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SOIL. AGRICULTURE. ENVIRONMENT.

Agricultural Scoping Report for the Proposed Soyuz 3 Wind Energy Facility, Northern Cape Province

Submitted by TerraAfrica Consult cc

Mariné Pienaar

30 July 2022

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1. INTRODUCTION

Terra-Africa Consult cc was appointed by Soyuz 3 (Pty) Ltd. to conduct the Agricultural Assessment for the proposed development of a commercial Wind Energy Facility (WEF) and associated infrastructure on a site located approximately 35 km south of Britstown (refer to Figure 1). The proposed site is located within the Emthanjeni Local Municipality and the Pixley ka Seme District Municipality in the Northern Cape Province. The assessment forms part of the Scoping and Environmental Impact Assessment (EIA) process being undertaken for the proposed WEF. The EIA process is managed by CES Environmental and Social Advisory Services (Pty) Ltd. (CES).

Five additional WEF's are concurrently being considered on the surrounding properties and are assessed by way of separate impact assessment processes contained in the 2014 Environmental Impact Assessment Regulations (GN No. R982, as amended) for listed activities contained in Listing Notices 1, 2 and 3 (GN R983, R984 and R985, as amended). These projects are known as Soyuz 1 WEF, Soyuz 2 WEF, Soyuz 4 WEF, Soyuz 5 WEF and Soyuz 6 WEF.

A preferred project site with an extent of approximately 125 000 ha has been identified as a technically suitable area for the development of the six WEF projects. It is proposed that each WEF will comprise of up to 75 turbines with a contracted capacity of up to 480 MW (see Figure 2). It is anticipated that each WEF will have an actual (permanent) footprint of up to 150 ha.

The Soyuz 3 WEF project site covers approximately 23 800 ha and comprises the following farm portions:

- Portion 4 of the Farm No. 143
- Remaining Extent of Portion 1 of the Farm No. 143
- Portion 9 of the Farm Combuisfontein No. 142.
- Portion 8 of the Farm Combuisfontein No. 142
- Portion 4 of the Farm Combuisfontein No. 142
- Portion 3 (a portion of Portion 1) of the Farm Combuisfontein No. 142
- Portion 6 (a portion of Portion 1 – Gemsbokdam) of the Farm Combuisfontein No. 142
- Portion 2 of the Farm Combuisfontein No. 142
- Portion 2 of the Farm No. 2
- Portion 0 of Farm No. 144.
- Portion 1 of the Farm No. 2
- Remaining Extent of the Farm No. 2
- Remaining Extent of Portion 13 of the Farm Welgedagt No. 3

In order to evacuate the energy generated by the WEF to the national grid, a separate Basic Assessment will be undertaken to assess two grid connection alternatives:

- Alternative 1: A 132 / 400kV overhead powerline (OHL) within a 500 m assessment corridor from the Switching Station on site to a proposed new 132 / 400 kV MTS located north of the WEF and adjacent to the Hydra – Kronos 400 kV line.

- Alternative 2: A 132 / 400 kV overhead powerline (OHL) within a 500 m assessment corridor from the Switching Station on site to a proposed new 132 / 400 kV MTS located south of the WEF and adjacent to the Droerivier - Hydra 400 kV line.

The EA applications for the wind farm project and grid connection infrastructure are being undertaken in parallel as they are co-dependent, i.e. one will not be developed without the other.

2. PROJECT DESCRIPTION

The Soyuz 3 WEF project site is proposed to accommodate the following infrastructure, which will enable the wind farm to supply a contracted capacity of up to 480 MW:

- Up to 75 wind turbines with a maximum hub height of up to 160 m and a rotor diameter of up to 200 m;
- A transformer at the base of each turbine;
- Concrete turbine foundations;
- Turbine, crane and blade hardstands;
- Temporary laydown areas (with a combined footprint of up to 14 ha) which will accommodate the boom erection, storage and assembly area;
- Battery Energy Storage System (with a footprint of up to 5 ha);
- Cabling between the turbines, to be laid underground where practical;
- Two on-site substations with a combined footprint of up to 4 ha in extent to facilitate the connection between the wind farm and the electricity grid;
- Access roads to the site and between project components inclusive of stormwater infrastructure. A 12 m road corridor may be temporarily impacted upon during construction and rehabilitated to 6m wide after construction. The WEF will have a total road network of up to 125 km.
- A temporary site camp establishment and concrete batching plants (with a combined footprint of up to 2 ha); and
- Operation and Maintenance buildings (with a combined footprint of up to 2 ha) including a gate house, security building, control centre, offices, warehouses, a workshop and visitor’s centre.

