



FINAL SCOPING REPORT
FOR THE CLEARING OF
VEGETATION ON THE
REMAINDER OF FARM
NAAUWTESFONTEIN NO.
78, HOPETOWN

PREPARED FOR

G.F. STEYTLER

SEPTEMBER 2021

Reference: **NC/EIA/12/PIX/THE/HOP1/2021**



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BACKGROUND

Digital Soils Africa (Pty) LTD (DSA) was tasked by Mr. George Frank Steytler to conduct environmental investigations and complete the Environmental Authorisation Application for the authorisation of clearing 269Ha of vegetation on the Remainder of the Farm Naauwtesfontein No. 78, Hopetown in the Northern Cape.

In terms of the National Environmental Management Act 107 of 1998 (“NEMA”), environmental authorisation must be obtained before any person can conduct activities that cause damage to the environment.

DSA was appointed by Mr. Steytler (also referred to as the Applicant) as the independent environmental assessment practitioner (EAP) to undertake the Environmental Authorisation Application for the commencement of a listed activity in terms of the Environmental Impact Assessment Regulations 2014, as amended in 2017.

Mr. Steytler would like to develop 269Ha of which about 177Ha of vegetation will be cleared to establish pivots for irrigating maize and wheat crops and pasture. Two sites on the same farm were chosen for this development, which will be referred to henceforth as Site A (198Ha in total) and Site B (71Ha in total).

Currently the site host intact vegetation with some evidence of overgrazing. Soil samples were taken and analysed to investigate if the soil is suitable for establishing crops. The soil study indicated that at Site A, the pivot placement does not exceed more than 10% of unsuitable soil in a pivot area. However, Site B has small areas of moderately suitable soils for irrigation, which can be incorporated into pivots, and thus the pivot placement is not affected by suitability.

In terms of the drainage, the A and B horizons of the sites are characteristically sandy and therefore will facilitate good drainage. Most of the soils are very high-potential irrigation soils.

From an environmental point of view, the larger 269Ha area should be under application, although only 177 Ha would most likely be disturbed, the rest of the 92Ha that are located between the proposed pivot areas should be used as an off-set area and to preserve if for conservation purposes and possible transplant of vegetation, depending on the outcome of the vegetation report.

An application to cultivate virgin soil (or commonly known as a plough certificate) will also be applied for at the Department of Agriculture to ensure all legal requirements for such a development are met.

The Applicant has existing water use rights and therefore do not require additional applications for a Water Use Right. In the future, they might apply for an increase in usage, however, at this stage, it is not required.

ENVIRONMENTAL STUDIES

The environmental studies for this project will be divided into 2 phases. This Scoping Report is a product of Phase 1 and identifies issues and concerns which are required to be evaluated by specialists and documented in Phase 2.

PHASE 1

- This Environmental Scoping Report aims to identify potential and biophysical impacts associated with the proposed clearing of vegetation and to propose further studies that are required to be undertaken and included within the EIA and EMP report.
- This report acts as a discussion document, and comments from the Department of Agriculture, Environmental Affairs, Rural Development and Land Reform on this report are encouraged.

PHASE 2

- Further investigation and assessment of all potentially significant environmental impacts (social and biophysical) identified in the Environmental Scoping Report. Mitigation measures are to be recommended where required, and the completion of the Environmental Impact Assessment and Environmental Management Report.

INVESTIGATION PROCEDURE

DESK STUDY

The investigation commenced with a desk study of all available information. This provided information on environmental and technical studies that have been conducted and identified potential issues to consider. Historical documentation included all the documents submitted in the previous applications for this area, maps of the area, and land use.

The desk study revealed that this potentially could be a site to develop into a crop and pasture land, but will depend on the field investigation, which should also include a soil survey and vegetation survey.

FIELD INVESTIGATION

An initial site visit was conducted on 29 June 2021 to investigate the sensitivity of the site and identify the listed activities that would be triggered for the application for environmental authorisation. During the site visit, it was noted that to the north, west and south of Site A, the abutting areas are transformed, due to agricultural activities, the old Hopetown-Douglas provincial road (R3112), and to the east, west and south of Site B, the abutting areas are also transformed, due to agricultural activities, and the R3112. To the immediate east, of Site A (across the R3112) and to the north of Site B the veldt is still in a natural condition and representative of the Kimberley Thronveld vegetation type. Further north from the site the natural vegetation changes to the Vaalbos Rocky Shrubland vegetation type. The site has been portioned through fencing and would limit the movement of larger wild animals.

No important ecological features with ecological functions were identified on the two sites and overall the area has limited connection to other environments.

A soil survey was carried out on the site and it was found that at Site A, the pivot placement does not exceed more than 10% of unsuitable soil in a pivot area. However, Site B has small areas of moderately suitable soils for irrigation, which can be incorporated into pivots, and thus the pivot placement is not affected by suitability. In terms of the drainage, the A and B horizons of the sites are characteristically sandy and therefore will facilitate good drainage. Most of the soils are very high-potential irrigation soils.

DETAILS OF THE APPLICANT

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LANDOWNER

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Responsible person:

Mr. G.F. Steytler will be the responsible person for this application.

LEGISLATION

The intention of environmental legislation is to regulate the interaction of human life with the natural environment. The purpose of environmental legislation is to protect and preserve the environment for current and future generations. The following Acts and Regulations apply to the proposed project and a summary of the most relevant environmental legislation is provided in this section.

1. Section 24 of the **Constitution of the Republic of South Africa Act (No 108 of 1996)** states that everyone has the right:
 - (ii) to an environment that is not harmful to their health or well-being;
 - (iii) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources, while promoting justifiable economic and social development.
2. The **National Environmental Management Act (Act No 107 of 1998)**. NEMA is based on the concept of sustainable development and the objective is to provide for co-operative environmental governance, by providing the legal framework for environmental planning and development.

NEMA has basic principles that state:

- That all the principles throughout the Republic apply to the actions of all organs of state that may significantly affect the environment;
- Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural, and social interests equitably.
- Development must be socially, environmentally, and economically sustainable.
- Sustainable development requires consideration of all relevant factors.
- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.
- There should be equal access to environmental resources, benefits, and services to meet basic human needs and the Government should promote public participation when making decisions about the environment;

- Decisions must be taken openly and transparently and there must be access to information;
 - Communities must be given environmental education;
 - Workers have the right to refuse to do work that is harmful to their health or the environment;
 - The role of youth and women in environmental management must be recognized;
 - The person or company who pollutes the environment must pay to clean it up;
 - The environment is held in trust by the state for the benefit of all South Africans; and
 - The utmost caution should be taken when permission for new developments is granted.
3. The **Environmental Impact Assessment Regulations: 324, 325, 326 & 327 of 7 April 2017**. The purpose of these Regulations is to regulate the procedure and criteria as contemplated in Chapter 5 of the Act relating to the preparation, evaluation, submission, processing, and consideration of, and decision on, applications for environmental authorizations for the commencements of listed activities, subjected to environmental impact assessment, to avoid or mitigate detrimental impacts on the environment, and to optimize positive environmental impacts, and for matters pertaining thereto.

Duty of Care

Chapter 7 of the NEMA prescribed a general ‘duty of care’ and the requirement to remediate environmental damage. Section 28(1) of NEMA states:

Every person who causes/has caused, or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing, or recurring, or insofar as such harm to the environment is authorized by law or cannot reasonably be avoided or stopped, to minimize and rectify such pollution or degradation of the environment.

The Duty of Care can, inter alia, be enforced through directives issued by the competent authority.

In terms of 2014 NEMA EIA Regulations, as amended, the activities listed in the below Table (Table 1) will be triggered by the clearing of vegetation, thereby requiring an EA from the Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAEARDLR).

TABLE 1: EIA LISTED ACTIVITIES

Government No. R325 Activity No(s):	Notice	Details of Activity(ies) requiring a Scoping Report and EIA
Activity 15		The clearance of an area of 20 hectares or more of indigenous vegetation.

4. The **National Water Act (No. 36 of 1998) (NWA)**.

Site A is situated more than 1.9km from the Orange River and Site B is situated more than 1.7km from the Orange River. There are no drainage lines, streams/rivers/wetlands present on the area under the application that provides any direct connectivity to the Orange River. Thus the clearing of vegetation will not take place within 100m from the drainage line and would not trigger any listed activity in terms of NEMA or NWA.

The landowner does have existing water use rights for irrigation, therefore at this stage, a Section 21 (a) application in terms of the NWA is not required.

5. The **National Environmental Management: Biodiversity Act:**

The act provides the framework for: i) the management and conservation of biological diversity within the Republic and the components of such biological diversity; ii) the use of indigenous biological resources in a sustainable manner; and iii) the fair and equitable sharing among stakeholders of benefits arising from bioprospecting involving indigenous biological resources.

The act also provides for co-operative governance in biodiversity management and by establishing a South African National Biodiversity Institute, the objectives of the Act can be achieved.

Three Regulations are applicable: 1) Threatened and Endangered Ecosystems, 2) ToPs (2008) (Threatened or Protected species), and 3) AIS (Alien and Invasive Species).

6. The **National Environmental Management: Protected Areas Act:**

The Protected Areas Act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. It provides for the establishment of a national register of all national, provincial and local protected areas and the management of those areas. The Act also provides for the governance and functions of South African National Parks and matters in connection therewith.

7. The **National Forests Act No. 84 of 1998 (NFA) & List of Protected Tree Species under the National Forest Act, 1998 (Act No. 84 of 1998)**.

The purposes of this Act are to promote the sustainable management and development of forests for the benefit of all. The Act also provides special measures for the protection of certain forests and trees and promotes the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes.

According to the Act, a natural forest is defined as a group of indigenous trees whose crowns are largely contiguous or which have been declared by the Minister to be a natural forest under section 7(2). No person may cut, disturb, damage or destroy any indigenous tree in a natural forest; or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any tree, or any forest product derived from a tree within a natural forest.

The principals of the Act indicate that:

- a) Natural forests must not be destroyed save in exceptional circumstances where, in the opinion of the Minister, proposed new land use is preferable in terms of its economic, social or environmental benefits;
- b) A minimum area of each woodland type should be conserved; and
- c) Forests must be developed and managed so as to-
 - conserve biological diversity, ecosystems and habitats;
 - sustain the potential yield of their economic, social and environmental benefits;
 - promote the fair distribution of their economic, social, health and environmental benefits;
 - promote their health and vitality;
 - conserve natural resources, especially soil and water;
 - conserve heritage resources and promote aesthetic, cultural and spiritual values; and
 - advance persons or categories of persons disadvantaged by unfair discrimination. Page 15 of 82 (4) The Minister must determine the minimum area of each woodland type to be conserved in terms of subsection (3)(b) based on scientific advice.

The protected trees that commonly occur in this region are *Acacia erioloba* and *Boscia albitrunca*. The presence of these trees on site will be confirmed as part of the Ecological Impact Assessment to be conducted during the EIA Phase.

8. Conservation of Agricultural Resources Act (Act 43 of 1983):

The objectives of the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) are to provide for the conservation of the natural agricultural resources of South Africa by the:

- Maintenance of the production potential of land;
- Combating and prevention of erosion and weakening or destruction of the water sources; and
- Protection of the vegetation and the combating of weeds and invader plants.

The CARA states that no land user shall utilise the vegetation of wetlands (a watercourse or pans) in a manner that will cause its deterioration or damage. This includes cultivation, overgrazing, diverting water run-off and other developments that damage the water resource.

The CARA includes regulations on alien invasive plants. According to the amended regulations (GN R280 of March 2001), declared weeds and invader plants are divided into three categories:

- Category 1 may not be grown and must be eradicated and controlled,
- Category 2 may only be grown in an area demarcated for commercial cultivation purposes and for which a permit has been issued, and must be controlled, and
- Category 3 plants may no longer be planted and existing plants may remain as long as their spread is prevented, except within the flood line of watercourses and wetlands.

It is the legal duty of the land user or landowner to control invasive alien plants occurring on the land under their control. Should alien plant species occur within the study area; this will be managed in line with the EMPr.

9. Bio-regional Plans:

In terms of the provincial and local protected areas, the area under application is situated within an area that has been identified as other natural areas according to the BGIS of the Northern Cape Biodiversity Conservation Plan and does not fall within a critically biodiversity area. The Thembelihle Municipality Integrated Development Plan (IDP) does not have a special development framework (SDF).

The purpose of the SDF is:

- To guide spatial planning, land development, and land use management in the local municipal area. More specifically, to geographically detail land use
- To give strategic direction in terms of investment in the local Municipal area to the private sector and community investors concerning the levels, locations, types, and forms of investment that need to be made and that will be supported by the Local Municipality.
- In the SDF identified amongst others, crop farming agriculture of mono-culture, less than 250Ha as a small area, and mixed agriculture (livestock & crops), but the impacts associated with it are:
 - The destruction of biodiversity;
 - Indigenous flora being substituted with exotic species;
 - The loss of herbaceous annuals;
 - Exposure of bare soil and subsequent erosion;
 - Areas are homogenized and ecosystem functioning on cultivated land is essentially simplified to the production of bio-mass;
 - Depletion and degradation of soils may lead to unproductive soils.

The Thembelihle Municipality has not mapped the environmental sensitivity of the municipal area thus the sensitivity of the site can not be compared to the Municipal verification of environmentally sensitive areas.

The vegetation survey that will be conducted will verify the sensitivity of the site from a botanical and ecological point of view.

10. Northern Cape Nature Conservation (Act 09 of 2009):

The objective of the Act is to provide for the sustainable utilisation of wild animals, aquatic biota, and plants, to provide for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, to provide for offenses and penalties for contravention of the Act, to provide for the appointment of nature conservators to implement the provisions of the Act, to provide for the issuing of permits and other authorisations, and to provide for matters connected therewith.

This Act aims at improving sustainability in terms of balancing natural resource usage and protection or conservation thereof. It includes six schedules, as follows:

- Schedule 1 - Specially Protected species;
- Schedule 2 - Protected species;
- Schedule 3 - Common indigenous species;
- Schedule 4 - Damage causing animal species;
- Schedule 5 - Pet species; and
- Schedule 6 - Invasive Species.

With regards to protected flora, the Northern Cape Nature Conservation Act includes a list of protected flora. The plant species potentially present within the proposed project area will be identified as part of the Flora Impact Assessment specialist study. However, it will be recommended as part of the EMP, that a detailed plant search and rescue operation be conducted before the clearance of vegetation. If any of the listed species are found, the relevant permits should be obtained by the Applicant before their relocation or destruction.

11. The Provincial Spatial Development Framework for the Northern Cape (Office of the Premier of the Northern Cape, 2012):

On 22 August 2012, the Northern Cape Provincial Spatial Development Framework (PSDF) was approved in accordance with the Northern Cape Planning and Development Act, 1998. However, the Spatial and Land Use Management Act (SPLUMA) was approved in 2013 and now requires the review of the Northern Cape PSDF 2012, which commences in 2018.

The PSDF needs to address spatial inefficiencies and inequalities, identify areas of opportunity and ensure proactive management of natural resources and ecosystems in the Province. The PSDF will focus on transforming spatial development whilst SPLUMA provides the tool for that transformation.

The approval of the PSDF in terms of the Northern Cape Planning and Development Act 7 of 1998 means that the PSDF has statutory status as the common spatial vision and strategy around which to align the future development and management of the province.

In terms of Land Use Management, there are 6 (six) Spatial Planning Categories, which are, 1) Category A (Nature Conservation Area); 2) Category B (Natural Buffer Areas) 3) Category C (Agricultural Areas); 4) Category D (Urban Related Areas); Category E (Industrial Areas); Category F (Surface Infrastructure Areas).

The SPCs are not a blueprint for land-use classification, or a zoning scheme, however, the SPCs provide a framework to guide decision-making regarding land use at all levels of planning, and they have been articulated in a spirit of creating and fostering an organised process that enables people to work together to achieve sustainable development in a coherent manner. The designation of SPCs does not change existing zoning or land-use regulations or legislation. SPCs merely help to clarify and facilitate coherent decision-making that can lead to better zoning, laws and regulations. The SPCs, furthermore, provide a framework in terms of which land-use decisions can be standardised throughout the province.

The land-use classification has further adopted a bioregional planning approach which provides for three broad land-use categories, i.e. a core conservation area (SPC A), a conservation focussed buffer area (SPC B), and a transition area (SPC C-F).

In terms of this application, the proposed development will fall within the Land Use Management Category C, since the Applicant would like to clear vegetation to establish intensive agricultural crop production. The plan is to establish a maize and wheat crop and alternate annually with pasture land (most likely lucerne).

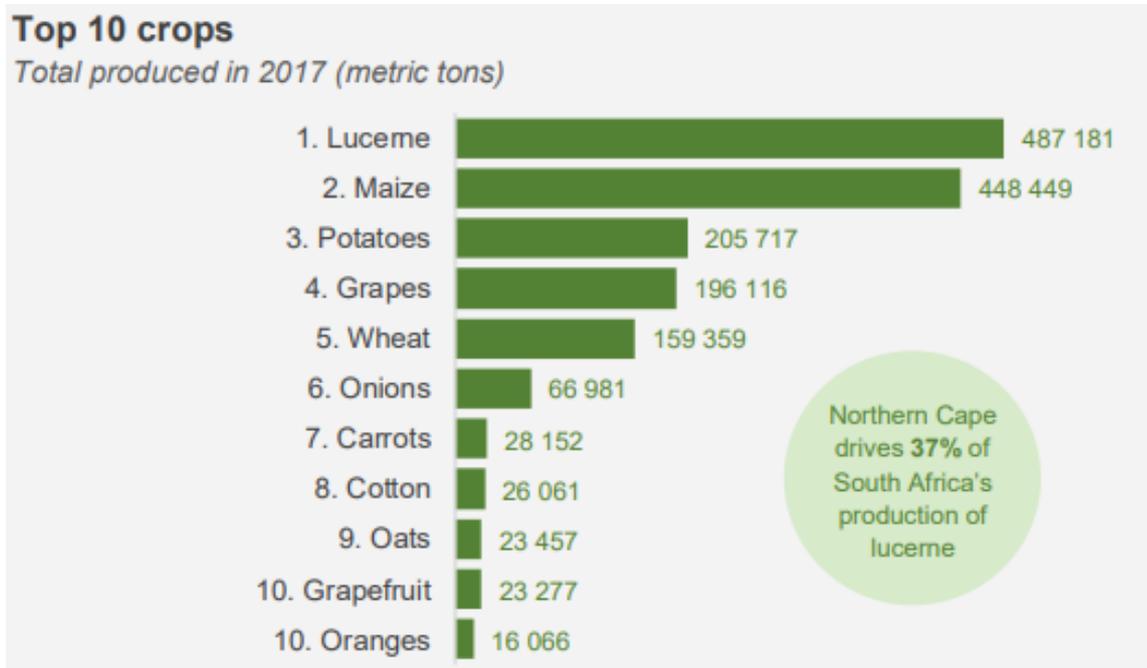


FIGURE 1: TOP 10 CROPS PRODUCED IN NORTHERN CAPE (SOURCE STATS SA, 2020).

The Northern Cape produces about 37% of South Africa lucerne (STATS SA, 2020) and about 9% of South Africa's total maize production (Department of Agriculture, Forestry and Fisheries, 2017), therefore the proposed production is in line with the achievement of the agricultural sector in the Northern Cape.

In terms of the Agricultural Areas in Spatial Planning, the key strategies and intervention are:

- Give effect to the ideas of the sustainable Development Goals pertaining to the promotion of sustainable agriculture and rural development.
- Development of an Agricultural Master Plan for the Province to identify and protect the most fertile land for cultivation and food security purposes.
- Consider the rezoning of low-potential agricultural land as a mechanism to promote sustainable economic development by unlocking the latent capital vested in non-agricultural uses through the Sustainable Development Initiative (SDI) approach.
- Encourage bona fide game farms to combine their landholdings to create an extensive Spatial Planning Buffer Area (SPC B), that would support biodiversity conservation in a meaningful manner. Such areas should be managed as Special Management Areas.
- Encourage local processing of farm products and the provision of local farm services to enhance the total economy, increase the viability of agricultural production and reduce rural poverty.

12. The **National Heritage Resources Act (No 25 of 1999)**:

The basic objectives of the National Heritage Resources Act are to set norms and maintain essential national standards and general principles for the governing and management of heritage resources in the Republic and to protect heritage resources of national significance.

The South African Heritage Resources Agency (SAHRA) has been established to coordinate and promote the management of heritage resources at the national level.

The proposed site is situated on agricultural land currently used for grazing, however, a heritage assessment will be completed during the EIA phase.

DETAILS OF THE AUTHOR

Natalie Sharp is the project manager and senior Environmental Assessment Practitioner leading this project and is registered as an Environmental Assessment Practitioner (EAP) with the Certification Board for Environmental Assessment Practitioners of South Africa (EAPSA) (Registration Number: 2020/230) and as a Professional Natural Scientist (Pri.Sci.Nat) with the South African Council for Natural Scientific Professions (SACNASP) (Registration Number: 123443) (see Appendix A). Natalie Sharp has worked in the environmental industry for over seventeen years.

CURRICULUM VITAE

NATALIA SHARP

Personal Details	Date of birth: 12 August 1979 Nationality: South African Identity number: 790812 000 7080 Gender: Female Languages: English / Afrikaans
Qualifications:	BSc (2000) UFS – Zoology and Botany BSc Honors (2001) UFS - Limnology Masters in Environmental Management (2003) UFS - Evaluation of Phytoplankton as an indicator in a biomonitoring program, with special reference to the Modder River.

Experience (Seventeen years' experience in environmental law and environmental management)

During the 2 years associated with the Centre for Environmental Management intense training was provided for equipping Natalia Sharp with adequate knowledge in terms of biomonitoring water systems and scientific report writing for research done by her through the Centre. Various scientific contributions were made during these few years which included formal reports to Bloem Water and seminars providing management principles for polluted water bodies, thus providing her with additional regulatory and environmental skills.

During the 5 years associated with the DME, now changed to the Department of Mineral Resources (DMR), vast knowledge was gained in terms mine environmental management, the development, rehabilitation and closure of mining and prospecting areas. Environmental Management Programmes, Environmental Performance Assessment Reports, and Closure Reports were scrutinized continually. Therefore, adequate expertise was gained to assist the applicants with relevant environmental and mining advice and providing her with adequate knowledge to evaluate environmental impacts relating to mining.

During the 11 years associated with SES (Stellenryck Environmental Solutions), Natalia Sharp has obtained immense understanding in completing environmental impact assessments, not only associated with mining projects, but also for a wide variety of different developing projects such as Light Industrial developments, Road upgrade projects, bush clearing for agricultural developments, and applications for exemptions, and so forth. She has excellent experience in writing environmental reports, which ranges from Scoping Reports, Environmental Management Plans, Environmental Awareness Plans, Mining Work Programs, Closure Plans, Risk Assessments, Performance Evaluations on projects, and Plan of Study reports. She has also been involved in performing biomonitoring on river systems associated with some of the projects, completing it by obtaining all the data and writing the Biomonitoring Report for the relevant Department. This is mainly attributed to her Limnology background and she is competently able to add value to this field in her current position.

