft plinthite and gleyic materials.

Figure 12 Cartref soils

The twelfth soil group is Technosols and represent areas that have been altered drastically so that the original soil horizon organization is no longer present. Only a small area of Technosols (3.1 ha) is present within Phase 1.

Figure 13 Technosols within a previously disturbed area

9.3 Land capability

The position of the different land capability classes (according to DALRRD, 2016) within the study area of the proposed Cato Ridge Land Development and Release project, is shown in Figure 14.

The study area consists of seven different land capability classes ranging from Class 03 (Low – Very low) to Class 09 (Moderate-High). The western part of the study area consists mainly of land with lower land capability and only small areas of Class 08 (Moderate) land capability. A few very small areas with Moderate-High (Class 09) is present in this area. The eastern part of the study area (where the proposed three development areas are located) consists mainly of land with Moderate (Class 08) land capability with narrow strips of lower land capability along the western boundary of Phase 2 and the eastern boundaries of both Phase 1 and Phase 3.

Following the soil classification of the proposed development areas, the three areas have been assigned land capability classification based on the soil properties present (see Figure 15). The verified land capability classification largely agrees with the classification of DALRRD's raster data (refer to Figure 14).

Phase 3 consists of four land capability classes with Class 05 (Low) the dominant soil class. The other three land capability classes in Phase 3 are Class 06 (Low-Moderate), Class 07 (Low-Moderate) and Class 08 (Moderate).

Phase 1 consists mainly of land with Class 08 (Moderate) land capability. A small area with Class 09 (Moderate-High) land capability is present in the middle of the area. Three separate areas with Class 05 (Low) land capability are found in the western corner, middle and northeastern corner of Phase 1. A small area with Class 03 (Low-Very low) land capability, is present in the northwestern corner of Phase 1.

The dominant land capability of Phase 2 is Class 08 (Moderate). An area with higher land capability (Class 09 – Moderate-High) runs in a narrow strip between the southern boundary and the eastern boundary of Phase 2. Land with Class 05 (Low) land capability is present along the western boundary and one small section along the eastern boundary of Phase 2. One small area with Class 07 (Low-Moderate) land capability is present just north of the southern boundary of Phase 2.

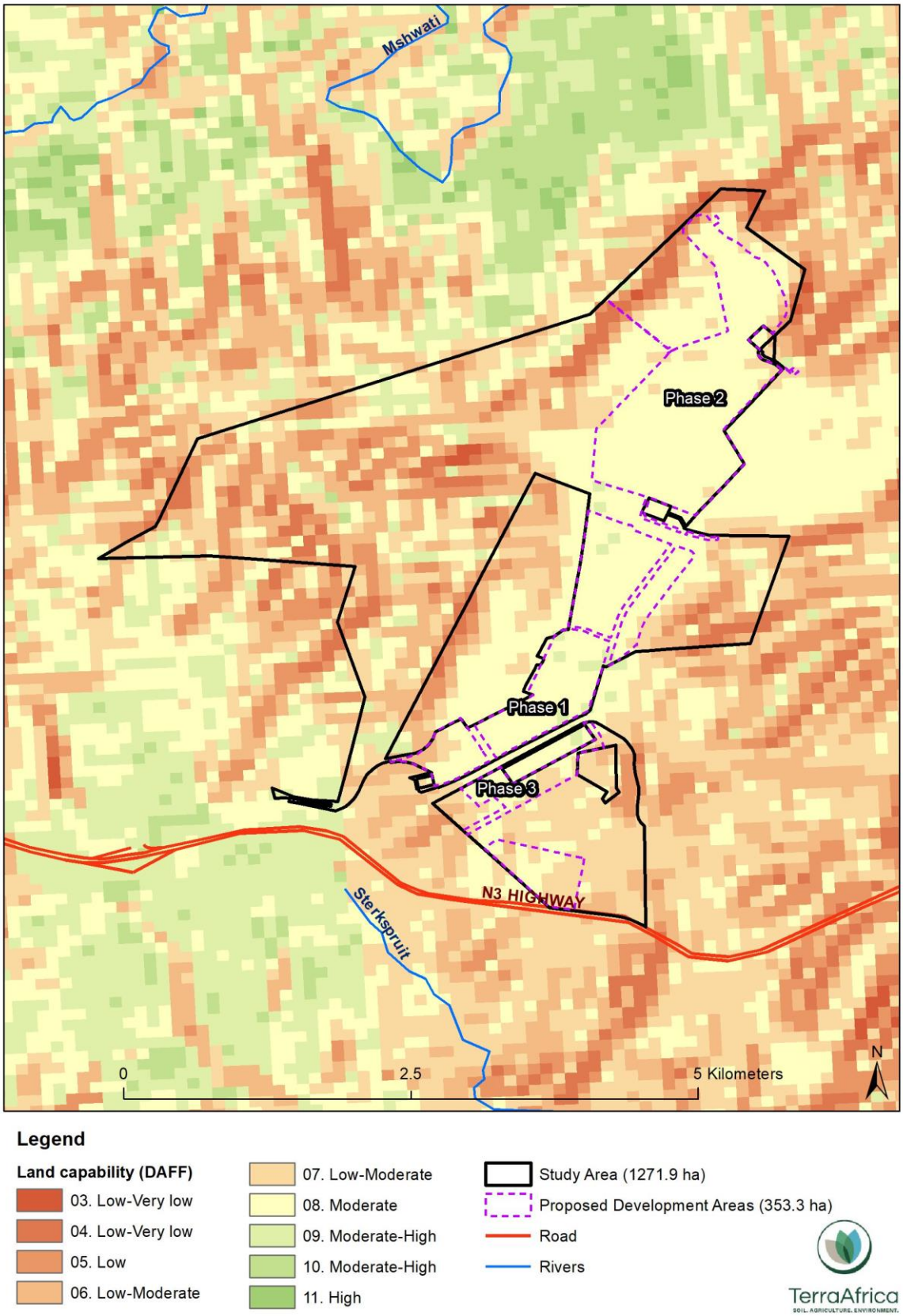

Figure 14 Land capability classification of the Cato Ridge Land Development and Release project's study area (data source: DALRRD, 2016)

