COMPLIANCE STATEMENT FOR C-N014-08 N14 AKKERBOOM, NORTHERN CAPE

PREPARED FOR

ZERO CARBON CHARGE

AUGUST 2023

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TABLE OF CONTENTS

List of Figures

BACKGROUND TO THE STUDY

Zero Carbon Charge aims to build a national network of charging stations for Electric vehicles (EV), approximately 150 km apart, covering all the strategic highways and major routes in South Africa. Zero Carbon Charge will utilize wind and solar plants, consequently making the charging stations independent of the national electricity grid.

Digital Soils Africa (Pty) LTD (DSA) were tasked by Enviro Africa, on behalf of Zero Carbon Charge, to undertake an Agricultural Compliance Statement for the Environmental Authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), Environmental Impact Assessment ("EIA") Regulations, 2014. As per GN960 of 2019, read with Section 24(5)(a) of the NEMA, an Environmental Screening Report (ESR) was generated for the application using the National Web-based Screening Tool. The ESR classifies the area as being of High sensitivity for the Agricultural theme. The medium sensitivity for the Agricultural theme.

The Compliance Statement is reported according to the protocol for the specialist assessment and minimum report content requirements for the environmental impacts on agricultural resources (GN320 of 2020).

The proponent intends to establish a farmstall with parking area, solar photovoltaic (PV) energy generation plant, charging facilities for electric vehicles (EV), energy storage battery units and associated structures on N14 (Figure 1). The solar panels' generated power (approximately 7 MW) will be transmitted to the associated battery storage units and EV charging facilities.

Lithium batteries will be utilised to store the generated electricity. The lithium will be stored within 15 m^3 batteries (approximate total storage capacity) which will be housed inside containers along with the other energy management equipment. The electricity transmission cable will be less than 2 kilometres in length from the renewable energy generation plant to the EV charging facilities. The renewable energy generation plant will have an electricity output of less than 1 megawatts and the transmission cable will have a capacity of approximately 1 kilovolt.

The farmstall with parking area, renewable energy generation plant, energy storage batteries and associated structures will cover an area of 7 ha. The electricity generated from the renewable energy generation plant will be used to charge EV's at charging facilities situated on the N7. The charging facilities cam accommodate approximately 6 cars.

The study site is along the N14 to the south-west of Upington, in the Northern Cape.

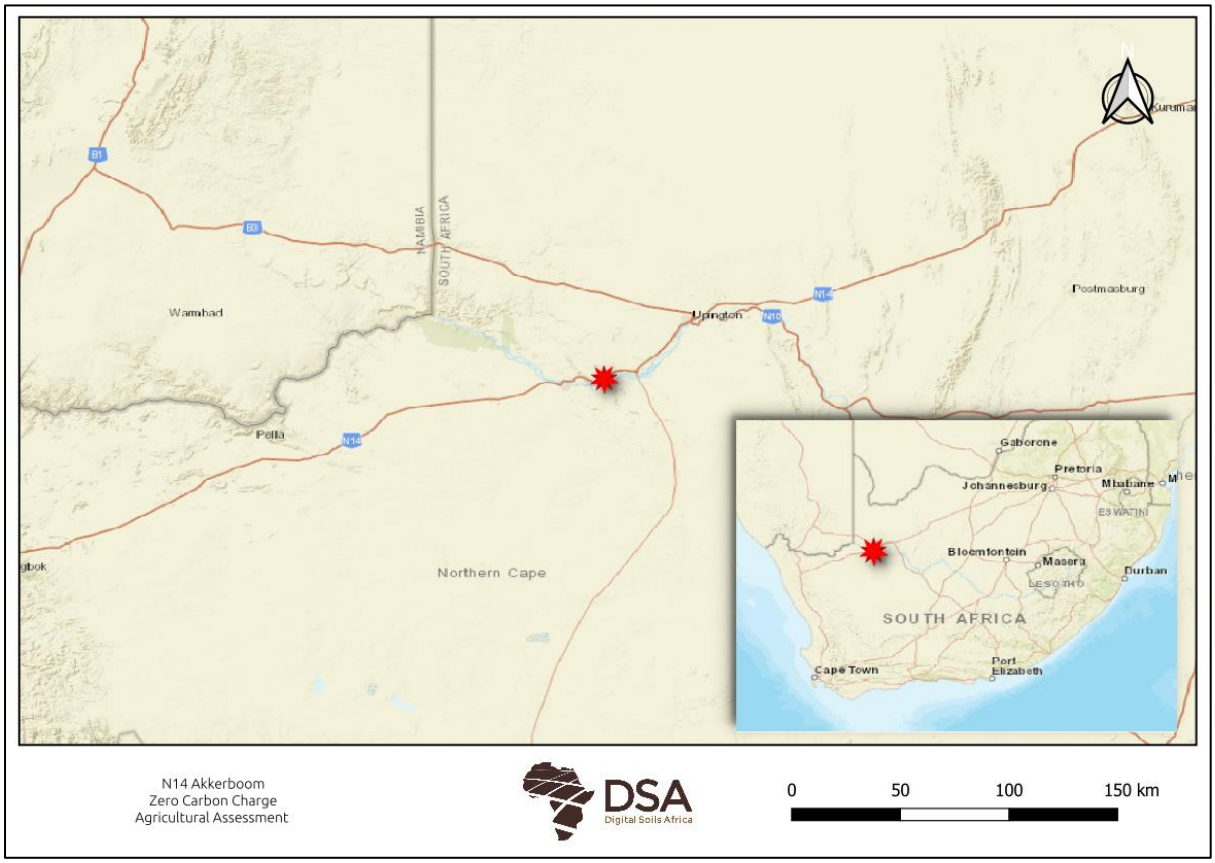


FIGURE 1: LOCATION OF THE STUDY AREA IN THE NORTHERN CAPE PROVINCE.

APPLICABLE LEGISLATION AND PERMIT REQUIREMENTS

A renewable energy facility requires approval from the National Department of Agriculture, Land Reform and Rural Development (DALRRD) if the facility is on agriculturally zoned land.

There are two approvals that apply:

Firstly, a No Objection Letter for the change in land use. This letter is one of the requirements for receiving municipal rezoning. It is advisable to apply for this as early in the renewable development process as possible because not receiving this DALRRD approval is a fatal flaw for a project. Note that a positive EA does not assure DALRRD's approval of this. This application requires a motivation backed by good evidence that the development is acceptable in terms of its impact on the agricultural production potential of the development site. This assessment report will serve that purpose.

Secondly, a consent for long-term lease in terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA). If DALRRD approval for the development has already been obtained in the form of the No Objection letter, then SALA approval should not present any difficulties. Note that SALA approval is not required if the lease is over the entire farm portion. SALA approval (if

required) can only be applied for once the Municipal Rezoning Certificate and Environmental Authorisation has been obtained.

Rehabilitation after disturbance to agricultural land is managed by the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA). Consent in terms of CARA is required for the cultivation of virgin land. Cultivation is defined in CARA as "any act by means of which the topsoil is disturbed mechanically". The purpose of this consent for the cultivation of virgin land is to ensure that only land that is suitable as arable land is cultivated. Therefore, despite the above definition of cultivation, disturbance to the topsoil that results from the construction of a renewable energy facility and its associated infrastructure does not constitute cultivation as it is understood in CARA. The construction and operation of the facility will therefore not require consent from the Department of Agriculture, Land Reform and Rural Development in terms of this provision of CARA.

