APPENDIX F10: Agricultural Compliance Statement

AGRICULTURAL COMPLIANCE STATEMENT FOR MOSSDUSTRIA DEVELOPMENT, MOSSELBAY, WESTERN CAPE

PREPARED FOR

GIBB ENVIRONMENTAL

MARCH 2023

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BACKGROUND TO THE STUDY

Digital Soils Africa (Pty) LTD (DSA) were tasked by GIBB Environmental 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 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 study area is located at the proposed extension of Mossdustria, outside of Mosselbay in the Western Cape. The property studied is the Remaider of Portion 8 of the farm Rietvalley 225. The proposed layout for the extension is presented Figure 2, and consists mainly of the following developments, namely, Conservation area, Motorsport arena and 4- Alternative energy facility and Industrial expansion.

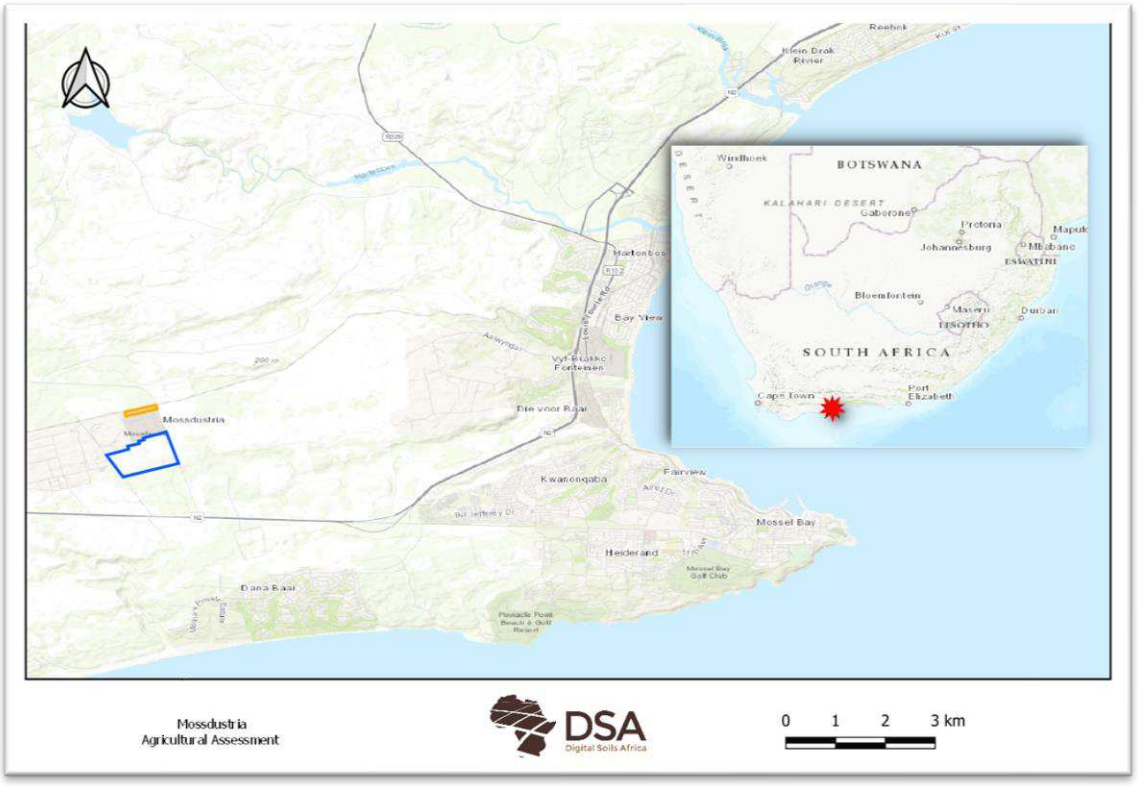


FIGURE 1: LOCATION OF THE STUDY AREA IN THE WESTERN CAPE PROVINCE.

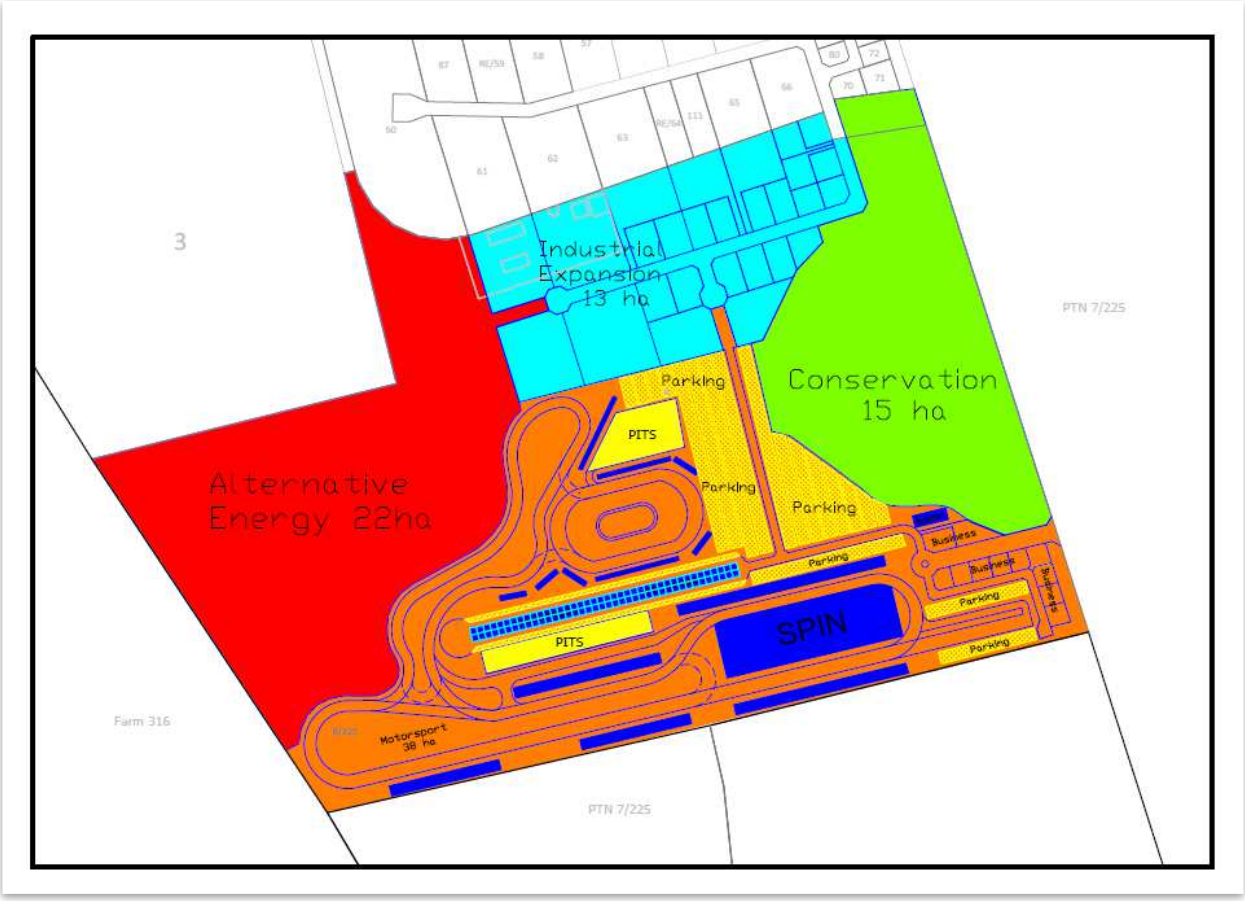


FIGURE 2: THE LAYOUT OF THE PROPOSED EXTENSION.