Previous Employment

Centre for Environmental Management University of the Free State: Lab Assistant [2001 – 2003]
Mine Environmental Management [2003-2005] at the Department of Mineral Resources: Environmental Officer
Mine Environmental Management [2005-2008] at the Department of Mineral Resources: Senior Environmental Officer
Stellenryck Environmental Solutions: Senior Environmental Practitioner [2008-2019]

Current Employment

Digital Soils Africa Pty Ltd: Senior Environmental Practitioner [2020-currently]

Digital Soils Africa Pty Ltd (DSA) is an independent environmental consulting firm that is also soil specialists, focussing on all soil solutions in the agricultural and environmental fields. The specialists are SACNASP registered and recognized leaders in their fields of study.

The soil specialist services provided include soil surveys, soil erosion mitigation, fertilization management, soil and land capability studies, and wetland delineation amongst others, while the fields of specialization are hydropedology and digital soil mapping. Together the directors have 58 years of experience.

Prof. Pieter le Roux boasts more than 35 years of experience as a soil scientist. He is the initiator and main driving force behind hydropedology research in South Africa, which has earned him a C2 NRF research grading. As such, he has published more than 50 peer reviewed scientific publications, but also oversaw more than 40 consultancy projects. He is SACNASP registered and recently co-produced a webinar on hydropedology.

Prof. Johan van Tol is currently the national leading researcher on hydropedology. He is a Y1 NRF rated researcher, who boasts 34 peer reviewed scientific publications and has put his research to work in more than 30 consultancy reports. He is also a SACNASP registered scientist.

Dr. George van Zijl is Africa's foremost Digital Soil Mapper. For his PhD he developed a DSM protocol for use in southern Africa, and has subsequently improved the methodology to include machine learning such as shown in the mapping of Ntabelanga catchment and City of Joburg Hydropedological mapping. He has served on the scientific committee for international DSM conferences. George has conducted more than 60 consultancy projects and is a SACNASP registered scientist.

Dr. Darren Boucher boasts 10 years' experience as a soil scientist. His PhD incorporated chemical measurements into hydropedological assessments, which improves flow path determination. He has also completed a post doctorate at Ghent University, Belgium, where he specifically worked on hydropedological modelling. Darren is a SACNASP registered scientist and has completed more than 45 consultancy reports.

DESCRIPTION OF THE RECEIVING ENVIRONMENT

SITE LOCATION

The site is situated north-west from Hopetown in the Northern Cape (**Site A:** 29° 30' 38.85"S; 23° 56' 40.97"E and **Site B:** 29° 31' 10.72"S; 23° 58 '19.99"E) on the Remainder of Farm Naauwtesfontain No. 78, within the Thembelihle Local Municipal area. The farm can be reached by traveling along the R3112 (old Douglas road) north-west from Hopetown for about 16km until the farm road of Site A is reached.

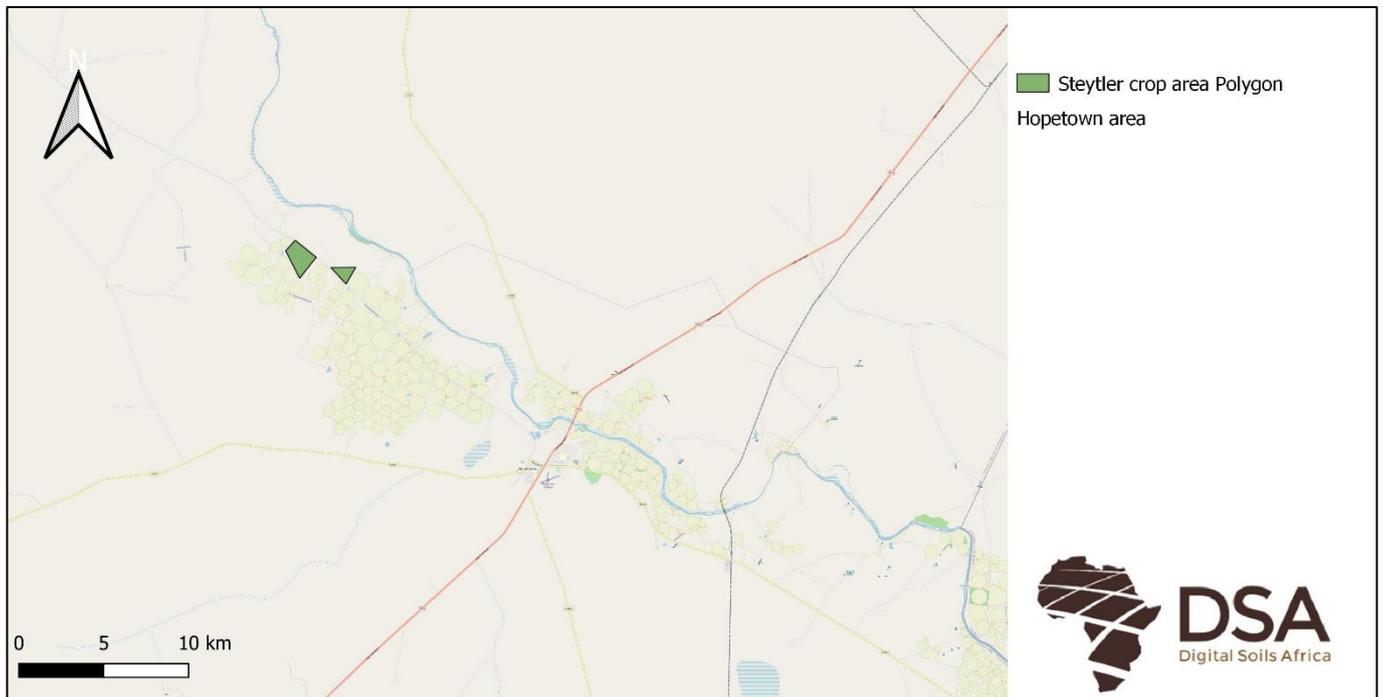


FIGURE 2: SITE LOCATION

PROJECT DESCRIPTION

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), an Environmental Authorisation (EA) must be obtained from the relevant competent authority before commencing with any listed activity that may impact the environment. The Applicant would like to clear more than 20Ha of vegetation to establish crops for agricultural purposes.

The Applicant already has a Water Use License, for the abstraction of water for irrigation and is in the process of obtaining approval for cultivating virgin soil (commonly referred to as a plough certificate) from the Directorate Land Use and Soil Management of the Department of Agriculture.

The area under application is not regarded as a site of ecological importance when studying the vegetation nor does the site have any high conservation value. The development is situated more than 1.8km from any watercourse on a fairly flat, undulated landscape.

PLANNING PHASE

Although 269 Ha are under application, only the pivot areas will be cleared from vegetation to establish crops. Thus, during the planning phase, the location of the pivots must be determined based on soil suitability.

The soil report and findings were the leading factors in deciding to allocate the pivot areas. Deep soil depths, favoured soil types, and drainage led to the best soil suitability areas. At Site A there is a central section that was identified as not being suitable for irrigation due to potential drainage issues, thus the pivot placement of Site A should not exceed more than 10% of unsuitable soil in a pivot. To achieve this objective, two 55Ha pivots should be placed as close as possible to the boundary of the north-eastern section of the property, as the soils along this portion are the most suited. A 20Ha pivot can be placed directly south of the most northern 55Ha pivot, west from the haul road (see Figure 4). In the soil report, another 20Ha pivot area was identified most south of Site A, however, it is the opinion of the author that this pivot should not be developed as more than 80% of this pivot area will have unsuitable soil.

Site B had small areas of moderately suitable soils for irrigation, while the majority of this site was favourable, thus the pivot placements would not be affected by suitability at Site B. One large pivot area of 40Ha will be placed in the center of Site B, with a smaller 7Ha pivot area north-west from the 40Ha pivot area.

Ultimately, the study area under application is 269 Ha, but if the proposed pivot areas are developed only 177Ha will be cleared from vegetation with the rest of the 92Ha in between the pivot areas of Site A and B will be left undisturbed and can be used as a nursery if plants are identified to be transplanted and conserved.



FIGURE 3: THE PROPOSED PIVOT AREAS ARE INDICATED BY THE BLUE POLYGONS, WHICH HAVE BEEN OVERLAYED BY THE PIVOT AREAS PROPOSED IN THE SOIL REPORT. THE RED POLYGON REPRESENTS THE UNSUITABLE SOIL SECTION IN THE CENTRE OF SITE A, AS CAN BE SEEN, THE VERY SOUTH PIVOT AREA COVERS ABOUT 80% OF UNSUITABLE SOIL AND THEREFORE SHOULD BE EXCLUDED FROM DEVELOPMENT.

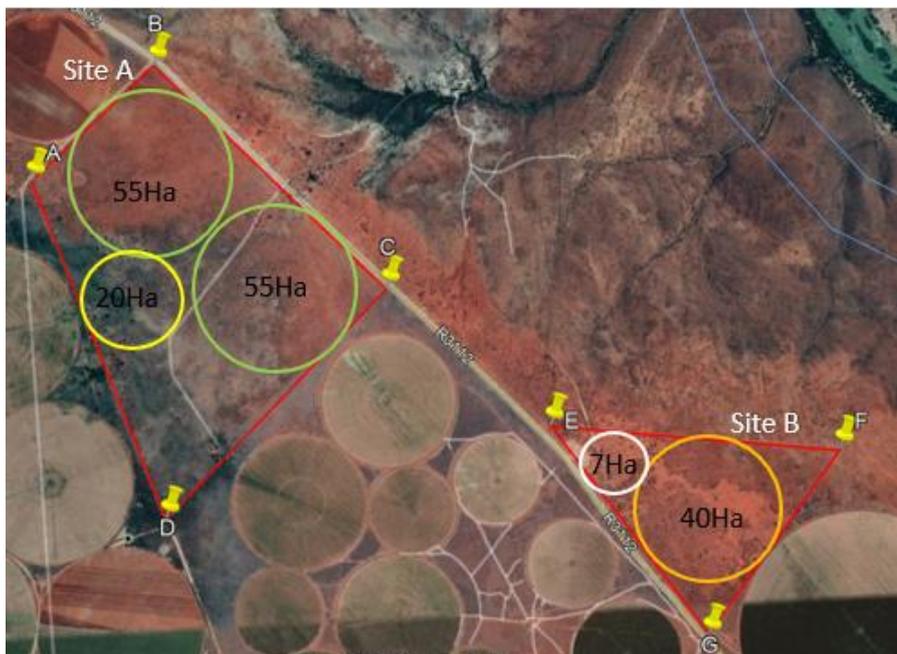


FIGURE 4: PROPOSED LAYOUT OF PIVOTS

CONSTRUCTION PHASE

The clearance of vegetation will take place simultaneously at Site A and Site B within 2-4 months. The construction phase will result in the clearing of natural veld on the allocated pivot areas according to the soil report and preparing the soil. Soil tillage, particularly primary tillage, is the foundation of any crop production system and is the biggest cost factor in maize production (du Plessis, 2003). According to du Plessis (2003), the most important processes affected by soil tillage include infiltration and evaporation of water. Because water availability during the growing season is the single most important factor in crop production in South Africa, soil tillage must be aimed at optimising infiltration and minimising evaporation.

According to the soil report, the A and B horizons are characteristically sandy and therefore will facilitate good drainage and the soil texture results confirm the morphological interpretations and good drainage is expected on the soils. However, the laboratory results indicate that the exchangeable sodium percentage (ESP) values are high. Na in relation to other cations is high, thus a possible indication of sodicity, and if not managed correctly, can lead to degradation of soil by reducing the flow of water through soil, which limits leaching and can cause salt to accumulate over time and develop of saline subsoils. It can also cause crusting and sealing on the soil surface, which impedes water infiltration, accelerating erosion and causing structureless soils.

The soil report indicated that this potential risk can be rectified with irrigation and fertilization on soils with adequate drainage, so that the Na can leach out and be replaced with Ca, Ma and K, lowering the ESP.

Thus during the construction phase and into the operational phase, soil management will be the most important principle to apply to manage the chemical parameters and prevent soil degradation.

Once the vegetation is cleared, the soil will be deep ripped, which will further improve drainage, access rocks will be removed, spreading of chicken manure or other organic fertilisers, but also Gipson or lime should be applied to leach out the Na. Once the soil is prepared, the maize or wheat will be planted.

Most of the workforce will be sourced locally or provincially.

OPERATIONAL PHASE

After about 4 months after the commencement of the project, all the areas applied for should be cleared and the crop production should be established. It will be managed and maintained by the farmer and will be a permanent establishment. It is also the intent of the Applicant to rest the crop fields annually through rotating crops. About 200Ha is currently approved and under crop production, the addition of the 269Ha will allow the Applicant to continue to produce 200Ha of crops per annum, but also allowing the alternating camps to rest. It is not the intent of the Applicant to increase crop production to 400Ha per annum. Resting camps will be grazed by cattle, feeding on crop residue and pasture land would be established. During the resting period, attention will be given to soil upgrading, such as deep ripping, removing access rocks, spreading of chicken manure or other organic fertilisers on the land, as well as Gipson or lime to leach out the Na.

As with the operational phase, the workforce (upkeep of the land) will be sourced locally.

DECOMMISSIONING PHASE

This is a permanent change from grazing to crop production. Should the activity be authorized, it is highly unlikely that the proposed development will be decommissioned. However, should crop production cease, the site will be used for pasture. Should the Applicant elect to decommission the crops and pasture land at any point in the future, the necessary authorization must be obtained and the correct decommissioning protocol must be followed. The relevant Government Departments (those applicable at the time of decommissioning) should be consulted before decommissioning.

Following the decommissioning, the site should be rehabilitated back to a predetermined state, e.g. sufficient for grazing or a near-natural state with natural vegetation cover. A qualified botanical specialist should be contacted for more information on rehabilitation techniques.

ALTERNATIVES INVESTIGATED FOR THE PROPOSED DEVELOPMENT

Alternative sites/land use/layout are chosen based on the outcome of the site investigation and proposed activities, which determine the social and environmental impacts. In the process, each environmental parameter and the possible impact of bush clearing is considered and investigated to determine any alternative location/land use/layout or method that could reduce the environmental and social impact and improve the sustainability of the project.

The investigation has led to no alternative sites being chosen for this particular project since no alternative land is available that belongs to, or is rented by the Applicant, which has water use rights.

Alternative land uses, instead of agriculture will not be considered, since it involves an application for change of land use and the landowner does not wish to change the land use of the property.

The soil report indicated that crops can be established on at least 177Ha of the site. A vegetation report will be conducted, but the site is situated on the Kimberley Thornveld which has a Least Concern conservation status. The target of conservation is 16% of which only 2% are currently conserved in Vaalbos national park as well as in Sandveld, Bloemhof Dam, and S.A. Lombard Nature Reserves. Some 18% is already transformed, mostly by cultivation (Mucina and Rutherford, 2006).

In light of this, it is recommended that this site be developed into a crop and alternating pasture land, with the benefit of socio-economic improvement and job creation opportunities, while remaining an agricultural unit.

In terms of alternative site layout, 269ha is under investigation as a potential development area. However, the soil report indicated that most of the surveyed area is suitable for irrigation, due to the free-draining soils and cracked rock underlying most profiles.

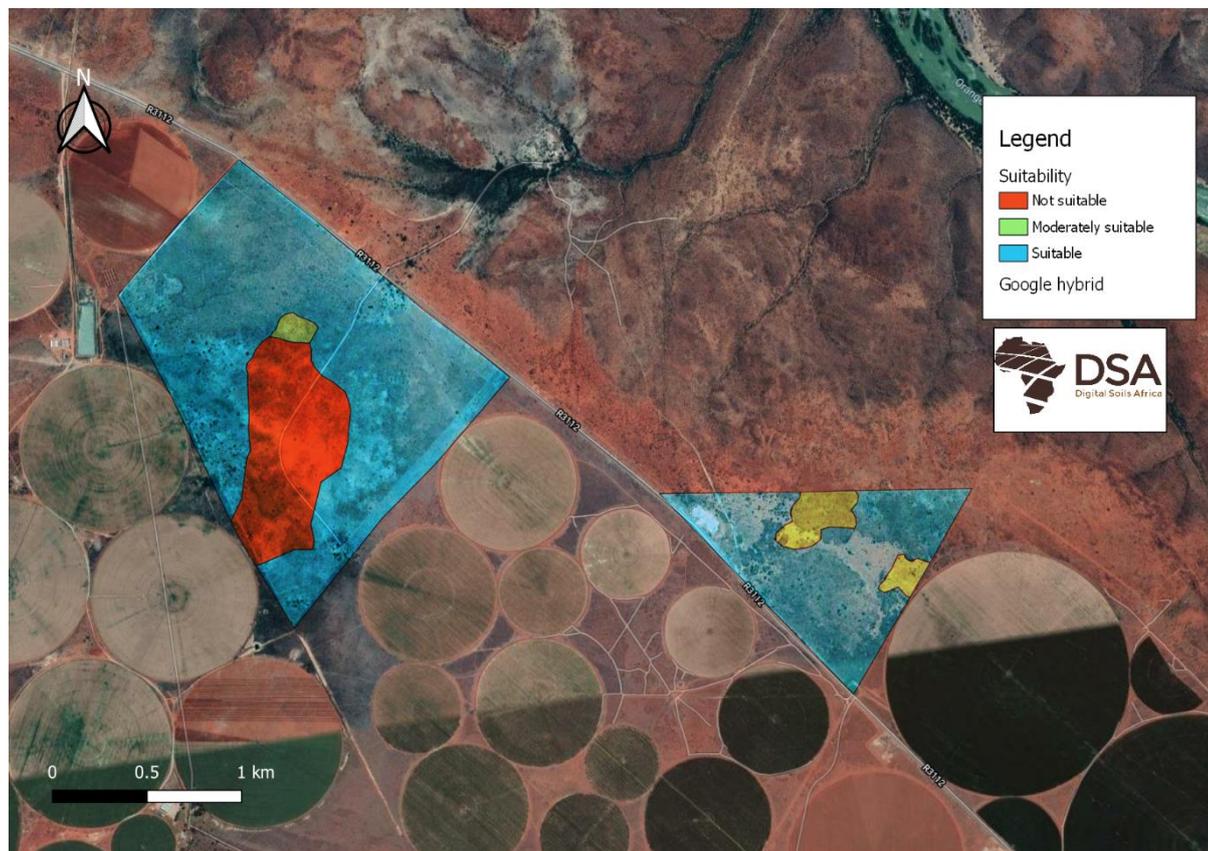


FIGURE 5: SOIL SUITABILITY OF THE STUDY AREA (SOURCE FROM THE SOIL REPORT)

The areas that are not suitable for irrigation (see Figure 5, the red polygon areas) are limited by external drainage. One area is underlain by a hardpan carbonate horizon, which is an indication of water accumulation in arid climates, and the other by hard rock.

Therefore, it was recommended in the soil report that the pivot placement in Site A does not exceed more than 10% of unsuitable soil. Site B only has small areas of moderately suitable soils for irrigation, which can be incorporated into pivot areas and thus the pivot placement is not affected by soil suitability.

Therefore the environmental impacts on soil quality would be too high if pivot placement on Site A was to be placed over more than 10% of the unsuitable soils. Therefore in this Scoping Report, the recommendations of the soil scientists would be applied and the best viable alternative site layout option was proposed in the planning phase of this development (see the previous discussion).

The full process in reaching these conclusions has been described in the Plan of Study to follow under the heading ‘A Description of the Alternatives to be Considered’ and will therefore not be repeated here.

In terms of the ‘no-go’ option; if the site is not developed there will be no change (good or bad) to the status of the site; it will remain as-is: an area that is Least Concern, but with both sites that have natural conditions that represent

the Kimberley Thornveld used for grazing. Site A has a limited connection to other environments, while Site B has connections to other environments, and if developed would reduce that connection. Considering that Site A & B is directly adjacent to established pivot areas, it will be a continuation of the development on the farm.

From an economic and agricultural point of view, it is better to develop the area and improve the agricultural potential of the land and from a soil management perspective to allow crop rotation production. Therefore, in the EIA no alternative site, no alternative land use, and the 'no-go' option will not be considered or evaluated. The EIA will assess the impacts of the area under application only.

NEED AND DESIRABILITY OF THE PROJECT

The purpose of this Environmental Authorisation Application is for the Applicant to obtain permission from the Department to develop 269 ha of which about 177Ha of vegetation will be cleared to establish crops and pasture land, alternating years.

Currently, the Applicant has 200Ha that is used for maize and/or wheat crops. This application, if approved, the addition of the 269Ha will allow the Applicant to continue to produce 177Ha of crops per annum, through crop rotation. It is not the intent of the Applicant to increase crop production to 400Ha per annum, but rather produce crops on one section of the 200Ha, and the rest the other 177Ha and rotate the next year. Resting camps will be grazed by cattle, feeding on crop residue and pasture land would be established. During the resting period, attention will be given to soil upgrading, such as deep ripping, removing access rocks, spreading of chicken manure or other organic fertilisers on the land, as well as Gipson or lime to leach out the Na.

The benefit of crop rotation is of great value to farmers not only from a financial perspective but also from an environmental and social-economic perspective. Rotation can also help manage diseases caused by pathogens that survive in the soils or in crop debris and pathogens whose populations decline in the absence of a susceptible host (Seminis, 2020).

In terms of insect management, crop rotation is not effective for managing insect pests, but crop rotation can be used to break the life cycle of such insect pests with limited mobility and narrow host ranges.

According to Seminis (2020), crop rotation can also be used to help manage weed problems, because different crops compete with weed species in diverse ways. Crops vary in their time of planting rate of canopy development, canopy height, row spacings, and harvest times, which creates varied environmental conditions that can prevent the buildup of a few weed species.

Thus from a socio-economic perspective, crop rotation can reduce the financial risk on the Applicant, not only saving him money on the costs of herbicides but also reducing the risk of a potential loss on abutting crops as a result of pathogens or insect pest outbreaks.

From an environmental and financial perspective, and in terms of soil moisture management, normally the late summer and early autumn rainfall results in some moisture storage and retention in the soils for the next production season. However, in the event of a drought, especially if monocultures such as maize are planted, the farmer can potentially face a dire situation of being unable to plant the next maize at the start of the season (Grain SA, 2016). Crop rotation and moisture conservation practices can reduce drought risks and will ensure that a variety of crops can be planted over a much longer period from October to January in a particular summer production season.

From a nutrient requirement and soil management perspective, crops differ in their nutrient requirements and their abilities to extract nutrients from the soil. Legumes such as lucerne help fix nitrogen in the soil and when it dies, the fixed nitrogen is released and becomes available to other plants. A mature maize plant, on the other hand, has total nutrient uptake of 8.7g of nitrogen, 5.1 g of phosphorus, and 4.0 g of potassium. Resulting in each ton of grain produced removes 15.0 - 18.0 kg of nitrogen, 2.5-3.0kg of phosphorus, and 3.0-4.0 kg of potassium from the soil (du Plessis, 2003).