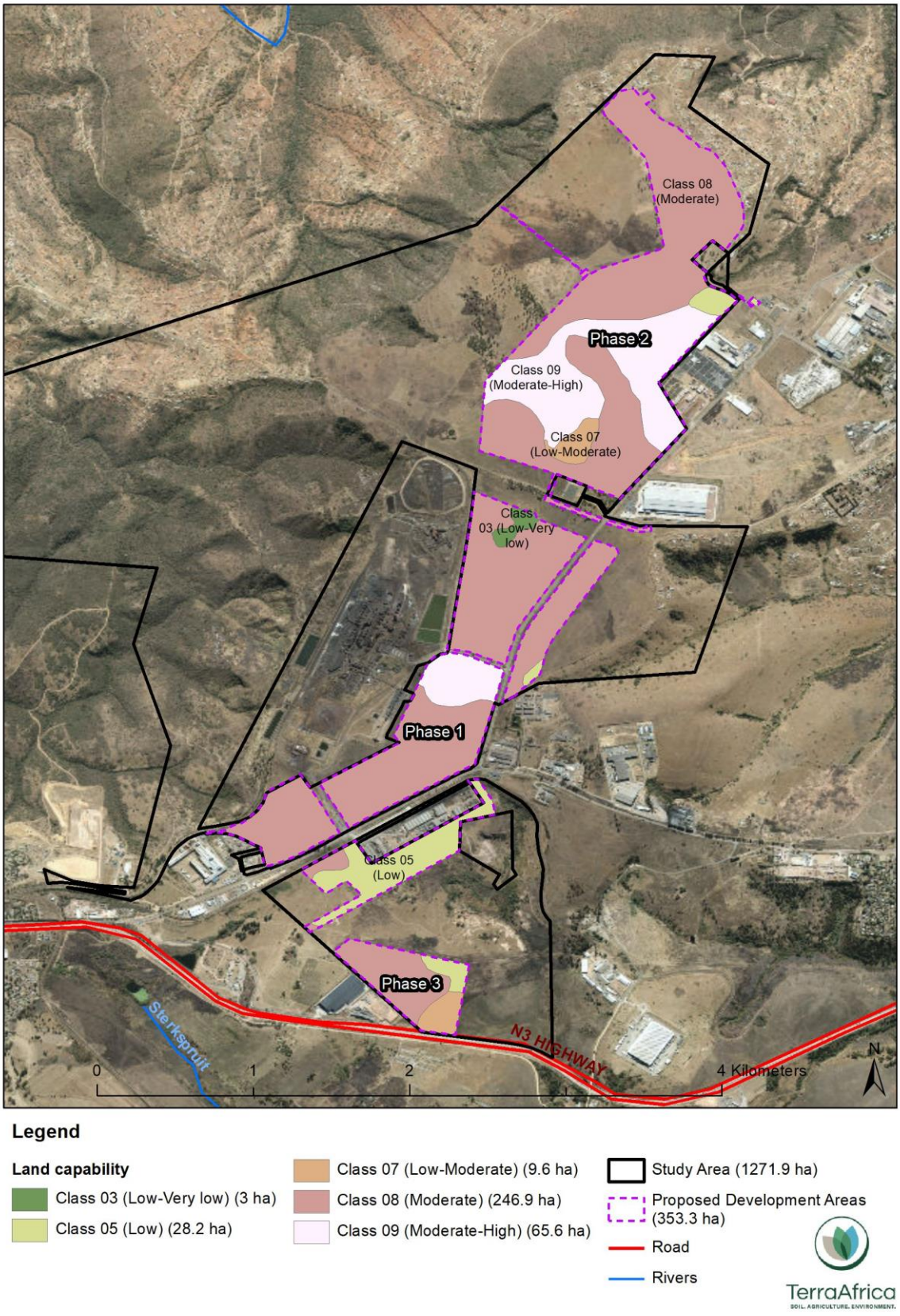

Figure 15 Land capability classification of the proposed three development areas of the Cato Ridge Land Development

9.4 Agricultural potential

Following the classification of the soil and the consideration of the soil properties and limiting factors to rainfed crop production, the agricultural potential soil of the three development areas was determined (see Figure 16).

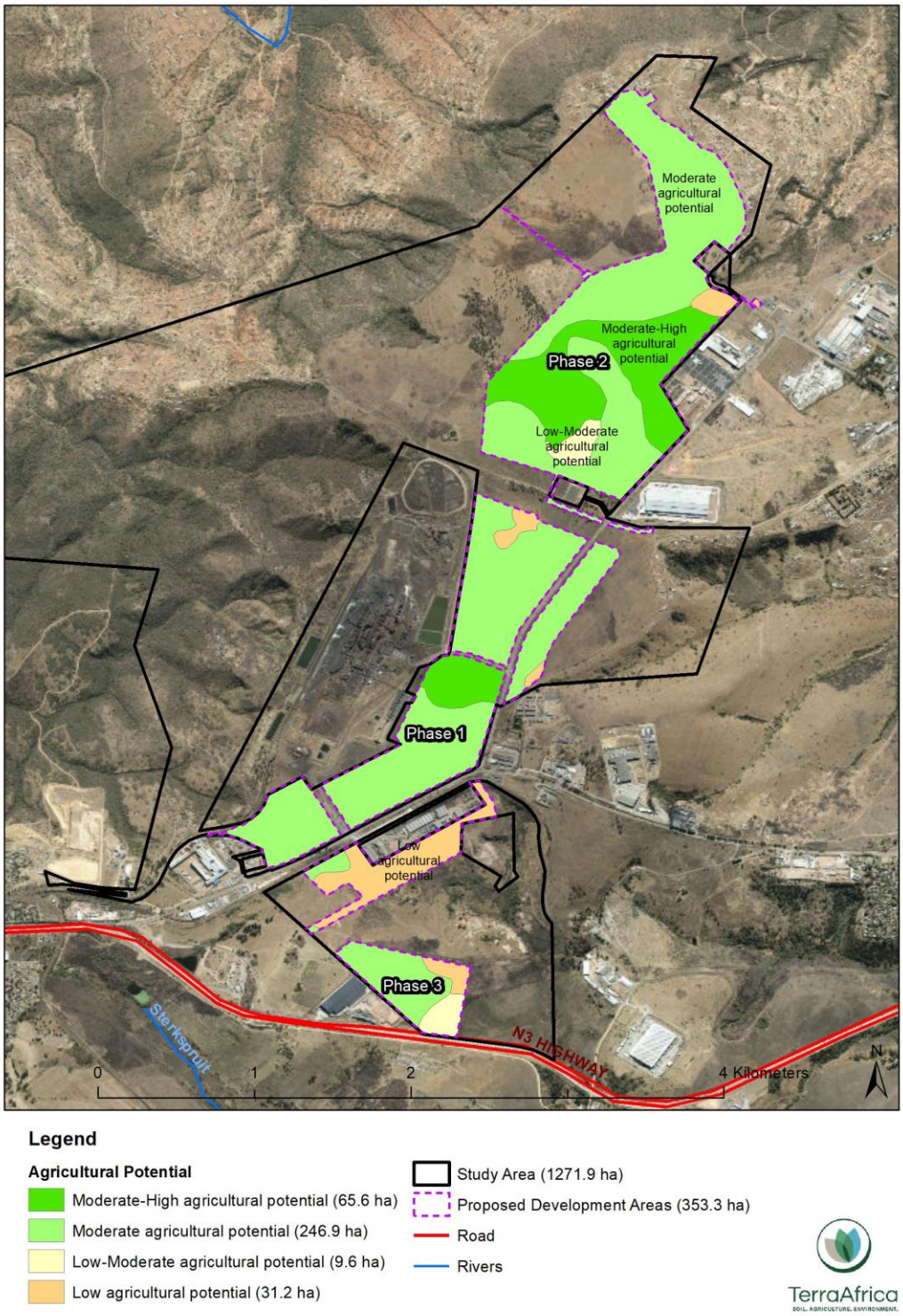

Figure 16 Agricultural potential of the three proposed development areas of the Cato Ridge Land Development and Release project

The largest part of the three areas, have Moderate agricultural potential (approximately 260.8 ha). These areas have suitability for rainfed crop production and livestock farming. Approximately 66.9 ha of the development areas, have Moderate-High agricultural potential.