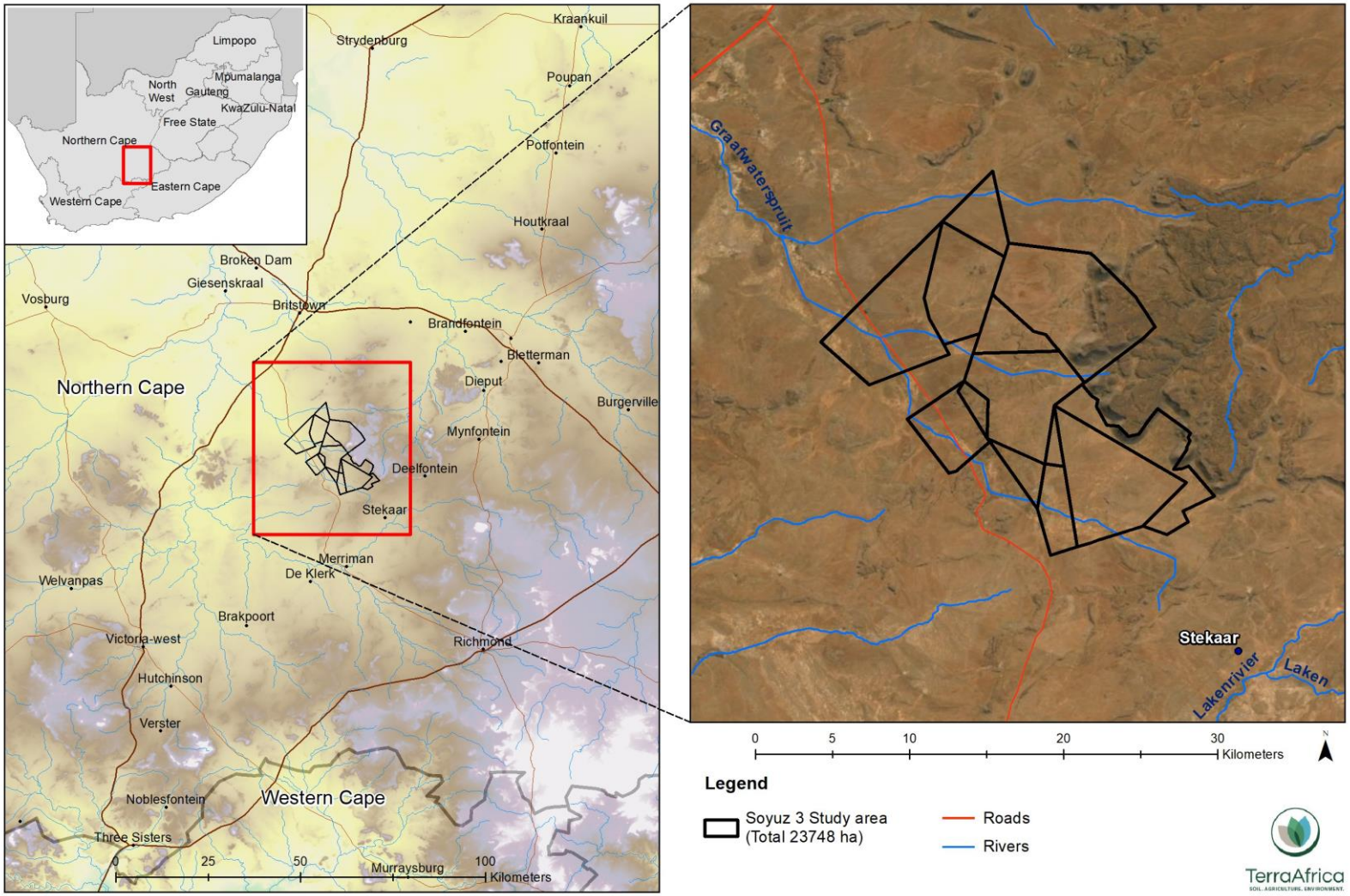


Figure 1: Locality of the Soyuz 3 WEF Project Site

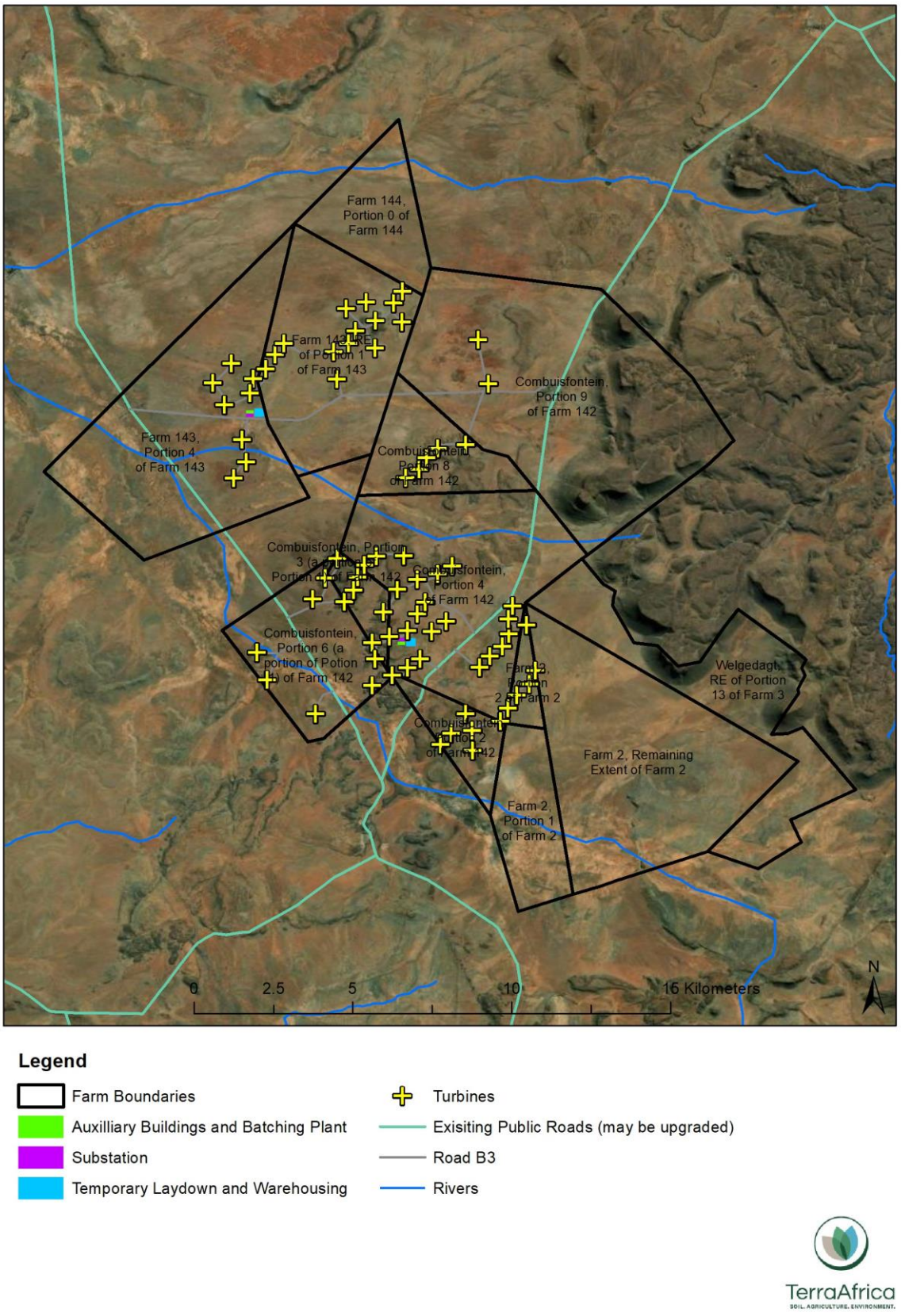


Figure 2: Preliminary infrastructure layout (actual footprint) of the proposed Soyuz 3 WEF Project

3. DETAILS OF THE SPECIALIST

This report has been 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). 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.

The full details and contact details of the specialist is attached as Appendix B: Curriculum Vitae of Specialist.