ENVIRONMENTAL SCREENING TOOL

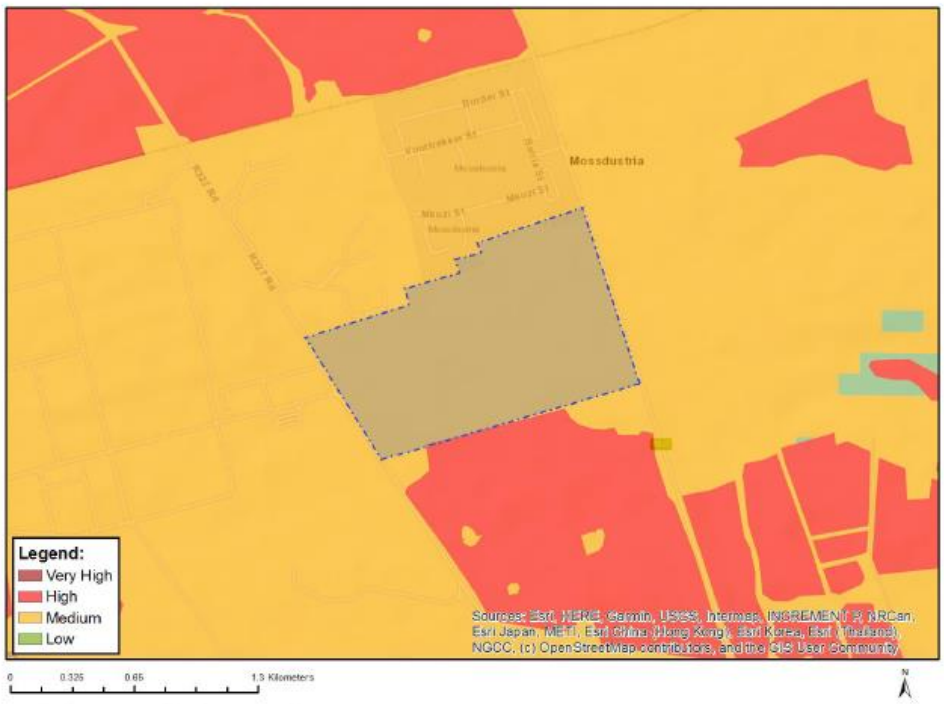
Agricultural sensitivity, as reported in the screening tool, is based upon the land use (SANLC, 2014) and land capability (Department of Agriculture, Forestry and Fisheries, 2017).

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 land use (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 high agricultural sensitivity (Figure 3), but this is due to the boundary touching the lands to south. Therefore, a medium sensitivity is more realistic. The medium sensitivity is due to the land capability (Department of Agriculture, Forestry and Fisheries, 2017), classifying the soils as having a land capability class of 6-8 (Low Moderate to Moderate).



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Annual Crop Cultivation / Planted Pastures Rotation;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

FIGURE 3: RESULTS FROM THE ENVIRONMENTAL SCREENING TOOL.

RESULTS

CLIMATE CAPABILITY

The climate is warm and temperate. The Köppen-Geiger climate classification is Cfb, which is considered wet all seasons, summers long and cool. The average annual temperature is 17 °C. Rainfall is generally distributed evenly with an annual precipitation of about 543 mm. The site has a semi-arid climate (FIGURE 4). Therefore, cultivation of dry land crops will be restricted, and most crop yields will be negatively impacted in the semi-arid climate.

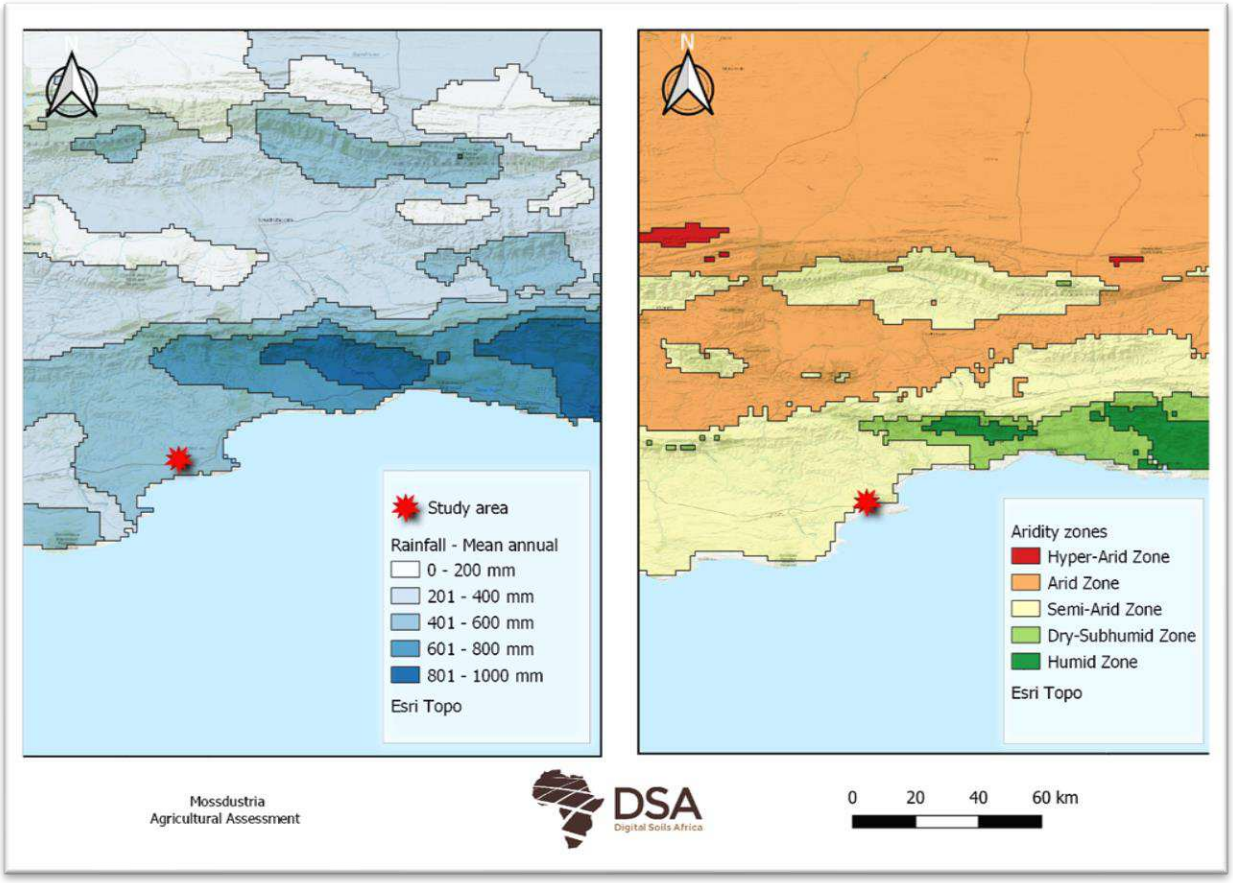


FIGURE 4: CLIMATE OF THE SITE AND THE SURROUNDING AREA (SCHULZE, 2007).

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

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature	21 °C	21.1 °C	20 °C	17.9 °C	15.8 °C	13.4 °C	12.8 °C	13.4 °C	14.5 °C	16.5 °C	17.8 °C	19.9 °C
Min. Temperature	17 °C	17.2 °C	16.1 °C	13.7 °C	11.5 °C	8.7 °C	8.1 °C	8.6 °C	9.9 °C	12.1 °C	13.6 °C	15.8 °C
Max. Temperature	25.8 °C	26 °C	24.9 °C	22.9 °C	21.1 °C	18.8 °C	18.4 °C	19 °C	19.9 °C	21.6 °C	22.7 °C	24.8 °C
Rainfall mm	42	36	47	50	43	41	42	51	37	48	56	41
Humidity	0.7	0.72	0.72	0.73	0.7	0.68	0.68	0.68	0.69	0.7	0.69	0.69
Rainy days	6	6	6	6	5	5	6	6	6	6	6	6
avg. Sun hours	8.9	8.3	8	7.8	7.8	7.6	7.6	7.9	8.3	8.7	9.4	9.5

Climate capability is 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 5 (Figure 5). This is considered a moderate Climate capability.