ENVIRONMENTAL SCREENING TOOL

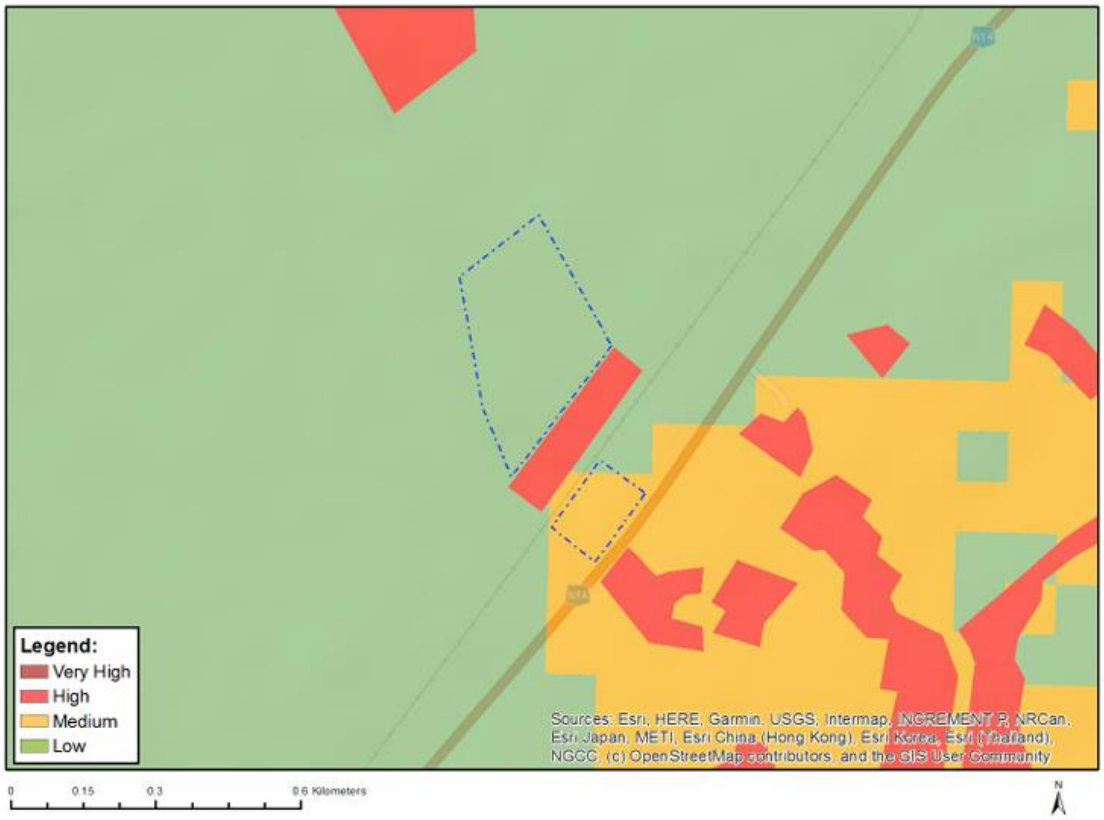
Agricultural sensitivity, as reported in the screening tool, is based upon the land use (SANLC, 2014) and land capability (Department of Agriculture, Forestry and Fisheries, 2017, also referred to as DAFF, 2017).

All cultivated land is considered a high sensitivity, while irrigation and unique crops, are considered very high sensitivity, irrespective of the land capability. The land use in the screening tool is based on the South African Nation Land Cover (SANLC, 2014). Meanwhile, there have been two more updated versions of the South African National Land Cover (2018 and 2020).

According to the Department of Agriculture, Forestry and Fisheries (2017), land capability is defined as the most intensive long-term use of land for purposes of rainfed farming determined by the interaction of climate, soil, and terrain. The following weight was given to each attribute when calculating the Land Capability:

Land capability = Climate (40%) + Terrain (30%) + Soil (30%)

According to the National Web based Environmental Screening Tool, the agricultural sensitivity is classified as medium agricultural sensitivity (Figure 2). The land capability (DAFF, 2017) classifies the soils as having a low to medium land capability (Figure 3). There are no cultivated crops on the site according to the screening tool (Figure 4).



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

FIGURE 2: RESULTS FROM THE ENVIRONMENTAL SCREENING TOOL.

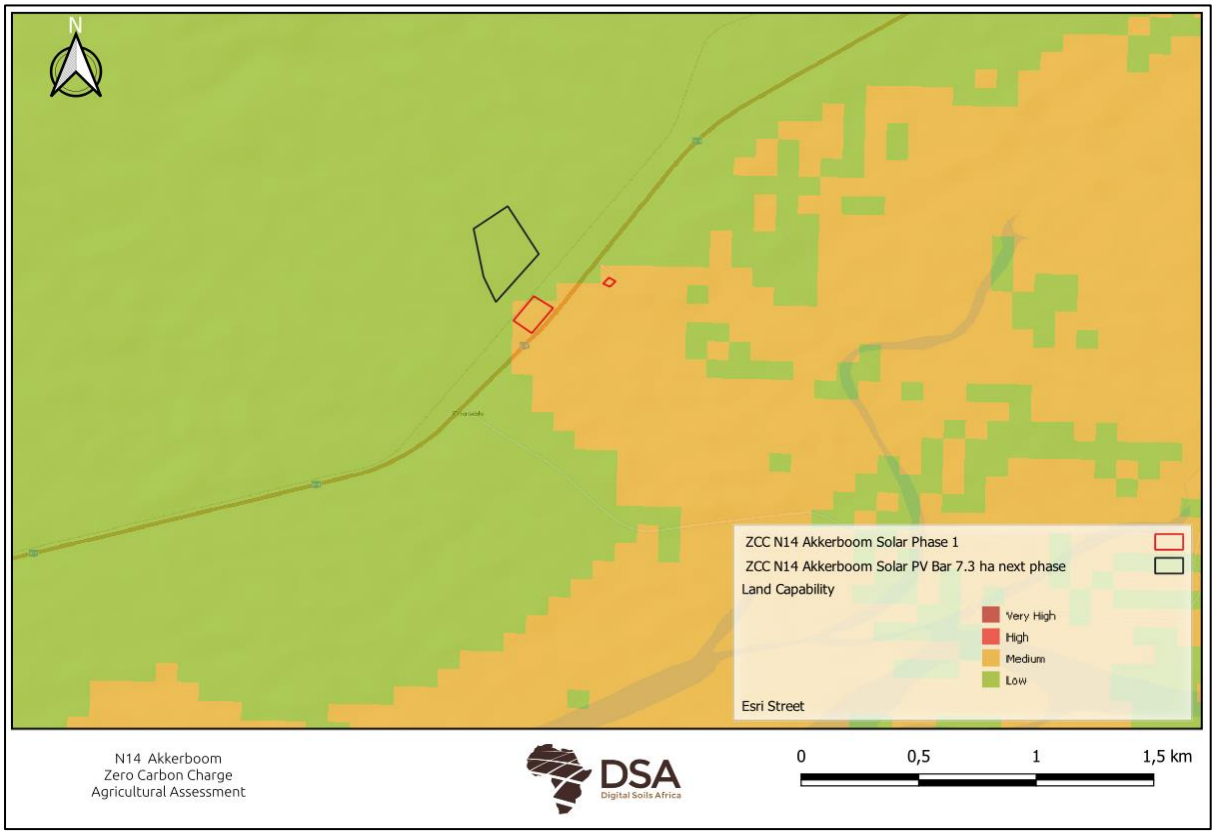


FIGURE 3: THE LAND CAPABILITY OF THE STUDY AS USED IN THE SCREENING TOOL.

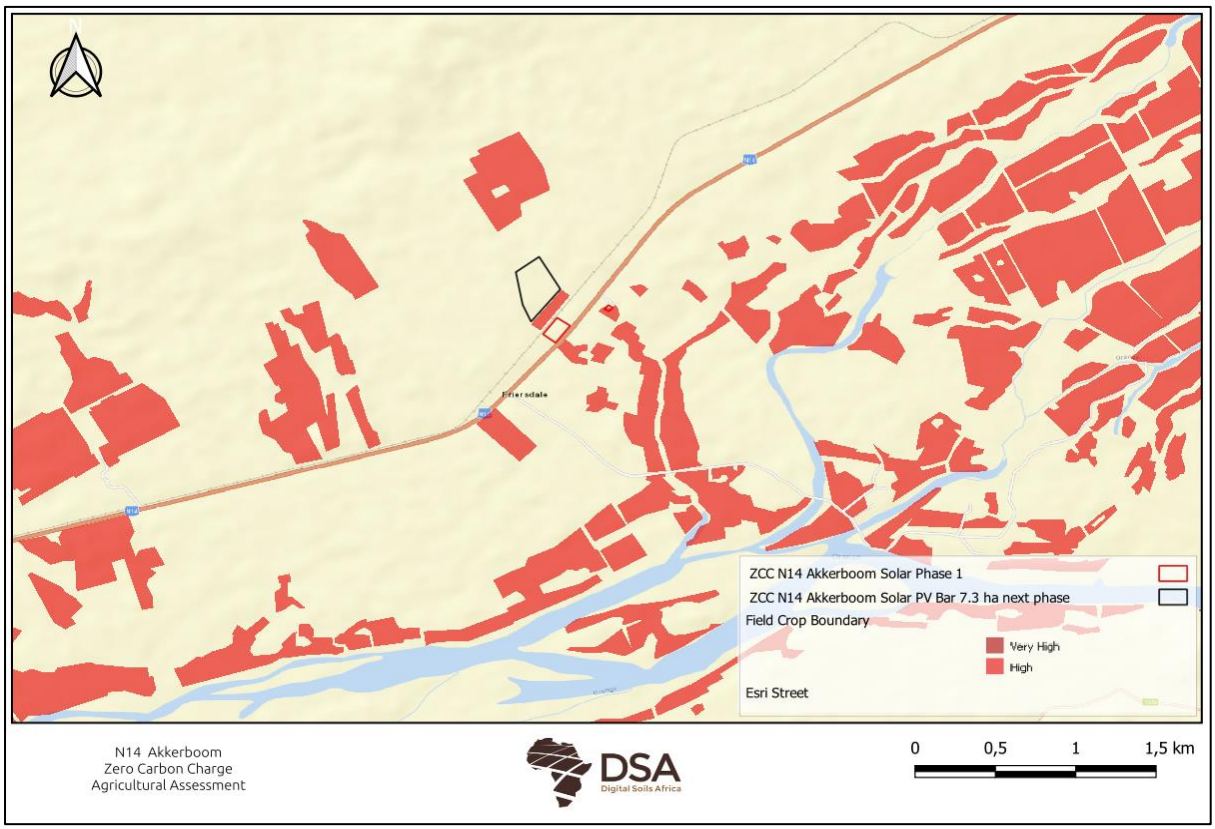


FIGURE 4: THE FIELD CROP BOUNDARIES AS USED IN THE SCREENING TOOL.