4. TERMS OF REFERENCE

The terms of reference applicable to the soil and agricultural potential scoping assessment include the following:

- Conduct a desktop assessment of the baseline soil and agricultural properties for the proposed project site
- Identify site sensitivities to the proposed project pertaining to the soil properties, associated land capabilities and the agricultural potential of the project site following the analysis of desktop data.
- Determine whether the proposed Soyuz 3 WEF project site falls within any High Potential Agricultural Areas of the Northern Cape Province.
- Provide preliminary site sensitivity ratings and identify initial no-go areas for the infrastructure associated with the proposed projects.
- Identify potential impacts that will be caused by the project and that will have to be assessed as part of the impact assessment phase.
- Identify a plan of study that will include the methodology to be followed during the detailed soil and agricultural potential impact assessment that will form part of the final EIA report that will be submitted.
- Comply with the Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more, gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

5. METHODOLOGY

The proposed Soyuz 3 WEF project site boundaries were superimposed on five data sets to describe high-level baseline characteristics and to determine the anticipated sensitivities of the properties to the development. The data sets are:

- Land type data for the project assessment zone which 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 assumption that the veld is in a relatively good condition (South Africa, 2018).
- The Northern Cape Field Crop Boundaries show crop production areas which 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: Northern Cape 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).

6. RESULTS OF DESKTOP ASSESSMENT

6.1 Land type classification

The project site of the proposed Soyuz 3 WEF project, consists of ten different land types i.e. Land Type Ae297, Ae298, Da140, Db213 and 214, Fc615, Ib 385, 386 and 389, and Ic162. Land Types Ae297 and 298 occur in a wide vertical strip along the middle section of the project site. Two areas of Land Type Ib386 is present on the eastern side of the Ae land types. Land Type Fc615 is present on Portion 0 of Farm 144 as well as along the far western boundary of Portion 4 of Farm 143. Land Type Db213 is also present on Portion 4 of Farm 143.

The eastern half of the project site consists largely of Land Type Da139 except along the eastern boundary and the far southern corner. The eastern boundary consists of shallow, rocky soils represented by Land Types Ic162 and Ib389. The far southern corner of the eastern half of the project site consists of Land Types Da140 and Db214.

Each of the land type groups present are described below:

- **"**Ae**"** land types represent areas with mostly red soils without water tables. These red soils are deeper than 0.3m with high base status and there is an absence of dunes in the landscape.

- **"**Da**"** land types include land where duplex soils are dominant. While Da land types refer to land where the colour of the B horizon of these soils is red.

- "Db" land types are also dominated by duplex soils but have non-red (yellow and brown) soil colours in the B horizon.

- "Fc" land types accommodate pedologically young landscape where soil formation has resulted in the development of orthic topsoil and clay illuviation has resulted in lithocutanic horizons. Lime occurs regularly in both upland and valley bottom soils.

- “Ib” land types represent areas where exposed rock, stones and boulders cover between 60 and 80% of the area.

- “Ic” land types refers to land types with exposed rock (including exposed country rock, stones, or boulders) that cover more than 80% of the area.

The position of the land types within the project site, is shown in **Figure 3**.

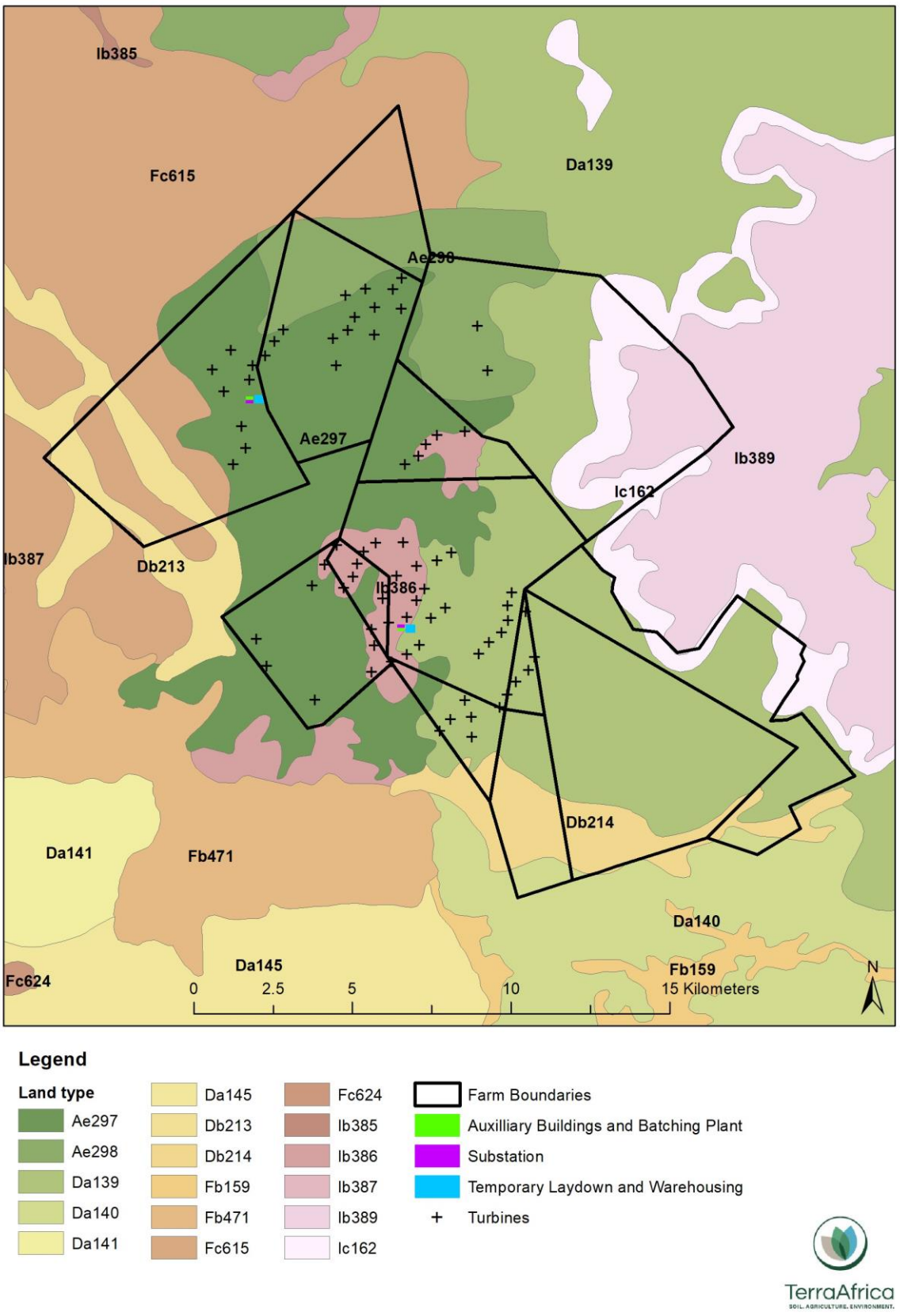


Figure 3: Land type map of the proposed Soyuz 3 WEF project site

6.2 Land capability classification

The land capability classification of the proposed Soyuz 3 WEF project site according to the DALRR raster data (DALRRD, 2016), is shown in **Figure 4**.