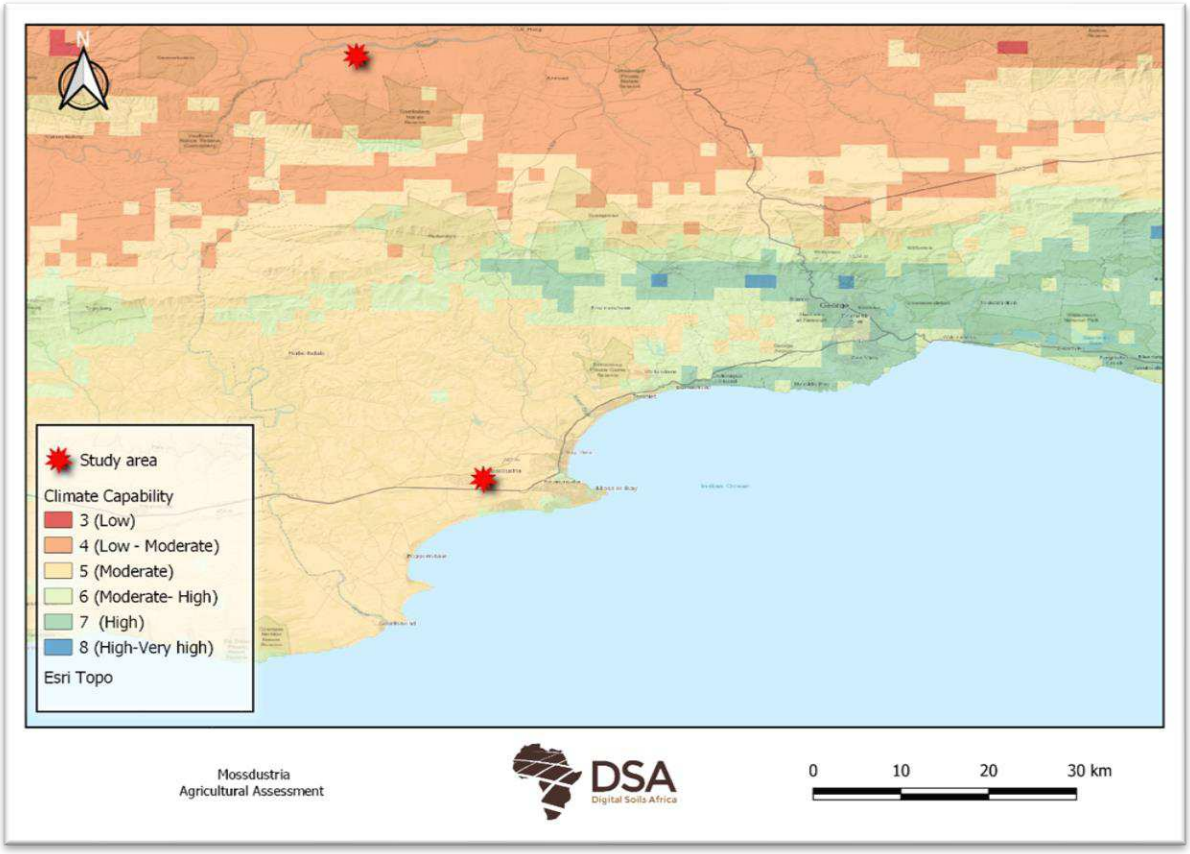


FIGURE 5: THE CLIMATE CAPABILITY OF THE SITE AND SURROUNDING AREA (DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES, 2017).

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 Db land type (Land Type Survey Staff, 1972 – 2002) (Figure 6). Db landtypes comprise of more than 50% Duplex soils (sandier topsoil abruptly overlying more clayey subsoil) of land type; and less than 50% of duplex soils have non-red B horizons.

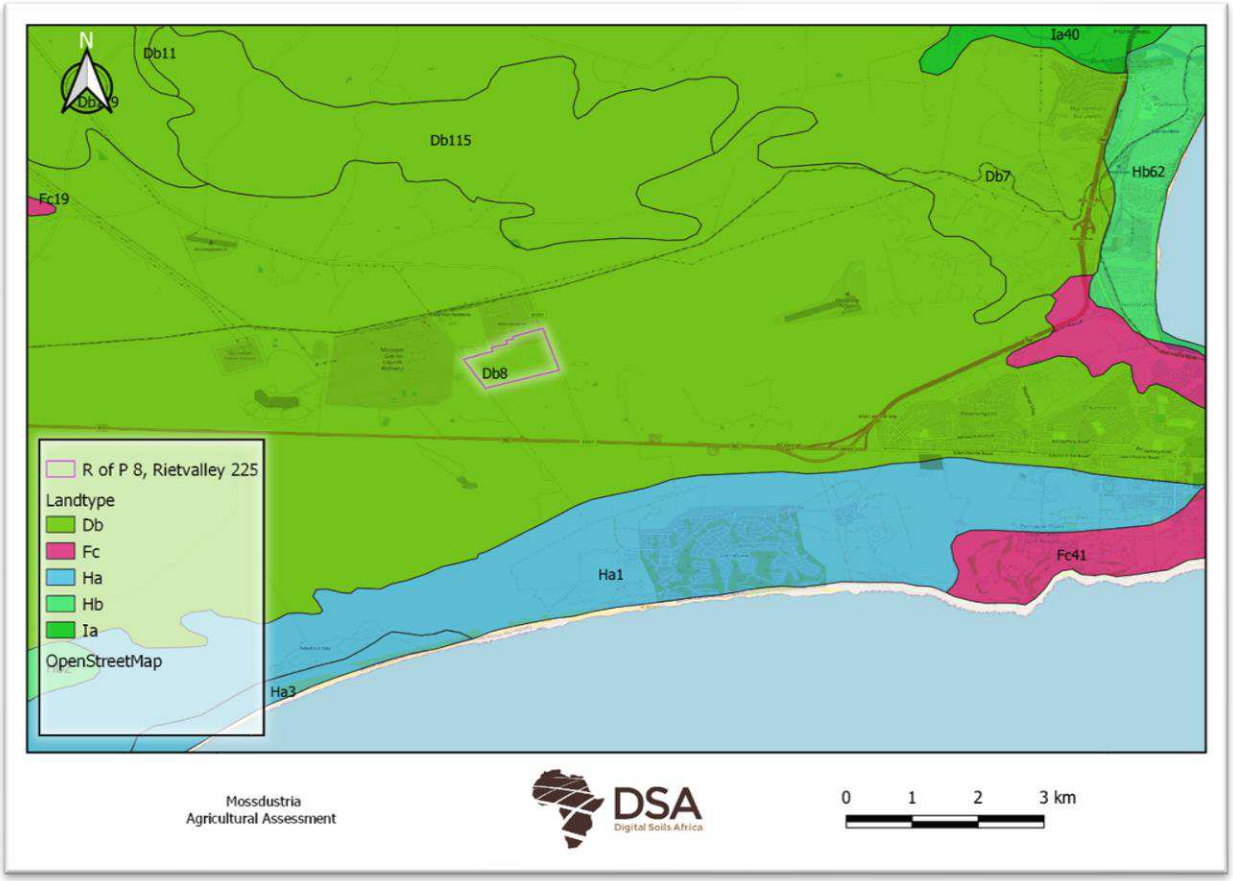


FIGURE 6: LANDTYPES FOUND IN THE STUDY AREA AND THE SURROUNDING AREA (LAND TYPE SURVEY STAFF, 1972 – 2002).

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 Department of Agriculture, Forestry and Fisheries, 2017, is a value of 4 (Figure 7). This is considered a Low- moderate Soil capability.