Preservation and Development of Agricultural Land Framework Act (PD-ALF) is in the process of being published. The new statutory framework will replace the Subdivision of Agricultural Land Act, Act 70 of 1970.

Protected Agricultural Area, as in the draft framework, is defined as *"an agricultural land use zone, protected for purposes of food production and ensuring that high potential and best available agricultural land are protected against non-agricultural land uses in order to promote long-term agricultural production and food security."*

The study area is not situated in a Protected Agricultural Area (Figure 5).

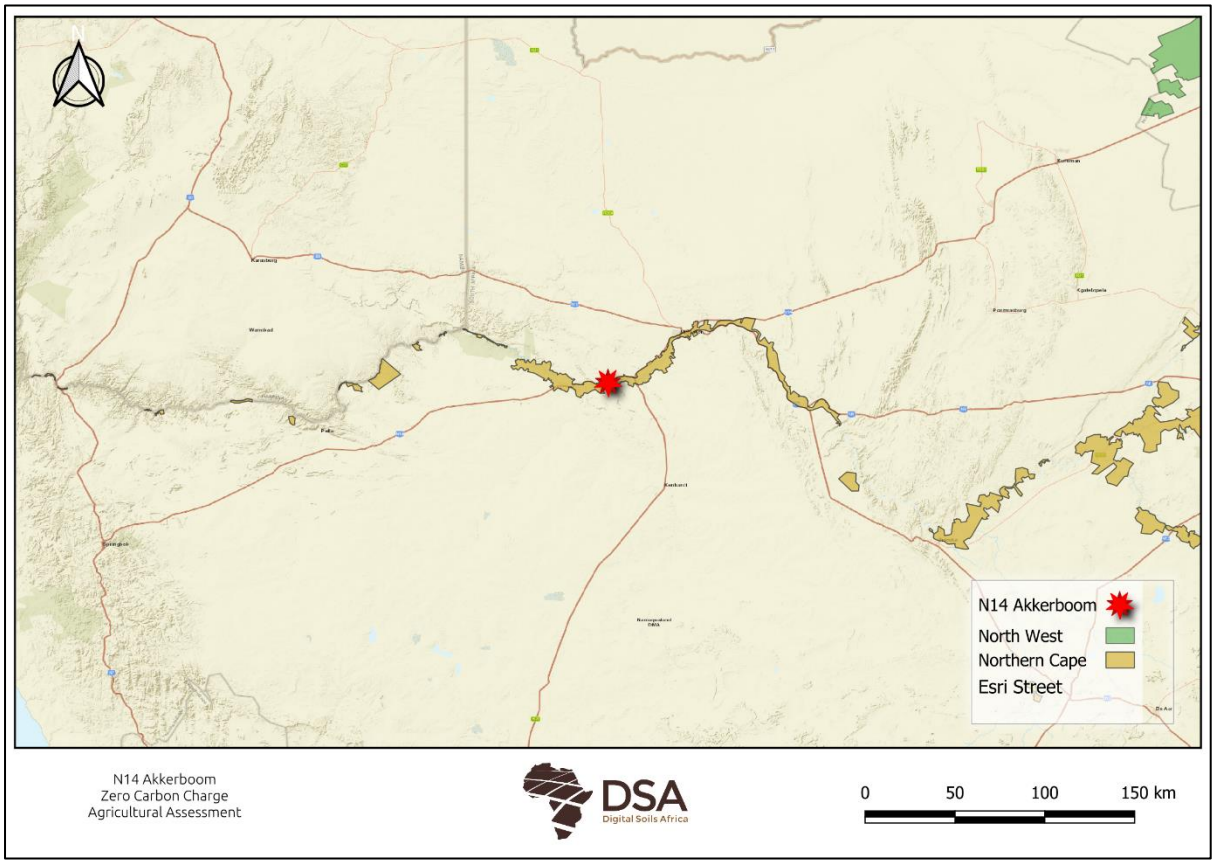


FIGURE 5: THE PROTECTED AGRICULTURAL AREAS FOR THE STUDY AREA.

As per the protocol, Terms of Reference applicable to an "Agricultural Compliance Statement" is as follows:

- The compliance statement must be prepared by a soil scientist or agricultural specialist registered with the SACNASP. (pg25)
- The compliance statement must:
- be applicable to the preferred site and proposed development footprint (pg4);
- confirm that the site is of "low" or "medium" sensitivity for agriculture(pg23);

- indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site (pg23).
- The compliance statement must contain, as a minimum, the following information:
- 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 (pg25);
- 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 (pg7);
- confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimise fragmentation and disturbance of agricultural activities (pg24);
- 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 (pg24);
- any conditions to which the statement is subjected (pg23);
- 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).
- where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr (not applicable);
- and a description of the assumptions made and any uncertainties or gaps in knowledge or data (pg10).

ASSUMPTIONS AND GAPS

It is assumed that the data used in the desktop is correct, as no observations were made on site.

RESULTS

CLIMATE CAPABILITY

The climate of the study site is characterised by a desert climate, with no or very low annual rainfall. This location is classified as BWh by Köppen and Geiger. The temperature here averages 21.7 °C with the annual rainfall is 191 mm.

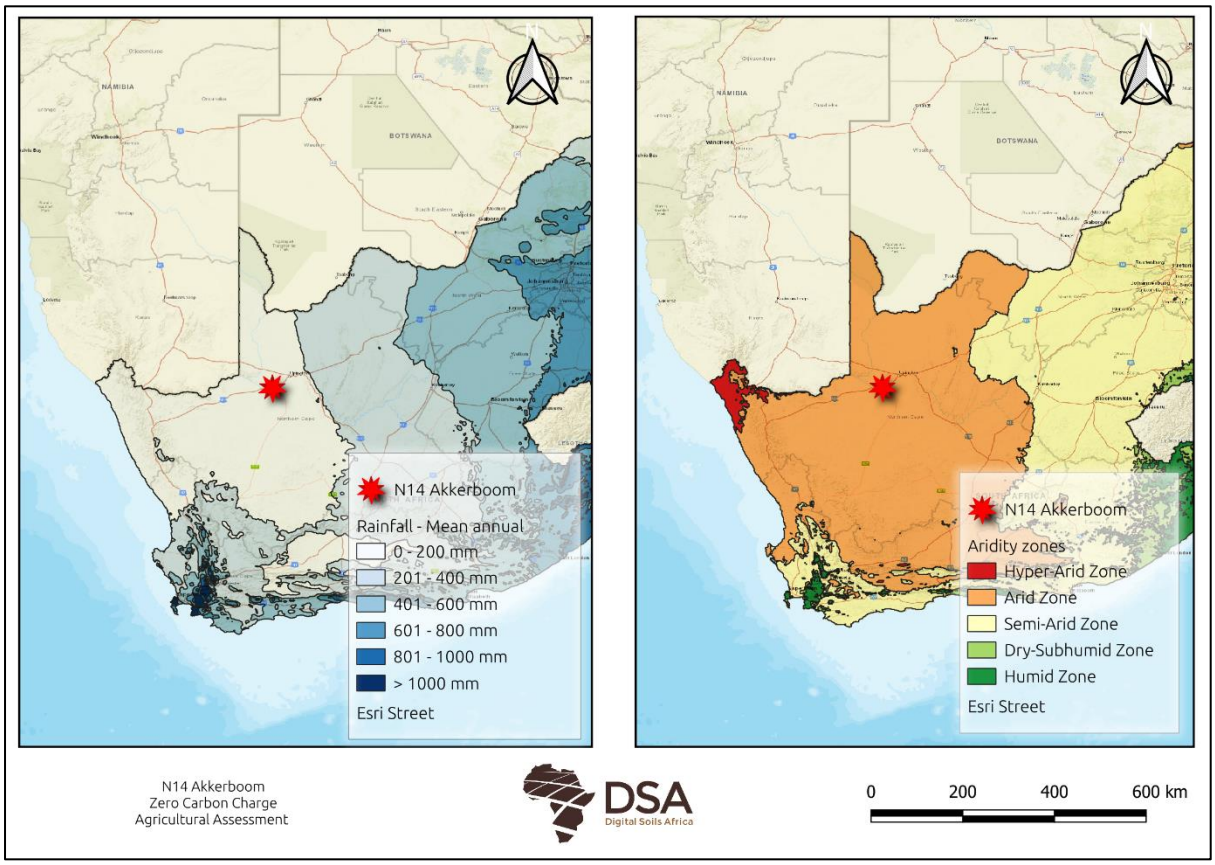


FIGURE 6: CLIMATE OF THE SITE AND THE SURROUNDING AREA (SCHULZE, 2007).