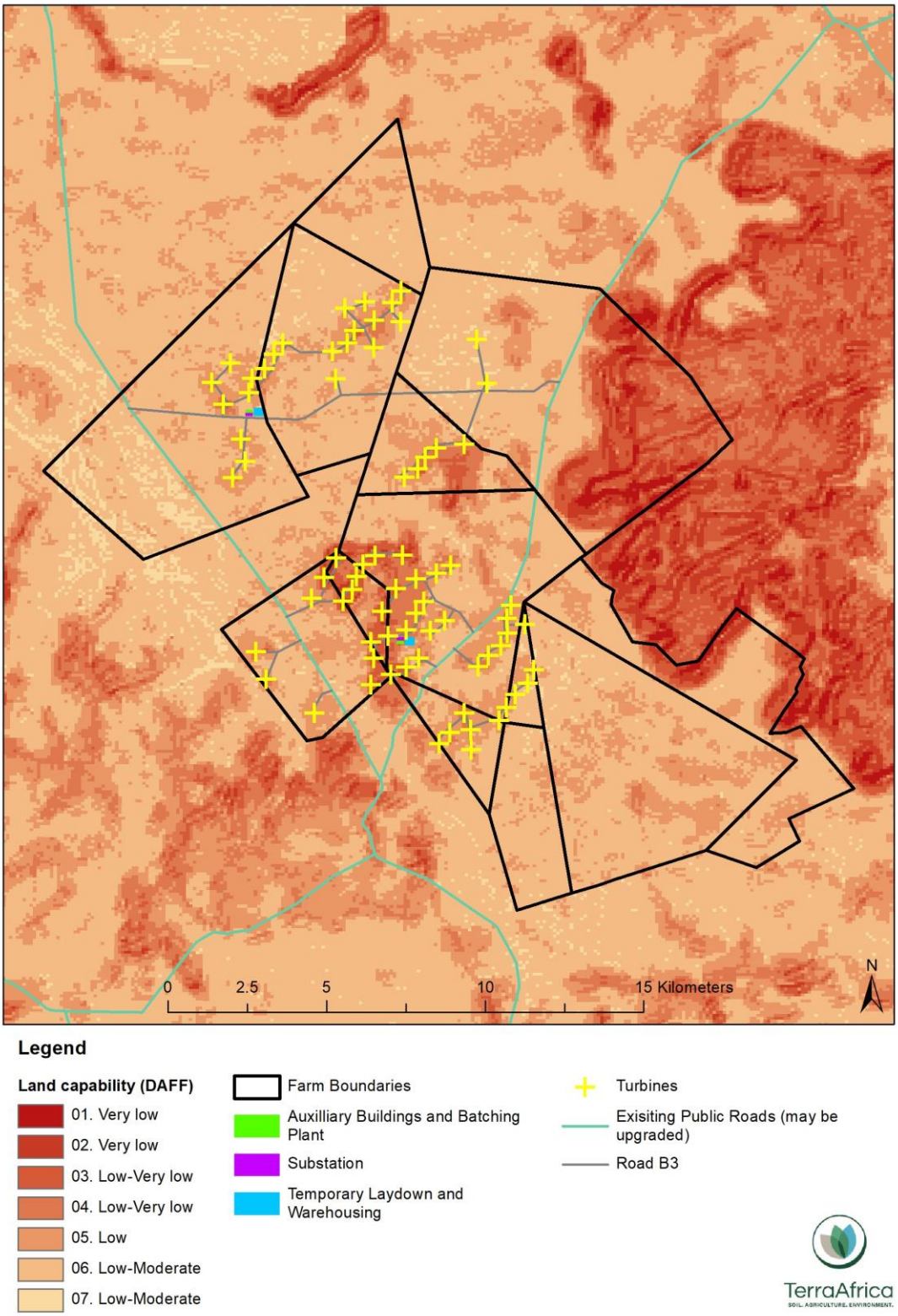


Figure 4: Land capability map of the proposed Soyuz 3 WEF project site (data source: DALRRD, 2016)

The land capability classification of the Soyuz 3 WEF project site shows that the site is only suitable for livestock farming and not suitable for rainfed crop production. The site consists of seven different land capability classes ranging from **Very low** (Class 01) to **Low-Moderate** (Class 07). The lowest land capability classes are located along the eastern boundary of the project site, mainly on Portion 9 of Farm Combuisfontein 142. The low land capability of this area is because of the exposed rock that is present at 60% or more of the surface. Portion 8 of the Farm Combuisfontein No. 142 and Portion 3 (a portion of Portion 1) of the Farm Combuisfontein No. 142 also consists mainly of Low to Very low land capability.

The remaining areas consist mainly of **Low-Moderate** (Class 06) land capability. The highest land capability class (Class 07 Low-Moderate) is present in two narrow strips along the western part of Portion 4 of Farm 143 and is associated with the surface water flow paths of this area. Other very small areas of Low-Moderate (Class 07) land capability is scattered throughout on mainly the northern properties of the project site.

6.3 Agricultural production

According to the Crop Estimates Consortium (2019), the Soyuz 3 WEF project site has three very small, isolated areas with field crop boundaries present (see **Figure 5**). According to the data, the field crops of all three these areas consist of rainfed grain crops or planted pastures (Crop Estimates Consortium, 2019). The three areas are located on the following properties:

- Portion 4 of Farm 143
- Portion 9 of Farm Combuisfontein 142
- Remaining Extent of Farm 2

There are no areas with irrigated crops within the entire project site (Crop Estimates Consortium, 2019). A few very small, scattered fields of rainfed crops or planted pastures are located between 3 and 30 km north, east, west and south of the project site boundaries. Apart from the three isolated small crop field areas, the rest of the project site is used for livestock grazing or otherwise left derelict where drought in the past decade has forced farmers to reduce or stop livestock production.