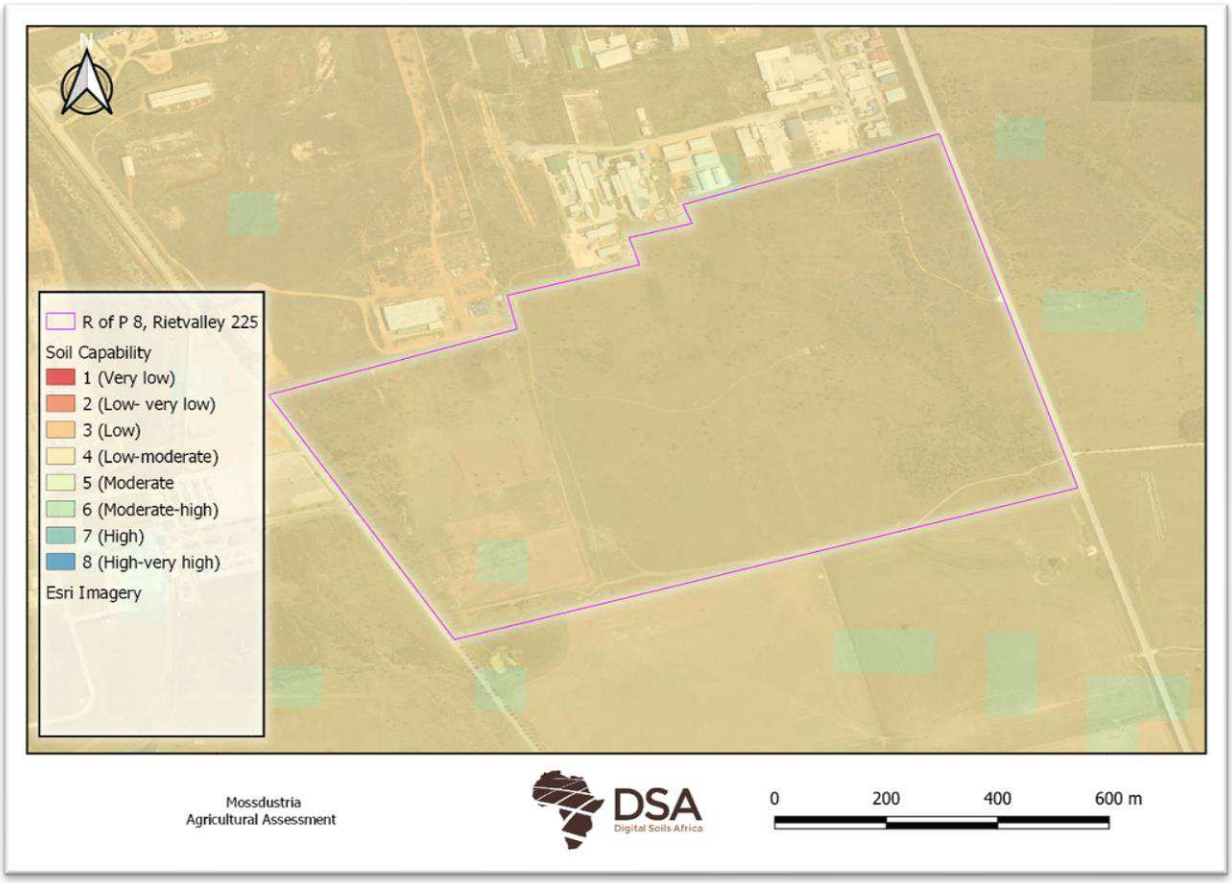


FIGURE 7: THE SOIL CAPABILITY OF THE SITE AND SURROUNDING AREA (DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES, 2017).

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 Department of Agriculture, Forestry and Fisheries, 2017, is a value of 5 to 7. This is considered a-moderate to high Terrain capability.

FIGURE 8: THE TERRAIN CAPABILITY OF THE SITE AND SURROUNDING AREA (DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES, 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
3-4	Very Low to Low
5	Low
6-7	Low to Moderate
8	Moderate
9-10	Moderate to High
11	High
12-13	High to Very High
14-15	Very High

The feature which creates the medium sensitivity are Land capability values of between 6 and 8, which are considered moderately arable soils.

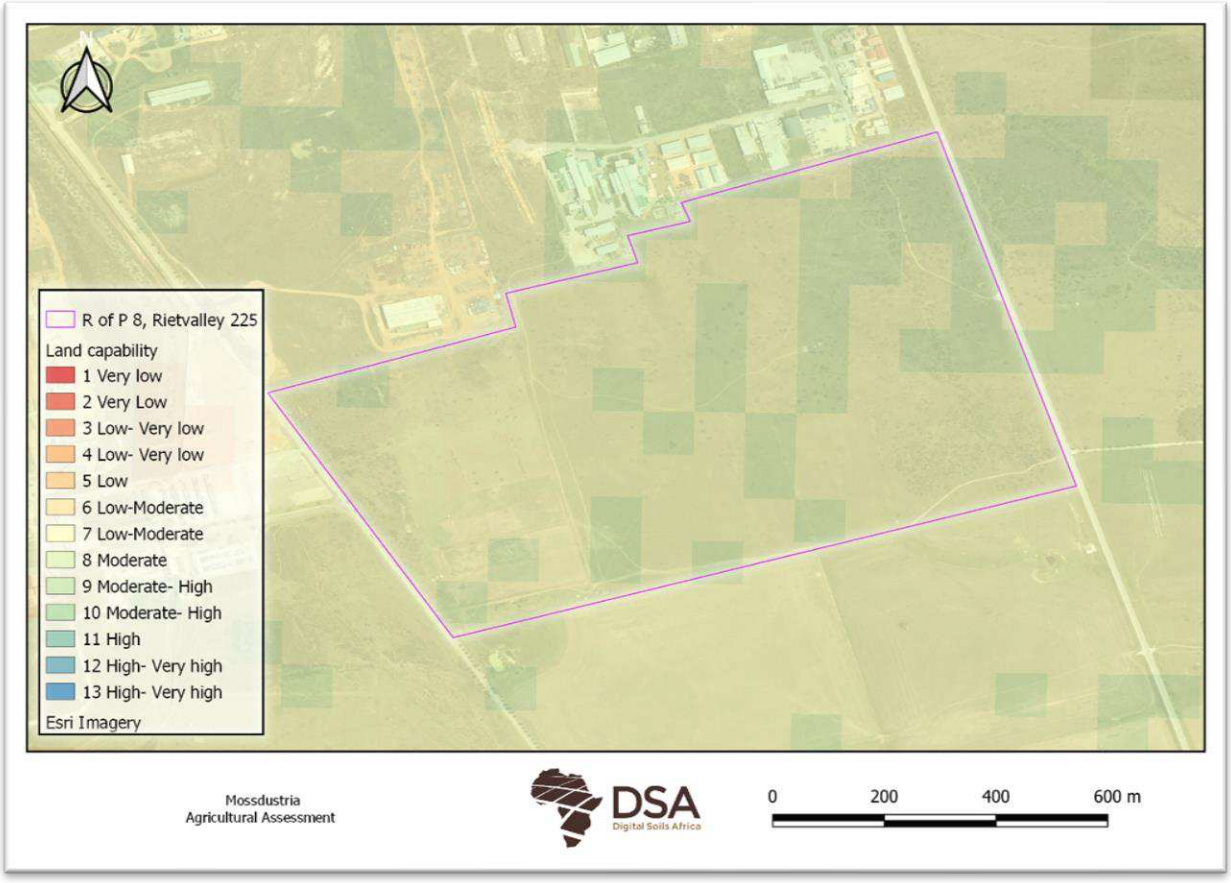


FIGURE 9: LAND CAPABILITY CLASS MAP OF THE STUDY AREA (DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES, 2017).

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 40 ha/LSU (Figure 10). 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).