TABLE 1: CLIMATIC PROPERTIES OF KEIMOES (CLIMATE-DATA.ORG).

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C	28.8 °C	28.5 °C	26.4 °C	21.4 °C	17.3 °C	13.4 °C	13.3 °C	15.3 °C	19.1 °C	23.2 °C	25.6 °C	27.8 °C
Min. Temperature °C	21.2 °C	21.4 °C	19.5 °C	15.2 °C	11.2 °C	7.4 °C	7 °C	8 °C	11.1 °C	15 °C	17.2 °C	19.5 °C
Max. Temperature °C	35.5 °C	35.1 °C	32.9 °C	27.8 °C	24 °C	20.1 °C	20.2 °C	22.7 °C	26.8 °C	30.6 °C	32.9 °C	34.9 °C
Precipitation / Rainfall mm	32	27	32	24	12	6	4	3	4	12	13	22
Humidity (%)	27%	29%	33%	40%	41%	44%	38%	31%	24%	22%	21%	23%
Rainy days (d)	4	4	3	2	1	1	1	1	1	1	2	2
avg. Sun hours (hours)	12.2	11.6	10.8	9.9	9.2	8.7	8.9	9.5	10.4	11.3	12.0	12.4

Climate capability is the highest weighted factor (40%) in the calculation of the Land capability (DAFF, 2017) which is used in the Screening Tool to determine the agricultural sensitivity. Soil capability (30%) and Terrain capability (30%) contribute the remaining considerations. The climate capability consists of 9 values, with 1 being the lowest value and 9 being the highest value (There is however no evaluation value of 1 & 2).

The Climate capability determined by the following factors:

- Moisture supply capacity (50%)
- Physiological capacity (20%)
- Climatic constraints (30%)

The climate capability according to the Department of Agriculture, Forestry and Fisheries, 2017, is a value of 3 (Figure 7). This is considered a low climate capability.

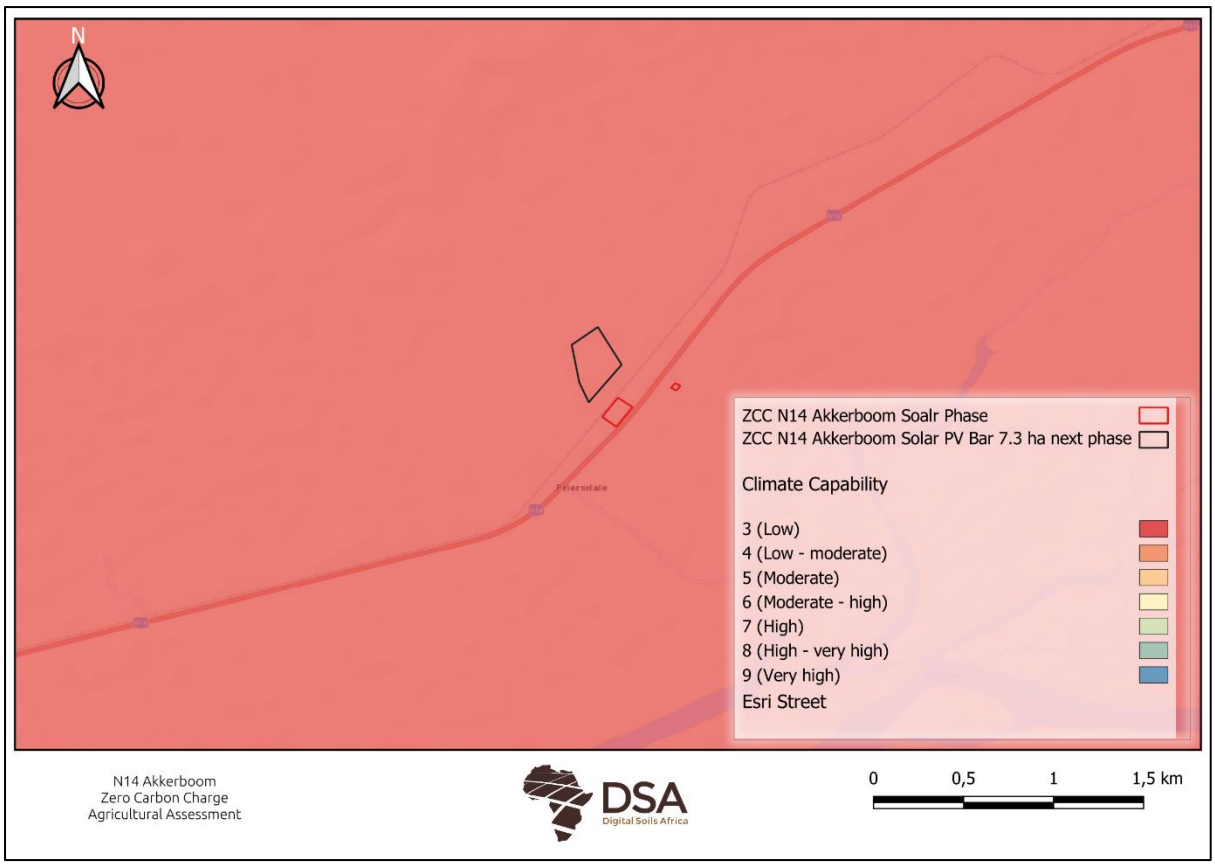


FIGURE 7: THE CLIMATE CAPABILITY OF THE SITE AND SURROUNDING AREA (DAFF, 2017).

SOIL

LANDTYPE

A land type is an area which can be demarcated at a scale of 1:250 000 with similar soil forming factors and therefore soil distribution patterns. A land type does therefore not represent uniform soil polygons, but rather information regarding the occurrence of different soils on different terrain units can be obtained from the land type inventory. Landtype data was used in calculating the soil capability (DAFF, 2017), and therefore, indirectly used in the Screening tool for estimating the agricultural sensitivity.

The study area is comprised of the Ag and Ia land types (Land Type Survey Staff, 1972 – 2002) (Figure 8). Ag land types comprise of freely drained, shallow (<300 mm deep) red, eutrophic, apedal soils comprise >40% of the land type (yellow soils comprise >10%), while Ia types comprise of deep alluvial soils comprise >60% of land types.