The grazing capacity of the largest part of the Soyuz 3 WEF project site is 24ha/LSU (**Figure 6**). Land with higher grazing capacity is present along the southern boundary of the site where the grazing capacity is 20ha/LSU. The project site of 23 748 ha therefore has the capacity to feed between 990 and 1187 head of cattle. Land with grazing capacity of between 20 to 24ha/LSU is considered to have low to low-moderate grazing potential. It is much lower than the wetter, eastern parts of the country such as Mpumalanga where the grazing capacity ranges from 4 to 6 ha/LSU or the Kalahari region where the grazing capacity in ranges between 11 and 17 ha/LSU. It is only the grazing capacity of very dry areas such as the Karoo that is much lower than that, with some areas having grazing capacity as low as 70ha/LSU.

It must be noted that the Britstown area has experienced crippling drought during the past decade and that the actual grazing capacity of the project site may currently be much lower after the prolonged drought has forced farmers to graze whatever vegetation was left, thereby increasing the risk of land degradation.

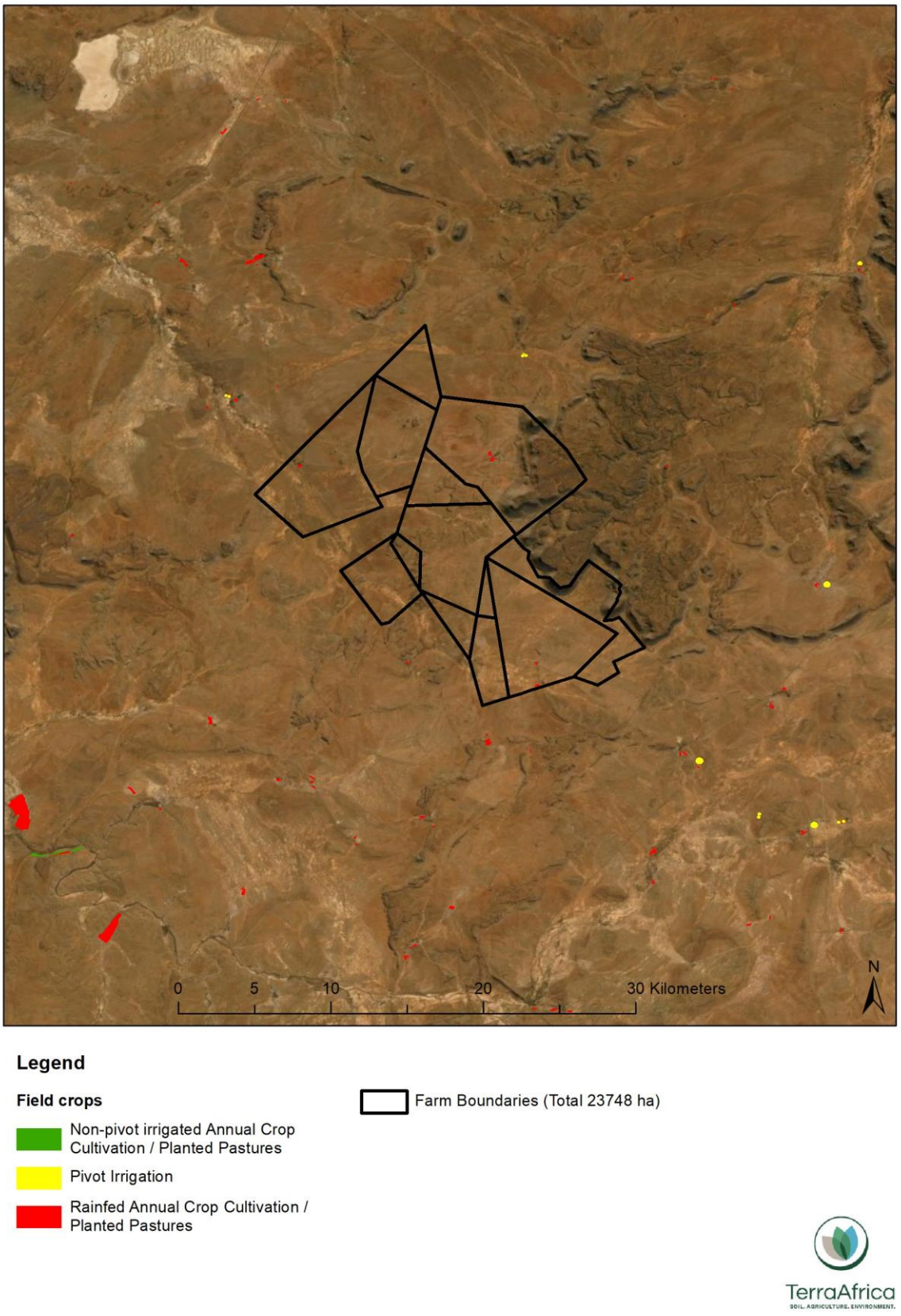


Figure 5 Field crop boundaries within and around the proposed Soyuz 3 WEF project site (data source: Crop Estimates Consortium, 2019)