Thus the benefit of rotating maize with lucerne will increase soil nitrogen and carbon content in the soil (Huynh, *et al.* 2019). In the Huynh, *et al.* study, maize was rotated with lucerne and it was found that crop rotation led to a higher yield than continuous maize planting as a result of this soil relationship. It also found that the significant effect of crop rotation on the yield of the following maize crop continued after two cycles of a 4-year crop rotation. This soil relationship will also reduce the application of fertilizers and reduce the potential impact on water resources.

The influence of agriculture practices on water quality (activities on farms that leads to an increase in nitrogen (N) release into water resources) has promptly improved farming practices to optimize the use of fertilizer N and reduce N loss to surface and groundwater. According to Al-Kaisi (2021) crop rotation can play a major role in minimizing the potential risk of nitrate leaching to the surface and groundwater by enhancing soil N availability, reducing the amount of N fertilizer applied, and minimizing the potential risk of N leaching. This can lead to a positive impact and the receiving environment.

Overall, the advantages of proper planning of a crop rotation system will ultimately include better moisture conservation, reduce financial risk, reduce mechanization costs and improve crop and soil health to ensure a sustainable farming future, and therefore the desirability of this project.

Maize and wheat will be planted, rotating with lucerne the following year and so forth and in terms of the need for this project, maize and wheat are an important field crop in South Africa, serving as the staple food for the majority of its population, particularly for low-income households (Ala-Kokko, 2021). Maize is also the major feed grain for the animal feed industry.

In South Africa, there is a surplus of maize production, which forces industry role players to utilise maize in one of two ways (BFAP, 2015). The first option involves exports. South Africa exported 2.5 million tons of raw maize (or 19 percent of maize production) during the 2013/14 season, with leading export destinations including Japan, China, Mexico, Namibia, Zimbabwe, and Mozambique. The second option is to transform maize into secondary or value-added products,1 such as maize meal, animal feed, and starch (BFAP, 2015).

The maize industry is important to the economy both as an employer and earner of foreign currency because of its multiplier effects (Mogala, 2017). This is because maize also serves as a raw material for manufactured products such as paper, paint, textiles, medicine, and food. The industry is divided into commercial and developing agriculture.

Although fluctuating, there has been a general increase in the contribution of the maize industry to the gross value of South African agricultural production (GVP) from 2006 of about 10 billion rands to 2016 of just under 30 billion Rands. The Northern Cape contributes to 9% of maize production in South Africa.

About 45 000 people are employed in agriculture in the Northern Cape, which represents approximately 16% of employment. The province supports livestock farming (mainly goats and sheep with cattle in the north), table grapes, dates, cotton, cereal crops, and vineyards along the banks of the Orange River and large varieties of crops including cotton, groundnuts, wheat, and maize on irrigated lands (including the large Vaalharts scheme) (Young, 2017).

In terms of wheat, the Northern Cape produces about 262 800 tons per year (DAFF, 2016). According to Coale (2017), wheat is important to South African food security. South Africa has become a net wheat importer, due to the significant drop in wheat area planted since the abolishment of the fixed price marketing system provided by the wheat board in 1997. Further, recent political uncertainty has resulted in the South African Rand devaluing (by 58% to the USD during 2012–2017), leaving South Africa exposed to risk in global wheat and exchange rate markets and increasing its food insecurity vulnerability. Thus, an assertive effort has been made to break South Africa's dependence on imported wheat by increasing wheat yields per hectare (Coale, 2017).

South Africa experienced its worst drought in 23 years in November 2015 and food insecurity spiked. According to STATSSA (2016), the number of 41% of households in the Northwest territory and 32%, 31%, and 26% in the Eastern Cape, Northern Cape, and the Free State respectively ran out of money to buy food. This disparity was driven by the fact that cereal prices (mainly maize and wheat) rose by an estimated 53.7% for the same time period (STATSSA, 2016). A situation that one would like to avoid in the future.

Four years later, South Africa is set to grow in importance as a grain exporter in 2020-21, on the back of an increased corn harvest and increased demand from its neighbors. The country's economy, like many, is reeling from the effects of the COVID-19 pandemic, although it has not directly had a major effect on farm output (Lyddon, 2021).

For this year (2020-2021), the International Grains Council (IGC) puts South Africa's total grains production at 18.6 million tonnes, up from 18 million the previous year. The total includes 2.1 million tonnes of wheat, compared with 1.5 million in 2019-20. The country's corn crop in 2020-21 is put at 15.8 million tonnes, down from 16 million the year before (Lyddon, 2021).

Lyddon further reports that South Africa's total grain imports in 2020-21 are put at 2.2 million tonnes, down from 2.9 million the year before. Its grain exports are forecast at 2.8 million tonnes, up from 2.1 million. Forecast imports include 1.9 million tonnes of wheat, down from 2.4 million in 2019-20. Exports include 2.7 million tonnes of corn, compared with 1.9 million the previous year. This is important since maize and wheat are the staple food for the majority of South Africans and it reduces food insecurity. If less wheat and maize are imported it benefits the

households reliant on the staple food, if more wheat and maize are exported, it benefits the farmer and Gross Domestic Product (GDP) of the area which is a positive economic impact.

At this stage, lucerne will be planted on alternative years during the rest period for the land. The Applicant did not indicate that it would be harvested but rather grazed by livestock. Lucerne has excellent qualities for grazing, but it can cause bloat, which can be treated.

In terms of the socio-economic benefit, it is no secret that South Africa has one of the world's highest unemployment rates. The Thembelihle Municipality 2017/2022 IDP indicating that the unemployment rate was about 28%, which is a very good variable in light of the 43% provincial unemployment figure. Whilst this is a good reflection, the IDP indicated that more can be done and the efforts can be directed towards ensuring sustainable jobs.

Therefore, the agricultural sector plays a key role to generate economic activity, create jobs, earn foreign currency and stimulate rural economies in general.

Most of the agricultural economy consists of extensive farming of sheep and goats, as well as game farming. However, there is intensive agriculture along the Orange Riet Canal System, along the upper Orange River (Coleberg-Hopetown area), and along the middle Orange River area. Hopetown is a center of irrigation farming.

If this project is approved, it is expected that at least 8-12 previously disadvantaged individual employment opportunities on the farm would be created. Although this would seem a small number, for those 8-12 families, it would mean a steady monthly income and other benefits over and above monthly salaries. The permanent work for these families must be seen as a small but positive contributor to the upliftment of farmworkers of this region.

This development will not only benefit the Applicant but will also create job opportunities for a few low-income households that will assist in poverty alleviation. It is thus clear that crop production, as proposed by the Applicant, will contribute to economic growth within the Thembelihle Municipal area and achieving the IDP objective of ensuring sustainable jobs.

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENT

Field and desktop studies were completed to establish which impacts might potentially be significant/insignificant and which impacts would require a specialist study.

The environmental parameters are identified and discussed below and potential impacts are classified. A complete Environmental Management Programme (EMP) will be compiled during the EIA process (second phase of the application) to mitigate, manage or eliminate the impacts. As a minimum the EMP document will contain:

1. The environmental impact assessment rating,
2. Specific mitigation measures and guidelines for the development to proceed in the most environmentally sustainable manner,
3. Relevant specialist reports identified during this scoping phase,
4. Maps,
5. Interested and Affected Party comments and objections (if any), and
6. Any additional information required by the DMR.

RECEIVING ENVIRONMENT

REGIONAL CLIMATE

Climatic conditions such as temperature, rainfall, and wind velocity influence for example plant growth, erosion level of disturbed areas, dust generation, and air pollution levels as well as social impact in terms of quality of life. Climatic conditions can, therefore, influence the significance of impacts caused by developments. It is important to understand the role thereof when determining the impacts of specific development and the remedial measures that need to be implemented.

The study site falls within the Hot Desert Climatic (BWh) Region of South Africa, according to the Köppen Climate Classification System. Mild Desert Climate is characterised by warm to hot summers, high evaporation, and dry warm winters.

RAINFALL & TEMPERATURE

The site is situated in a rainfall area that receives about 201-400mm per annum according to the AGIS Comprehensive Atlas, which is a general classification. Hopetown has a summer rainfall between October to May.

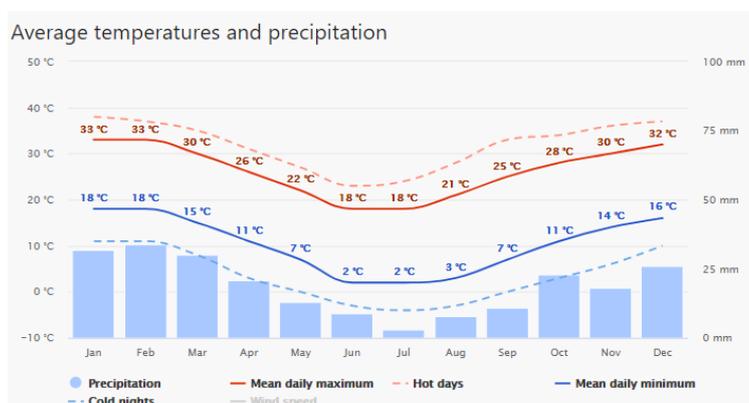


FIGURE 6: AVERAGE TEMPERATURES AND PRECIPITATION (SOURCE METEOBLUE)

Daily mean maximum temperatures range between 33.1°C and 35°C and daily mean minimum temperatures between 0.1°C and 2°C. January-February are the hottest months of the year and June-July the coldest.

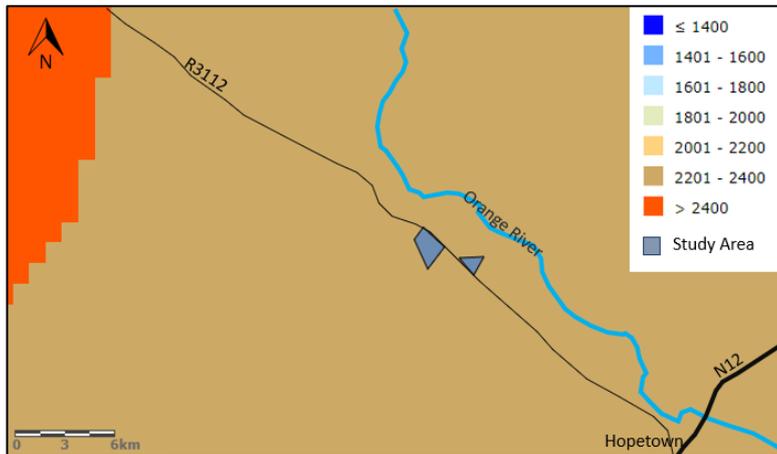


FIGURE 7: EVAPORATION EXPERIENCED ANNUALLY ACCORDING TO THE AGIS COMPREHENSIVE ATLAS

The proposed farm area falls within an area where the annual evaporation is high, between 2201-2400mm.

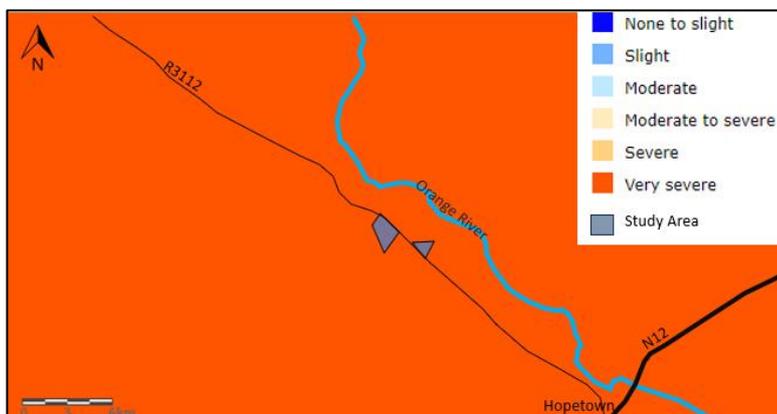


FIGURE 8: MOISTURE AVAILABILITY EXPERIENCED ANNUALLY ACCORDING TO THE AGIS COMPREHENSIVE ATLAS

The moisture availability is the ratio of actual to potential evapotranspiration. Evapotranspiration is the process by which water is transferred from the land to the atmosphere by evaporation from the soil, other surfaces (e.g. rivers, dams, wetlands, etc.), and by transpiration from plants. The moisture availability of the area is classified as being very severe. In other words, the evapotranspiration of the area is very high.

This is important for irrigation strategies. The low rainfall combined with the high evapotranspiration rates will result in a higher amount of water required for irrigation per hectare than a farm situated for example in the sub-tropics, where the rainfall is higher and the evapotranspiration is low. The Applicant will consider working out an irrigation scheduling to establish and maintain the proposed crops and pasture lands.

WIND REGIMES

The prevailing wind directions are predominantly east-north-easterlies and north-easterlies as well as south-westerlies and west-south-westerlies, with wind speeds, recorded highest during August to October (>38km/h but <50km/h).

There is a distinct seasonal variation between summer and winter wind direction with predominant winds in summer being westerlies and predominant winds in winter being easterlies. Generally, wind speeds are also stronger during night-time compared to daytime conditions.

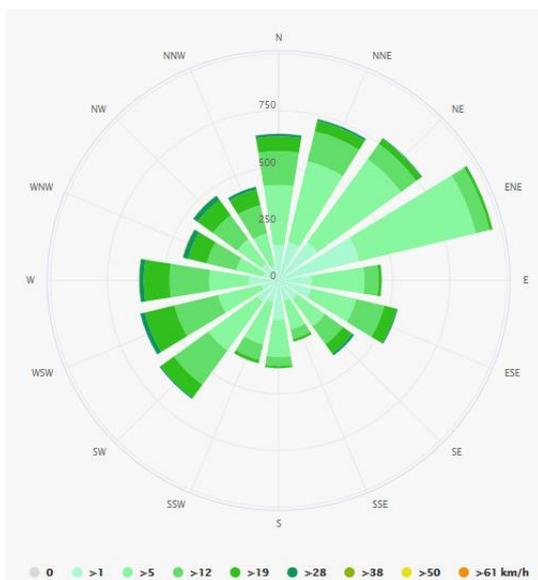


FIGURE 9: WIND ROSE OF HOPETOWN AREA (SOURCE METEOBLUE)

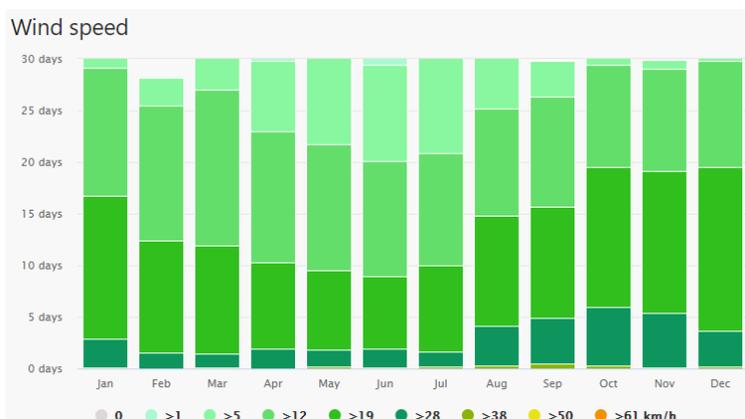


FIGURE 10: WINDSPEED OF HOPETOWN AREA (SOURCE METEOBLUE)

TOPOGRAPHY

Morphology or the Topography of an area can be described as the form and structure of the landscape. The structure is given by the underlying geology and the form is given by erosion factors such as the rivers cutting through the geology to form valleys, or the wind eroding the tops of the mountains and filling in the valleys to form rolling hills and plains.



FIGURE 11: THE SLOPE PROFILE OF THE STUDY AREA ACCORDING TO AGIS

Site B is level with slopes ranging $\leq 2\%$. The majority of Site A is level with slopes ranging $\leq 2\%$, with sections in the northern area of slopes ranging 3-5% according to AGIS. This is in accordance with the findings in the soil report, which indicated that the topography of the area was relatively flat with the majority of the area having an elevation of between 1114 and 1082 m. The only area where a decrease in elevation can be seen is on the north-eastern side towards the river. The slope was northeast and drainage would occur in the north-eastern direction. Although a slope was present, it was insignificant due to the slope being too level. It can thus be concluded that farms close to the study area would possibly not be affected by drainage. Small areas situated in the middle of Site A had a southern slope. The drainage would be to the riverside (northeast). Site A & B both showed a downward movement of the slope.

It is not expected that the proposed development will impact the topography of the site.

POSSIBLE MITIGATION MEASURES

The impact on the topography of cleared out will be minimum. Topsoil will be disturbed but the general topography of the site will remain intact. Possible mitigations to prevent topographical scaring could include:

- Clearing of vegetation may not result in excavations, areas where trees might be uprooted must be filled in.
- Clearing of vegetation must follow the same incline as the natural environment.

GEOLOGY & PALAEOLOGY

During an interval of some 150 million years, from Late Carboniferous through to Early Jurassic times, deposition of a very thick succession of Karoo Supergroup sediments took place within several intra-continental basins in the Northern Cape. The most extensive of these was the Main Karoo Basin. This basin now occupies the southern half of the province and in ancient Karoo times, it was situated within the interior of the Supercontinent Pangaea. The proposed site falls within the earliest Karoo sediments – massive glacial tillites of the Permocarbiniferous Dwyka Group – are largely unfossiliferous, although thin intervals of interglacial and post-glacial mudrocks yield sparse fossils of marine invertebrates and fish (e.g. near Douglas) as well a small range of trace fossils generated by arthropods and fish. Reddish sandy and pebbly glacial outwash sediments contain plant fossils (leaves, wood, and other debris) of the Glossopteris Flora that soon colonised southern Pangaea following the final retreat of the Permocarbiniferous ice sheets (Almond & Pether, 2008).

TABLE 2: FOSSIL HERITAGE OF THE NORTHERN CAPE (ALMOND & PETHER, 2008)

Geological Unit		Rock Types & Age	Fossil Heritage
Karoo Supergroup	Dwyka Group (C-Pd)	Glacial, interglacial and post-glacial siliciclastic sediments (e.g. tillites) Late Carboniferous – Early Permian c. 320-290 Ma	Trace fossils, organic-walled microfossils, rare marine invertebrates (e.g. molluscs), fish, vascular plants.

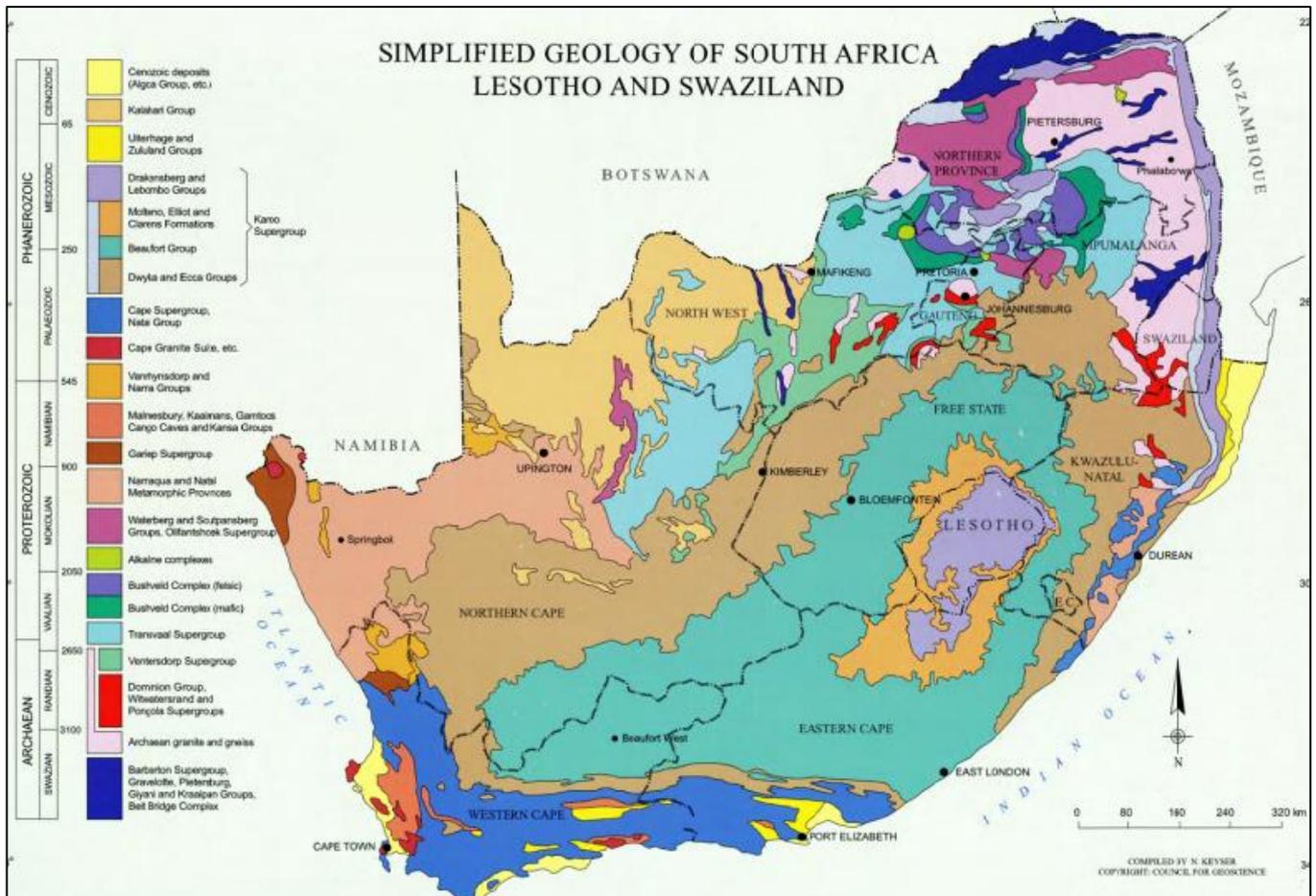


FIGURE 12: SIMPLIFIED GEOLOGY OF SOUTH AFRICA

POSSIBLE MITIGATION MEASURES

The clearing of vegetation will not impact the geology of the site. No mitigations will be required.

SOILS

Topsoil:

Topsoil is a very precious, non-renewable resource with high conservation importance and is necessary for the production of grapes that the topsoil be protected. The potential of soils to produce crops is dependent on its depth, structure, texture, and sequence of soil horizons.

The opposite of topsoil preservation is topsoil degradation, which involves the removal of soil, and alteration or damage to soil and soil-forming processes, usually due to human activity. Stripping of vegetation will impact negatively on soil formation, natural weathering processes, moisture levels, soil stability, humus levels, and biological activity. It is therefore essential that where it occurs, it be preserved and protected or upgraded to improve the agricultural potential of the property.

A soil survey was conducted to determine whether the land would be suitable for the cultivation of crops. The soil forms found included, Coega, Glenrosa, Kimberley, Olienhout, Nkonkoni, and Plooyburg. The Nkonkoni, Glenrosa, Olienhout, and Kimberley soil forms were generally considered suitable for irrigation, while portions of the Nkonkoni, Glenrosa, and Plooyburg soil forms were only moderately suitable due to the depth of limiting material. The Coega soil form and portion of the Olienhout soil forms were considered not suitable for irrigation.