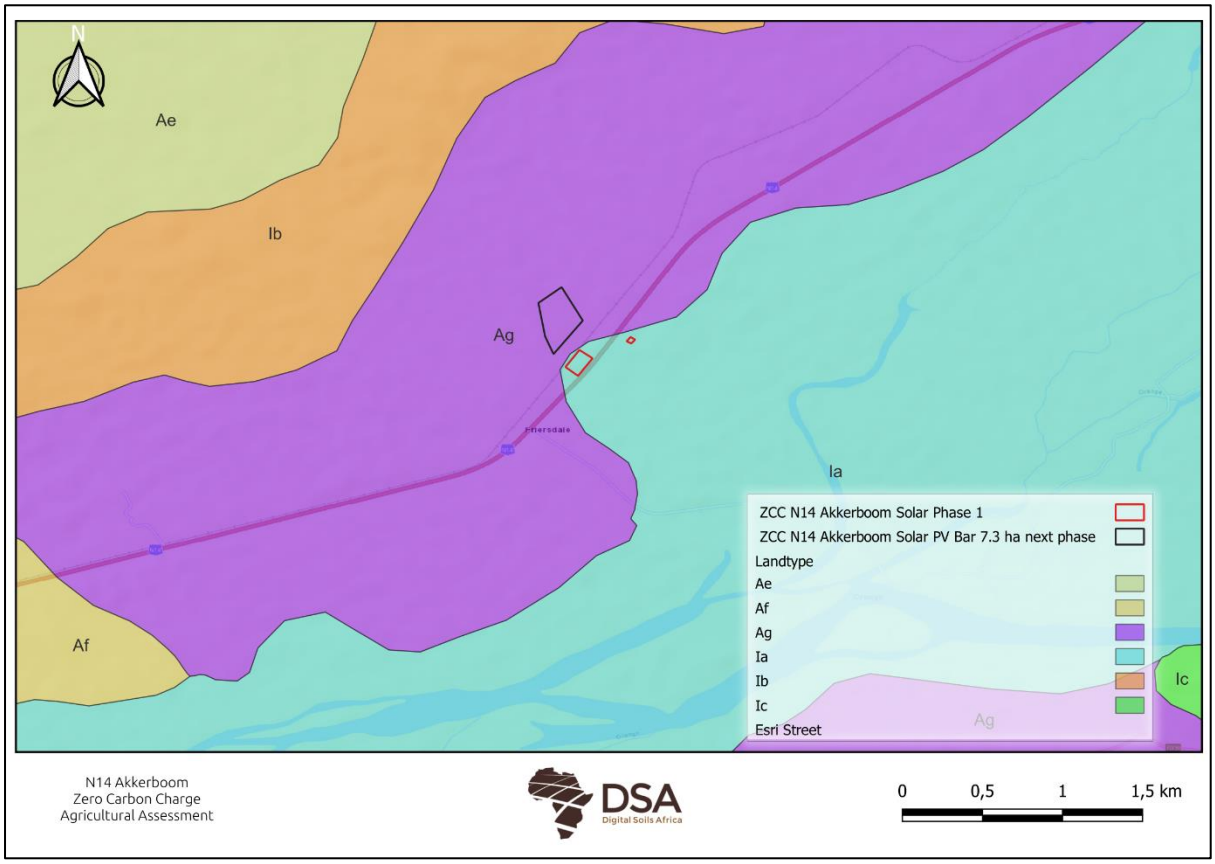


FIGURE 8: LANDTYPES FOUND IN THE STUDY AREA AND THE SURROUNDING AREA (LAND TYPE SURVEY STAFF, 1972 – 2002).

SOIL CAPABILITY

The Soil capability consists of 9 values, with 1 being the lowest value and 9 being the highest value. The main factors contributing to the Soil capability consist of:

- Plan available water (80%)
- Soil sensitivity (17%)
- Soil fertility (3%)

The soil capability according to the DAFF (2017), is a value of 3 (Low) within the "Solar Phase 1" of the study site and a value of 6 (Moderate to high) within the "Solar PV next phase" of the study site (Figure 9).

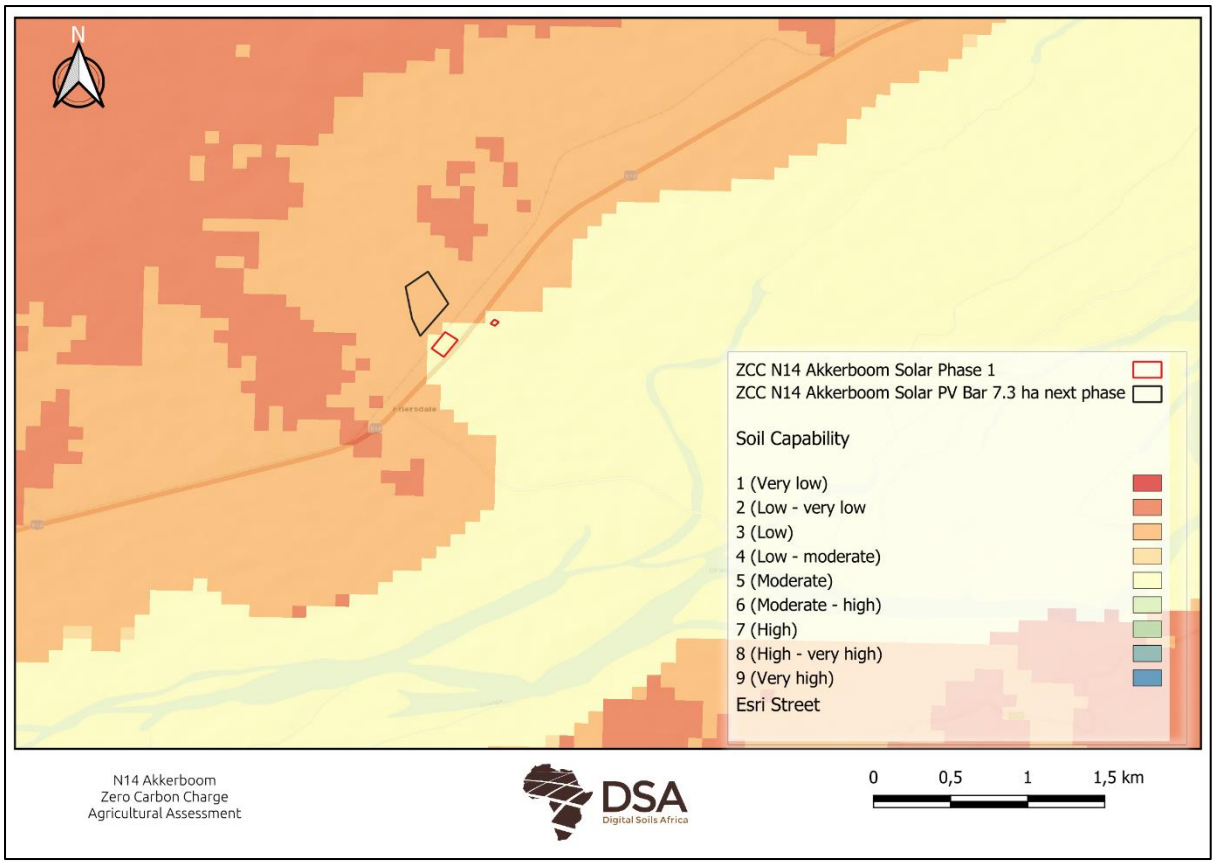


FIGURE 9: THE SOIL CAPABILITY OF THE SITE AND SURROUNDING AREA (DAFF, 2017).

TERRAIN CAPABILITY

Terrain plays an important role in a plants' physiological growth requirements, and from a sensitivity and accessibility perspective, Therefore, the two terrain modelling concerns included in the terrain capability modelling exercise were plant physiology and terrain sensitivity. The Terrain capability consists of 9 values, with 1 being the lowest value and 9 being the highest value.

The terrain capability according to the DAFF (2017), has a value of 6 (Moderate to high) and 7 (High). This is considered a Moderate to High terrain capability.