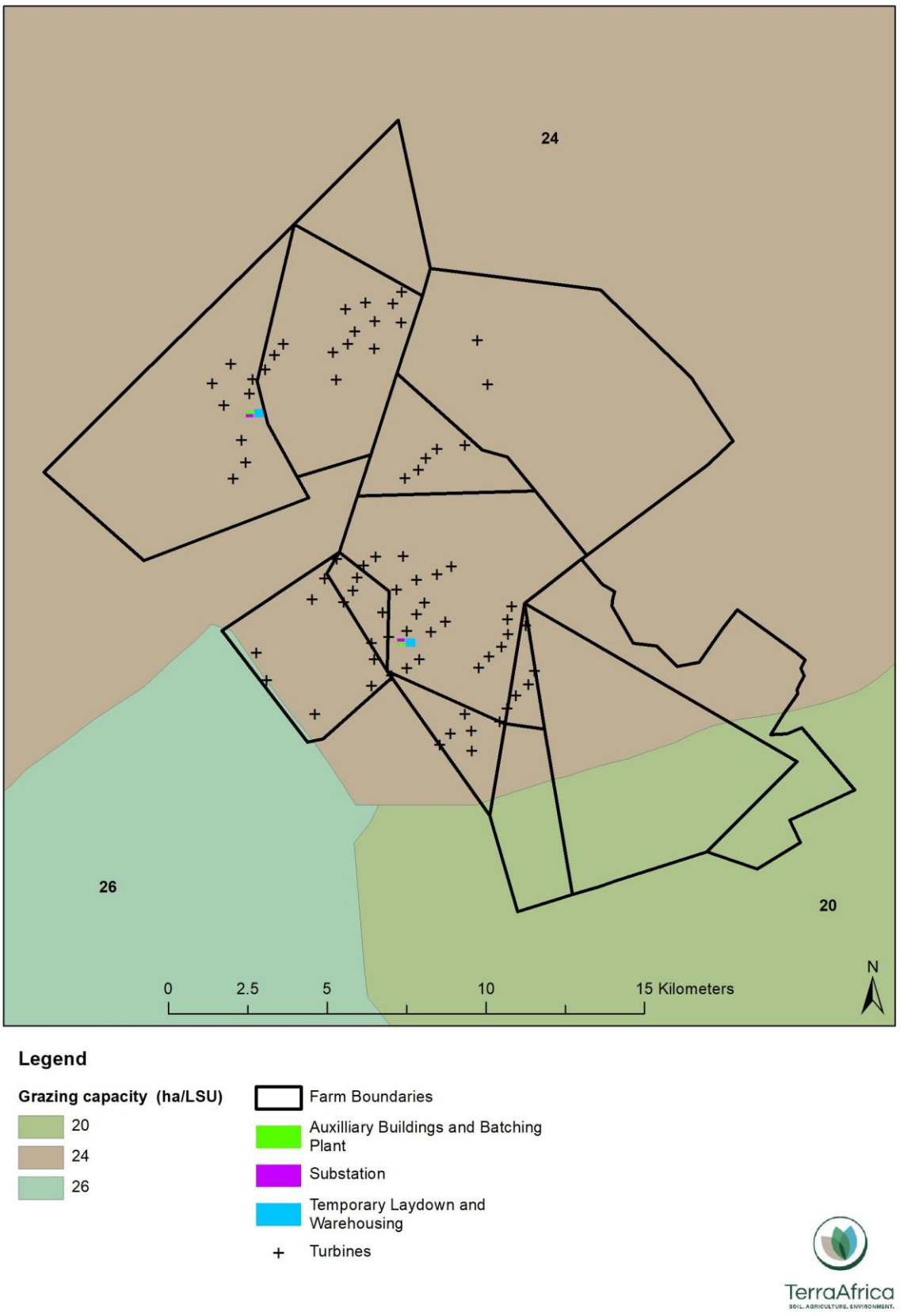


Figure 6 Grazing capacity of the proposed Soyuz 3 WEF project site (data source: South Africa, 2018)

Figure 7 The development areas of the proposed Soyuz 3 WEF project site in relation to High Potential Agricultural Areas (DALRRD, 2019)

5.4 High Potential Agricultural Areas

To determine whether the proposed Soyuz 3 WEF project site will affect any High Potential Agricultural Areas (HPAAs) delineated within the Northern Cape Province, the development areas were depicted in relation to these areas (see **Figure 7**). Category A areas have the highest priority for conservation, followed by Category B areas and then Category C areas. Differentiation is also made between areas with irrigated and rainfed agriculture. Although large areas are delineated as HPAAs, not all within the area may be used for irrigated agriculture.

The results show that the entire project does not overlap with any HPAA. The nearest HPAA is the Smart Syndicate PAA, a Category B Irrigation area, that is located about 45 km northwest of the project site.

7. PRELIMINARY SENSITIVITY ANALYSIS

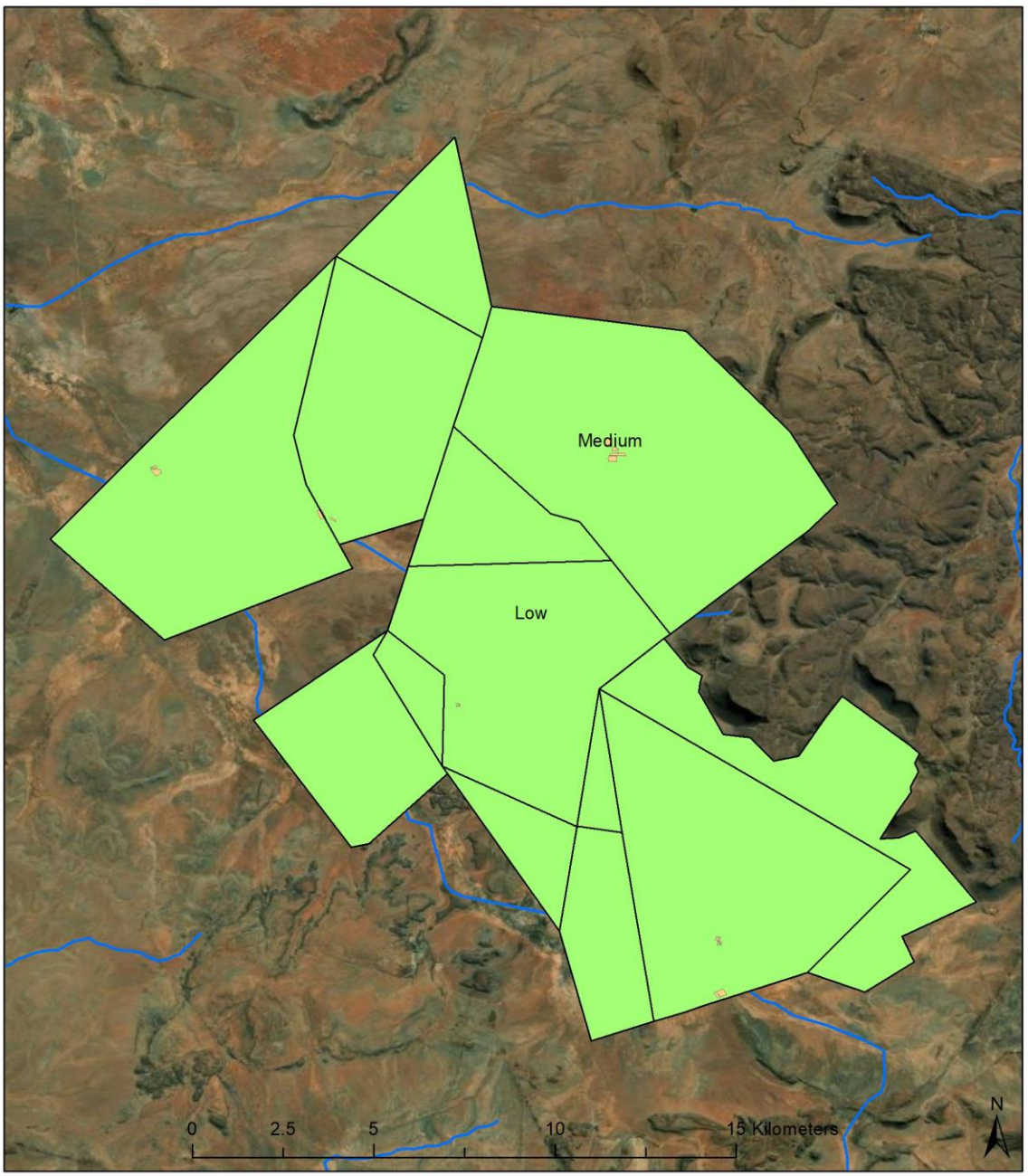
Considering the desktop data discussed in **Section 5** above, the site has been assigned a preliminary sensitivity rating (see **Figure 8**). The assigned sensitivity rating is compared to the agricultural sensitivity as depicted in the screening tool report (refer to **Figure 9**).