The Nkonkoni (97 ha) and the Plooyburg (65 ha) soil forms are the dominant soil forms in the study area (see Figure 13). The Kimberley soil form was found in the northern and southern sides of the study areas and covered approximately 57 ha. The Glenrosa soil form (36 ha) was observed in the northern and eastern sides. The Coega and Olienhout soil forms occurred the least in the study area with the Coega covering 21 ha and the Olienhout 9 ha.

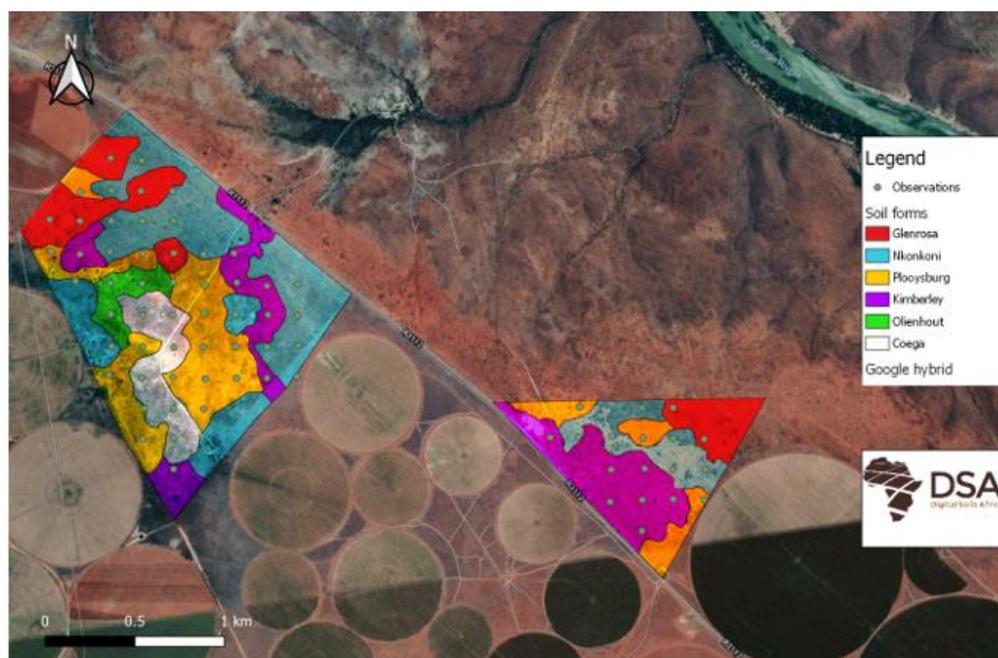


FIGURE 13: SOIL FORMS OF THE STUDY AREA (SOURCE SOIL REPORT)

According to the soil report, the soils of the study area are quite deep with most of the soils ranging from 1.01-2 m in depth. The Coega soils were associated with the 0-0.5 m soil depths and represent mostly soils not suitable for irrigation.

The only restricting layers were hard carbonate and the lithic horizons. The hard carbonate was found within the Coega, Plooyburg, and Olienhout soil forms, while the lithic was found within the Nkonkoni and Glenrosa soil forms.

The Lithic horizon had a restricting layer at 800 mm depths at certain profiles where the TLB did not go further. Upon further inspection of the profiles, it was found that the lithic horizon could be ripped and thus giving way to depths more suitable for irrigation.

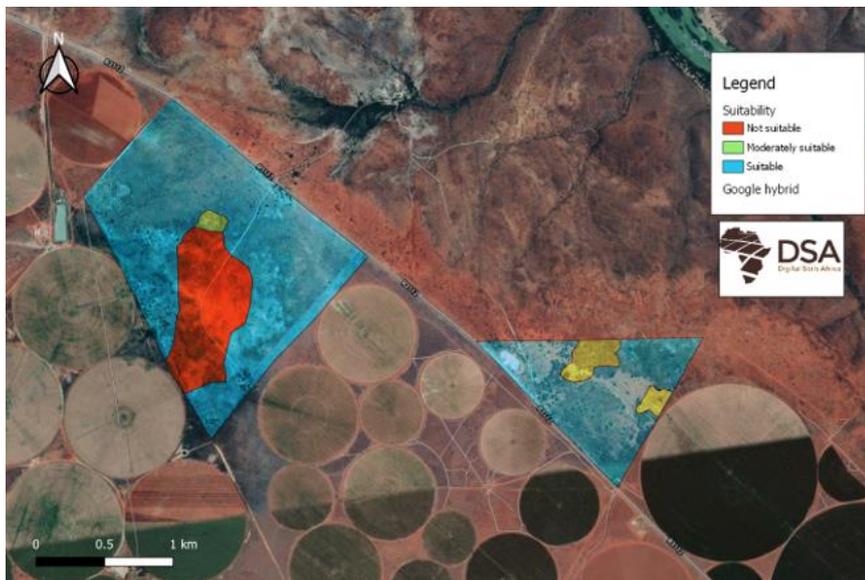


FIGURE 14: SUITABILITY AREAS FOR CROP PRODUCTION (SOIL REPORT)



FIGURE 15: SOIL DEPTH AT THE STUDY AREA (SOIL REPORT)

Chemical analysis of the soil was done and was found the A and B horizons are chemically very similar. The pH is slightly acidic and ranges from 5.56 to 5.94, indicating that there is no salinity evident from the pH values. The pH values can be altered from a fertility perspective. The Cation Exchange Capacity (CEC) is extremely low (2.63-4.38 cmol(+)/kg), this, in turn, has a pronounced effect on the Exchangeable Sodium Percentage (ESP). The ESP is very high and especially high for a red apedal soil. Since ESP is a percentage of the Na to CEC, the low CEC can exaggerate

the ESP. An exaggerated ESP is supported by the low Electrical Conductivity of the soils. The irrigation threshold of EC for water is 400 mS/m. These soils can be rectified with irrigation and fertilization on soils with adequate drainage, the Na should leach out and be replaced with Ca, Ma and K, lowering the ESP.

Clay percentages are generally low and very sandy. Most soils will have good drainage, but soil water holding capacity and fertility will be low and will require good management. Since the soils are generally sandy, the soil depth would be the biggest contributing factor to drainage.

The laboratory results indicate that the chemical parameters are manageable, provided there is sufficient physical drainage. The texture results show that in general, the soils do have sufficient drainage.

Ultimately the soil report concluded that most of the surveyed area is suitable for irrigation, due to the free-draining soils and cracked rock underlying most profiles. Both areas not suitable for irrigation are limited by external drainage.

The soil report recommended that in Site A, the pivot placement does not exceed more than 10% of unsuitable soil in a pivot. Since Site B has small areas of moderately suitable soils for irrigation, these can be incorporated into pivots, and thus the pivot placement is not affected by suitability.

The impact on soil properties is expected to be rated low if recommendations of the soil report are carried out.

Erosion:

Soil erosion is a natural process that, without disturbance, would balance itself with the formation of new soil. Any development that destroys the natural protective canopy of vegetation speeds up the process of soil erosion. Soil properties determine the erodibility of soils and their ability to support vegetation and this needs to be understood in assessing the potential for erosion and the suitability for the proposed establishment of a crop and pasture. Soils susceptible to water erosion are normally silty, are weakly structured, have low organic contents, and have poor internal drainage.

The erodibility index is determined by combining the effects of slope and soil type, rainfall intensity, and land use. These aspects are represented by terrain morphology (soil and slope), mean annual rainfall, and broad land-use patterns.

According to the soil report, the Nkonkoni soil form has medium potential for wind erosion and a high potential for water erosion. The Plooyburg soil form has a low potential for wind erosion and medium potential for water erosion. The Kimberley soil form has medium potential for wind- and water erosion.

The clearing of vegetation will not cause depressions or changes in natural topography and will follow the natural incline of the area, which will reduce the erosion impact. The level of impact and erosion, as a result of the clearance of vegetation, will be investigated further in the EIA phase.

Soil pollution:

Soil pollution can only occur should hydrocarbon spills occur, or when 1) used oils and lubricants are purposefully drained into the soil, 2) storage facilities are destabilized or 3) if ablution facilities contaminate soils. At the proposed site there is a very low risk for hydrocarbon pollution since there will be vehicular/earthmoving activity to clear the site. The impact is rated of very low significance if the limited number of vehicles on the site, that will be required, is considered. Also, no servicing of vehicles or storage of fuels, oils, and lubricants or refueling will take place on-site.

Chemical toilet facilities can be provided for workers during the construction phase (clearing of vegetation) and be managed well and it is anticipated that the impacts on soil pollution will be very low.

During the construction and operational phase, the soil will be upgraded with fertilizer. The leaching of nutrients into the groundwater could be a potential impact. It will be further assessed during the EIA phase of the application.

POSSIBLE MITIGATION MEASURES

- All topsoil should be preserved as much as possible.
- When the clearance of vegetation is completed, the topsoil should be ploughed.
- Upgrading of topsoil will be investigated during the EIA and EMP phase since the activity should not cause the enrichment of groundwater.
- Any erosion that develops must be filled in and rehabilitated and an erosion control programme must be adopted. The appropriate programme will be investigated during the EIA and EMP phase.
- Hydrocarbon spillages should be prevented by not allowing any storage of fuels, oils & lubricants within the area under application and conducting any repairs within allocated areas at the farm workshop.
- If spills occur, the affected areas must be treated with bio-remedial products and appropriate response will be stipulated in the EIA and EMP phase.
- The toilet facilities should be well maintained according to Municipal bylaws and the surrounds should not be used as ablutions.

LAND USE AND LAND CAPABILITY

Although land use is not a feature of the environment as such, it does represent the current status of the land surface as a whole, and therefore also reflects the condition of the environment. Land use is reflected by land-use patterns, based on terrain morphological units.

Conservation is the maintenance of environmental quality and resources or a particular balance among the species present in a given area. The resources may be physical, biological, or cultural.

The study area is zoned agricultural. The AGIS figure below is outdated as areas to the south and west of Site A are used for commercial irrigation. Overall the site itself can be mostly described as an area with a mix of shrubland and unimproved natural grassland.



FIGURE 16: LAND COVER CLASSIFICATION ACCORDING TO AGIS

Considering the current low conservation status of the site and the zoning, a change in agricultural practice would not detrimentally affect the ecological value of the property concerned. As with any disturbance, there will be a limited impact, but with the proposed crop rotation method, the negative impacts could be effectively be mitigated.

As a contribution and a step towards reclaiming the protected plant species from the site should the clearing of vegetation be granted, the transport/transfer and/or rehabilitation and processes to achieve this objective will be further investigated in the EIA and EMP phase.

It is the author's view that this particular development can be integrated with the surrounding land uses. The development of agricultural land from grazing into crop production would also not compromise the needs and the wellbeing of future generations.

The clearing of vegetation to establish a crop and pasture will conform to the land use abutting the farm and increase the land capability in terms of agricultural potential as a whole farm.

POSSIBLE MITIGATION MEASURES

- An area identified for the transfer of protected plant species (if identified on-site) should be established and during the EIA and EMP the specific method and recommendations of a botanical specialist should be applied.
- In circumstances where species cannot be transferred, the offset area identified should be seeded with similar species.

- The maize/wheat and pasture and maintenance thereof will be discussed in the EIA phase, to prevent the establishment of alien vegetation, weeds, pest control, or degradation of the site if the crop is unsuccessful.

FLORA

Vegetation plays an important role in maintaining ecosystems, stabilizing soils, maintaining the aesthetics of an area, and providing income for landowners. Therefore, when development is anticipated the vegetation structure needs to be analyzed, and rare or endangered plant species must be identified. Vegetation structure is mostly determined by the geology and climatic factors.

There are an estimated 5 400 plant species in the Northern Cape that occur in six large biomes: the Nama Karoo Biome, Succulent Karoo Biome, Savanna Biome, Grassland Biome, Fynbos Biome, and Desert Biome. More than 30% of the plants found in the Northern Cape are endemic and most of these occur in the Succulent Karoo along the West Coast of South Africa. Many of these plants are rare or threatened, with very limited distribution.

A tree aloe that is a typical landscape feature of the Northern Cape is the kokerboom, or quiver tree (*Aloe dichotoma*). This tree aloe is found growing mainly on the rocky habitat of the hills along the Orange River. In places it occurs in dense “forests”, and good examples of these occur just south of Kenhardt and between Pofadder and Pella. The Doringberg hiking trails near Prieska pass by these gentle aloe giants, and close to 4 000 trees can be seen in the Kokerboom forest on the Kokerboom hiking trail near Kenhardt. Necessitated by the harsh climatic conditions, the kokerboom has adapted to survive. Low air humidity, low soil moisture and intense sunshine levels have made it necessary for it to absorb every available scrap of moisture. It, therefore, has a superficial root system enabling it to absorb moisture quickly (Experiencenortherncape).

A vegetation survey will be completed by a SACNASP registered specialist. The site, according to Mucina and Rutherford (2006), host the Kimberley Thronveld (SVk4) vegetation type.

In terms of the distribution, the Kimberley Thronveld occurs in the North-West, Free State and Northern Cape Provinces.

Important Taxa Tall Tree: *Acacia erioloba*.

Small Trees: *Acacia karroo*, *A. mellifera* subsp. *detinens*, *A. tortilis* subsp. *heteracantha*, *Rhus lancea*.

Tall Shrubs: *Tarchonanthus camphoratus*, *Diospyros pallens*, *Ehretia rigida* subsp. *rigida*, *Euclea crispa* subsp. *ovata*, *Grewia flava*, *Lycium arenicola*, *L. hirsutum*, *Rhus tridactyla*.

Low Shrubs: *Acacia hebeclada* subsp. *hebeclada*, *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum zeyheri*, *Hermannia comosa*, *Lycium pilifolium*, *Melolobium microphyllum*, *Pavonia burchellii*, *Peliostomum leucorrhizum*, *Plinthus sericeus*, *Wahlenbergia nodosa*.

Succulent Shrubs: *Aloe hereroensis* var. *hereroensis*, *Lycium cinereum*.

Graminoids: *Eragrostis lehmanniana*, *Aristida canescens*, *A. congesta*, *A. mollissima* subsp. *argentea*, *Cymbopogon pospischilii*, *Digitaria argyrograpta*, *D. eriantha* subsp. *eriantha*, *Enneapogon cenchroides*, *E. scoparius*, *Eragrostis rigidior*, *Heteropogon contortus*, *Themeda triandra*.

Herbs: *Barleria macrostegia*, *Dicoma schinzii*, *Harpagophytum procumbens* subsp. *procumbens*, *Helichrysum cerastioides*, *Hermstaedtia odorata*, *Hibiscus marlothianus*, *Jamesbrittenia aurantiaca*, *Lippia scaberrima*, *Osteospermum muricatum*, *Vahlia capensis* subsp. *vulgaris*.

Succulent Herbs: *Aloe grandidentata*, *Piarranthus decipiens*.

Biogeographically Important Taxa (^{GW}Griqualand West endemic, ^KKalahari endemic)

Low Shrub: *Blepharis marginata*^{GW}.

Succulent Shrub: *Euphorbia bergii*^{GW}.

Graminoid: *Panicum kalaharensis*^K.

Herbs: *Helichrysum arenicola*^K, *Neuradopsis bechuanensis*^K.

Succulent Herbs: *Lithops aucampiae* subsp. *aucampiae*^{GW}, *Tridentea marientalensis* subsp. *marientalensis*^K.

Conservation Least threatened. Target 16%. Only 2% statutorily conserved in Vaalbos National Park as well as in Sandveld, Bloemhof Dam and S.A. Lombard Nature Reserves. Some 18% already transformed, mostly by cultivation. Erosion is very low. Area is mostly used for cattle farming or game ranching. Overgrazing leads to encroachment of *Acacia mellifera* subsp. *detinens*.

The vegetation report will indicate more specific vegetation and identify any species of concern. During the EIA phase the full impact will be evaluated and discussed.

PHOTO RECORD OF SITE A

Below are photos of Site A, representing Kimberley Thronveld that has been impacted through grazing.





PHOTO RECORD OF SITE B

Below are photos of Site B, representing Kimberley Thronveld that appears to be more impacted through grazing.





POSSIBLE MITIGATION MEASURES

- No vegetation outside the approved area should be removed or damaged.
- All indigenous plant species, that can be transplanted should be removed from the proposed study area.
 - A rehabilitation plan (i.e. relocation of plants that can be transplanted to identify areas outside of the proposed area to be cleared) must be implemented, which will be investigated in the EIA and EMP phase. This must be done in consultation with the botanical specialist.
 - Some of the geophytes must be transplanted in other natural areas.
- Alien plant species should be removed and eradicated from the site as a high priority.
 - The spread of alien vegetation must be prevented through an alien vegetation control programme, which will be investigated in the EIA and EMP phase.
- Veld fires should be controlled and prevented.

FAUNA

Animals play an important role in maintaining the functioning of any ecosystem, for example, pollination, spreading of seeds, removing of pests, trimming of vegetation, etc. The largest part of the Northern Cape falls within the Nama-

Karoo biome with a vegetation of low shrubland, grass and trees limited to watercourses. The region is typically an arid environment and the terrain and general landscape do not represent much topographical variation. Therefore faunal species are generally widespread across the region, although some key biotopes such as rivers or pans, or the presence of a particular plant species can become an obvious niche for particular animal species that can result in a concentrate of species at a certain location.

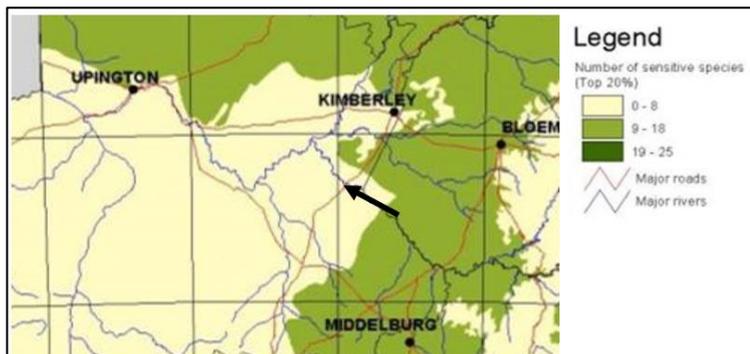


FIGURE 17: SENSITIVE MAMMAL SPECIES IN THE REGION. THE BLACK ARROW INDICATES THE LOCATION OF THE SITE.

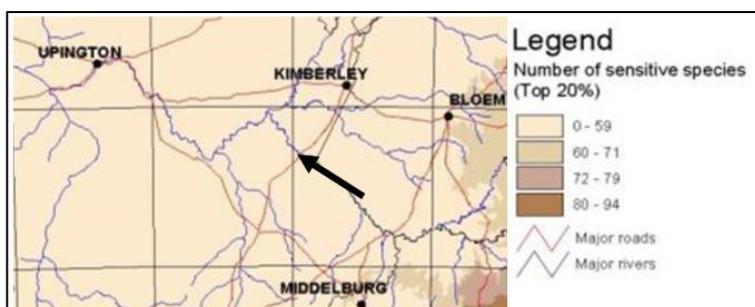


FIGURE 18: SENSITIVE BIRD SPECIES IN THE REGION. THE BLACK ARROW INDICATES THE LOCATION OF THE SITE.

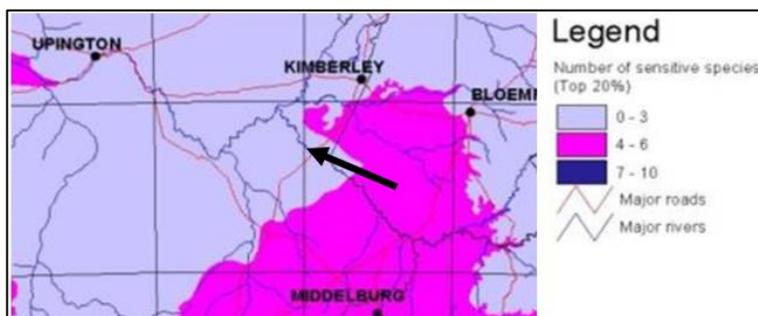


FIGURE 19: SENSITIVE REPTILE SPECIES IN THE REGION. THE BLACK ARROW INDICATES THE LOCATION OF THE SITE.



FIGURE 20: SENSITIVE BUTTERFLY SPECIES IN THE REGION. THE BLACK ARROW INDICATES THE LOCATION OF THE SITE.

The occurrence of faunal species within the proposed area is likely, however, it is farm properties and generally fenced-in camps, which will hinder the mobility of some of the larger wildlife that cannot jump a fence or the smaller wildlife that cannot borrow. Typically, many of the species encountered in the region are species such as the Common Duiker (*Sylvicapra grimmia*), Springbok (*Antidorcas marsupialis*), Steenbok (*Raphicerus campestris*), Blesbok, (*Damaliscus pygargus phillipsi*), Smiths red rock rabbit (*Pronolagus rupestris*), Scrub Hare (*Lepus saxatilis*), Spring Hare (*Pedetes capensis*), Meerkat (*Suricata suricatta*), Ground Squirrel (*Xerus inauris*), Rock elephant shrew (*Elephantulus myurus*), Suricate or Stokstertmeerkat (*Suricata suricatta*), Rock dassie (*Procavia capensis*), Yellow Mongoose (*Cynictis penicillata*), and Aardvark (*Orycteropus afer*).

Some reptiles can include the Leopard tortoise (*Stigmochelys pardalis*), Cape Cobra (*Naja Nivea*), Puff adder (*Bitis arietans*), Mole snake (*Pseudaspis cana*), Bibron’s gecko (*Pachydactylus bibronii*), Southern rock agama (*Agama atra*), Ground agama (*Agama aculeata*), Striped skink (*Plestiodon fasciatus*), Cape skink (*Trachylepis capensis*). Amphibians such as the Common caco (*Cacosternum boettgeri*), Giant bullfrog (*Pyxicephalus adspersus*), Karoo Toad (*Bufo gariiepensis*), Common platanna (*Xenopus laevis*) might also occur in the region.

This arid region hosts at least 215 bird species of which 68 species are endemic or near-endemic species, 18 red-listed species, and 5 red-listed endemic species. Several large terrestrial bird and raptor species, of which the most important are Ludwig’s Bustard (*Neotis ludwigii*), Kori bustard (*Ardeotis kori*), Secretarybird (*Sagittarius seppentarius*), Karoo Korhaan (*Eupodotis vigorsii*), Verreaux’s Eagle (*Aquila verreauxii*), the Tawny eagle (*Aquila rapax*) and Martial Eagle (*Polemaetus bellicosus*), Lanner falcon (*Falco biarmicus*).