The soil with Moderate-High agricultural potential is present in Phase 1 and Phase 2. Areas with Low-Moderate agricultural potential covers about 4.8 ha of the development areas while Low agricultural potential is found at 35.7 ha of the areas.

Even though a large portion of the development areas have Moderate agricultural potential and therefore limited suitability for rainfed crop production, there are no crop fields within the areas. The only agricultural land use is livestock farming by the surrounding local community. Cattle was seen grazing the area during the site visit (Figure 17). The absence of any crop production in the study area, is confirmed by the absence of any field crop boundaries as delineated by the DALRRD (2019) (refer to Figure 18).

Figure 17 Cattle grazing the study area

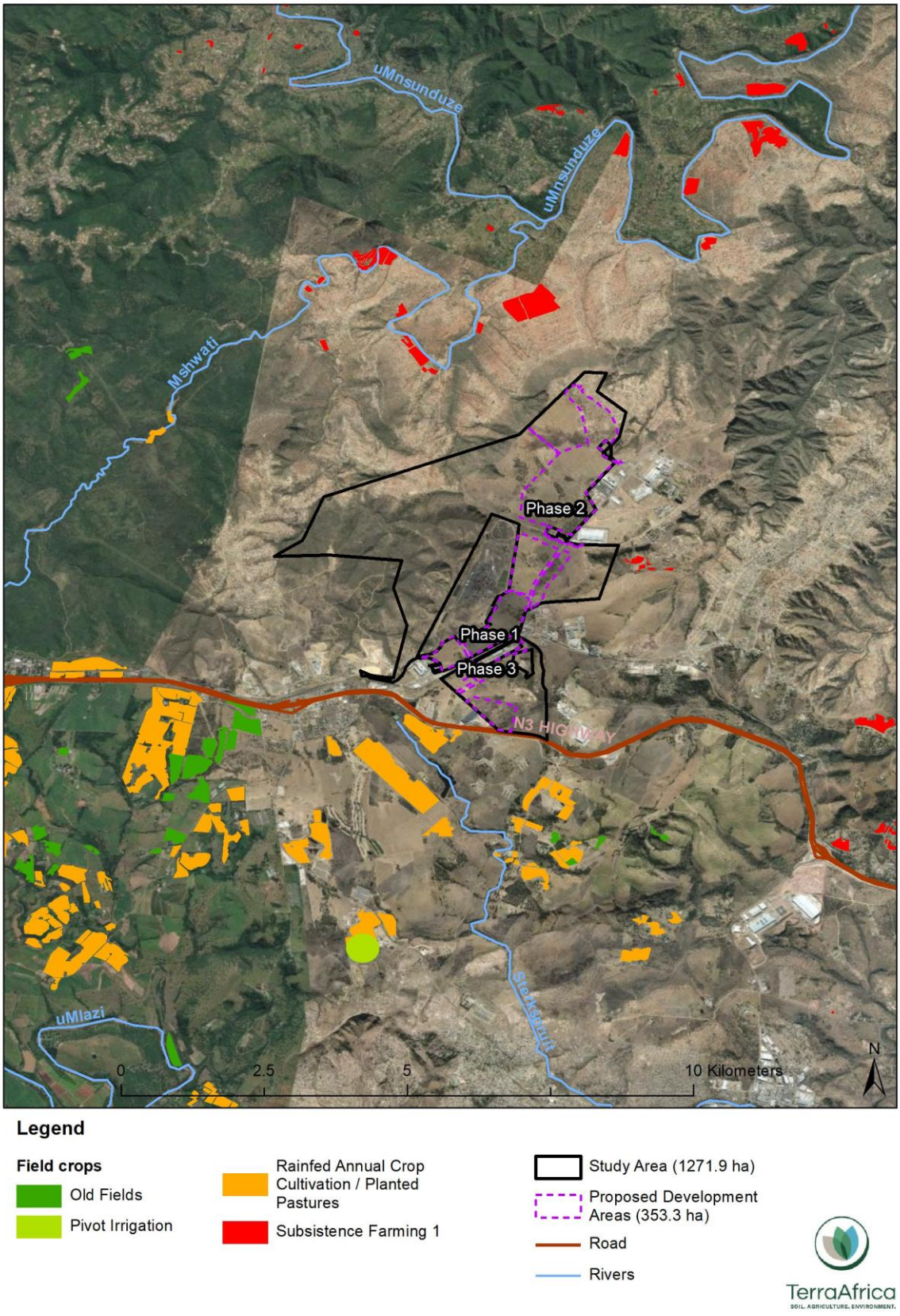

Figure 18 Location of field crop boundaries around the proposed Cato Ridge development areas (data source: DALRRD, 2019)

Following the metadata layer obtained from DALRRD, the long-term grazing capacity of the largest part of the three development areas is 6 ha/LSU (see Figure 19).