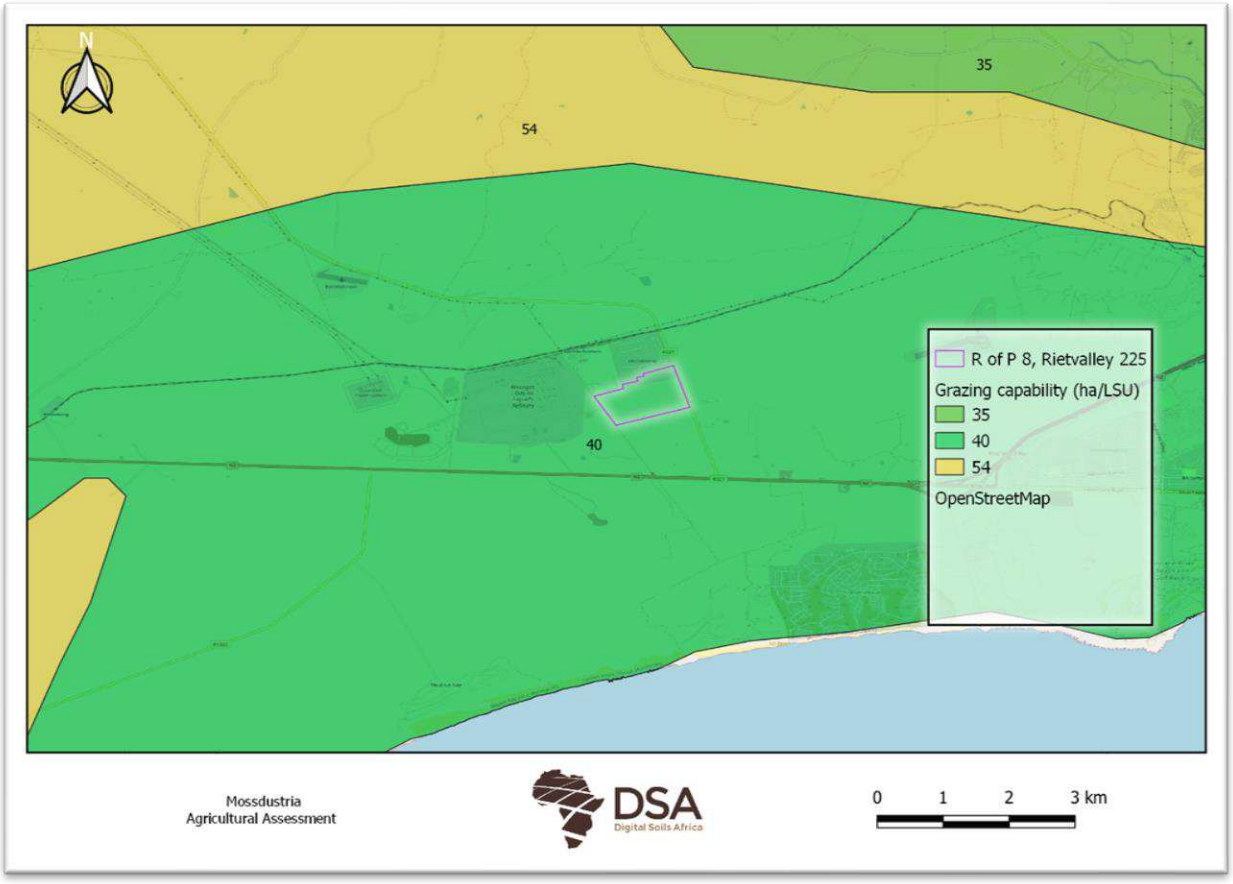


FIGURE 10: GRAZING CAPACITY FOR THE SITE AND THE SURROUNDING AREA (DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES, 2016).

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, and there was conflicting classification in the study area. The 2014 land use had lands surrounding the area, but no lands to the south east, as is in the 2020 land use. The Land cover classify the area as Low Shrubland, Cultivated Commercial Annuals and Industrial (Figure 11).

TABLE 3: LEGEND TO FIGURE 11

No.	Class Name	Class Definition
10	Low Shrubland (Succulent 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 Succulent Karoo vegetation communities.
40	Cultivated Commercial Annuals Non-Pivot / Non-Irrigated	Active or recently active cultivated lands used for the production of agricultural crops, in this case specifically associated with commercial annual crops, The plants only remain in the field for one growing seasons and one harvest, and are grown non-irrigated, rainfed fields.
66	Industrial	Built-up areas primarily containing formally planned and constructed industrial structures and associated utilities. Includes both light and heavy industry, power generation, airports, rail terminals and ports. In the agricultural sector this class also represents (chicken and pig) animal batteries, greenhouses and tunnels and intensive feedlots

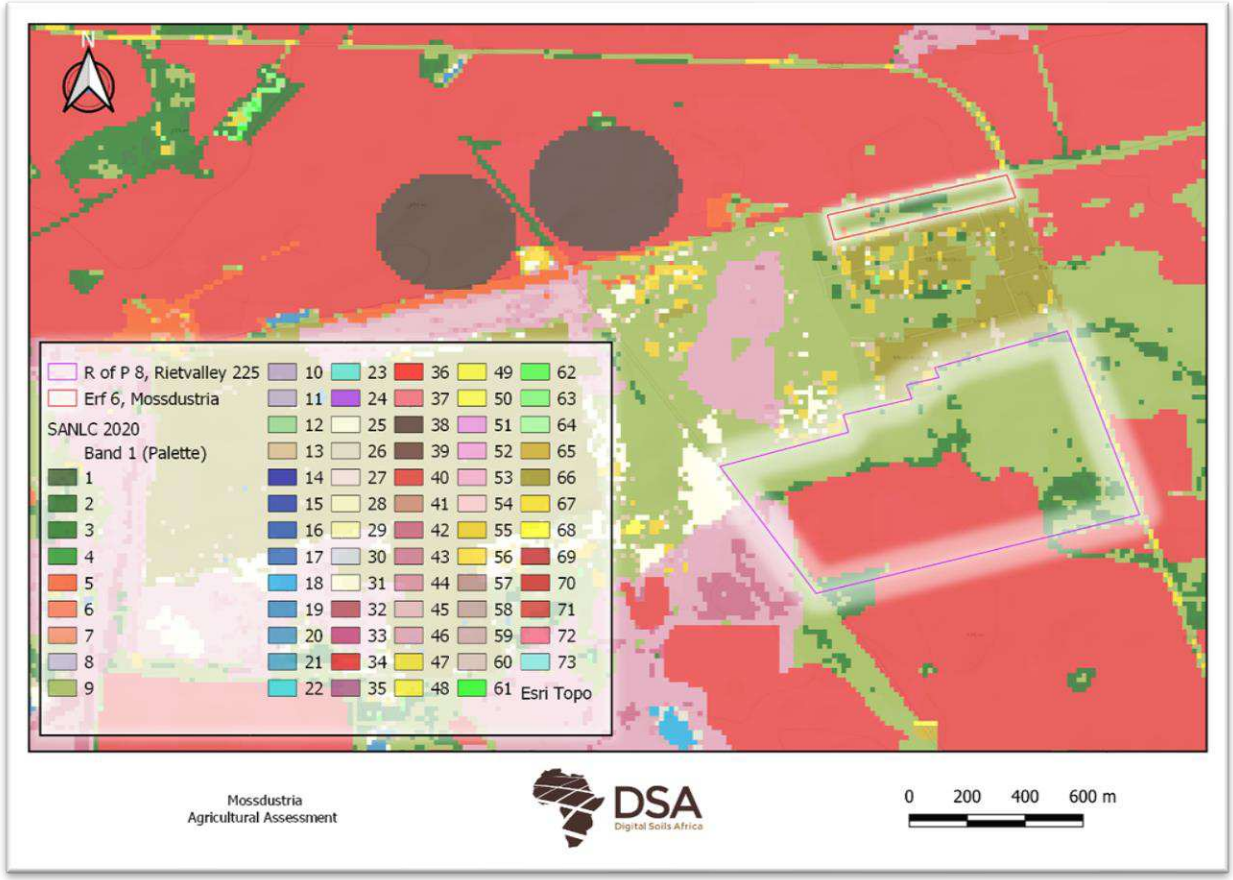


FIGURE 11: SOUTH AFRICAN NATIONAL LAND-COVER 2020 (SANLC 2020).