The Northern Cape is home to an assemblage of arid zone adapted smaller bird species including larks, such as Spike-heeled Lark (*Chersomanes albofasciata*), sparrow-larks, and others. From a conservation perspective, the Red Lark (*Calendulauda burra*) and Sclater’s Lark (*Spizocorys sclateri*), who are both listed as regionally threatened species (vulnerable and near-threatened respectively). They have very restricted ranges. Other species can include the Spotted Eagle-owl (*Bubo africanus*), Martial Eagle (*Polemaetus bellicosus*).

Other potential birds include the Sociable weaver (*Philetarius socius*) which builds huge grass nests to the critical infrastructure of developments which can cause problems.

On the day of site inspection, the following animal species were noted at the site, steenbok (*Raphicerus campestris*), springbok (*Antidorcas marsupialis*) was within the abutting crop fields, mongoose (*Herpestidae*), and various common birds. A few burrows were noted and diggings out of old termite hills, which could indicate the presence of aardvark (*Orycteropus afer*).

The clearing of vegetation would be restricted to limited areas and the fairly slow clearance rate would provide adequate time for migration of any animals remaining on-site to be sustained in similar adjoining habitats. Also, noise generated by vehicles will cause most animals to vacate the site temporarily. If certain species were to be affected they would simply vacate the proposed cleared areas during the day and return during the night. Since there are no water features onsite, the clearing of vegetation will not impact amphibian species.

With regards to insects and pathogens, it would be important to discuss the potential impact, since not all insects are environmentally or economically beneficial for the farm. For example, bees pollinate certain crops, which is essential for crop production, while certain moths species lay eggs in stems that can ruin crops. Crop rotation has been used as a method to prevent, curb and/or decrease possible insect pests and pathogens from spreading.

In terms of pathogens such as fungi, nematodes, and a few bacteria, they can inhabit soil and can persist for many years in the absence of a susceptible crop. Although the populations of these types of pathogens may not decline with crop rotation, the rotation can prevent the populations from increasing or reduce the rate of increase (Seminis, 2020). Some pathogens have wide host ranges that can include crops in different rotational groups, thus care must be taken when designing rotational sequences to manage such pathogens. In addition, crop rotation will not be effective against pathogens that primarily enter fields on air currents, by vectors (e.g. insects), or on seed.

The length of time between similar crops also requires management with regards to the pathogen. Some pathogens remain viable in the soil or infested crop debris for a short time, thus rotating away from a susceptible host for 1-2 years is adequate for reducing populations of the pathogens.

It must be noted that crop rotation will not be a successful tool in fighting or reducing pathogens levels in the soil if plants that belong to the same family are rotated, because the same family often share the same pest problems.

Another factor that needs to be considered in crop rotation, is that it is not very effective on pathogens that have a wide host range, such as: *Rhizoctonia solani*, and *Pythium* species. It is very difficult to find a suitable crop to rotate with and crop rotations need to be especially carefully selected to reduce pathogens such as these. The full impact will be discussed in the EIA and EMP phase.

In terms of insects pests, there are a few that can cause much damage to maize crops. According to Bell (2016):

- The maize stalkborer (*Busseola fusca*), is the most serious insect pest of maize in South Africa and has caused enormous crop losses (estimated at more than 10% of the national crop). The use of pheromone moth traps has greatly enhanced timeous spraying against this pest.

- The cutworm (*Euxoa* and *Agrotis* species) is the second most important maize pest in South Africa. It is a general feeder, and attacks almost any kind of succulent young plant, causing the most damage in spring.
- The black maize beetle, (*Heteronychus arator*), affects a wide variety of crops, including maize, sorghum, wheat, ryegrass and oats. Symptoms are sometimes confused with cutworm damage. Although it occurs virtually throughout S.A., there are certain areas in which it assumes plague proportions. It seems to favour cooler areas and sandy soils.
- The common name, maize snout beetle, refers to several kinds of closely-related weevils which feed on the leaves of young maize plants. Four different species cause the most loss and others that are occasionally troublesome. The four major species are *Tanymecus destructor*, *Systates exaptus*, *Mesoleurus dentipes* and *Protostrongylus* spp. None of these fly. Once land is infested trouble can be expected year after year.
- The spotted maize beetle, *Astylus atromaculatus*, is also known as the *Astylus* beetle or the pollen beetle. The adult feeds on pollen, but will also attack the soft, young kernels of maize cobs when the silks are wilting off. Larvae can reduce seedling stands drastically. Larvae are also known to drill into maize pips, preventing their germination.
- The American bollworm, *Heliothis armigera*, derives its common name from the fact that it is one of the worst pests of cotton in the United States. Where it attacks maize cobs it is commonly called the cobworm.
- The maize chafer beetle, *Adoretus cribrus*, attacks tender growth at night, causing damage to the leaves. It is easily controlled with insecticides, but spraying is seldom necessary.
- Various members of the family Aphididae suck the sap from young leaves. Spraying is seldom necessary.
- The maize rootworm, *Bufocephalus murina*, is becoming a significant pest in parts of South Africa. A granular systemic insecticide is registered for use against maize rootworms.
- Leafhoppers belonging to the family Jassidae transmit streak virus in maize. Systemic insecticides are registered for use against these leafhoppers.
- Wireworms (Elateridae) and false wireworms (Tenebrionidae) are sporadic but potentially serious pests, and it is occasionally necessary to treat for these pests.

In terms of insects on wheat, according to the ARC, 2014 the following insects can cause damage to the crops:

- The greater false wireworm (*Somaticus* spp.) They are controlled through cultural practices supporting germination and rapid seedling development, which will shorten the vulnerable 'damage period' of the plant thus limiting seedling loss and retaining plant densities. Targeting the larval stage in the soil through seed treatments can also be used with the best effect where seedlings grow actively under moist soil conditions.
- The lesser false wireworm (*Gonocephalum* spp.). They are controlled through cultural practices supporting germination and rapid seedling development which will shorten the 'damage period' of the plant thus limiting seedling loss and retaining plant densities. Targeting the larval stage in the soil through seed treatments can also be used with the best effect where seedlings grow actively under moist soil conditions.
- The black maize beetle (*Heteronychus arator*). Cultural practices supporting germination and rapid seedling development will shorten the 'damage period' of the plant thus limiting seedling loss and retaining plant densities. Chemical seed treatments are registered as pre-plant approach toward control of adult beetles.
- The Russian wheat aphid (*Diuraphis noxia*). The best control option for RWA is the use of resistant cultivars.

- The greenbug (*Schizaphis graminum*). Infestations during hot, dry conditions seem more injurious. Chemical interventions can be considered when 30-40% of the tillers are infested with 10 or more aphids per tiller.
- The oat aphid (*Rhopalosiphum padi*). The oat aphid is less harmful than RWA. Population increase generally occurs after the flag leaf stage and chemical control can be considered when 50% of the tillers are infested with 10 or more aphids per tiller.
- The maize aphid (*Rhopalosiphum maidis*). Mixed populations of Maize Aphid, Brown Ear Aphid and Oat Aphid do occur and should be controlled when 50% of the tillers are infested with 10 or more aphids per tiller.
- The brown wheat mite (*Petrobia latens*). In South Africa, two systemic insecticides are registered against the Brown Wheat Mite on wheat. Rainfall of more than 12 mm will destroy mite populations.

All of these insects can be controlled by applying insecticides (in the correct manner). However, by understanding the life cycles of these insects and by disrupting their habitat through ploughing and crop rotation, insects can be managed. Unfortunately, for crop rotation to control an insect pest effectively, the insect must live in one crop to the beginning of the next in a stage with low mobility and must have a restricted range of host plants, of which not many insects fit this pattern. Most adult insects can travel easily across at least a single farm and emerge from their overwintering stage in the spring, so crop rotation from one year to the next will not affect them. But by growing a crop that is not a host plant for that pathogen or insect could lead to the pest dying out and its population levels lowering.

For example, the hibernating larva is the weak link in the stalkborer life-cycle, and ploughing can reduce the stalkborer threat (Bell, 2016). Likewise, winter ploughing before August destroys winter weeds and the cutworm larvae exposed on the soil surface might be damaged or taken by birds. Frost also kills cutworm larvae and the destruction of winter weeds prevents the larvae from feeding and also denies the moth a site for oviposition.

Cultivation can be used to control the black maize beetle, because the larval stage is very sensitive to disturbance. Partial suppression of insect numbers might be obtained by cultivating during September and October. While the American bollworm can be controlled if the maize lands are kept free of weeds.

The Applicant indicated that years ago when they first started with the maize production they had massive problems with the stalkborer (*Busseola fusca*), which lead to 80% crop damage. They have since changed to genetically modified crops which have completely eliminated the stalkborer infestation. With the change to genetically modified crops, they rarely have 2-3% damage on the entire maize crops.

In terms of pathogens, the Applicant indicated that during wet years (usually once every 5 years) they do sometimes have a struggle with the *Fusarium* fungus in the lower-lying areas on the wheat crop area. The *Fusarium* fungus grows on the dead residue from the maize crops and favours moist and warm conditions which then affects the wheat crop that is planted during winter. The fungus is effective to control via chemical control, however, the farm predominately does not battle with fungus or bacteria due to the dry climate.

As a general rule, rotating crop plants not related botanically will help ensure that non-host crops are being used. Some pests problems have such a wide host range or can survive in the soil for such long periods that other methods

of control need to be considered. The impact of using chemical control will be discussed in the EIA and EMP phase, as such chemical control measures can potentially lead to other environmental impacts. At the end of the day, crop rotation is still one of the better, more widely practiced, and cost-effective methods of disease prevention.

The full impact on animal species will be concluded in the EIA and EMP phase.

POSSIBLE MITIGATION MEASURES

- The areas to be cleared should be swept before vegetation is removed and if animals are found, then they should be relocated, without harming, or killing the animal. An expert who holds a Competency Certificate to handle Dangerous and Venomous Reptiles should be contracted to remove such animals. This requirement should be included in the environmental awareness programme that will be provided in the EIA and EMP phase.
- No hunting or snaring should be allowed outside or inside the proposed study area and the Applicant should implement a severe penalty system for people transgressing this requirement.
- Chemical control and genetically modified cultivars must be used by following the prescribed methods.

SENSITIVE SITES

The National Protected Area Expansion Strategy (NPAES) was developed to expand protected areas in South Africa to increase ecological sustainability and adaptation to climate change. The proposed study area does not fall within any National Protected area, nor is close to any formal or informal protected area.

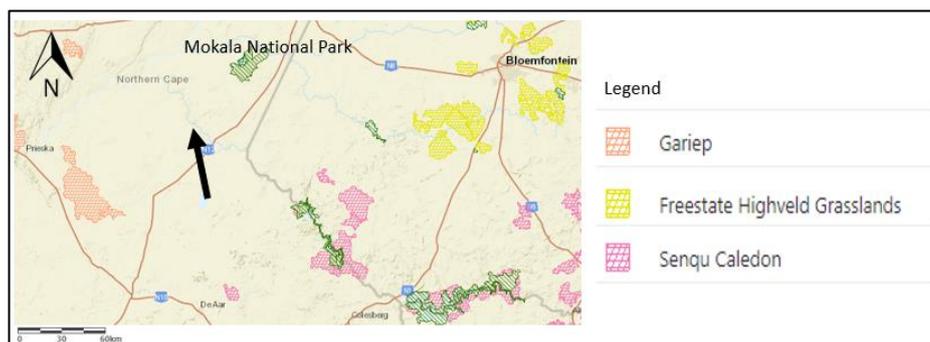


FIGURE 21: THE NATIONAL PROTECTED AREAS EXPANSION STRATEGY (NPAES) INDICATES THAT THE GARIEP FOCUS AREA, THE SENQU CALEDON FOCUS AREA AND THE MOKALA NATIONAL PARK IS SITUATED MORE THAN 60KM FROM THE SITE.

The Northern Cape has a full Protected Area Expansion Strategy developed by the Northern Cape Department of Environment with support from the National Department of Environmental Affairs. The PAES priorities are largely a

subset of the Critical Biodiversity Areas from the systematic conservation plan that were identified on implementation priority. SANParks priorities were fully included in the provincial PAES.

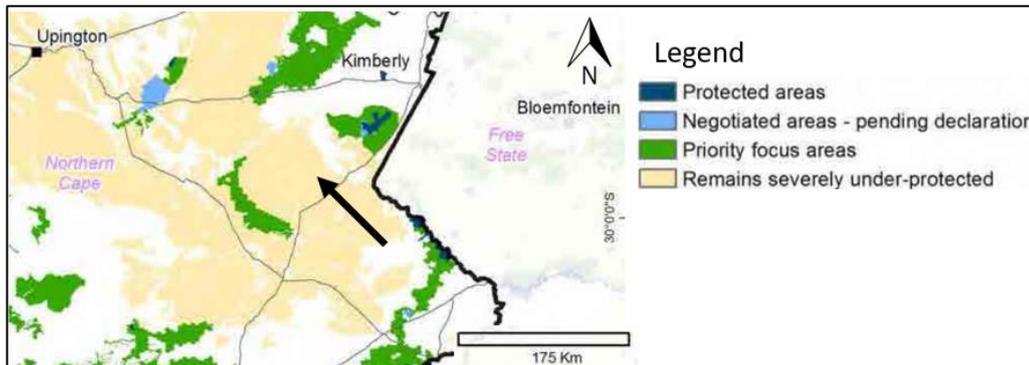


FIGURE 22: PRIORITY AREAS FOR THE PROTECTED AREA EXPANSION IN THE NORTHERN CAPE (BELFOUR ET AL. 2016).

The priority areas in the Northern Cape are in the Succulent Karoo areas of the Namakwa District, Bushmanland, the southern Nama-Karoo as well as in the expansion areas of the existing national parks in the province. The main biodiversity features are the Succulent Karoo and southern Nama-Karoo priorities, as well as river and wetlands. Arid Savanna and some Desert ecosystems are currently not fully included in these priorities. As indicated in the map above, the site does not fall within a focus area.

According to the Northern Cape Biodiversity Conservation Plan, the site falls within a Terrestrial CBA 1 area. Critically Biodiversity Areas (CBA) play an important role in supporting ecological processes. This is particularly the case with riparian areas, some key catchment areas, and key pieces of corridors. CBA areas should preferably not be further developed, no further intensification of land-use activities should be permitted and they should be prioritised for rehabilitation, where possible.

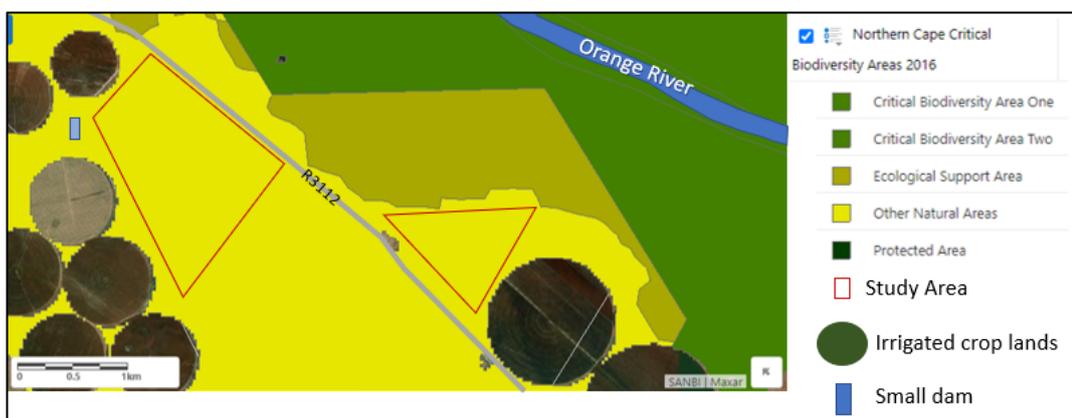


FIGURE 23: THE SITE FALLS WITHIN 'OTHER NATURAL AREAS' ACCORDING TO THE BGIS OF THE NORTHERN CAPE BIODIVERSITY CONSERVATION PLAN.

Critical biodiversity areas (CBA) map and guidelines assist in decision-making when considering the biodiversity status of an area and the proposed land-use or development proposal. The overall aim is to avoid loss and degradation of natural habitat in critical biodiversity areas (CBA's), whilst managing sustainable development in other natural areas remaining. Although the CBA maps constitute the best available biodiversity information, they can never replace a site assessment and are always to be viewed as the biodiversity informant only in the triple bottom line of sustainable development, i.e. social, economic, and natural environments.

TABLE 3: CBA CATEGORY AND LAND MANAGEMENT OBJECTIVES

CBA category	Land Management Objective
CBA 1	<p>Natural landscapes: Ecosystems and species fully intact and undisturbed</p> <ul style="list-style-type: none"> • These are areas with high irreplaceability or low flexibility in terms of meeting biodiversity pattern targets. If the biodiversity features targeted in these areas are lost then targets will not be met. • These are landscapes that are at or past their limits of acceptable change
CBA 2	<p>Near-natural landscapes:</p> <ul style="list-style-type: none"> • Ecosystems and species are largely intact and undisturbed. • Areas with intermediate irreplaceability or some flexibility in terms of the area required to meet biodiversity targets. There are options for the loss of some components of biodiversity in these landscapes without compromising the ability to achieve targets. • These are landscapes that are approaching but have not passed their limits of acceptable change.
Ecological Support Areas (ESA)	<p>Functional landscapes:</p> <ul style="list-style-type: none"> • Ecosystems moderately to significantly disturbed but still able to maintain basic functionality. • Individual species or other biodiversity indicators may be severely disturbed or reduced. • These are areas with low irreplaceability with respect to biodiversity pattern targets only.
ONA (Other Natural Areas) and Transformed	<p>Production landscapes: manage land to optimize sustainable utilization of nature.</p>

The Thembelihle Municipality does not have a Spatial Development Framework, but the Pixley Ka Seme District Municipality has a Spatial Development Framework. According to this SDF, the site falls within an area that is rated as a low sensitivity area, according to the Sensitivity Map (see Figure 24).

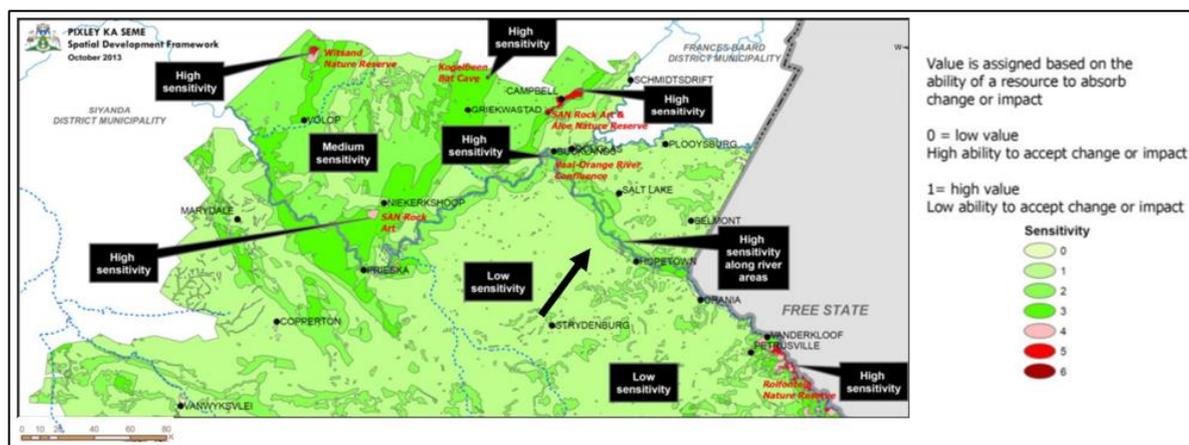


FIGURE 24: SENSITIVITY MAP OF THE PIXLEY KA SEME DISTRICT MUNICIPALITY. THE BLACK ARROW INDICATES THE LOCATION OF THE SITE.

Conservation of the unique Karoo landscape and fauna and flora is very important to maintain the environmental quality and resources in the Pixley Ka Seme District. The conservation of an area must be seen as a form of land use and such land areas must be carefully managed to ensure it remains a viable resource for the future. The sensitivity map of the Pixley Ka Seme District Municipality provides a guideline for the effective management and conservation of the high sensitivity areas and care should always be taken to adhere to environmentally sustainable use of these areas to ensure the biodiversity of the areas.

Considering all the maps available and data presented, it must be concluded that the NPAES, the Northern Cape PAES, the Northern Cape Biodiversity Conservation Plan (NCBCP), and the Pixley Ka Seme SDF all indicate that the proposed site does not fall within any biodiversity-sensitive area. While most of these plans are broad-based, regional/national plans are wide-scale plans and do not consider the land-use of the area and surround or site-specific features and locations. Others are more regionally specific, for example, if the Thembelihle Municipality had an SDF, it would have been considered a localised plan. Thus broad-based, regional/national plans might indicate that a site is not sensitive, but localised plans might indicate otherwise, or *vice versa*.

To assess the sensitivity of the environment the onsite verification is therefore essential. The preliminary investigation indicated that the site does not host sensitive fauna or flora, however, a SACNASP registered botanist will be appointed to conduct the vegetation survey and to determine the ecological importance of the vegetation at the site, which will then be regarded as the localised plan and evaluation of onsite conditions.

Mitigation measures will be detailed in the EIA phase but the objective will be to reduce the biodiversity impact due to clearance of vegetation through an 'offset plan'. The impact might range from low-moderate to moderate, but with mitigation, it could be reduced to low or very low.

The principal approach to biodiversity offsets is to provide a *'like for like or better'* area to compensate for the area which will be negatively affected. Offsets that do not involve securing and managing habitat but include funding research, education, staffing, etc. are generally believed to be unacceptable for impacts on biodiversity. Biodiversity offsets are to be used in cases where the EIA process identifies negative residual impacts of 'medium' or 'high' significance on biodiversity. Activities resulting in impacts of 'low' significance may not require an offset. In other words, biodiversity offsets can provide a mechanism to compensate for significant residual impacts on biodiversity. It refers to measures over and above rehabilitation to compensate for the residual negative effects on biodiversity, after every effort has been made to minimise and then rehabilitate impacts.

POSSIBLE MITIGATION MEASURES

- Those mitigation measures listed under the headings 'Fauna' and 'Flora'.
- Providing a biodiversity offset plan.

WATER

Surface Water

The proposed site falls within the Orange River Catchment area. The Orange River originates in the Lesotho Highlands and flows in a westerly direction 2 200 km to the west coast where the river discharges into the Atlantic Ocean (ORASECOM, 2007). The Orange River basin is one of the largest river basins south of the Zambezi with a catchment area of approximately 1 million km².

It has been estimated that the natural runoff of the Orange River basin is in the order of 11 300 million m³/a of which approximately 4 000 million m³/a originates in the Lesotho Highlands and approximately 800 million m³/a from the contributing catchment downstream of the Orange/Vaal confluence which includes a small portion in Botswana feeding the Nossob and Molopo rivers. The remaining 6 500 million m³/a originates from the areas contributing to the Vaal, Caledon, Kraai and Middle Orange rivers

The Northern Cape is divided into the following four Water Management Areas:

- Lower Orange;
- Upper Orange;
- Olifants/Droon; and
- Lower Vaal.