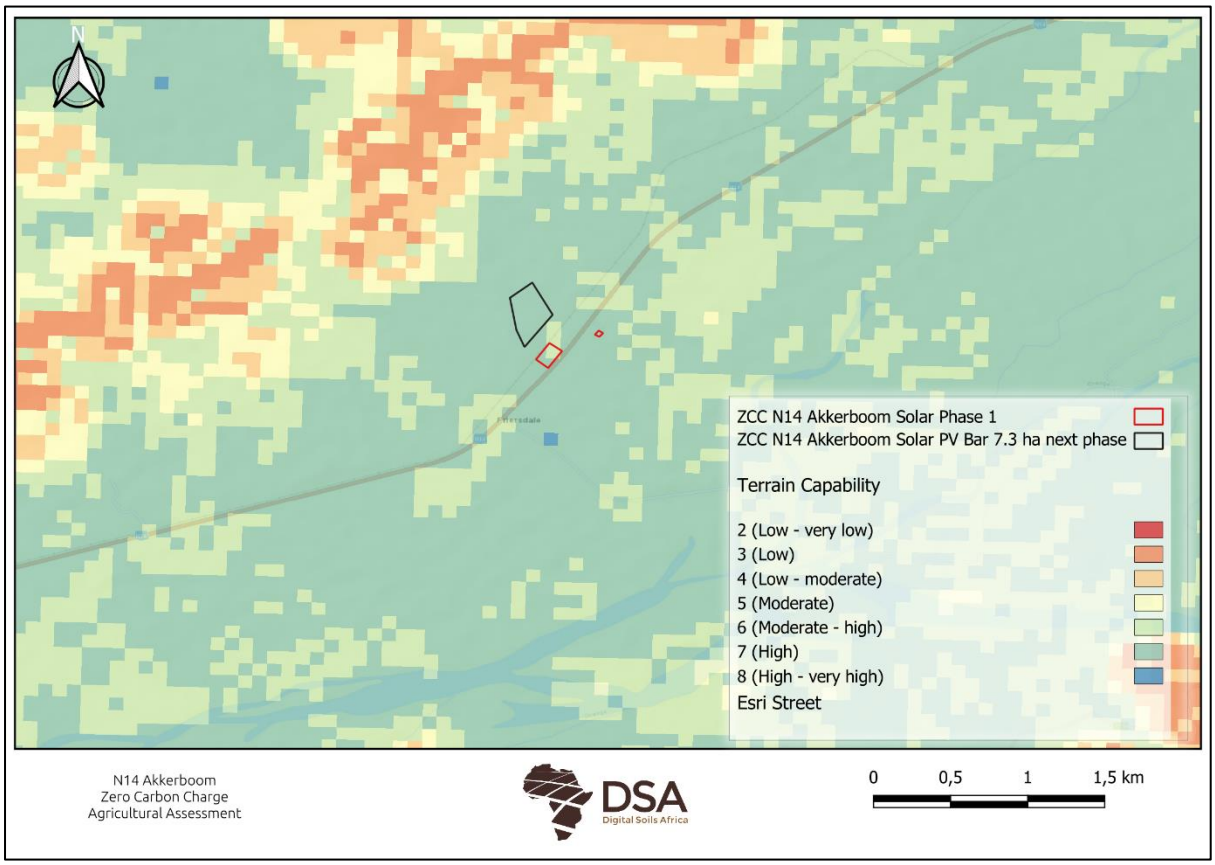


FIGURE 10: THE TERRAIN CAPABILITY OF THE SITE AND SURROUNDING AREA (DAFF, 2017).

LAND CAPABILITY

The new Land capability (Department of Agriculture, Forestry and Fisheries, 2017) has fifteen classes, as opposed to the eight classes described by Schoeman et al. (2002). The data is usable on a scale of 1:50 000 – 1: 100 000, therefore, not suitable for farm scale recommendations. Classes 1 to 7 are of low land capability and only suitable for wilderness or grazing. Classes 8 to 15 are considered to have arable land capability with the potential for high yields increasing with the land capability class number.

TABLE 2: LAND CAPABILITY CLASS AND THE DESCRIPTION OF THE CLASS

Land Capability Class	Description	
1-2	Very Low	Not arable
3-4	Very Low to Low	
5	Low	
6-7	Low to Moderate	
8	Moderate	Arable
9-10	Moderate to High	
11	High	
12-13	High to Very High	
14-15	Very High	

The Land capability values ranges from 6 (Low to moderate) to 7 (Low to moderate), which is generally considered not arable (Figure 11).

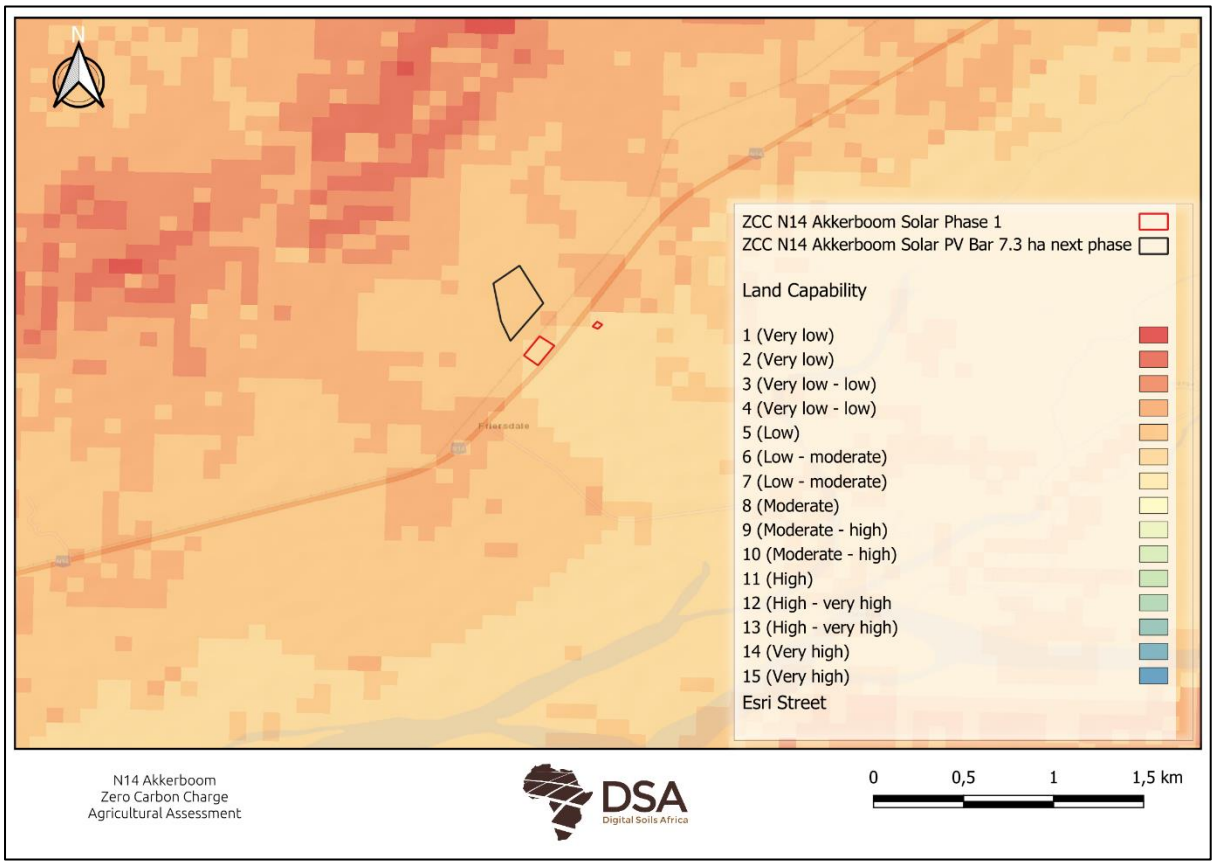


FIGURE 11: LAND CAPABILITY CLASS MAP OF THE STUDY AREA (DAFF, 2017).

GRAZING CAPACITY

The unit used in the grazing capacity is hectares per large stock unit (ha/LSU). The site has a low grazing capacity of 36 ha/LSU (Figure 12). A homogeneous unit of vegetation expressed as the area of land required (in hectares) to maintain a single animal unit (LSU) over an extended number of years without deterioration to vegetation or soil. Where an LSU = An animal with a mass of 450 kg and which gains 0.5 kg per day on forage with a digestible energy of 55%. (Trollope et. Al., 1990).