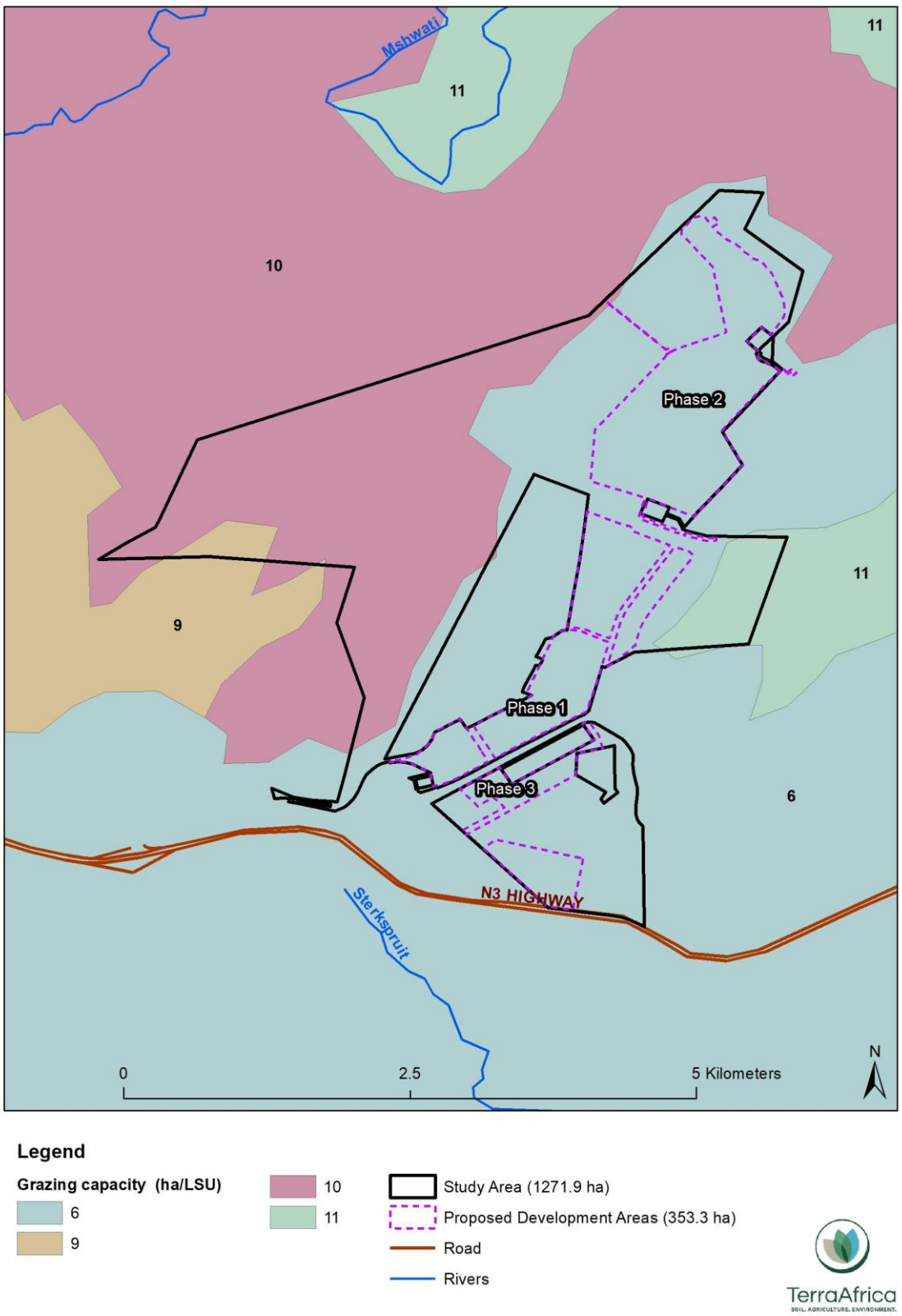

Figure 19 Grazing capacity of the proposed Cato Ridge Land Development study area (data source: DALRRD, 2018)

This grazing capacity is moderate to moderate-high in comparison to the grazing capacity of the rest of the country. The rest of the study area has lower grazing capacity in the western part (10 ha/LSU) and a small area with 11 ha/LSU along the eastern boundary of Phase 1.

To determine the loss of forage from the area, should the project be authorised, the grazing capacity of 6 ha/LSU was used to calculate the loss from the development footprint that will likely be fenced off. The development footprint will be up to 352 ha and therefore the grazing forage of about 59 head of cattle will be lost from the area.

9.4 Sensitivity analysis

Following the consideration of all the desktop and verified baseline data above, the findings of the report agree largely with that of the results of the Environmental Screening Tool. The largest parts of Phase 1 and Phase 2 consist of land with Medium agricultural sensitivity to the development. The Medium sensitivity was derived from the Moderate agricultural potential of the soil forms of these areas. Two areas (one within Phase 1 and one within Phase 2) have High agricultural sensitivity because of the deep Avalon soils in these areas that have high suitability for rainfed crop production. The remaining areas have Low agricultural sensitivity because of the shallow, rocky soils of these areas or existing soil disturbance in the case of the 3.1 ha Technosols.

Although there is 65.6 ha of land with High agricultural sensitivity, there is no crop production in these areas. The rest of the development footprint has Medium sensitivity (246.9 ha) and Low sensitivity (40.8 ha). The natural areas within the three proposed development areas, are currently used for livestock grazing by the community's cattle. The development footprint of up to 352 ha, will result in the loss of grazing forage of 59 head of cattle.

In alignment with the CARA, the Department of Agriculture, Land Reform and Rural Development (DALRRD) developed spatial data that depict High Potential Agricultural Areas (HPAAs) of the different provinces of South Africa (DALRRD, 2019). According to the DALRRD, these areas can be defined as: *"large, relative homogeneous portions of high value agricultural land that has the potential to sustainably, in the long-term, contribute significantly to the production of food.*"

The data layer of the HPAA's of KwaZulu Natal Province shows that the proposed project's development areas fall outside of any HPAA (refer to Figure **20**). It is located approximately 4 km northeast of a Category B Rainfed Crop Production HPAA. Since the development footprint will remain within the boundaries of the proposed development areas, it will not affect or fragment a High Potential Agricultural Area.

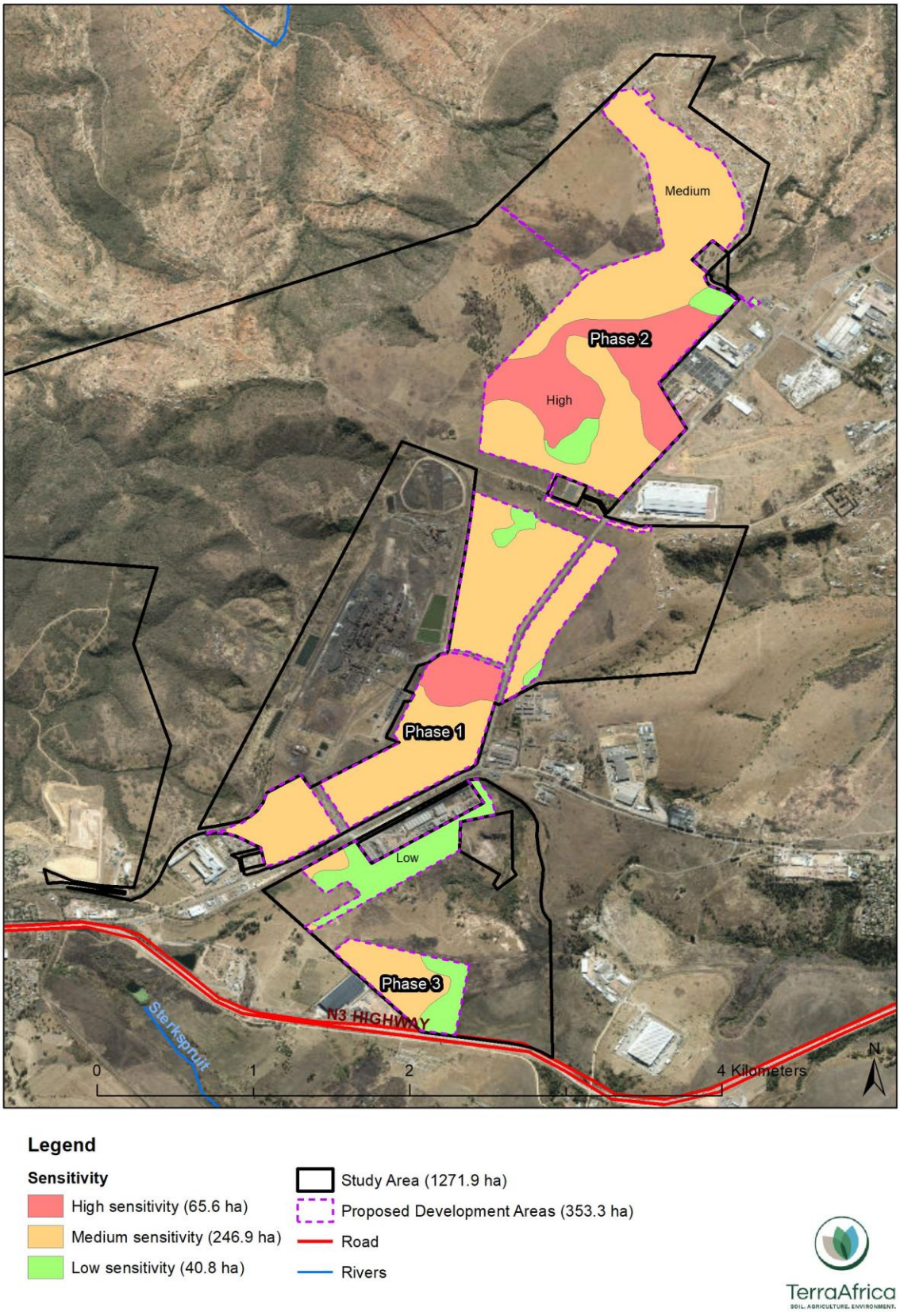

Figure 20 Agricultural sensitivity rating of the proposed Cato Ridge development areas