More specifically the proposed site falls within Lower Orange Water Management Area, in the D33G. The National Freshwater Ecosystems Priority Areas (NFEPA) identifies important catchments based on the presence of important biota or the degree of riverine degradation. The important catchment areas are then classified as Freshwater Ecosystem Protection Areas (FEPA's).

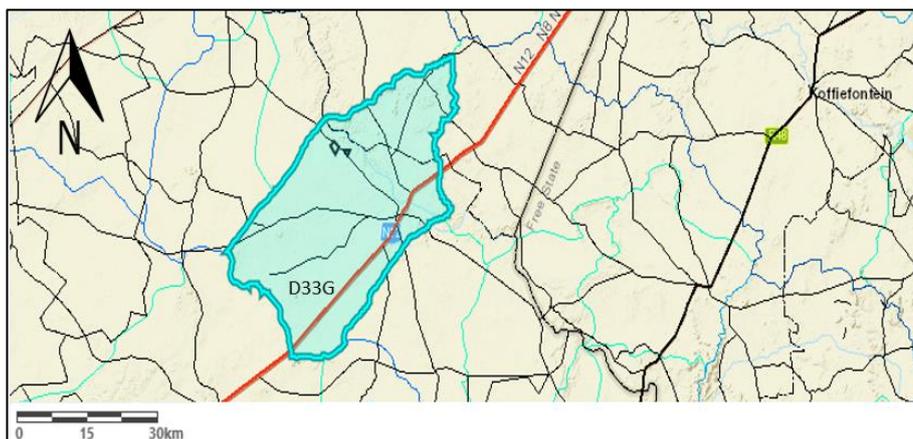


FIGURE 25: QUATERNARY CATCHMENT OF THE SITE IS D33G.

The site is located within a Fish Support Area of the *Barbus anoplus*. The back fish symbol on the map (see Figure 26) indicates the presence of vulnerable or near-threatened fish populations. If it was a red fish symbol, it would have indicated that there is at least one 13 population of a critically endangered or endangered fish species within that sub-quaternary catchment. Some fish sanctuaries are FEPAs, with their associated sub-quaternary catchments shown in dark green; others are Fish Support Areas, with their associated sub-quaternary catchments shown in medium green, such as the proposed site.

A goal of NFEPA is to keep further freshwater species from becoming threatened and to prevent those fish species that are already threatened from going extinct. To achieve this, there should be no further deterioration in river condition in fish sanctuaries and no new permits should be issued for stocking invasive alien fish in farm dams in the associated sub-quaternary catchment. Since both Sites A and B do not host any water feature (wetland, drainage line, stream, or river) and are situated more than 1.8km from the Orange River, there is no impact expected on the *Barbus anoplus* fish sanctuary.

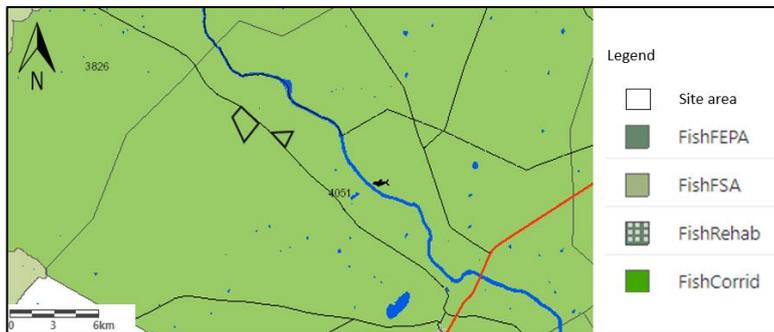


FIGURE 26: THE SITE FALLS WITHIN A FISH SUPPORT AREA.

The site is situated within the Eastern Kalahari Bushveld Group 3 wetland vegetation group.

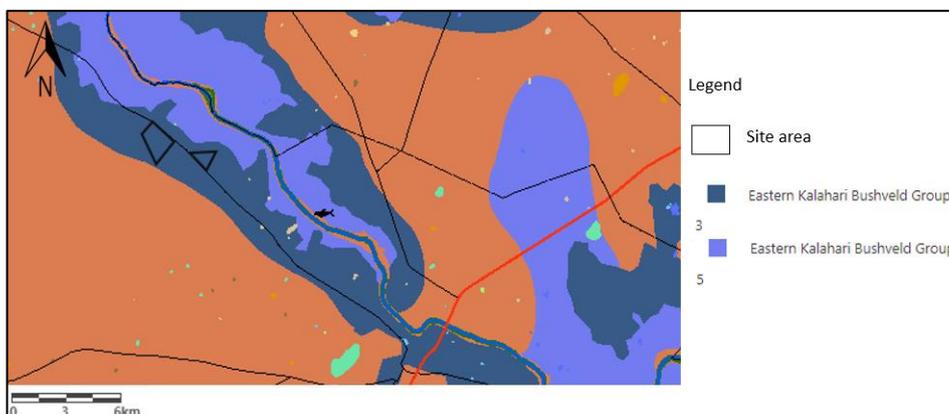


FIGURE 27: THE SITE FALLS WITHIN THE EASTERN KALAHARI BUSHVELD GROUP 3 VEGETATION GROUP.

During the EIA and EMP phase, the presence of any watercourse attributes will be further investigated, but it is not foreseen that the proposed clearing of vegetation will have an impact on the water sources surrounding the site. The Application already has a Water Use Right, therefore water abstraction has already been accounted for.

POSSIBLE MITIGATION MEASURES

- Clearing of vegetation should be restricted to the proposed footprint and development plan.
- Water for establishing the crops and/or lucerne will be obtained as per the Water Use Right.
- No foreign or unapproved material/substance should be dumped or stored within the footprint of the study area.
- Refueling of vehicles (such as the bulldozer) will be done by fuel browser and all vehicles/equipment shall be maintained to a high standard off-site and shall not display any major leaks. Vehicle/machinery inspection should be done regularly and emphasis should be on checking hydraulic hoses and couplings.
- In case of an emergency, repairs on site must be done over a drip pan.

- In case of large, critical spills the Departments of Water Affairs and DMR will be informed immediately for assistance and advice and a competent company conversant with bio-remediation will be appointed immediately to address the possible impacts of such spill. All costs would be for the account of the applicant.
- The applicant accepts the principle of 'polluter pays'.

AIR QUALITY

The air quality of the immediate surroundings is good due to its rural status. During windy periods a limited amount of dust will be deposited into the atmosphere causing a slight rise in air pollution levels during the clearing of vegetation. Since the property involved is still zoned agricultural and rural, it would cause tolerable ambient levels to be higher than those for residential areas. It would on the other hand not exempt the applicant to implement measures to keep disturbed areas as small as possible and to reduce dust generation when and wherever possible.

The amount of dust generated on a site is directly linked to the type of material that is extracted, mechanical processes involved, traffic volumes, wind speed and soil moisture content. The finer the material (more easily airborne) and the higher the clay and silt concentrations, the more severe the impact is. The dryer the soil becomes the more dust it generates therefore the site will be cleared in phases and the crops planted as soon as possible and irrigated. This will reduce the areas exposed to wind and will limit dust generation.

The potential dust generation source will mainly be during the clearing of vegetation until the crops are established.

Mechanical processes will continue into the operational phase since summer crops will be alternated with winter crops or lucerne for the 'rest years'. It will be restricted to the clearing of vegetation and ploughing, since ploughing is currently taking place on abutting farming sites, the dust generation would remain similar to what is currently being experienced. During normal climatic conditions, a very low impact is anticipated.

The overall impact on air quality, without mitigation is anticipated to be low (calm days) to low-moderate (windy days) only during the construction phase, considering the small sections to be developed at any given time.

POSSIBLE MITIGATION MEASURES

- No cooking fires will be allowed on the property, no chemicals will be stored or disposed off on-site and no waste will be burned on site.
- Waste should not be buried.
- Water will be used to irrigate areas.
- The clearing of vegetation should not impose dust counts of more than 20 mg/m²/per day at any residence or more than 40 mg/m²/per day during abnormal climatic conditions.
- Speed of vehicles should be restricted to 30km/h, which will assist in mitigating dust generated on haul roads.

NOISE

The impact of noise levels generated by farming activities is determined by the type of activity, the time of day, the consistency thereof, distance to people, whether it is a low or high-pitched noise and whether beneficiation is taking place. Noise levels are more intense in the morning and evening than during the rest of the day and are more irritating if it is high-pitched. The more continuous the noise is the higher the impact. In terms of SABS standards, noise levels for rural residential areas are 45dB during the day, 40dB in the early evening, and 35dB at night. Noise impact is rated against the following: 1) The average dB will result in no or sporadic complaints from communities whilst an increase between 5-10dB will result in widespread complaints, 3) An intruding noise is defined by National Noise Regulations as disturbing if it causes the ambient noise levels at the border of the property from which it emanates to increase with 7dB, 4) An average person will perceive such an increase in the ambient noise levels as a doubling of noise levels and very strong response will be expected from communities/residents.

The rural setting of the study area and the extensive agricultural activities characteristics of the area would, under normal circumstances, probably result in the ambient noise levels being between 40 and 45dB during the day. However, traffic on the R3112, especially trucks, will intermittently increase noise levels to approximately 65-70dB along the road. Thus, noise impact is already experienced and it is not anticipated that the proposed agricultural activities will result in a cumulative impact. It is not anticipated that the proposed development will impact the tranquility of the area, but rather fit in with the surrounding area.

Noises generated during the construction and operational phase (clearing of vegetation and crops) will generally be low-pitched if earth-moving machinery is well maintained. There is one exception and that is the reverse sirens which produce a high-pitched, irritating noise and could cause some irritation to nearest residences early in the morning or later at night. Since the closest resident is more than 1km from Site A, very low to no impact is expected. Since the fitting of sirens is a requirement of the OHS Act, there is no mitigation possible.

No campsite would be established in the study area, therefore no noise would be generated at night that could become a nuisance.

Management of the human impact during the day could be achieved via the environmental awareness programme. Also, staff and contractors should be sensitized not to engage in unnecessary hooting, shouting, flapping of tailgates, and use of exhaust brakes during operational hours. Maintaining speeds below 40km/h would assist in curbing noise impact.

The expected impact rating on noise is very low, but will be further investigated during the EIA and EMP phase.

POSSIBLE MITIGATION MEASURES

- Unnecessary hooting, shouting, flapping of tailgates, and use of exhaust brakes should be discouraged as well as the unnecessary idling of vehicles.

- Moving parts of vehicles should be regularly serviced and repair work that involves using grinders and hammers on steel or any other steel on steel activity should be done during the day at the farm workshop.
- This potential impact should be addressed in an environmental awareness programme, which will be completed during the EIA and EMP phase.

WASTE GENERATION

Domestic Waste

The waste stream will consist mainly of small volumes of domestic waste (food, bottles, plastic bags, paper, clothing, rags, etc) and will be deposited in small containers provided in the earth moving vehicles, for this purpose. It can be emptied once a day in a refuse bin at the farmhouse/workshop. Poor control over domestic waste handling could lead to littering the site and abutting properties and must be avoided since it could lead to livestock mortality or impacts on fauna. Due to the limited number of people anticipated on-site, the limited waste stream will have negligible impacts on soils, water vegetation, air quality, and humans.

Clearing of vegetation residue

The geology of the area restricts the type of residue to possible oversize stones, and root mass. The former could be returned to the old excavation areas perhaps found on the farm and be covered with some of the root mass. The rest of the root mass can be worked into the topsoil as organic matter. The cumulative impact on soils, water quality, vegetation and aesthetics is expected to be rated of low significance.

Sewage system

A chemical toilet must be provided. Considering the limited number of people on-site, the effluent stream will be limited to approximately 0,1 m³ per month and no impacts on soils, groundwater, surface water, air and humans are anticipated if it is maintained/serviced properly.

Hydrocarbons

No hydrocarbon storage will take place onsite. Servicing of equipment and vehicles would be done off-site at the farm workshop therefore no hydrocarbon waste such as used oil, lubricants and hydrocarbon-contaminated filters will be generated. Any such material generated during emergency repairs will be removed from site immediately.

No-wash bay or oil trap will be constructed as vehicles will be washed off-site and all hydrocarbon spills will be contained within large drip pans. The impact is anticipated to be low.

POSSIBLE MITIGATION MEASURES

- Any domestic waste produced would be temporarily stored at allocated areas at the farm area and removed continuously to a legal waste facility. Appropriate containers and storage areas will be investigated during the EIA and EMP phase. Easy access to these should be a priority and no waste should be burned or buried on site.
- The site should always remain neat and tidy.
- Any hydrocarbon spills would be cleaned up immediately and vehicles will be maintained to a fuel, oil, or lubricants leak-free status. Vehicles should be parked over drip trays.
- The chemical toilet/s would be regularly serviced and emptied at an approved waste site in Hopetown and strict controls will be enforced to ensure that the surrounds are not used as ablutions. This aspect would be included in the environmental awareness programme. Waste from the toilet should be taken to a licensed WWTW.
- The chemical toilet/s can be moved to and from the site as they are needed.
- Residue in the form of oversize stones could be returned to old excavation sites on the farm.

VISUAL IMPACT AND AESTHETIC ACCEPTABILITY

Originally, the landscape would have been described as very attractive and of high aesthetic quality because of the meandering status of the river and the unique riverine environment. However, due to the anthropogenic impacts such as the establishment of cultivation areas, Eskom servitudes, and road infrastructure, the current surrounding landscape can be viewed as impacted.

The landscape itself does not provide valleys and ridges to add to the visual character of the area, and roads, bridges, telephone and power lines, and residences on farms, farm buildings, etc. further reduced the aesthetic value of the surroundings. Onsite assessment of immediate landscapes revealed that the areas surrounding Site A to the east, south, and west are completely transformed due to agricultural activities. To the north, across the R3112, is natural veld. Likewise, the areas surrounding Site B to the east, south, and west are also completely transformed, but the north is natural veld and representative of veld in the Kimberley Thronveld. However, Site A has limited connection to other environments, whilst Site B has a connection to the north with the Kimberley Thronveld.

With the removal of vegetation and establishment of crops, the anthropogenic impact will be evident, especially along the R3112, but since it will be directly abutting existing pivot areas, it would seem like a continuation of the same activity and therefore reduce the perceived aesthetic impact.

The clearing of vegetation will temporarily change the texture (vegetated/rough to bare/smooth) and color (green/brown to whitish-grey) of the cleared out areas and will increase onsite visibility, but as the crops are established the onsite visuals will be absorbed into the landscape and will fit in with the surrounding landuse. This

will be a continued impact during the operational phase, as summer and winter crops are planted or lucerne for alternating years.

During the EIA phase this procedure will be elaborated on. This visual impact should, however, be temporary and of low significance considering the frequent ploughing of abutting croplands.

POSSIBLE MITIGATION MEASURES

- No vegetation clearing should take place outside the proposed study area and the visual impact will be reduced through the establishment of crops and alien control programme.
- Excessive dust generated by the bulldozer, haul roads, and ploughing machinery, harvesting, etc. that increases visual impact could be reduced through an irrigational plan.

TRANSPORT IMPACT

The existing access roads on the farm and the R3112 will be used. During the construction phase (vegetation clearing) a bulldozer will be at the site and will not add heavy vehicle traffic to the national and provincial road system. It is not anticipated that there will be any impact on the farm road infrastructure.

Once operational, the R3112 will be used to transport harvest crops to the relevant silos and/or market. It is anticipated that during the harvest time, heavy vehicles will add to the traffic count on the R3112, but since this road is built for heavy vehicles, the impact is anticipated to be low.

During the EIA and EMP phase the condition/integrity of the roads will be investigated, but despite the sometimes poor quality of the road, safety risks for motorists would not increase since the proposed development will just be a continuation of existing agricultural activities on the farm. Cyclists and pedestrians will experience a similar risk and truck drivers will be sensitized on the matter and provided with the necessary transport training.

It was noted during the site visit that during the commuting time to work, many farmworkers walk the 15km along the R3112, and many requested rides (hitchhiking) from bypassing cars. This potentially can cause a social impact from a safety point of view for both pedestrians and oncoming traffic and will be investigated during the EIA and EMP phase.

POSSIBLE MITIGATION MEASURES

- All vehicles and earthmoving machinery would be properly maintained and will be road-worthy and all drivers must dispose of applicable driver's licenses.
- Traffic should be observed and necessary road etiquette enforced and this aspect will be included in the environmental awareness programme.
- The appropriate road signage should be erected on both sides of the farm entrance and if needed, a flagman will be appointed at the access point to increase road safety during harvest periods when an increase in trucks are expected on the farm.

SOCIO-ECONOMIC IMPACT

During the construction phase, the development will provide permanent and casual work for a number of people, whether it is renting a bulldozer from a local company, employing workers to 1) remove the vegetation, 2) remove stones, 3) constructing the irrigation infrastructure, or 4) fencing the camps, etc. Once in operation and the crops are harvested, it will create job opportunities for harvesters, transport companies, etc. and must be seen as a positive contributor to upliftment of inhabitants of the Thembelihle Municipal area.

In terms of the socio-economic benefit, it is no secret that South Africa has one of the world's highest unemployment rate. While the Thembelihle Municipality 2017/2022 IDP indicating that the unemployment rate was about 28%, which is a very good variable in light of the 43% provincial unemployment figure, by creating employment in the agricultural section is a step towards ensuring sustainable jobs. The agricultural industry plays a key role to generate economic activity, create jobs, earn foreign currency and stimulate rural economies in general.

It is thus clear that the proposed crop production, as proposed by the Applicant, will contribute to a small portion of the economic growth within the Thembelihle Municipal area. This development will not only benefit the Applicant but will also create job opportunities for 8-12 low-income households that will assist in poverty alleviation.

In terms of the negative impacts, it could potentially pose some social impacts on residents in terms of safety and security issues, nuisance factors such as dust & noise generation. However, the Applicant is a farmer and has a close relationship with the local community. Most of the families employed on the farm will be from families that have been on the farm for generations, which is the basis of their mutual trust between each other. The Applicant will therefore employ local community members known to the farming community, which is in line with current farming practices. Farm safety remains a major concern and will be investigated during the EIA and EMP phase.

Based on the above, the overall social-economic impact is expected to be rated positive.

POSSIBLE MITIGATION MEASURES

- If needed, meetings with nearby neighbors should be held to address any unknown impacts.
- Farmworkers may not wander on any area outside the farm and stock theft and poaching should not be tolerated. Any farm worker/contract worker found guilty of these transgressions should be removed from the property, dismissed and handed over to the police for sentencing.
- No wood should be gathered from outside the study area and no plant or crop should be removed by the workforce.
- Landowners will be fully compensated for stock or crop loss.

STRUCTURES OF ARCHAEOLOGICAL AND CULTURAL INTEREST

These sites represent the heritage of communities and are therefore protected in terms of current legislation. In addition, all materials/buildings older than 60 years are protected. The Northern Cape is rich in fossils and archaeological heritage and therefore the area will be subject to a Phase 1 Archaeological and Paleontology Report will be completed by Dr. Lloyd Rossouw who has a BA Hons (SU), MSc (Wits), and PhD (UFS). The full report will be submitted with the EIA and EMP phase. Also, an environmental awareness plan will be compiled to inform the operators of earthmoving equipment of the company's obligation to protect any archaeological or cultural artefacts and to inform management when anything of interest is noted on the site.

POSSIBLE MITIGATION MEASURES

- Recommendation from the Heritage Survey Report will be included in the mitigation measures, which will be completed during the EIA and EMP phase.
- Operators of earthmoving equipment should be informed of the company's obligation to preserve archaeological and historical material and this aspect will be included in the environmental awareness programme.

PUBLIC PARTICIPATION FOR THE SCOPING PHASE

In terms of Regulation 40 of the Schedule published in GNR 326 under NEMA 107 of 1998, interested and affected parties must be consulted as part of the public participation process. Due to Covid and the risk of contamination, it is proposed that where possible email correspondence or digital meetings (if required) will be used as opposed to hard copies of documents or in person meetings. Thus the following steps were taken, in accordance with current legislation:

- A Notice Board to inform the public about the application and allow registering as an interested and affected party was placed at the entrance to the property that is accessible to the public. The date of the notice is 27 August 2021 and the comment period will stop on 27 September 2021.
- An advert was placed in DFA on 27 August 2021 to inform the public about the application and provide an opportunity to register as interested and affected parties to register or raise concerns about the proposed project. The comment period will stop on 27 September 2021, which gives potential I&AP's time to register.
- Mr. Jennings, who is the landowner, has agreed that Mr. Steytler develops the property. In addition, a letter of consent was provided.
- All abutting neighbours were consulted with a detailed letter and sent via email and an opportunity was given to object or raise concern to the proposed project. The letter was emailed on 27 August 2021 and the comment period will stop on 27 September 2021. The following people are abutting neighbours:
 - Leon Ferreira
 - Gerrie Scholtz
- The Thembelihle Municipal was consulted via email and register post and an opportunity was given to object or raise concern to the proposed project. The letter was sent on 27 August 2021 and the comment period will stop on 27 September 2021.
- The Pixle Ka Seme District Municipal was consulted via email and register post and an opportunity was given to object or raise concern to the proposed project. The letter was sent on 27 August 2021 and the comment period will stop on 27 September 2021.
- The Ward 2 Councilor was consulted via email and an opportunity was given to object or raise concerns about the proposed project. The letter was sent on 27 August 2021 and the comment period will stop on 27 September 2021. It should be noted that there are currently only 4 wards, after local elections, there will be 6 wards, of which this site will then fall within Ward 6.
- The Department of Water and Sanitation was consulted via email and register post and an opportunity was given to object or raise concern to the proposed project. The letter was sent on 27 August 2021 and the comment period will stop on 27 September 2021.
- The Department of Agriculture was consulted via email and an opportunity was given to object or raise concern to the proposed project. The letter was sent on 27 August 2021 and the comment period will stop on 27 September 2021.
- The Department of Roads and Public Work Northern Cape was consulted via email and an opportunity was given to object or raise concern to the proposed project. The letter was sent on 27 August 2021 and the comment period will stop on 27 September 2021.
- The Lands Claim Commissioner of the Northern Cape was consulted via email and an opportunity was given to object or raise concern to the proposed project. The letter was sent on 27 August 2021 and the comment period will stop on 27 September 2021.
- An application to the South African Resource Agency was submitted online as per their SAHRIS application format. An opportunity was given to object or raise concerns about the proposed project. The letter was sent on 27 August 2021 and the comment period will stop on 27 September 2021.

Section 41 (3) of the regulations indicates that the notice, notice board, and advertisement must give details of the application and state if the application is a BAR or an EIA. In addition, the notice must also provide the activities being

applied for, the location, where further information on the application can be obtained, and how a person can register as an IAP. According to Section 41 (6)(b) of the regulations, the potential or registered IAPs must have a reasonable opportunity to comment on the application.

The timeframes are very clear in the NEMA Regulations, that IAPs must have 30 days to comment and register as IAPs and the time frames to submit the Scoping Report are very rigid (44 days – of which 10 days could be utilized by the authority to accept/reject the application; 30 days must be provided to IAPs to comment and register, thus leaving 4 days for finalization of the Scoping Report before submitting). This results in the Scoping Report is available to any potential IAP for comment and not just registered IAPs.