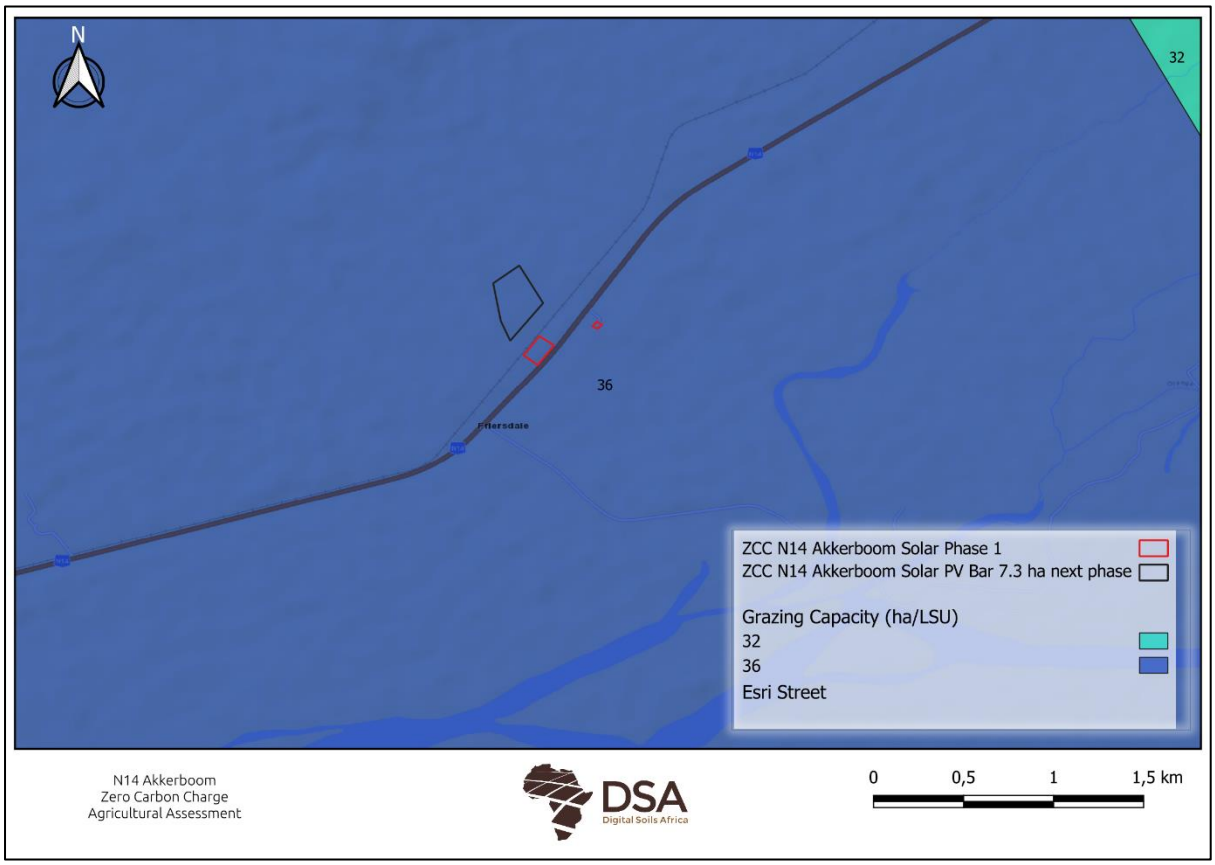


FIGURE 12: GRAZING CAPACITY FOR THE SITE AND THE SURROUNDING AREA (DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES, 2016).

LAND USE

South African National Land-Cover 2020 (SANLC 2020) (GeoTerraImage, 2020) was compared to the 2014 Land Cover to determine if there was a land use change since 2014. The SANLC 2020 classifies the area as 9 (Low Shrubland (Fynbos)) and 46 (Fallow Land & Old Fields (Low Shrub)) with the class names listed in the Table 3 below.

TABLE 3: LEGEND TO FIGURE 13

No.	Class Name	Class Definition
4	Contiguous & Dense Planted Forest	Dense to contiguous cover, planted tree forests, consisting primarily of exotic timber species, with canopy cover exceeding 35%, and canopy heights exceeding 2.5 metres. Typically represented by mature commercial plantation tree stands. This class also includes smaller woodlots and windbreaks, where they have been identified by the same spectral-based image modelling procedures used to detect the plantation forests.
11	Low Shrubland (Nama Karoo)	This is the same as class 8, Low Shrubland, but now represents low, indigenous karoo-type vegetation communities, which have been identified using image-based spectral models, but which fall spatially inside the SANBI defined boundaries for Nama Karoo vegetation communities.
12	Sparsely Wooded Grassland	Natural woody vegetation, with a woody canopy cover ranging between only 5 - 10%, and canopy heights exceeding 2.5 metres, in a grass-dominated environment. Typically represented by very sparse woodland or lightly wooded grassland communities. This class has been included as it is part of the new gazetted land-cover classification standards, but is challenging to map with 20m resolution imagery, since the associated woody cover component is not a spatially dominant component. Whilst the class has been generated with all possible due care and attention, it must be used and with caution, and should be interpreted as a sub-component of the grassland areas, especially in drier more arid areas.
33	Cultivated Commercial Permanent Vines	Active or recently active cultivated lands used to produce agricultural crops, in this case specifically associated with commercial viticulture. The plants remain in-field for multiple growing seasons and harvests. Often irrigated.
67	Roads & Rail (Major Linear)	Built-up features represented by primary road and rail networks that are image-detectable (i.e., networks are non-contiguous), as well as smaller airfields and airstrips. Note that road and rail networks have not been mapped as contiguous networks but are only represented in the NLC dataset where the linear feature is image detectable, which is dependent on object size, shape, orientation, material, and surrounding landscape characteristics. This class is therefore not a definitive representation of road and rail networks. It has been included as a requirement to match, as far as possible, the gazetted land-cover standard.

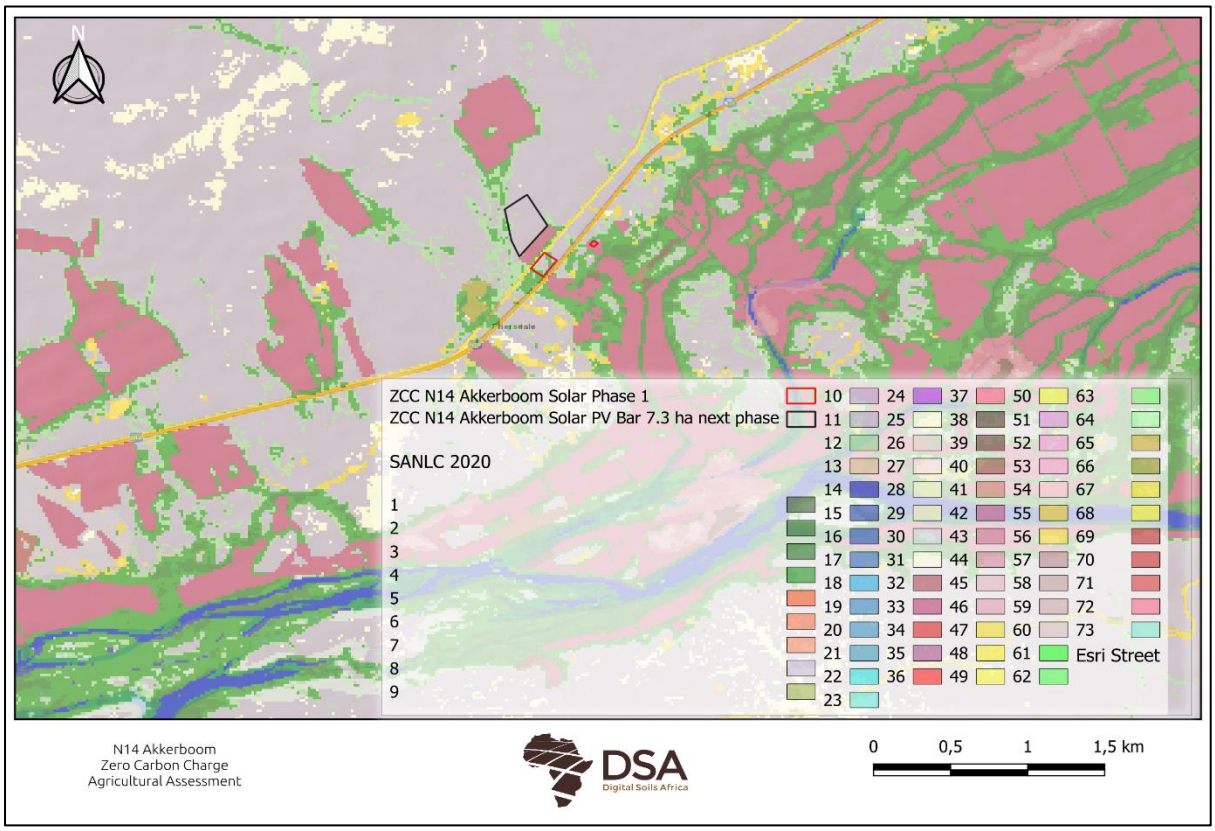


FIGURE 13: SOUTH AFRICAN NATIONAL LAND-COVER 2020 (SANLC 2020).