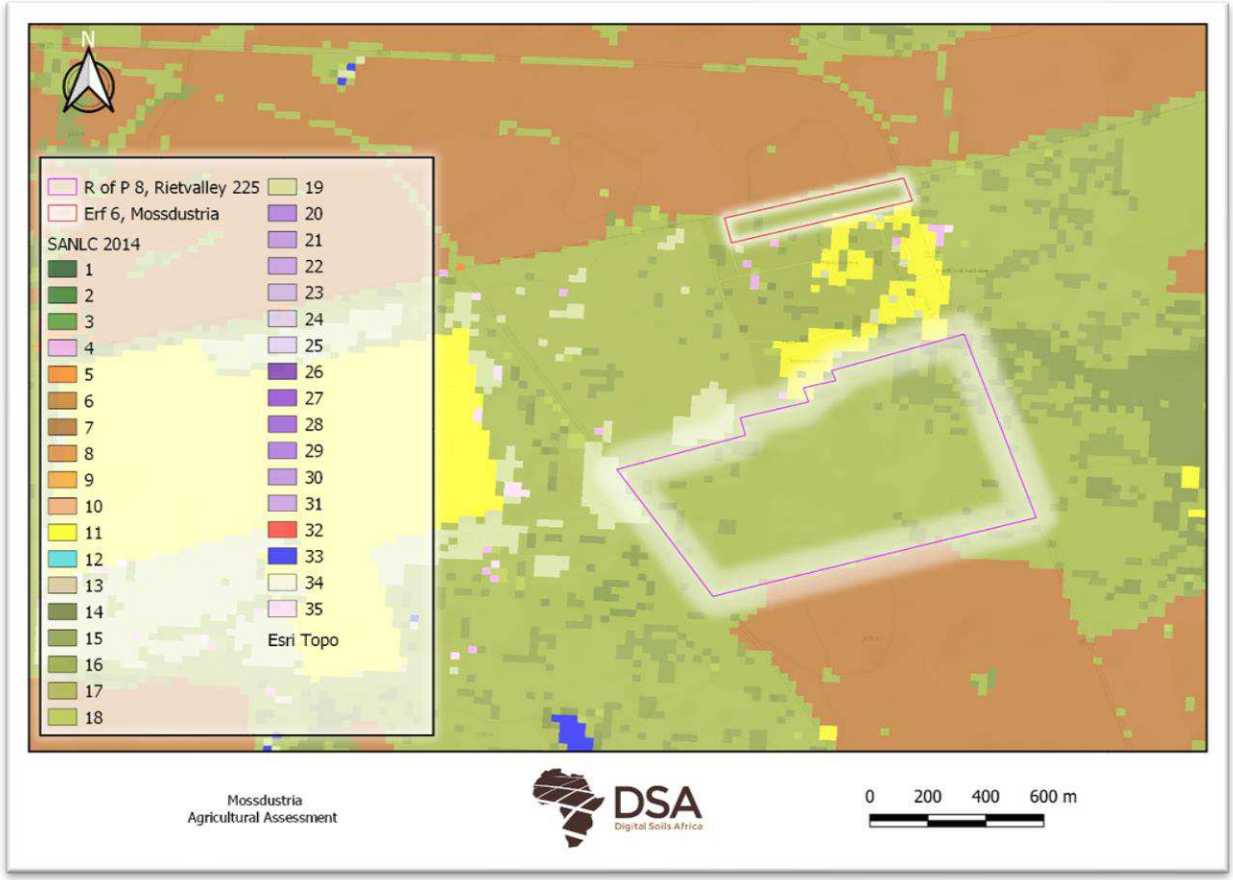


FIGURE 12: SOUTH AFRICAN NATIONAL LAND-COVER 2014 (SANLC 2014).

SITE VERIFICATION

The field survey was conducted on the 10th of March 2023. Visual observations were made to access the land use and grazing conditions.

A soil auger was used to make observations and the soils were classified according to the Soil Classification Working Group (2018). During the fieldwork, a total of 16 observations were made during the fieldwork.

LAND USE

The current land uses within the study area are natural veld, grazing land and abandoned cultivated lands. The agricultural activities on the Remainder of Portion 8 of the farm Rietvalley 225 (Figure 13), are abandoned lands and horses are currently being kept. The lands are overgrown by weeds and no formal crops or planted pastures. Infrastructure consisted of a kraal and water troughs. The site visit verified that both the SANLC 2014 and 2020 are correct, in that, satellite imagery indicates that lands were created in 2019 (Figure 14) but are currently neglected. Evidence of ostrich farming is visible from fencing and signs on the farm.

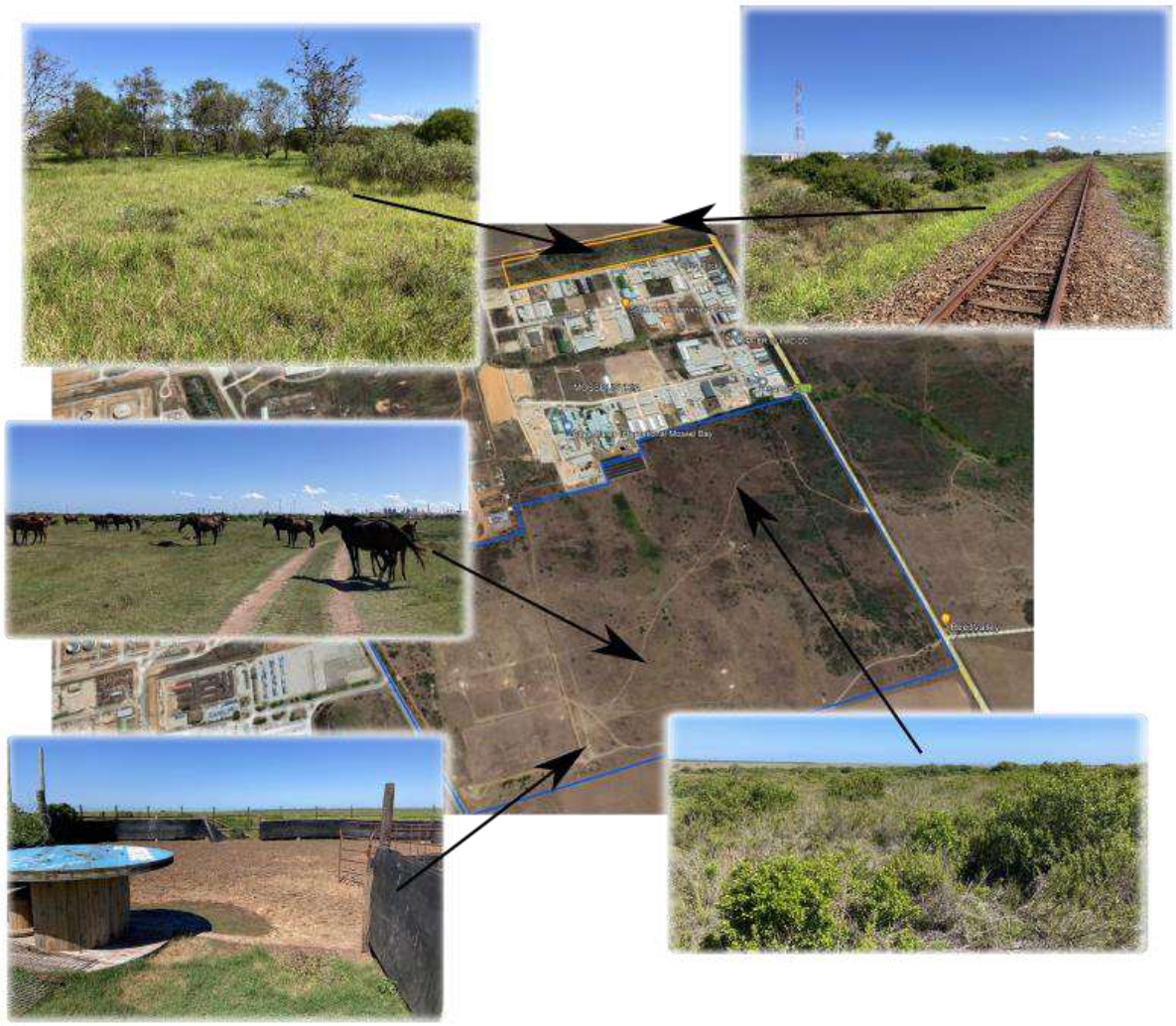


FIGURE 13: PHOTOGRAPHS OF THE EXISTING INFRASTRUCTURE, LAND USE AND VEGITATION.