The Scoping Report and Plan of Study will be submitted 2-3 days after acceptance of the application is received from the Department of Agriculture, Environmental Affairs, Rural Development, and Land Reform and the notice board, advertisement and notification letters will be placed/emailed accordingly. If any IAP wants to comment on the Scoping Report and Plan of Study they can contact Digital Soils Africa (contact information provided in the notice) and enquire regarding the website information where the document is available for public viewing.

The Scoping Report will also be submitted to all organs of the state which have jurisdiction in respect of the activity or any part thereof during the mentioned 30 day period. At the cessation of the 30 day comment period, the Public Participation Report will be finalized and submitted with the Final Scoping Report to the DAEARDLR.

If no comment or written request to be registered as an IAP is received from potential IAPs during this 30 day consultation period, then the public participation process will be concluded and only entities regarded as registered IAPs will be given notice of the EIA.

Proof of consultation during the Scoping Phase is attached in Appendix C – Public Participation.

During the EIA phase, another 30-day comment period on the draft EIA and EMP will be provided to all registered I&AP's.

PLAN OF STUDY

INTRODUCTION

Any activity which is listed in Listing Notice 1 or Listing Notice 2 of these EIA Regulations is subject to environmental authorization. The difference between Listing Notices 1 and 2 is in the process that needs to be followed, with Listing Notice 1 activities being subject to Basic Assessment and those in Listing Notice 2 to Scoping and Impact Assessment. For this application activities listed under Notice 2 were identified, therefore the EIA process has to be followed.

The amendments to the National Environmental Management Act have led to the Plan of Study to be included in the Scoping Report and are no longer a separate document submitted with applications. Since, a detailed description of the components and issues considered, have been included in the Scoping Report, this chapter of the report,

therefore, provides the context for the Plan of Study for the Environmental Impact Assessment, supplementary to the Scoping Report.

Therefore this Plan of Study describes how the EIA for the proposed project will proceed and includes proposed specialist studies to be completed for those potential impacts provisionally evaluated to be of significance.

Should the Scoping Report be accepted by the Department of Agriculture, Environmental Affairs, Rural Development, and Land Reform, the application will proceed with the EIA Process as described in the NEMA Regulations of 8 December 2014 as amended in 2017.

OBJECTIVES OF THE EIA

The objective of the assessment of impacts is to identify and assess all the significant impacts that may arise from the undertaking of an activity. The findings of impact assessments are used to inform the competent authority's decision as to whether the activity should be authorized. The objectives of the EIA are:

- To identify issues/concerns that should be included in the scope of the Environmental Impact Assessment process;
- To provide an assessment and rating of the social and biophysical environments affected by the proposed project, to an appropriate level of detail, which will include the physical, biological, and socio-economic components.
- Identify and recommend appropriate mitigation measures for potentially significant environmental impacts;
- To identify possible specialist studies to be conducted to address significant issues;
- To describe/ recommend mitigation measures/ Environmental Management Plan (EMP) to be implemented to address significant aspects/ impacts associated with the proposed development to fall within acceptable levels;
- To inform all stakeholders about the proposed mining development through a public participation process as published in Regulation 41 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended and ensure that IAP's have the opportunity to raise their concerns.

EIA APPROACH

In the EIA, aspects, and impacts (cumulative impacts, degree of impacts, nature of impacts, the degree to which impacts can be reversed), associated with the construction, operational, and closure phases shall be extensively

assessed, as determined through site visits and field investigation to determine the baseline environmental parameters. A desktop study will determine:

- Ecological sensitive sites;
- Conservation areas;
- Surface water resources;
- Soil stability; and
- Vegetation sensitivity.

Comprehensive mitigation measures informed by the investigation and specialist reports, as well as consultation with key stakeholders, shall be included in the EIA report and the Draft Environmental Management Plan.

Since this will be a change from grazing land to crop production and the proposed development will have a lifespan of more than 10 years, a closure phase should consist of rehabilitating the site back to a natural veld used for grazing. However, ten years from now, it is most likely that environmental laws would have been amended and requirements might change. Therefore as a condition to guard the long-term sustainability of the project, it is proposed that as a condition of approval, the following be stipulated: should the Applicant decide to cease the crop production, a closure plan must be submitted to the relevant Department for approval.

A DESCRIPTION OF THE ALTERNATIVES TO BE CONSIDERED

No alternative sites were investigated as:

1. The Applicant has a rental agreement with the landowner;
2. A Soil Report indicated that the site is suitable for crop production and from an environmental point of view the best option which will have the least amount of impact, and
3. The Applicant already has the necessary water use right for irrigation.

Alternative site layout will be investigated since the soil report identified better areas for crop production within the study area and recommends that no more than 10% of unsuitable soil should be included in pivot areas.

ALTERNATIVE LAYOUT

The soil report and findings were the leading factors in deciding to allocate the pivot areas. Deep soil depths, favoured soil types, and drainage led to the best soil suitability areas. It was found that there is only one layout proposed for Site B and no other alternative layout would be feasible or economic to develop.

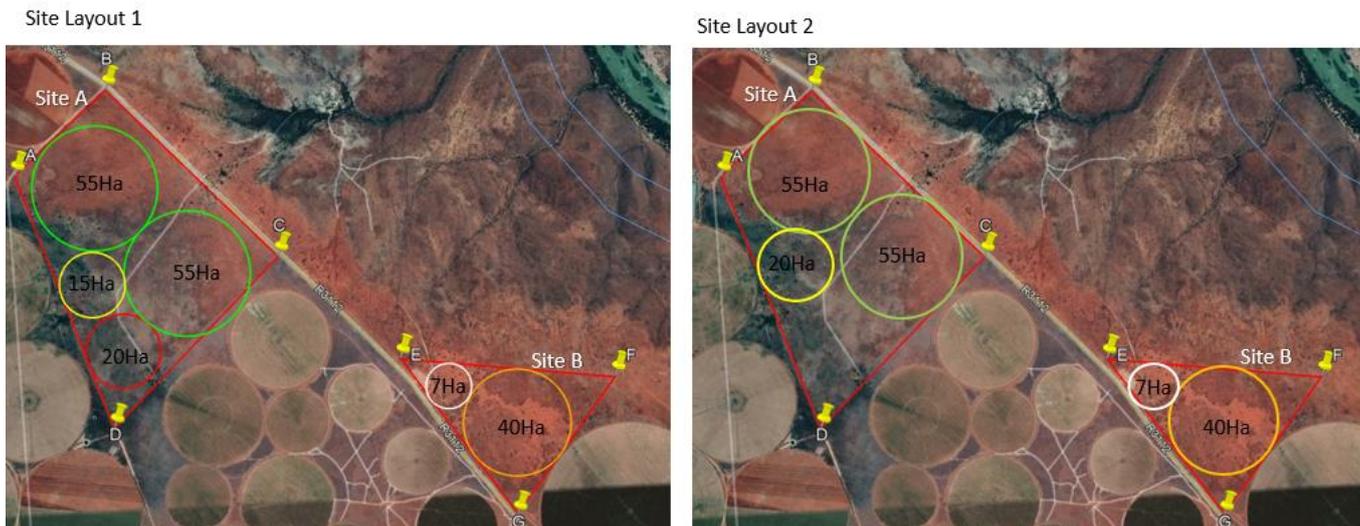


FIGURE 28: ALTERNATIVE SITE LAYOUT PLANS.

Site A, as proposed in the soil report could be slightly adjusted. In Figure 28 Site Layout 1 was proposed in the soil report. However, considering the soil factors a slight adjustment to the pivot areas is suggested in the Site Layout 2 plan. The sizes of the pivot areas can remain mostly the same, however, the two 55Ha pivots should be moved to the boundary of the north-eastern section of the property, as the soils along this portion are the most suited. The 15Ha pivot area could increase to 20Ha and moved slightly north and away from the haul road on this property and the 20Ha pivot (Site Layout 1) should not be developed as more than 80% of this pivot area will have unsuitable soil (see Figure 29).

It might seem like a slight adjustment, but considering the soil report and possible impacts with regards to drainage, Site Layout 2 is the preferred option.



FIGURE 29: OVERLAY OF SITE LAYOUTS 1 AND 2 FOR SITE A. THE BLUE POLYGONS REPRESENT THE PROPOSED PIVOTS AND THE RED POLYGON REPRESENTS THE UNSUITABLE SOIL AREA.

ALTERNATIVE LAND USE

Alternative land uses, instead of agriculture will not be considered, since it involves an application for change of land use and the landowner does not wish to change the land use of the property. However, it is important to discuss the process of this conclusion.

Agriculture

The area under application is used for grazing. According to the AGIS, the grazing capacity is 22Ha per LSU (Large-stock unit) which is a low carrying capacity, unless the area is cleared from the natural vegetation and lucern or Kikuyu is planted and irrigated the carrying capacity will not increase. This action will result in the same environmental impact as clearing the site for maize or wheat crops. Since the crop rotation method is going to be applied, the difference is that the agriculture use will interchange between grazing (with a higher carry capacity) and crop production.

The soil investigation found that the A and B horizons are characteristically sandy and therefore will facilitate good drainage. Most of the soils are very high-potential irrigation soils and the soil texture results confirm the morphological interpretations and good drainage is expected on the soils. The main concern was the Na that was high in relation to other cations, which could lead to sodicity. However, the laboratory results indicate that the chemical parameters are manageable. The exchangeable sodium percentage (ESP) values are high, thus, it indicates that sodicity is not a general threat to irrigation on this site. On these soils this can be rectified with irrigation and fertilization on soils with adequate drainage, the Na should leach out and be replaced with Ca, Ma and K, lowering the ESP. This is confirmed by the very low ECe values.

Ultimately the soil report concluded that most of the area applied is suitable for crop production, except for a central area within Site A. With the proposed Site Layout Plan (2) the unsuitable soils can be avoided and the Applicant will still have about 177ha of the area that can be utilised.

Currently, there are cultivation lands to the south, east, and west of both Sites A & B, but none towards the north of the sites and if cultivation is to be approved, it will fit in with the surrounding land use and appear to be an extension of existing cultivated lands.

It must, however, be noted that the area under application will never be able to carry large amounts of cattle, even if this development is not approved. Since the proposed crop production will add great value to the farming industry; agriculture, as land use, will remain the choice landuse to be the best option for development.

Conservation

The final consideration of alternative land use versus developing the site into crop production is to establish the site as a conservation area.

Depending on the vegetation survey, some important or protected plant species might be identified on the site, and this should be considered during the EIA Phase. However, Site A and B do not host a water resource. Site A is situated directly abutting cultivated land and to the north, which could provide connectivity to undisturbed areas, it is fenced and the R3112 separates the area from the Orange River system more than 1.8km from the site.

Site B has the most potential if conservation is considered. Although the site is also directly abutting cultivated areas to the south, east, and west, it is not separated towards the north from the Orange River system which is more than 1km from the site and could provide a corridor for migration.

It should be considered that the site does not fall within a critical biodiversity area or near any formally protected areas. For this site to become a prime conservation area, the following must be addressed first:

- The immediate and surrounding land needs to be upgraded from agricultural land use to conservation, which will be a problem since the Applicant does not own all the abutting land is not in a position to enforce this transformation. In areas that do belong to the Applicant the transformation from agriculture to conservation will result in income loss generated from farming and job losses will occur for farmworkers.
- All neighboring property owners must agree to conserve their properties and fences must be removed to ensure a suitable size area that is a viable conservation area that can host biodiversity and act as a corridor for animal movement.
- All alien vegetation must be removed and indigenous vegetation must be established.

This option as land use is therefore not recommended, since:

1. It will be a highly costly exercise with very little to no return income to cover rehabilitation costs and implementing conservation procedures.
2. This will be a significant expense that will not benefit the Applicant or landowners since they will not be allowed to farm optimally. Also, farming is the main income for the property owners and many workers are dependent on agricultural produce for their livelihood. It is highly unlikely that fences will be removed.
3. The soil report indicated that crop production can be established on the site.

Establishing this site alone as a conservation area will be futile since it is only about 269Ha in size and is mostly isolated and surrounded by transformed areas. For a conservation area to be successful it needs to interrelate with the broader landscape and socio-economic context within which they are situated. If surrounding areas are not going to change, the conservation of this section will be futile.

In light of this, it is recommended that this site be developed into crop production, with the benefit of socio-economic improvement and job creation opportunities, while remaining an agricultural unit. Developing this site will be the best viable land-use option for the Applicant who is also the landowner.

NO DEVELOPMENT OF THE SITE

In terms of the 'no-go' option; if the site is not developed there will be no change (good or bad) to the status of the site; it will remain as-is: an area that is Least Concern, but with both sites that have natural conditions that represent the Kimberley Thornveld used for grazing. Site A has a limited connection to other environments, while Site B has connections to other environments, and if developed would reduce that connection. Considering that Site A & B is directly adjacent to established pivot areas, it will be a continuation of the development on the farm.

The development of the site into a crop production of maize, wheat, and alternating lucerne will have a permanent impact on the natural grazing capacity. Every alternative year the site will have limited grazing capacity as livestock will feed on crop residue, however for the resting year when lucerne is planted the grazing capacity will increase considerably compared to the natural veldt capacity. The Applicant intends to rest the crop fields annually through rotating crops. About 200Ha is currently approved and under crop production, the addition of the 269Ha (or 177Ha of the identified suitable area within the 269Ha) will allow the Applicant to continue to produce crops per annum, but also allowing the alternating camps to rest. Part of the soil management will also include that during the resting period, attention will be given to soil upgrading, such as deep ripping, removing access rocks, spreading of chicken manure or other organic fertilisers on the land, as well as Gipson or lime to leach out the Na.

The proposed farm practice will increase the yield production of the land and increase capital revenue for the farm, and due to the rotation practice, no losses will occur in terms of grazing capacity. The offset against crop production, the increased job opportunities, and the capital value of the property outweighs the option not to develop this site.

From an economic and agricultural point of view, it is better to develop the area and improve the agricultural potential of the land and from a soil management perspective to allow crop rotation production. Therefore, the 'no-go' option for this portion of land as an alternative is not recommended.

Furthermore, in the EIA no alternative site, no alternative land use, no alternative site layout, and the 'no-go' option will not be considered or evaluated. The EIA will assess the impacts of the area under application only.

ASPECTS TO BE ASSESSED DURING THE EIA PHASE

For the application, a few activities triggered the requirement to apply for environmental authorization. These listed activities include:

Vegetation of clearing

- GNR 325 Activity 15: The clearance of an area of 20 Ha or more of indigenous vegetation.

The above-listed activity cause direct, indirect, and/or cumulative impacts on the biophysical environment. Therefore each listed activity will be assessed in perspective to the biophysical parameter and the following biophysical parameters will be assessed:

Topographical assessment

Geological & Soil assessment

Land capacity assessment

The vegetation assessment

The fauna assessment

Site Sensitivity assessment

Surface & Ground Water assessment

Air quality assessment

Noise impact assessment

Waste management assessment

Visual impact assessment

Traffic impact assessment

Socio-Economic impact assessment

Archaeological & Palaeontology assessment

Management actions or mitigation measures will be fully described in the Environmental Management Plan (EMP) that forms part of the EIA process. In the above Scoping Report, potential mitigation measures have been discussed, but as the EIA progress, more specific mitigation measures will be prescribed to the proposed project to mitigate specific impacts.

SPECIFIC ISSUES TO BE ADDRESSED IN SPECIALIST STUDIES

The Terms of Reference for each specialist should be outlined, before appointing the specialist, and for each specialist study, the method of assessing the environmental impacts should be similar to the below to ensure uniformity with providing scientific information.

The site visit during the Scoping Phase revealed that the following specialist studies should be completed, also considering the applicable legislation:

- Soil survey – to be completed by Dr. Bouwer and Mr. Marx (Hydropedologists)
- Botanical survey – to be completed by a SACNASP registered (Botanist)
- Heritage and Palaeontology survey – to be completed by Dr. Rossouw (Heritage & Paleontologist Specialist)

If additional issues are identified by the consulting authorities or through interested and affected parties that must be investigated by a specialist, the additional specialist will be appointed and the studies completed and input from the specialists will be included during the EIA and EMP phase.

METHODOLOGY OF IMPACT ASSESSMENT

The identification and assessment of environmental impacts is a multi-faceted process, which combines quantitative and qualitative analysis and evaluation. It involves the application of scientific measurements and professional judgment to determine the significance of environmental impacts associated with the proposed project.

The assessment of impacts will be based in accordance with Section 3: Assessment of Impacts, in DEAT Guideline 5, June 2006. This identification of potential impacts should include impacts that may occur during the different phases of the operation (construction, operational, and closure phases) and assessment of the impacts should include the direct, indirect, and cumulative impact.

The process of the identification and assessment of impacts must always include the conditions of the current environment so that an environmental baseline is determined from which impacts can be identified and measured. The process must also determine future changes to the environment that will occur if the activity proceeds and the consequences (environmental/social risks as well as the positive and negative consequences).

Different approaches can be adapted to the undertaking of the assessment of impacts, but they should always be based on a methodology that includes:

- A clear process for impact identification, prediction and evaluation;
- Criteria for evaluating the significance of impacts;
- Identifying and assessing the potential impacts associated with a proposed activity and its alternatives (if any) and defining types of impacts (direct, indirect or cumulative);
- Predicting the nature, magnitude, extent and duration of potentially significant impacts;
- The design of mitigation measures to address impacts;
- Evaluating the significance of residual impacts i.e. impacts that remain after taking mitigation measures into account; and
- Specifying uncertainties.

As per the DEAT Guideline, the following methodology is to be applied to the prediction and assessment of impacts. Potential impacts should be rated in terms of direct, indirect, and cumulative:

Direct impacts – are impacts that are caused directly by the activity and generally occur at the same time and the place of the activity.

Indirect impacts – are impacts caused as a result of the activity and normally do not manifest immediately when the activity is undertaken or could occur at a different place as a result of the activity.

Cumulative impacts – these are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present, or reasonably foreseeable future activities. Cumulative impacts can include both direct and indirect impacts and can occur from the coactive impacts of individual minor actions over a period of time.

Cumulative Scoring: None, Very Low, Low, Low-Medium, Medium, Medium-High, High, Very High.

Impacts will be assessed according to the criteria listed below:

TABLE 4: IMPACT ASSESSMENT TABLE

Criteria	Description	Rating	
Spatial Extent	Whether the impact will occur on a scale limited to the immediate site of the proposed activity, local area and immediate communities and settlements, sub-regional (municipal), regional (provincial), or national scale.	None/Insignificant	0
		Site	1
		Local	2
		Sub-Regional	3
		Regional	4
Duration	Whether the period of the impact will be short term (0-5 years), medium term (5-15 years), long term (> 15 years) or permanent where natural processes or mitigation processes cannot eliminate the impacts.	None	0
		Short Term	1
		Medium Term	2
		Long Term	3

		Permanent	4
Intensity	Whether the size of the impact is low, medium, high, or negligible.	None	0
		Very Low	1
		Low	2
		Low-Medium	3
		Medium	4
		Medium-High	5
		High	6
		Very High	7
Probability	The probability of the impact occurring as either unlikely, probable, likely or definite.	None	0
		Unlikely	1
		Probable	2
		Likely	3
		Definite	4
Significance	The total level of impact.	Insignificant	0-6
		Very Low	7-15
		Low	16-22
		Low-Moderate	23-31
		Moderate	32-40
		Moderate-High	41-47
		High	48-55
		Very High	>55

These criteria are evaluated in terms of

- Significance (Insignificant-low-moderate-high)
- Status (positive-negative-neutral)
- Confidence (based on academic information, specialist knowledge, site evaluations, applicants approach)

To determine/calculate the level of significance, the weight of the spatial extent, the duration, and intensity ratings are added and this total is multiplied by the probability rating.

Example: If the spatial extent is site-specific (thus = 1), the duration of the project is permanent (thus = 4), and the intensity of the impact is high (thus = 6) the total is (1+4+6) = 11.

If the probability of that impact occurring is likely (thus = 3), then the significance of the impact is (11 x 3) = 33 – which will make this impact of moderate significance.

The significance of the impact on the parameters of the affected environment is rated as:

Low Significance

The project will not cause any major adverse or beneficial changes to the biophysical, social, or economic environment. Impacts experienced will abate almost immediately after cessation of activities and the biophysical, social or

economic system should recover and return more or less to the natural state. No expensive mitigating measures will be needed to address any of these impacts. Ecological functions will continue undisturbed and no complaints from Interested and Affected Parties (I&APs) are anticipated. No rare and endangered species or sensitive areas exist in the area.

Moderate Significance

The project will induce moderate short to medium term changes to the biophysical, social, or economic environment. The impact would be induced outside the development area and also possibly on a sub-regional level. Over the medium term the impacts could fade away but the implementation of mitigation measures is normally required to eliminate these impacts. The impacts would be experienced for some time after cessation of activities but would not affect the biophysical, social, or economic environment severely. With mitigation, the biophysical, social, or economic system should recover but the return to the natural state would be very slow and in some instances may not be achieved. I&APs might express some concerns and complaints may be received on an *ad hoc* basis. Rare and endangered species or sensitive areas may exist in the area and could be marginally affected.

High Significance

The project will induce extensive long-term changes to the biophysical, social, or economic environment. The impact would be induced outside the development area and also possibly on a regional to national level. The possibility of secondary impacts arising from the project is high. Over the long term the impacts could fade away but the implementation of expensive mitigation measures is normally required to eliminate or mitigate these impacts. These impacts would be experienced after cessation of activities and could affect the biophysical, social, or economic environment severely. With mitigation, the biophysical, social, or economic system could recover but the return to the natural state would normally not be achieved. Ecological functions will be permanently disturbed and major complaints from Interested and Affected Parties (I&APs) could be expected. Rare and endangered species or sensitive areas existing in the area might be critically affected.

Status Whether the impact on the overall environment will be positive (environment overall will benefit from the impact), negative (environment overall will be adversely affected by the impact), or neutral (environment overall will not be affected).

Confidence The degree of confidence in predictions based on available information and specialist knowledge.

The discussion in the EIA leading up to the assessment/rating of the impact and the baseline environmental conditions are measured up to the potential impact and the quantitative and qualitative analysis are evaluated (of a specific activity resulting in an impact) during the construction, operational and closure phase. In the discussion, the impact is categorized as a direct, indirect, or cumulative impact and scientific and professional judgment is applied

to rate the significance of the impact. The ratings are also influenced by the presence or absence of mitigation measures and once the discussion is concluded, the ratings are displayed in a table format.