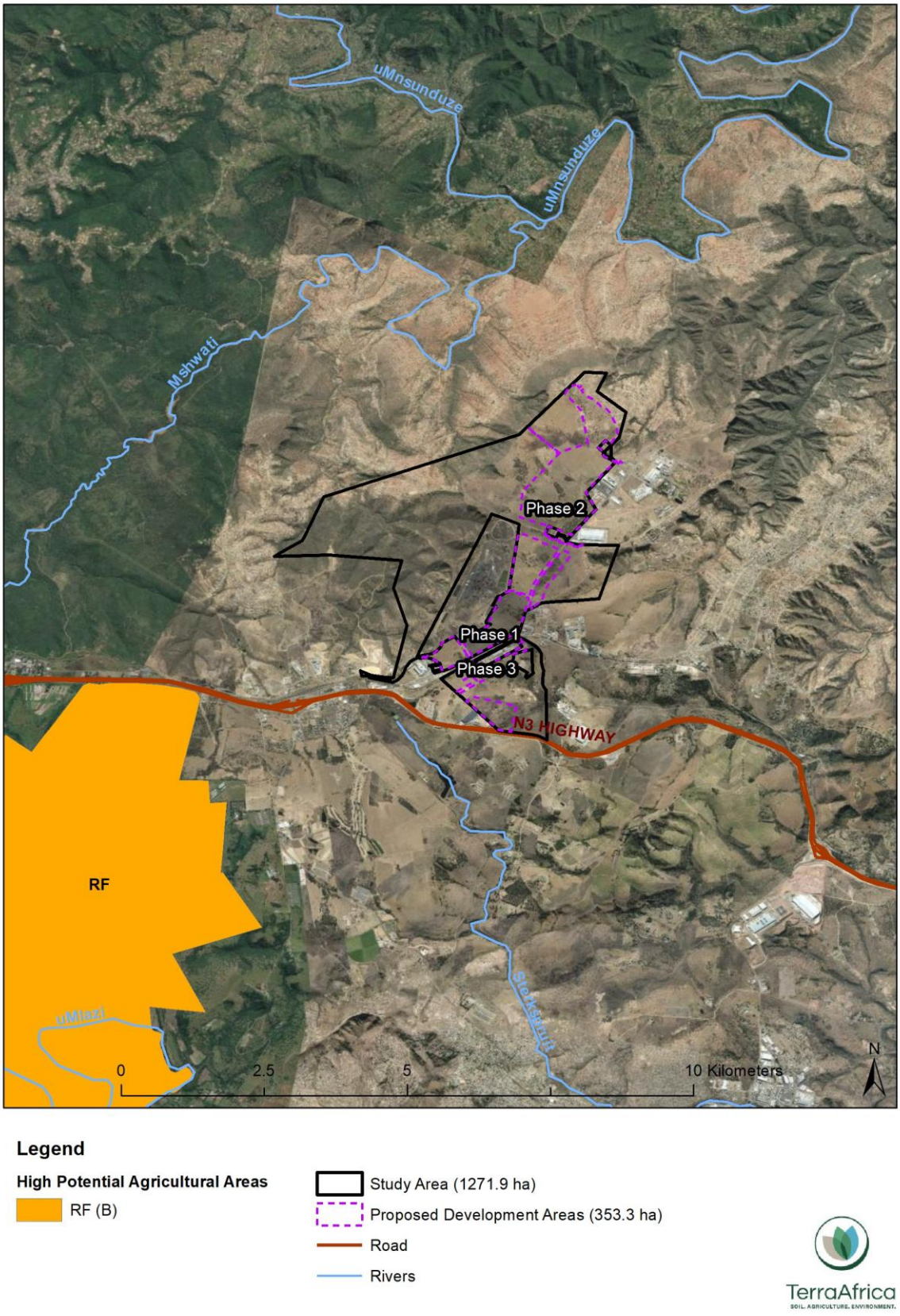

Figure 21 Presence of High Potential Agricultural Areas around the development areas of the proposed Cato Ridge Land Development and Release project (DALRRD, 2019)

11. Impact assessment

11.1 Key impacts anticipated for the proposed project

- The construction of the roads and other infrastructure will reduce the areas available for livestock grazing by communal livestock. Once the project's development footprint will be fenced off, the area will no longer be available for livestock grazing.
- During the construction phase, the intentional compaction of the soil surface where roads will be constructed will result in soil compaction that reduces water infiltration and increase surface run-off. This will result in an increased risk of soil erosion next to the roads.
- The delivery of materials and equipment for the construction activities will also result in soil compaction that affects the soil physical properties negatively.
- Prior to construction, vegetation will be removed from the soil surface and this will expose soil particles to erosion by wind and water.
- The risk of soil erosion will remain during the operational phase in the areas adjacent to hard surfaces, especially after intense rainfall.
- The traversing of vehicles as well as the use of materials on site, both during the construction and operation phases, can cause soil contamination.

11.2 Assumptions, information gaps and limitations of the impacts assessed and mitigation measures proposed

- The anticipated impacts are limited to that associated with the construction and operations of the infrastructure and services (roads, sewer, water, electricity, and stormwater) that will be provided by CRDC in the project area.
- The mitigation measures proposed for the management of the soil and agricultural impacts, will be included in the Environmental Management Programme (EMPr). The approved EMPr will be part of any agreements with prospective end users and will be binding.
- Although the project description indicates that the project is planned for a light industry, warehousing, distribution and logistics precinct, the individual businesses that will develop in the area, are not currently known. Therefore, it is not possible to prescribe mitigation measures that will address all possible impacts associated with a range of possible business.
- It is assumed to each of the end users will adhere to environmental legislation and regulations and that an Environmental Control Officer (ECO) will be present on site to monitor and enforce environmental management.
- It is also assumed that CRDC will not allow the development of informal industries, that are associated with a high risk of soil pollution, alongside the roads and other service areas within the boundaries of their properties.
- It is further assumed that a well-designed Stormwater Management Plan (SWMP) will be implemented by CRDC, to avoid the risk of soil erosion and sedimentation of surface water bodies outside the boundaries of the CRDC properties.
- Finally, it is assumed that there will be only construction and operation phases for the project and that there will be no decommissioning.