FIGURE 14: DEVELOPMENT OF CULTIVATED LANDS ON SITE (GOOGLE EARTH).

SOIL STUDY

Auger and visual observations were made in the study area and are presented in Figure 15, with the soil types classified on the site presented in Table 4.

The Remainder of Portion 8 of the farm Rietvalley 225 was dominated by shallow Mispah soils, with Westleigh soils in-between.

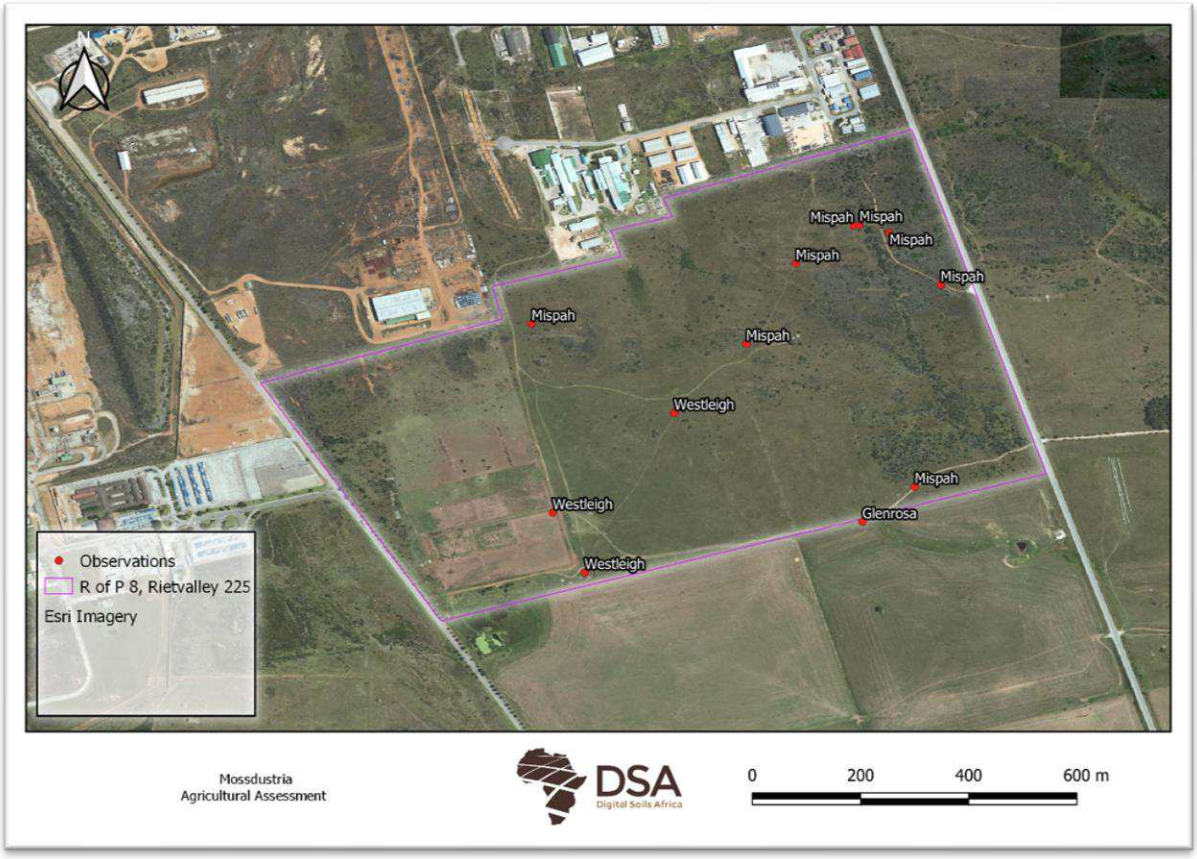


FIGURE 15: POSITIONS OF THE OBSERVATIONS MADE DURING THE STUDY.

TABLE 4: DESCRIPTION OF SOIL TYPES FOUND IN THE STUDY AREA

Soil Forms	Soil characteristics	Dryland Potential	Land Capability Class
Mispah	Shallow soils on relatively solid rock. The topsoil was sandy, apedal and bleached in colour. Depths ranged from 100 to 200m	Very Low	Low
Glenrosa	Topsoil is like the Mispah, but slightly deeper soil depth. There was variation in the lithic, ranging from chemically weathered subsoil to rounded large stones.	Very Low	Low
Westleigh	These soils were associated with micro depressions in the landscape. The A horizons were darkened and contained mottling in the transition to the soft plinthic. Most of the Westleigh soils were underlied by a highly weathered saprolite with redoximorphic features. Soil depths ranged from 500 to 800 mm.	Low	Low

FIGURE 16: PROPERTIES OF THE GLENROSA IN THE STUDY AREA.

FIGURE 17: PROPERTIES OF THE WESTLEIGH IN THE STUDY AREA.

The Land capability of the site was calculated to range from 4 to 6 (Very-low to Low-moderate). The Mispah soils are classified as class 4 Land capability (Very-low) due to the shallow nature of the soils. These soils are not suitable for cultivation. The Glenrosa are classified as class 5 Land capability (Low) due to the shallow depths of the soils, but the weathered nature of the

subsoils makes it slightly better for root development. These soils are suitable for grazing. The Westleigh soils are classified as class 6 Land capability (Low-moderate). These soils are arable, but with severe limitations. The Climate and Terrain capabilities are high, but the soils have restrictions. The water holding capacity is low and there are limitations to root development. The formula used by the Department of Agriculture, Forestry and Fisheries, 2017:

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

Furthermore, wetlands were identified on the site, and these should be protected (Figure 18). If grazing does occur on wetlands, it does need to be managed, as over grazing will have a significant impact on the vegetation of wetlands. Animals tend to selectively graze wetlands in the dry seasons, which could negatively impact the wetlands. No wetlands may be cultivated.