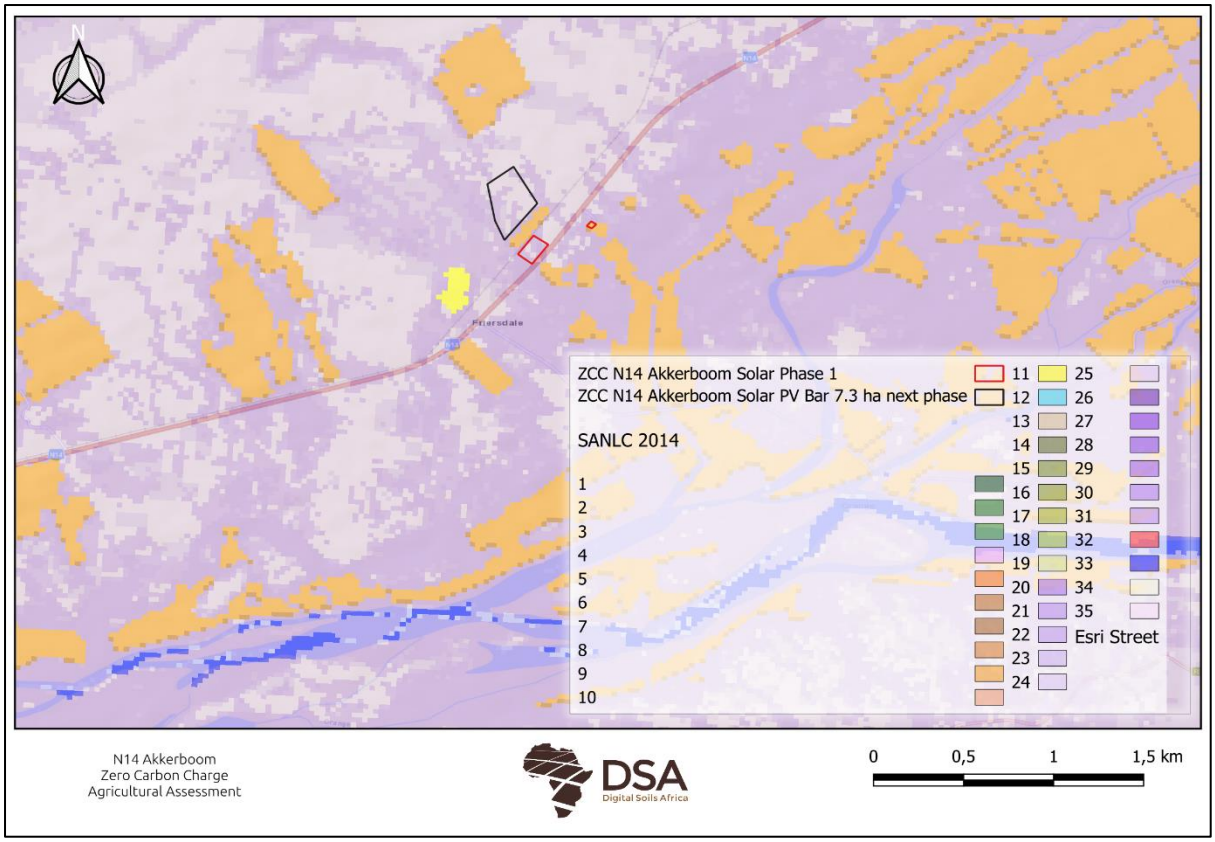


FIGURE 14: SOUTH AFRICAN NATIONAL LAND-COVER 2014 (SANLC 2014).

The Google satellite images in Figure 15 suggest that the landuse within the study site (both development sites) has not changed over the period of 2014 to 2022, however, the adjacent fields indicates a change in the presence of crops/vegetation over the years (yellow arrows), furthermore, a slight change in forest density (red arrows) is evident within the smaller development site.

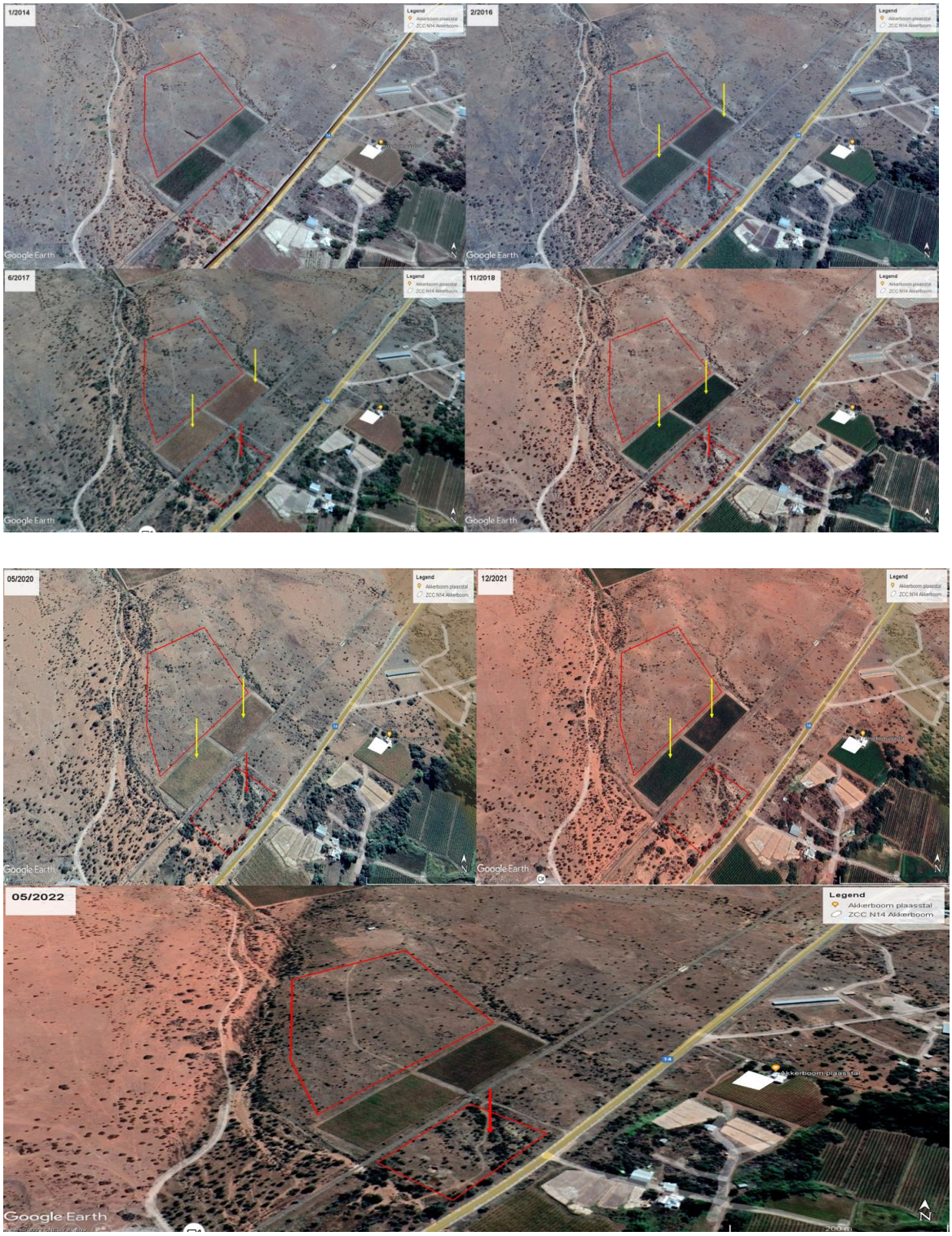


FIGURE 15: GOOGLE SATELITE IMAGES SHOWING MAJOR LAND USE CHANGES FROM 2014 TO 2022.

COMPLIANCE STATEMENT

According to the screening tool, the site is classified as having a medium agricultural sensitivity due to a low to moderate land capability. No Agricultural practices were observed within the study area from the Google satellite images. However, there are irrigation fields adjacent to the site. The grazing capacity is considered low.

Micro siting is of a low concern as access to the fields between the development should not be problematic.

One prerequisite underlying the following recommendation is that the development should not obstruct access to the fields, whether it's during construction or operation.

Due to the small footprint and low impact on existing agricultural activities, it is the specialist's opinion that the development continues. The development will not have a significant impact on agricultural activities in the area and poses no threat to food security. In terms of agricultural sensitivity, the development should thus be allowed to proceed.

APPENDIX 1: SPECIALIST CV

DR DARREN BOUWER

EDUCATION

PhD Soil Science	University of the Free State	2018
M.Sc. Soil Science	University of the Free State	2013
B.Sc. Soil Science (Hon)	University of the Free State	2009
B.Sc. Soil Science	University of the Free State	2008
Matric certificate	Queens College	2005

PROFESSIONAL AFFILIATIONS

- SACNASP- Pri Nat Sci 400081/16
- Member of the Soil Science Society of South Africa
- Member of the Soil Classification Work Group
- Member of South African Soil Surveyors Organisation

WORK EXPERIENCE

- **Digital Soils Africa** / Soil Scientist - May 2012 – Present
- **Ghent University** / Researcher- January 2016 - December 2016
- **University of the Free State**/ Assistant Researcher- January 2011- December 2015

PUBLICATIONS

Total consultancy reports: >120 **Total Publications: 5**

Most relevant:

Bouwer, D., Le Roux, P. A., van Tol, J. J., & van Huyssteen, C. W. (2015). Using ancient and recent soil properties to design a conceptual hydrological response model. Geoderma, 241, 1–11.

Van Zijl, G. M., Bouwer, D., van Tol, J. J., & le Roux, P.A.L. (2014). Functional digital soil mapping: A case study from Namarroi, Mozambique. Geoderma, 219-220, 155–161.

SPECIALIST DECLARATION

I, Darren Bouwer, declare that –

- I act as the independent specialist in this application;
- I regard the information contained in this report to be true and correct;
- I do not have a conflict of interest in this project;
- I will conduct the work relating to the project in an objective manner.

Dr Darren Bouwer
PhD Soil Science
Pri Nat Sci 400081/16