11.3 Impact assessment per project phase

Table 9 Construction phase impacts

ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACT	APPLICABLE AREA	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION						
Description of proposed land use/ activity/ aspect	Summary description of the impact	Site Camp/ s, access routes and services corridors/ specific focus area or LAP study area	Results of application of impact assessment methodology							Outline of recommended mitigation measures	Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status(pos/ neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status(pos/ neg)	Significance
Construction of perimeter fence around the development footprint of up to 352 ha	*Reduction of grazing land available for the cattle of the surrounding communities*	*All three proposed development areas (Phase 1, Phase 2 and Phase 3)*	4	6	3	7	91	Negative	Moderate - negative	*1. Conduct a research study on the inclusion of cattle in the biodiversity off-set areas outside the development footprint. Where possible, conservation areas must still allow for cattle grazing.*	3	6	3	5	60	Negative	Minor - negative
Construction of water and sewer infrastructure, including pipelines as well as roads and stormwater infrastructure	*Disturbance of soil horizon organization and associated hydropedology*	*Access routes and services corridors*	2	6	2	7	70	Negative	Minor - negative	*1. Keep disturbance footprint to a minimum.* **2.** *Construction materials must be stored in designated laydown areas to minimise disturbance around construction footprint.*	2	6	1	7	63	Negative	Minor - negative
Construction of proposed access roads	*Deliberate compaction of soil where access roads will be constructed as well as areas directly next to access roads*	*All access routes within the proposed development areas*	5	7	2	6	84	Negative	Moderate - negative	*1. Restrict access of delivery vehicles and equipment to existing gravel roads.* *2. Only store construction materials in designated construction yards.* *3. Limit any deliberate soil compaction to only the areas where the roads will be*	5	7	1	6	78	Negative	Moderate - negative

ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACT	APPLICABLE AREA	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION						
Description of proposed land use/ activity/ aspect	Summary description of the impact	Site Camp/ s, access routes and services corridors/ specific focus area or LAP study area	Results of application of impact assessment methodology							Outline of recommended mitigation measures	Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status(pos/ neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status(pos/ neg)	Significance
										constructed. *4. Alleviate soil compaction next to roads with deep soil ripping.*							
Clearing of vegetation from the soil surface at onset of construction	*Exposing bare soil surface to wind and water energy that causes soil erosion*	*Access routes and services corridors*	5	6	2	5	65	Negative	Minor - negative	*1. Limit vegetation clearance to only the areas where earthworks are required.* *2. Regularly monitor the areas directly next to infrastructure areas for signs of soil erosion.* *3. Soil erosion around the infrastructure footprint must be rehabilitated.* *4. Implement SWMP that prevent surface runoff over bare surfaces.*	2	2	1	4	20	Negative	Negligible - negative
Delivery and use of construction materials	*Soil pollution with materials used for construction as well as oil and fuel from vehicles and equipment*	*Access routes and services corridors*	5	4	2	5	55	Negative	Minor - negative	*1. Enforce proper waste management during the construction phase.* *2. Conduct regular vehicle and equipment checks to ensure that vehicles don't spill oil and fuel.*	2	1	1	4	16	Negative	Negligible - negative

ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACT	APPLICABLE AREA	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION						
Description of proposed land use/ activity/ aspect	Summary description of the impact	Site Camp/s, access routes and services corridors/ specific focus area or LAP study area	Results of application of impact assessment methodology							Outline of recommended mitigation measures	Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status(pos/ neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status(pos/ neg)	Significance
										3. In the case of accidental fuel or oil spillage, the spill must be cleaned up immediately. *4. Remove all left-over materials from site after maintenance work.* *5. Ensure equipment and vehicles are in good condition and do not leak oil or fuel.* *6. Implement SWMP that direct dirty water away from exposed soil surfaces.*							

Table 10 Operation phase impacts

ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACT	APPLICABLE AREA	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION						
Description of proposed land use/ activity/ aspect	Summary description of the impact	Site Camp/s, access routes and services corridors/ specific focus area or LAP study area	Results of application of impact assessment methodology							Outline of recommended mitigation measures	Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance		Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance
Runoff from hard surfaces into nearby areas	*Runoff from hard surfaces increase soil erosion risk next to hard surfaces such as along access roads.*	*Access routes and service corridors*	5	6	2	5	65	Negative	Minor - negative	1. *Regularly monitoring areas outside the hard surfaces for signs of erosion.* 2. *In the case that erosion is detected, immediately rehabilitated eroded areas.* 3. *Monitor vegetation around hard surfaces to ensure there are no bare surfaces.* **4.** *Monitor stormwater management system to ensure it functions properly and do not cause erosion.*	2	2	1	4	20	Negative	Negligible - negative
Maintenance work on serviced areas	*Soil pollution caused by maintenance work*	*Access routes and services corridors*	5	4	2	5	55	Negative	Minor - negative	1. *Enforce proper waste management during the operation phase.* 2. *Conduct regular vehicle and equipment checks of maintenance vehicles to ensure that vehicles don't spill oil and fuel.* 3. *Monitor SWMP to ensure that dirty water are channeled away from uncovered soil surfaces.*	2	1	1	4	16	Negative	Negligible - negative

11.4 Cumulative impact assessment and rating

A "cumulative impact" is defined in the EIA regulations, 2014 as the '*past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities'*.

Examples of cumulative impacts include those resulting where several hydroelectric projects are constructed or planned on the same river or within the same watershed, multiple oil and gas projects or mines are developed in proximity, or several wind farms are constructed or planned within the same flyway or region. In other cases, cumulative impacts occur from the combined effects over a given resource of a mix of different types of projects, for example, the development of a mining site, access roads, transmission lines, and other adjacent land uses.

The assessment of the cumulative impacts considers the cumulative impact of proposed land uses and developments in the broader Cato Ridge LAP area. To this end, the EDTEA was approached for information on current and authorised developments in the study area. These are provided in Table 11.

Table 11: Authorised Developments in the Cato Ridge study area (sourced from N. Brijlal, 16 November 2021)

NEAS number	Provincial Ref. Number	Project title	Project Description	Status
KZN/EIA/000160 2/2021	DM/0021/2021	Decommissioning of the facilities At Goswell Developments (Pty) Ltd located in Cato Ridge, eThekwini Metropolitan Municipality, KZN	Goswell Developments (Pty) Ltd are proposing to decommission its facility for the recycling of aluminium which was established at the Goswell Developments waste processing site in Cato Ridge within the eThekwini Metropolitan Municipality.	Authorised
KZN/EIA/000154 5/2021	DM/0009/2021	Proposed levelling of 18.7ha of virgin land for Industrial purposes, located on portion 34 of Uitkomst and Doornrug no. 852, Cato Ridge, KwaZulu-Natal (Phase two)	Proposed levelling of 18.7ha of virgin land for Industrial purposes, located on portion 34 of Uitkomst and Doornrug no. 852, Cato Ridge, KwaZulu-Natal (Phase two)	Authorised
KZN/EIA/000165 0/2021	DM/0030/2021	Basic Assessment Process for the proposed levelling of 16.7 of virgin land for industrial purposes, located on portion 34, portion 45, portion 46, portion 293 and portion 298 of Uitkomst and Doornrug No. 852, Cato Ridge, eThekwini Municipality, KZN	levelling of 16.7 of virgin land for industrial purposes, located on portion 34, portion 45, portion 46, portion 293 and portion 298 of Uitkomst and Doornrug No. 852, Cato Ridge. The realignment and relaxation of a portion of rem of portion 34 of Uitkomst and Doornrug No. 859	Current
	DM/S24G/0001/2018	Cato Ridge crematorium	Portion 8 of 50, Cato Ridge, within the eThekwini Municipality	Finalized
	DM/0067/2013	Construction of warehousing for Lougat Properties	The remainder of Portion 30 of Farm Uitkomst and Droonrug, No 862, located within the eThekwini Municipality	Finalized