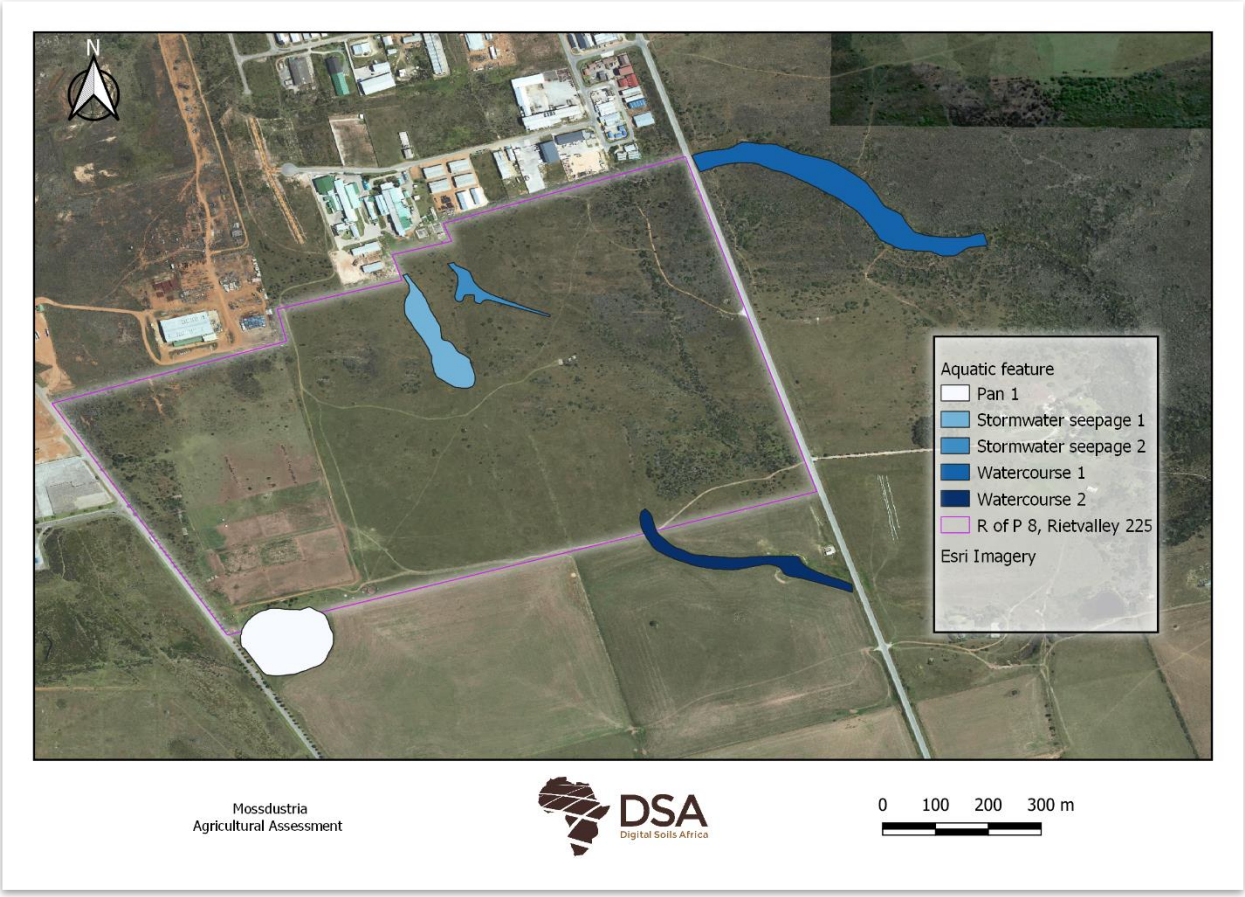


FIGURE 18: AQUATIC FEATURES FOUND WITHIN 500 M OF THE STUDY AREA.

COMPLIANCE STATEMENT

According to the screening tool, the site is classified as medium agricultural sensitivity due to moderate land capability. Evidence of cultivation was observed in the desktop study from 2019, but field verification suggests that the lands are abandoned. The climate data suggests that arable lands would be under strain in summer months. The grazing capacity is very low, and therefore there would be an insignificant loss of grazing due to the development.

Based on the observations made on site and analysis of the data collected, the proposed site for the development is considered as low to medium sensitivity for the following reasons:

- shallow soils dominate the study area,
- the alternative soil, Westleigh, is generally classified as wetland,
- the lands are on low land capability; therefore, the long-term sustainability is questionable.

Therefore, the medium sensitivity based on the moderate land capability is disputed. The field assessment recommends that the site is dominated by a 'low sensitivity' due to the low land capability (Figure 19).

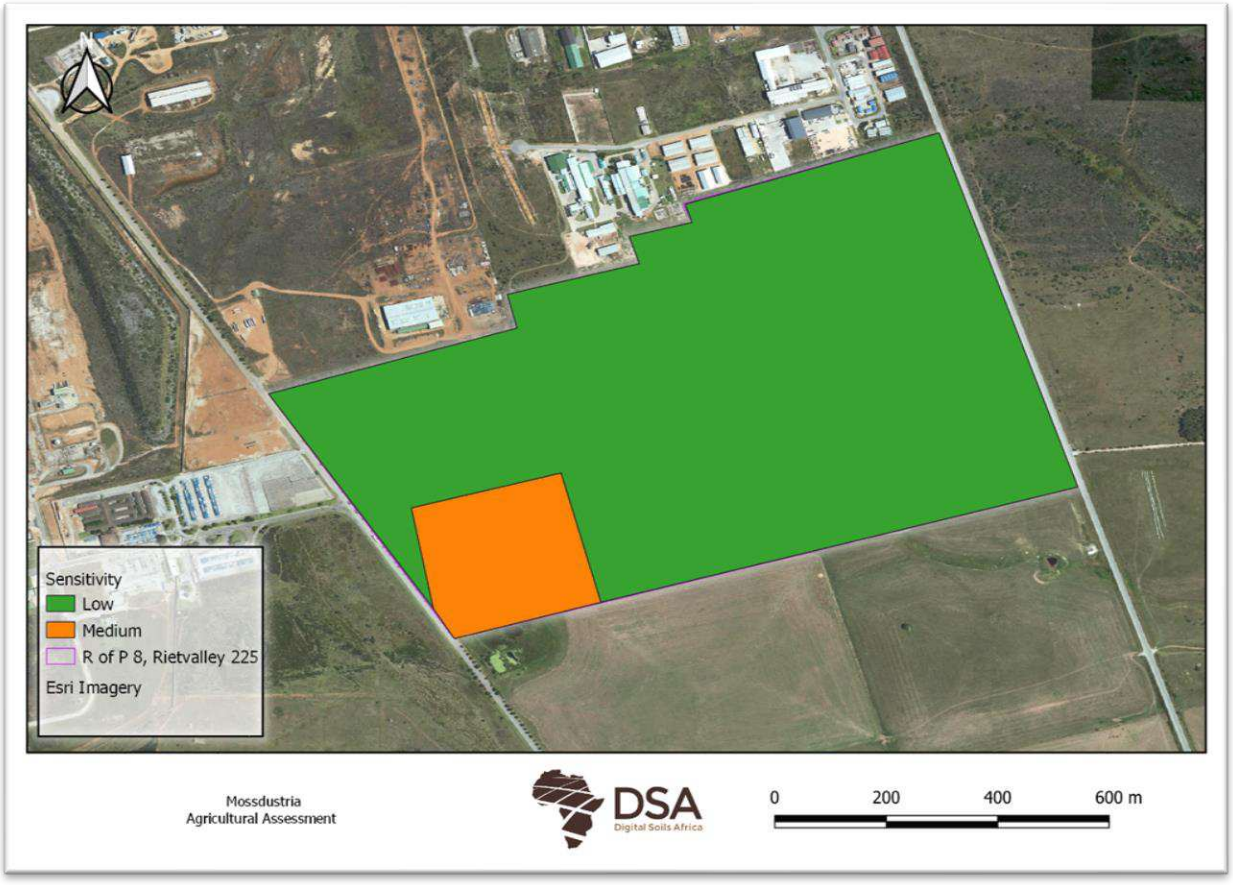


FIGURE 19: AGRICULTURAL SENSITIVITY OF THE STUDY AREA.

Due to the low to medium sensitivity, it is the specialist's opinion that the proposed development will not have a significant impact on agricultural in the area. No micro-siting is foreseen due to the development and no mitigation is recommended. No further studies are foreseen.

In terms of agricultural sensitivity, the proposed development should thus be allowed to proceed at the identified site.

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: >100 **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

SACNASP
South African Council for Natural Scientific Professions

herewith certifies that

Darren Bouwer

Registration Number: 400081/16

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)

Effective **9 March 2016** Expires **31 March 2024**

Chairperson

Chief Executive Officer

To verify this certificate scan this code

APPENDIX 2: OBSERVATION DETAILS

Lon	Lat	Altitude	Obs	Soil type	Depth	Land Capability
22.00714167	-34.15668611	184.8446199	1	Glenrosa	300	Low
22.00528333	-34.157075	184.8489495	2	Westleigh	400	Low
22.00426944	-34.15755	184.658674	3	Mispah	300	Low
22.00480833	-34.15748611	183.6863593	4	Westleigh	400	Low
22.01023889	-34.16911944	164.4838358	5	Mispah	200	Low
22.00918889	-34.16982222	163.0411797	6	Mispah	200	Low
22.00363611	-34.17083333	167.1487018	7	Westleigh	500	Low
22.00299722	-34.16963889	167.626327	8	Westleigh	500	Low
22.00257778	-34.16586389	175.8249232	9	Mispah	100	Low
22.00542222	-34.16764722	171.0131666	10	Westleigh	800	Low
22.00686389	-34.16626667	173.5170886	11	Mispah	100	Low
22.00785278	-34.16465833	175.0631048	12	Mispah	200	Low
22.00901111	-34.16390278	176.70282	13	Mispah	200	Low