Almost the entire project site (99.9% of it), consists of land with Low agricultural sensitivity to the proposed development. The remaining 23.8 ha (or 0.1% of the project site) has Medium agricultural sensitivity. The sensitivity rating was assigned using the land capability classification that indicates land with suitability for livestock farming only (Class 07 or lower) as well as the absence of crop fields, except for two small areas. The low grazing capacity of the area (20 to 24 ha/LSU) was also considered in the assignment of the agricultural sensitivity.

The sensitivity rating agrees only to some extent with the agricultural sensitivity rating in the screening tool report (see **Figure 9**). The screening tool report has assigned a larger area of land a Medium sensitivity rating intersperse with smaller areas of Low sensitivity. These areas have likely been assigned higher sensitivity as a result of the land capability of Low-Moderate (Class 06) of these areas according to DALRRD (2016). The screening tool report has assigned High sensitivity to the three areas of crop fields.

However, the higher ratings of the agricultural sensitivity depicted in the screening tool report are considered an overestimate of the agricultural potential of the area. The larger area that includes the project site, has experienced periods of severe drought the past decade that has resulted in overgrazing and land degradation that forced farmers to reduce livestock numbers that affect the viability of their farming operations.

During the detailed study for the EIA phase, the sensitivity rating of each facility's development area, will be refined based on the soil classification and verified land capability of the area.



Legend

Sensitivity

Medium (23.8 ha)

Low (23723.8 ha)

Farm Boundaries (Total 23748 ha)

Rivers

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Figure 8 Agricultural sensitivity of the proposed Soyuz 3 WEF project site

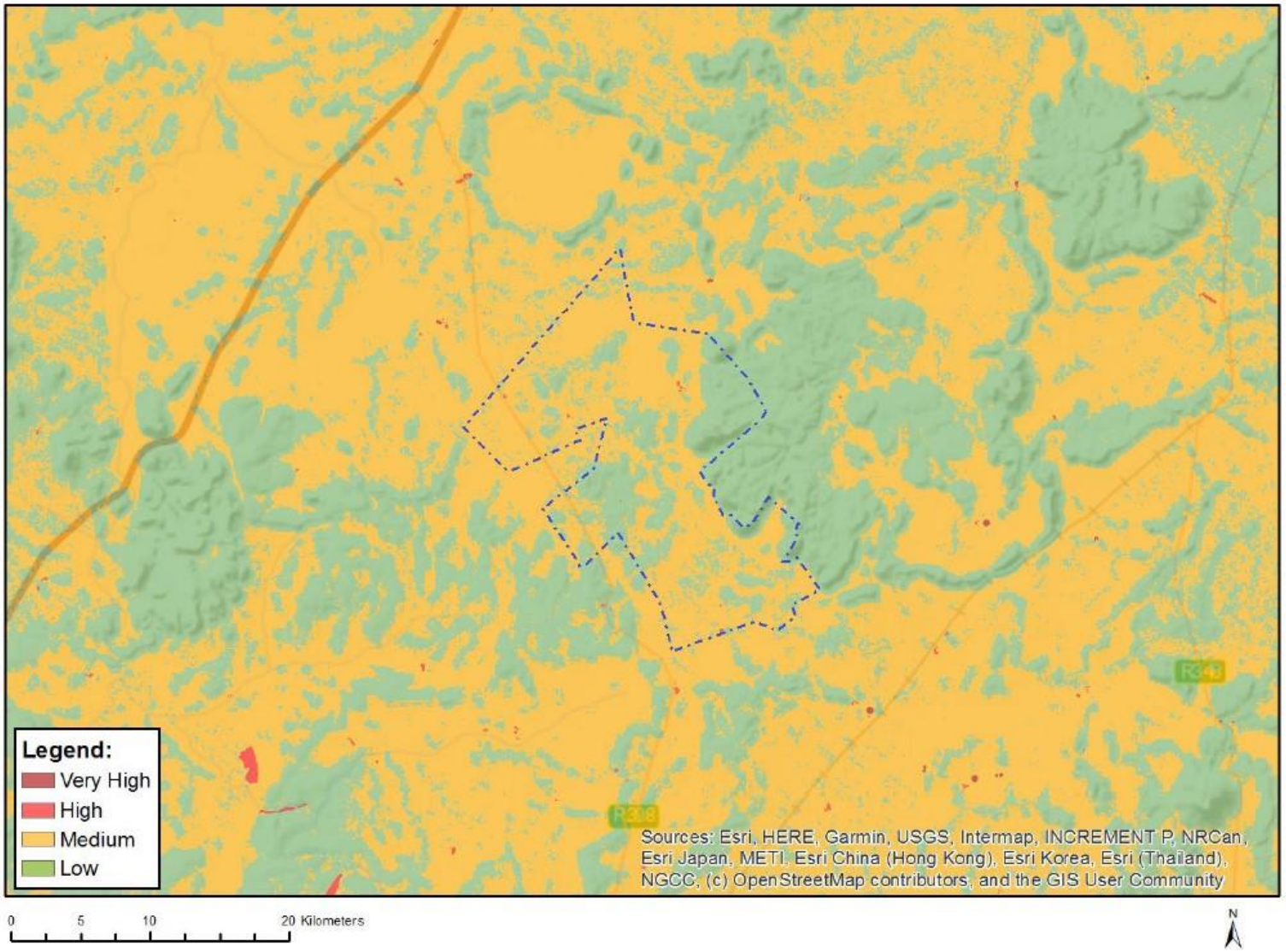

Figure 9 Agricultural combined sensitivity of the north-western part of the proposed Soyuz 3 WEF project site and surrounding area (Screening Tool Report, 2022)

8. POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

Below follows a description of the potential impacts anticipated for the proposed Soyuz 3 WEF project:

8.1 Potential impacts on agricultural production

Impact Loss of areas of grazing areas where livestock can be produced			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Areas where the wind turbines and other infrastructure will be constructed, will no longer be available for livestock production.	Negative	Local	None
Description of expected significance of impact The sites have largely Low-Moderate land capability and are used for livestock production. The expected significance of this impact is Low to Medium.			
Gaps in knowledge & recommendations for further study The final layout of the infrastructure, especially the need for additional access roads, will determine the size of the areas to be lost. Once the final layout is available, the impacts can be assessed in detail.			

8.2 Potential impacts on soil

Impact Soil compaction			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Soil compaction will occur wherever construction vehicles and equipment will traverse the site and where the wind turbines and other long-term infrastructure will be erected.	Negative	Local	None
Description of expected significance of impact Wherever the impact occurs (where heavy vehicles traverse) the impact is expected to be of Medium significance during the construction phase. Once construction is finalised, areas that are affected by compaction outside of the development footprint, must be rehabilitated.			
Gaps in knowledge & recommendations for further study The exact footprint will be determined for the EIA phase and it is recommended that existing roads be used for the transport of equipment as far as possible to limit soil compaction.			

Impact: Soil erosion

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Wherever construction activities will result in bare soil surfaces, these surfaces prone to loss of soil particles as a result of wind and water movement	Negative	Local	None
Description of expected significance of impact The impact is expected to be of medium significance.			
Gaps in knowledge & recommendations for further study Soil texture and soil organic carbon analysis results of the EIA phase will be used to calculate the erodibility of soils within the development footprint.			

Impact: Loss of soil fertility through disturbance of in situ horizon organisation			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
In any area where topsoil will be stripped for construction purposes, the soil horizons will be mixed and the mixture may have lower soil fertility than before it was stripped.	Negative	Local	None
Description of expected significance of impact Low to moderately low significance			
Gaps in knowledge & recommendations for further study The final results of the EIA phase soil classification survey will be used to develop guidelines for topsoil stripping and stockpile management during the construction phase.			

Impact: Soil chemical pollution			
Issue	**Nature of Impact**	**Extent of Impact**	**No-Go Areas**
Oil and fuel spillages as well as waste generation during the project cycle will result in soil chemical pollution.	Negative	Local	None
Description of expected significance of impact The significance of this impact is moderate to high.			
Gaps in knowledge & recommendations for further study The only knowledge gap is a project description that includes detail of activities and materials that may result in soil pollution during the different project phases.			

9. PLAN OF STUDY

Once the infrastructure layout has been refined based on the recommendations of this report and other reports, the site visit will be conducted for the purpose of on-site verification. The survey will include soil classification according to the Soil Classification: A Natural and Anthropogenic System for South Africa (Soil Classification Working Group, 2018).

The landowners and/or land users will be consulted individually for discussion of the productivity and employment data associated with the areas that will impacted by the proposed

development. For properties where farmers have reduced or stopped livestock farming, the discussion will also address the reasons for this change, as well as the limitations and risks of livestock production in the area in order to compare it to renewable energy production. This will be used to consider the acceptability of the project.

The reports will be prepared in alignment with all the relevant NEMA regulations as well as General Notice 320 of 2020 that specifically addresses Agricultural Compliance reporting for the renewable energy sector.

10. CONCLUSION

Following the desktop analysis of available data, it is concluded that the proposed development, will affect mostly land with **Low agricultural sensitivity**. The only exception is three areas where crop field boundaries are present. Those areas have been classified as Medium sensitivity. The combined areas delineated as Medium sensitivity measure 23.8 ha. No no-go areas have been identified for the proposed project from the perspective of soil and agricultural resource conservation. None of the proposed development areas overlap with delineated High Potential Agricultural Areas within the larger area where the projects will be located.

It is anticipated that the proposed project will have limited impact on the soil properties and land capability while the land use will change from livestock farming to generation of renewable energy only in the areas where the permanent footprint (surface infrastructure) will be established. The detailed assessment and subsequent reporting will provide in-depth detail on all these aspects.

It is therefore my professional opinion, that from a soil and agricultural perspective, the proposed Soyuz 3 WEF can proceed to the impact assessment phase as there are no fatal flaws. At this stage, (the Scoping Phase), the development is considered an acceptable project for the area.

11. LIST OF REFERENCES

Crop Estimates Consortium, 2019. *Field crop boundary data layer (NC province)*, 2019. Pretoria. Department of Agriculture, Forestry and Fisheries.

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The Soil Classification Working Group, 2018. *Soil Classification – Taxonomic System for South Africa.* Dept. of Agric., Pretoria.

APPENDIX A: DECLARATION OF INDEPENDENCE

1. SPECIALIST INFORMATION

Specialist Company Name:	TerraAfrica Consult CC			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	100%
Specialist name:	Mariné Pienaar			
Specialist Qualifications:	MSc. Environmental Science (Wits) ; BSc. (Agric) Plant Production (UP)			
Professional affiliation/registration:	SACNASP Registration No:400274/10 Soil Science Society of South Africa ; IAIAsa			
Physical address:	Farm Strydpoort 403, Ottosdal, 2610			
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			

2. DECLARATION BY THE SPECIALIST

I, Mariné Pienaar, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

TerraAfrica Consult

Name of Company:

2022-07-08

Date

APPENDIX B: CURRICULUM VITAE OF SPECIALIST

MARINÉ PIENAAR

Specialist Scientist

+2782-828-3587

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linkedin.com/in/marinepienaar

Wolmaransstad,
South Africa

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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