Table 12 Cumulative impacts

ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACT	APPLICABLE AREA	SIGNIFICANCE PRE-MITIGATION							SUMMARY OF MITIGATION MEASURES
Description of proposed land use/ activity/ aspect	Summary description of the impact	Site Camp/s, access routes and services corridors/ specific focus area or LAP study area	Results of application of impact assessment methodology							Outline of recommended mitigation measures
			Intensity	Duration	Extent	Probability	Total	Status (pos/ neg)	Significance	
Land use change from livestock grazing to serviced areas for light industrial use	*The project footprint of up to 352 ha will be fenced off. This increases the total area of land use change in the broader Cato Ridge LAP area.*	*Total development footprint*	5	6	2	5	65	Negative	Minor - negative	*1. Research and implement a regenerative grazing plan that can co-exist with biodiversity conservation in the off-set areas.*
Increased areas where hard surfaces result in soil sealing	*All areas within the project footprint where hard surfaces will be established, increase areas where soil sealing limits soil functionality and water infiltration into groundwater.*	*Access routes and services corridors*	5	4	2	5	55	Negative	Minor - negative	*1. Maintain effective SWMP for the entire development footprint.* *2. Leave sufficient areas between hard surfaces for landscaped areas where soil functionality can remain minimally altered.*

11.4 Assessment of No Go Alternative

The No-Go Option should the Cato Ridge Land Development and Release Project not proceed would be that CRDC not pursue any development of the land. The site will remain in the ownership of CRDC/ Assmang and the status quo will be retained for the site.

For purposes of comparative assessment in terms of the EIA, a likely worst-case scenario approach for the no-go option is considered and compared with the impact assessment for the worst-case scenario preferred development alternative for consistency. Extrapolating the existing land use practices under a no-go development option, it is reasonable to assume that incursions onto the property for illegal sand mining, waste dumping, grazing (including burning) and informal settlements would continue. The landowner would continue to manage the areas together with law enforcement to the extent reasonable. However, historical impacts and in the absence of additional income to facilitate an intensified management approach to the land, it would be reasonable to assume that these impacts would continue and possibly escalate as the surrounding rural communities continue to expand and densify, creating increasing demand for land and resources.

For the agricultural potential of the area, waste dumping and illegal sand mining will degrade the soil quality and reduce the areas available where livestock grazing is safe. Informal settlement into the area will increase the risk of soil erosion where vegetation is removed and soil surfaces around homesteads are left bare.

ACTIVITY Description of proposed land use/	**POTENTIAL ENVIRONMENTAL IMPACT** Summary description of impact	**APPLICABLE AREA** Development Areas	**SIGNIFICANCE** Results of application of impact assessment methodology						
			Intensity	Duration	Extent	Probability	Total	Status (pos / neg)	Significance
NO GO Alternative	Increased risk of soil degradation and reduction in safe areas for livestock grazing.	All areas	4	6	3	4	52	Neg	Minor

12. Conclusion and recommendations

It is my professional opinion that the proposed Cato Ridge Land Development and Release Project is an acceptable project for the area where it is proposed by CRDC. The proposed project will not affect any crop production activities and will affect largely land with medium and low agricultural sensitivity. The only agricultural activity currently in the area, is cattle grazing by the local community that live in the vicinity of the proposed project area.

The impacts on agriculture and soil range from the reduction in grazing areas available for cattle of the local community to soil compaction and increased risk of soil erosion and pollution. The significance of these impacts range from moderate negative to negligible negative prior to the implementation of mitigation measures. With the mitigation measures proposed, it is expected that these impacts can be reduced to minor and negligible negative. While it is not

currently known exactly what businesses will settle in the development area, it is known that it will not include any hazardous chemical industries. This exclusion limits the risk of soil pollution to that listed for the construction and operation phases.

It is recommended that in addition to the mitigation measures stipulated for soil and agricultural impacts in the EMPr, that the environmental management team of CRDC, develop best practice guidelines for the management of soil quality that can be integrated with the EMPr stipulations by the prospective future end users.

It is further recommended that a thorough research study be commissioned to investigate the possibility of regenerative grazing with cattle in the areas that will be part of the biodiversity off-set program. While the aim of the biodiversity off-set program is the conservation of the habitat and species diversity of the KwaZulu-Natal Sandstone Sourveld grasslands, the area has already been subjected to cattle grazing for several years. If a research study can monitor the impact of managed livestock grazing on the biodiversity of the area and also study the positive impacts of regenerative agriculture on soil quality, especially soil carbon content, it may be highly beneficial to the local community if they can continue with cattle grazing in parallel to the proposed project.

13. Reference list

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APPENDIX 1 – DECLARATION OF INDEPENDENCE AND SPECIALIST DETAILS

DECLARATION OF INTEREST BY SPECIALIST

KWAZULU-NATAL PROVINCE
ECONOMIC DEVELOPMENT, TOURISM
AND ENVIRONMENTAL AFFAIRS
REPUBLIC OF SOUTH AFRICA

	(For official use only)
Provincial Reference Number:	
NEAS Reference Number:	KZN / EIA /
Waste Management Licence Number (if applicable):	
Date Received by Department:	

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

Submitted in terms of section 24(2) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) or for a waste management licence in terms of section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008).

KINDLY NOTE:

1. This form is current as of **May 2021**. It is the responsibility of the Applicant / Environmental Assessment Practitioner ("EAP") to ascertain whether subsequent versions of the form have been released by the Department.

PROJECT TITLE

Cato Ridge Land Development and Release Project

DISTRICT MUNICIPALITY

eThekwini Metropolitan Municipality

1. SPECIALIST INFORMATION

Specialist name:	TerraAfrica Consult CC		
Contact person:	Mariné Pienaar		
Postal address:	P.O. Box 433, Ottosdal		
Postal code:	2610	Cell:	082 828 3587
Telephone:	082 828 3587	Fax:	N/A
E-mail:	mpienaar@terraafrica.co.za		
Professional affiliation(s) (if any)	SACNASP – Registration No: 400274/10 Soil Science Society of South Africa		
Project Consultant / EAP:			

DECLARATION OF INTEREST BY SPECIALIST

Contact person:			
Postal address:			
Postal code:		Cell:	
Telephone:		Fax:	
E-mail:			

2. DECLARATION BY THE SPECIALIST

I, Mariné Pienaar,

General declaration:

- I act as the independent specialist in this application;
- do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;
- 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 am aware that a person is guilty of an offence in terms of Regulation 48 (1) of the EIA Regulations, 2014, if that person provides incorrect or misleading information. A person who is convicted of an offence in terms of sub-regulation 48(1) (a)-(e) is liable to the penalties as contemplated in section 49B(1) of the National Environmental Management Act, 1998 (Act 107 of 1998).

Mariné Pienaar

Signature of the specialist:

Name of company:

TerraAfrica Consult CC

Date:

31 October 2022

APPENDIX 2 - CURRICULUM VITAE OF SPECIALIST

MARINÉ PIENAAR

Specialist Scientist

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EXPERTISE

Soil Quality Assessment

Soil Policy and Guidelines

Agricultural Agro-Ecosystem Assessment

Sustainable Agriculture

Data Consolidation

Land Use Planning

Soil Pollution

Hydropedology

EDUCATION

MASTER'S DEGREE
Environmental Science
University of Witwatersrand
2010 – 2018

BACHELOR'S DEGREE
Agricultural Science
University of Pretoria
2001 – 2004

PROFESSIONAL PROFILE

I contribute specialist knowledge on agriculture and soil management to ensure long-term sustainability of projects in Africa. For the past thirteen years, it has been my calling and I have consulted on more than 200 projects. My clients include environmental and engineering companies, mining houses, and project developers. I enjoy the multi-disciplinary nature of the projects that I work on and I am fascinated by the evolving nature of my field of practice. The next section provide examples of the range of projects completed. A comprehensive project list is available on request.

PROJECT EXPERIENCE

Global Assessment on Soil Pollution

Food and Agricultural Organisation (FAO) of the United Nations (UN)

Author of the regional assessment of Soil in Sub-Saharan Africa. The report is due for release in February 2021. The different sections included:

- Analysis of soil and soil-related policies and guidelines for each of the 48 regional countries
- Description of the major sources of soil pollution in the region
- The extent of soil pollution in the region and as well as the nature and extent of soil monitoring
- Case study discussions of the impacts of soil pollution on human and environmental health in the region
- Recommendations and guidelines for policy development and capacitation to address soil pollution in Sub-Saharan Africa

Data Consolidation and Amendment

Range of projects: Mining Projects, Renewal Energy

These projects included developments where previous agricultural and soil studies are available that are not aligned with the current legal and international best practice requirements such as the IFC Principles. Other projects are expansion projects or changes in the project infrastructure layout. Tasks on such projects include the incorporation of all relevant data, site verification, updated baseline reporting and alignment of management and monitoring measures.

Project examples:

- Northam Platinum's Booysendal Mine, South Africa
- Musonoi Mine, Kolwezi District, Democratic Republic of Congo
- Polihali Reservoir and Associated Infrastructure, Lesotho
- Kaiha 2 Hydropower Project, Liberia
- Aquarius Platinum's Kroondal and Marikana Mines

MARINÉ PIENAAR

Specialist Scientist

PROFESSIONAL MEMBERSHIP

South African Council for Natural Scientific Professions (SACNASP)

Soil Science Society of South Africa (SSSSA)

Soil Science Society of America (SSSA)

Network for Industrially Contaminated Land in Africa (NICOLA)

LANGUAGES

English (Fluent)

Afrikaans (Native)

French (Basic)

PRESENTATIONS

There is spinach in my fish pond
TEDx Talk
Available on YouTube

♦

Soil and the Extractive Industries
Session organiser and presenter
Global Soil Week, Berlin (2015)

♦

How to dismantle an atomic bomb
Conference presentation (2014)
Environmental Law Association (SA)

PROJECT EXPERIENCE (Continued)

Agricultural Agro-Ecosystem Assessments

Range of projects: Renewable Energy, Industrial and Residential Developments, Mining, Linear Developments (railways and power lines)

The assessments were conducted as part of the Environmental and Social Impact Assessment processes. The assessment process includes the assessment of soil physical and chemical properties as well as other natural resources that contributes to the land capability of the area.

Project examples:

- Mocuba Solar PV Development, Mozambique
- Italthai Railway between Tete and Quelimane, Mozambique
- Lichtenburg PV Solar Developments, South Africa
- Manica Gold Mine Project, Mozambique
- Khunab Solar PV Developments near Upington, South Africa
- Bomi Hills and Mano River Mines, Liberia
- King City near Sekondi-Takoradi and Appolonia City near Accra, Ghana
- Limpopo-Lipadi Game Reserve, Botswana
- Namoya Gold Mine, Democratic Republic of Congo

Sustainable Agriculture

Range of projects: Policy Development for Financial Institutions, Mine Closure Planning, Agricultural Project and Business Development Planning

Each of the projects completed had a unique scope of works and the methodology was designed to answer the questions. While global indicators of sustainable agriculture are considered, the unique challenges to viable food production in Africa, especially climate change and a lack of infrastructure, in these analyses.

Project examples:

- Measurement of sustainability of agricultural practices of South African farmers – survey design and pilot testing for the LandBank of South Africa
- Analysis of the viability of avocado and mango large-scale farming developments in Angola for McKinsey & Company
- Closure options analysis for the Tshipi Borwa Mine to increase agricultural productivity in the area, consultation to SLR Consulting
- Analysis of risks and opportunities for farm feeds and supplement suppliers of the Southern African livestock and dairy farming industries
- Sustainable agricultural options development for mine closure planning of the Camutue Diamond Mine, Angola

MARINÉ PIENAAR
Specialist Scientist

PROFESSIONAL DEVELOPMENT

Contaminated Land Management 101 Training
Network for Industrially Contaminated Land in Africa
2020

Intensive Agriculture in Arid & Semi-Arid Environments
CINADCO/MASHAV R&D Course, Israel
2015

World Soils and their Assessment Course
ISRIC – World Soil Information Centre, Netherlands
2015

Wetland Rehabilitation Course
University of Pretoria
2010

Course in Advanced Modelling of Water Flow and Solute Transport in the Vadose Zone with Hydrus
University of Kwazulu-Natal
2010

Environmental Law for Environmental Managers
North-West University Centre for Environmental Management
2009

PROJECT EXPERIENCE (Continued)

Soil Quality Assessments

Range of projects: Rehabilitated Land Audits, Mine Closure Applications, Mineral and Ore Processing Facilities, Human Resettlement Plans

The soil quality assessments included physical and chemical analysis of soil quality parameters to determine the success of land rehabilitation towards productive landscapes. The assessments are also used to understand the suitability for areas for Human Resettlement Plans

Project examples:

- Closure Planning for Yoctolux Colliery
- Soil and vegetation monitoring at Kingston Vale Waste Facility
- Exxaro Belfast Resettlement Action Plan Soil Assessment
- Soil Quality Monitoring of Wastewater Irrigated Areas around Matimba Power Station
- Keaton Vanggatfontein Colliery Bi-Annual Soil Quality Monitoring

REFERENCES

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APPENDIX 3 – PROOF OF SACNASP REGISTRATION OF SPECIALIST

SACNASP
South African Council for Natural Scientific Professions

herewith certifies that

Mariné Pienaar

Registration Number: 400274/10

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following fields(s) of practice (Schedule 1 of the Act)

Soil Science (Professional Natural Scientist)
Agricultural Science (Professional Natural Scientist)

Effective **20 October 2010** Expires **31 March 2023**

Chairperson

Chief Executive Officer

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