TABLE 5: EXAMPLE OF THE IMPACT RATING

	CONSTRUCTION	WEIGHT	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Site Specific	1	Site Specific	1	Site Specific	1	Site Specific	1
Duration	Short Term	1	Medium Term	2	Short Term	1	Short Term	1
Intensity	Medium-High	5	High	6	Medium-High	5	Medium	4
Probability	Likely	3	Definite	4	Likely	3	Probable	2
Cumulative Impact	Very Low		Low		Very Low		None	
Status	Negative		Negative		Negative		Negative	
Confidence	High		High		High		High	
Significance	Low	21	Moderate	36	Low	21	Very Low	12

In the table, the cumulative impact is presented as surrounding activities (not necessarily agriculture) which can add to the direct or indirect impacts experienced by receptors. Through the scoring system, the weight of the impact is determined and then the impact is categorized.

Should the impact assessment as a minimum reflect 2-3 impacts of high significance and 2-3 impacts of moderate significance, the project shall be viewed as potentially flawed and continuation of the project should be seriously reconsidered or special engineering or biophysical/social intervention must be implemented.

The definition of indigenous vegetation is defined in the NEMA Regulations as: “vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding 10 years.” Considering that vegetation and soil of the area under application have not been disturbed, through ploughing or clearing for more than 10 years, the current state of the vegetation is therefore regarded as ‘indigenous vegetation’. This application will also require an application with the Department of Agriculture for cultivating virgin soil or more commonly known as a ploughing certificate.

STAGES OF CONSULTATION WITH DEPARTMENT OF AGRICULTURE, ENVIRONMENTAL AFFAIRS, RURAL DEVELOPMENT AND LAND REFORM

TABLE 6: STAGES OF CONSULTATION WITH THE DEPARTMENT OF AGRICULTURE, ENVIRONMENTAL AFFAIRS, RURAL DEVELOPMENT AND LAND REFORM

DATE	SUBMISSION/CONSULTATION
August 2021	Initiate specialist studies to identify environmentally sensitive areas.
August -September 2021	Submit Environmental Authorisation Application and compile Scoping Report and submit for public review to registered IAPs for 30 day period.
October 2021	Submit Final Scoping Report to DAEARDLR.
November - December 2021	Compile EIA and EMP and submit for public review to registered IAPs for 30 day period.
January-February 2022	Submit Final EIA and EMP to DAEARDLR.
As per regulations (107 days from, receipt of EIA)	Authority Decision-making period.
As per regulations (5 days from ROD)	Authority to notify the Applicant of the decision or the appeal of the decision from the Applicant, if necessary.
As per regulations (14 days from ROD notification)	Registered IAPs to be notified of the authority's decision and right to appeal.

PUBLIC PARTICIPATION PROCESS DURING THE EIA

As per NEMA Regulations, there is a specific public participation protocol that must be followed:

- A written notice either via email or register post will be given to:
 - the occupiers of the site, if the applicant is not the owner or person in control of the site;
 - the adjacent owners, occupiers or persons in control of such land;
 - the municipal councilor;
 - the applicable Municipality (Local & District);
 - any organ of state that has jurisdiction in respect of any aspect of the activity, including the Department of Agriculture, Environmental Affairs, Rural Development and Land Reform; and
 - any other party as required by the competent authority.
 - all those who registered during the Scoping Phase public participation period as a result of the newspaper advertisement or notice board.

By definition, according to NEMA Regulations, as amended in April 2017, a 'registered interested and affected party', in relation to an application, means an interested and affected party whose name is recorded in the register opened for that application in terms of Regulation 42.

In order for an IAPs name to be placed on a register (and thus become a registered IAP) and according to Regulation 42, it is any person who has submitted written comments or attended public meetings held by the applicant or EAP; or any person requesting, in writing, that their name be placed on the register as a result of the public participation process being conducted in specific timeframes by the EAP.

According to Section 43 (1), a registered IAP is entitled to comment, in writing, on all reports or plans submitted, provided that the IAP discloses any direct business, financial, personal, or other interest(s) which that party may have in the approval or refusal of the application.

Thus, once a person has registered as an IAP, he/she is obligated to disclose his/her matter of interest in the application and as part of the public participation process and will be requested to complete an undertaking under oath, disclosing their interest.

Furthermore, the EAP must submit an undertaking under oath or affirmation that there is a level of agreement between the EAP and the registered IAP on the Plan of Study for undertaking the environmental impact assessment. If no comment is received on the Plan of Study it would therefore be presumed that the IAP does not have any objection and that a level of agreement has been reached.

If Digital Soils Africa (the EAP) receives a comment on the Scoping Report and Plan of Study or receives requests to be placed on the register, then only those parties will be considered registered IAPs for the application process going forward. However, no comment or written request was received from registered IAPs during this 30 day consultation period, thus the public participation process is concluded for the Scoping Phase. Most correspondence will be via email (digital) and only where necessary will hard copies be forwarded, due to the Covid pandemic to reduce the possible chance of spreading infection.

The results of the specialist studies will be integrated into the EIA and EMP and the EIA and EMP will be released to the registered IAPs for a 30 day period to review the document and comment. Registered IAPs will be notified via email, telephonically, or registered post, where the EIA and EMP will be available and the timeframes constraint on such a review period.

No public meetings are proposed to be held during this period since it is a rural area with a sparse population. If necessary, one-on-one meetings will take place with registered IAPs upon request and would most likely be virtual, considering the Covid pandemic. Comments raised by registered IAPs and responses given to the EAP will be captured in a Public Participation Report and will be included in the Final EIA and EMP.

TASKS TO BE UNDERTAKEN FOR THE EIA

1. Topographical assessment –

- A desktop assessment of available literature to identify and describe the general topography of the area under application;
- Conduct field investigation and assess the site-specific topography and site layout and identify potential constraints imposed on the proposed development plan;
- Assess the slope of the study area and the surroundings and determine the risk of erosion and leaching of Na.
- Identify and assess project related impact as per the prescribed methodology; and
- Outline mitigation measures for the management of potential impacts.

2. Soil assessment –

- A specialist will be appointed to conduct the assessment, which should include:
 - A desktop assessment of available literature to identify and describe the soil classification of the affected area;
 - Through soil field investigation.
 - Assess onsite soil properties and characteristics and identify potential constraints imposed on the proposed development of crops.
 - Assess the potential impact in relation to the soil features, as per the prescribed methodology; and
 - Recommend mitigation measures for the management of potential impacts.

3. Land capacity assessment –

- A desktop assessment of available literature and aerial special data will identify the land use/capacity area under application;
- Conduct field investigation and assess the site-specific land use;
- Determine the current economic viability of land parcel vs the proposed agricultural development;
- Identify potential constraints imposed on the proposed development;
- Identify and assess project-related impacts as per the prescribed methodology; and
- Outline mitigation measures for the management of potential impacts.

4. The vegetation assessment –

- A specialist will be appointed to conduct the assessment, which should included:
 - A desktop assessment of available literature to identify and describe the status of the vegetation and ecological/conservational value of the vegetation type;

- Through the desktop assessment, determine whether the study area falls entirely or partially within a biodiversity area;
- Conduct field investigation and identification of vegetation found on-site and their relevant ecological status (Least Threatened, Vulnerable, Endangered, Critically Endangered, and Protected);
- Conduct a floral survey, assess red data list, and assess vegetation maps;
- Identify and determine alien species present and their distribution within the study area, and
- Recommend mitigation measures for the management of potential impacts.

5. The faunal assessment –

- A desktop assessment of available literature to identify and determine whether the study area falls entirely or partially within the distribution range of species listed as Vulnerable, Endangered, Critically Endangered or Protected;
- Conduct field investigation to identify potentially important or unique faunal habitat on-site;
- Discuss faunal presence with landowners/abutting landowners where necessary;
- Determine activities that could impact the fauna;
- Determine the effectiveness of general remedial measures to prevent activities to impact fauna;
- Determine faunal corridors in the study area and the significance of the corridors;
- Identify and assess project related impact as per the prescribed methodology; and
- Outline mitigation measures for the management of potential impacts.

6. The sensitive site assessment –

- A desktop assessment of available literature and aerial special data will identify the ecological sensitivity of the area under application;
- Conduct field investigation and assess the ecological status of the land;
- Compare field investigation findings with desktop assessment and determine the current ecological viability of the area;
- Identify potential constraints imposed on the proposed development;
- Identify and assess project-related impacts as per the prescribed methodology; and
- Outline mitigation measures for the management of potential impacts.

7. Surface & Ground Water assessment –

- A desktop assessment of available literature will identify the catchment area and impacts and constraints on the catchment area;
- Identify if an application to the Department of Water and Sanitation must be made;
- Assess possible sensitivity of surface resources;
- Determine Na leaching, sediments, and hydro-carbon generating activities and the likelihood of spills to reach surface water and or groundwater;

- Identify and assess project related impact as per the prescribed methodology; and
- Outline mitigation measures for the management of potential impacts.

8. Air quality assessment –

- A desktop assessment of available literature to identify and describe the general wind directions, strengths, frequencies, and land uses that can influence the air quality of the surrounding area;
- Determine the population density (number of people to be affected);
- Determine the potential dust generating capacity of various activities that will take place or be used on-site;
- Determine the distances to receptors and how distances from the study area will influence ambient dust levels at receptor areas.
- By doing a site visit, determine how possible topographical and vegetation screens will reduce dust dispersion to receptor areas.
- Identify and assess project related impact as per the prescribed methodology; and
- Outline mitigation measures for the management of potential impacts.

9. Noise impact assessment –

- Determine the population density (number of people to be affected);
- Estimate the noise levels of various pieces of equipment/vehicles that will be used on-site;
- Determine the distances to receptors;
- Determine how distances from the study area will influence ambient noise levels at receptor areas;
- Determine how possible topographical and vegetation screens will reduce the propagation of noise waves and ultimately noise levels at receptor areas;
- Determine activities that could result in instant and severe spikes in noise levels;
- Identify and assess project-related impacts as per the prescribed methodology; and
- Outline mitigation measures for the management of potential impacts.

10. Waste management assessment –

- Determine the number of people on-site and type/number of ablution facilities and waste receptacles required at the site;
- Determine possibility of spills and impact that standard mitigation measures will have;
- Determine hydrocarbon disposal strategy required to result in limited to zero impact.
- Determine the number of vehicles to be used on-site;
- Determine the distance to water resources and soils with high agricultural potential;
- Identify and assess project related impact as per the prescribed methodology; and
- Outline mitigation measures for the management of potential impacts.

11. Visual impact assessment –

- Through a site visit, the following will be determined:
 - Vegetation and topography screens between the study area and receptor areas;
 - The slope and elevation of the affected area in relation to the receptor areas;
 - The distance to receptor areas and sensitivity of receptor areas.
- Assess the influence of remedial action of phase development on the impact in the absence of any natural visual mitigation factors;
- Determine the possibility of dust liberated into higher air columns and its visibility from receptor areas;
- Assess the implementation of dust suppression measures on the impact of dust generation;
- Identify and assess project related impact as per the prescribed methodology; and
- Outline mitigation measures for the management of potential impacts.

12. Traffic impact assessment –

- Through site investigation the width and alignment of the road and the line of sight along the road as well as critical areas will be determined;
- Determine locality of haul roads in relation to distance from receptor areas;
- Assess the possible impact on the wearing course and restrict to a minimum through consultation with the District Roads Engineer for his opinion in terms of structural integrity and traffic flow/road safety;
- Determine the production capacity and the hauling density in order to determine the traffic count and the possible impact on traffic volume;
- Identify and assess project related impact as per the prescribed methodology; and
- Outline mitigation measures for the management of potential impacts.

13. Socio-Economic impact assessment –

- Determine the value of grazing practices on natural veldt versus crop production;
- Through consultation with the applicant, determine:
 - Whether the development will permanently host employees on-site;
 - the possibility of the theft of stock/wildlife and trespassing;
 - the possibility of fires and the impact of farming in relation to the locality of receptors;
 - the number of jobs created in relation to the available labour pool and the unemployment rates;
 - the possibility of breaching the safety requirements of abutting residences;
- Identify and assess project related impact as per the prescribed methodology; and
- Outline mitigation measures for the management of potential impacts.

14. Archaeological and Palaeontology assessment –

- A specialist will be appointed to conduct the assessment which should include:
 - A desktop assessment in order to determine the type and location of artefacts that may be present within the study area
 - Survey the area on foot and record the findings

- Compile a report and recommendations which must indicate if further Phases 2 or 3 investigations must follow.
- Identify and assess project-related impacts as per the prescribed methodology; and
- Outline mitigation measures for the management of potential impacts.

POSSIBLE MITIGATION MEASURES

Possible mitigation measures to avoid, reverse, mitigate or manage identified impacts were listed under the heading 'Receiving Environment'. During the EIA and EMP phase, the extent of the residual risks that need to be managed and monitored will be identified.

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<https://www.experiencenortherncape.com/visitor/experiences/flora#:~:text=There%20are%20an%20estimated%205,Fynbos%20Biome%20and%20Desert%20Biome>. 29/07/2021, 15:16

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UNDERTAKING OF EAP

The EAP herewith confirms

- a) the correctness of the information provided in the reports;
- b) the inclusion of comments and inputs from stakeholders and I&AP's;
- c) the inclusion of inputs and recommendations from the specialist reports where relevant; and
- d) that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein.



Signature of the environmental assessment practitioner(s)

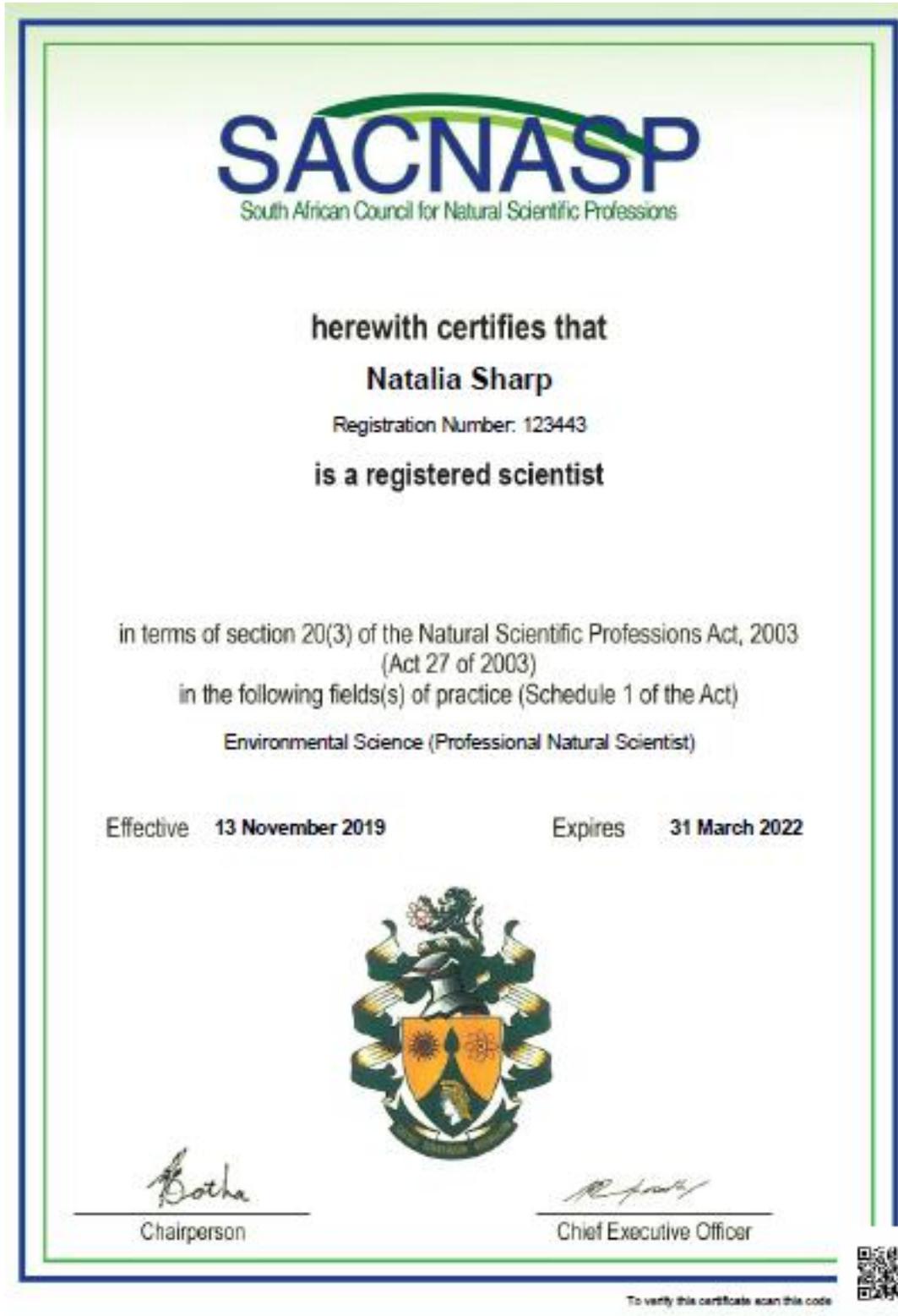
Digital Soils Africa (Pty) Ltd

Name of the company

28 September 2021

Date

APPENDIX A – EAP QUALIFICATION



EAPASA

Unit 19 Oxford Office Park
3 Bauhinia Street
Highveld Techno Park
Centurion
0157
Tel. (+27) 12 880 2154

Environmental Assessment Practitioners Association of South Africa

Advancing environmental assessment practice in South Africa



Email: registrar@eapasa.org / Website: www.eapasa.org

Mrs Natalia Sharp
9 Peter Graham Ave
Glen Hurd
Port Elizabeth
6045

Sent by email to: natsharp@icloud.com

Dear Mrs Sharp

**Registered Environmental Assessment Practitioner: Number 2020/230
Natalia Sharp : South African ID 7908120007080**

The Environmental Assessment Practitioners Association of South Africa (EAPASA) herewith certifies that Natalia Sharp is a Registered Environmental Assessment Practitioner (EAP) in accordance with the prescribed criteria of Regulation 15.(1) of the Section 24H Registration Authority Regulations (Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).

Your registration is duly authorised by EAPASA as the single Registration Authority for EAPs in South Africa (appointed as per Regulation No. 104, Gazette No. 41434 of 8 February 2018, in terms of section 24H(3)(a) of the NEMA). Your status as a Registered EAP is displayed in the 'EAP Register' - please find your name and contact email address at

<https://registration.eapasa.org/registered-practitioners>

Your registration is effective for a period of five years from 07 February 2020, and expires on 07 February 2025. The renewal of your registration in 2025 will be contingent on you having met the requirements of EAPASA's Continuing Professional Development (CPD) policy during each year of registration.

As a Registered EAP you are required to uphold the EAPASA Code of Ethical Conduct and Practice in your professional endeavours, towards the goal of quality assurance in environmental assessment practice.

Please accept my congratulations on your registration.

Best regards



Dr Richard Hill
Registrar
Date: 07 February 2020

Board Members: Ms Snowy Makhudu (Chairperson), Mr Khangwelo Desmond Musetsho (Vice-Chairperson),
Mr Ntsako Baloyi, Mr Zama Dlamini, Mr Siyabonga Gqalangle, Ms Jacqui Hex, Ms Sibusisiwe Hlela,
Mr Malcolm Moses, Mr Phumudzo Nethwadi, Mr Danie Neumann, Ms Keshni Rughoobeer.
Registrar: Dr Richard Hill
NPO Reg. No. 122-986

DIE UNIVERSITEIT
VAN DIE ORANJE-
VRYSTAAT



THE UNIVERSITY
OF THE ORANGE
FREE STATE

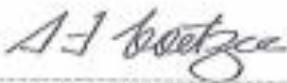
HIERMEET WORD VERKLAAR DAT DIE GRAAD THIS IS TO CERTIFY THAT THE DEGREE

Baccalaureus Scientiae
Bachelor of Science

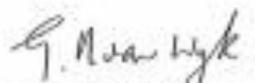
TOEGEKEN IS AAN
HAS BEEN CONFERRED UPON

NATALIA POTGIETER

NADAT AAN DIE STATUTE EN REGULASIES VAN DIE UNIVERSITEIT VOLDOEN IS, AS BEWYS DAARVAN PLAAS ONS ONS ONDERSEIE HANDTERKENINGE EN DIE SEEL VAN DIE UNIVERSITEIT HIERONDER. IN ACCORDANCE WITH THE STATUTES AND REGULATIONS OF THE UNIVERSITY, AS WITNESS OUR RESPECTIVE SIGNATURES AND THE SEAL OF THE UNIVERSITY BELOW.



VICE-CHANCELLOR



DEAN



BLOEMFONTEIN
2001-01-16
190002914



REGISTRAR

It is hereby certified that the above-named person has been admitted to the degree of Baccalaureus Scientiae (Bachelor of Science) in the Faculty of Science, University of the Orange Free State, Bloemfontein, on the 12/6/2019.

Date: 12/6/2019

Dean: 

Registrar: 

Faculty of Science - P.O. Box 339, Bloemfontein 9400

UNIVERSITEIT
VAN DIE
VRYSTAAT



UNIVERSITY
OF THE
FREE STATE

HIERMEE WORD VERKLAAR DAT DIE GRAAD THIS IS TO CERTIFY THAT THE DEGREE

Honneursbaccalaureus Scientiae

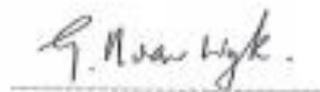
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HAS BEEN CONFERRED UPON

NATALIA POTGIETER

NADAT AAN DIE STATUTE EN REGULASIES VAN DIE UNIVERSITEIT VOLDOEN IS, AS BEWYS DAARVAN PLAAS ONS ONS ONDERSEKE HANDTEKENINGE EN DIE SEEL VAN DIE UNIVERSITEIT HIERONDER. IN ACCORDANCE WITH THE STATUTES AND REGULATIONS OF THE UNIVERSITY, AS WITNESS OUR RESPECTIVE SIGNATURES AND THE SEAL OF THE UNIVERSITY BELOW.


VIRKANSKELER/VICE-CHANCELLOR


DEKANEAN



REGISTRASIE
2003-06-28
199803114


REGISTRAR/REGISTRAR


Date: 10/4/2019
Deel van die Fees - R 1,000 (South African Rand) (R 1,000)

UNIVERSITEIT
VAN DIE
VRYSTAAT



UNIVERSITY
OF THE
FREE STATE

HIERMEE WORD VERKLAAR DAT DIE THIS IS TO CERTIFY THAT THE

Magister in Omgewingsbestuur
Magister in Environmental Management

TOEGEKEN IS AAN
HAS BEEN CONFERRED UPON

NATALIA POTGIETER

NADAT AAN DIE STATUTE EN REGULASIES VAN
DIE UNIVERSITEIT VOLDOEN IS, AS BEWYS
DAARVAN PLAAS ONS ONS ONDERSKEIE
HANDTEKENINGE EN DIE SEËL VAN DIE
UNIVERSITEIT HIERONDER.

IN ACCORDANCE WITH THE STATUTES AND
REGULATIONS OF THE UNIVERSITY, AS
WITNESS OUR RESPECTIVE SIGNA-
TURES AND THE SEAL OF THE
UNIVERSITY BELOW.


VICE-CHANCELLOR


DEKANUS


REGISTRAR

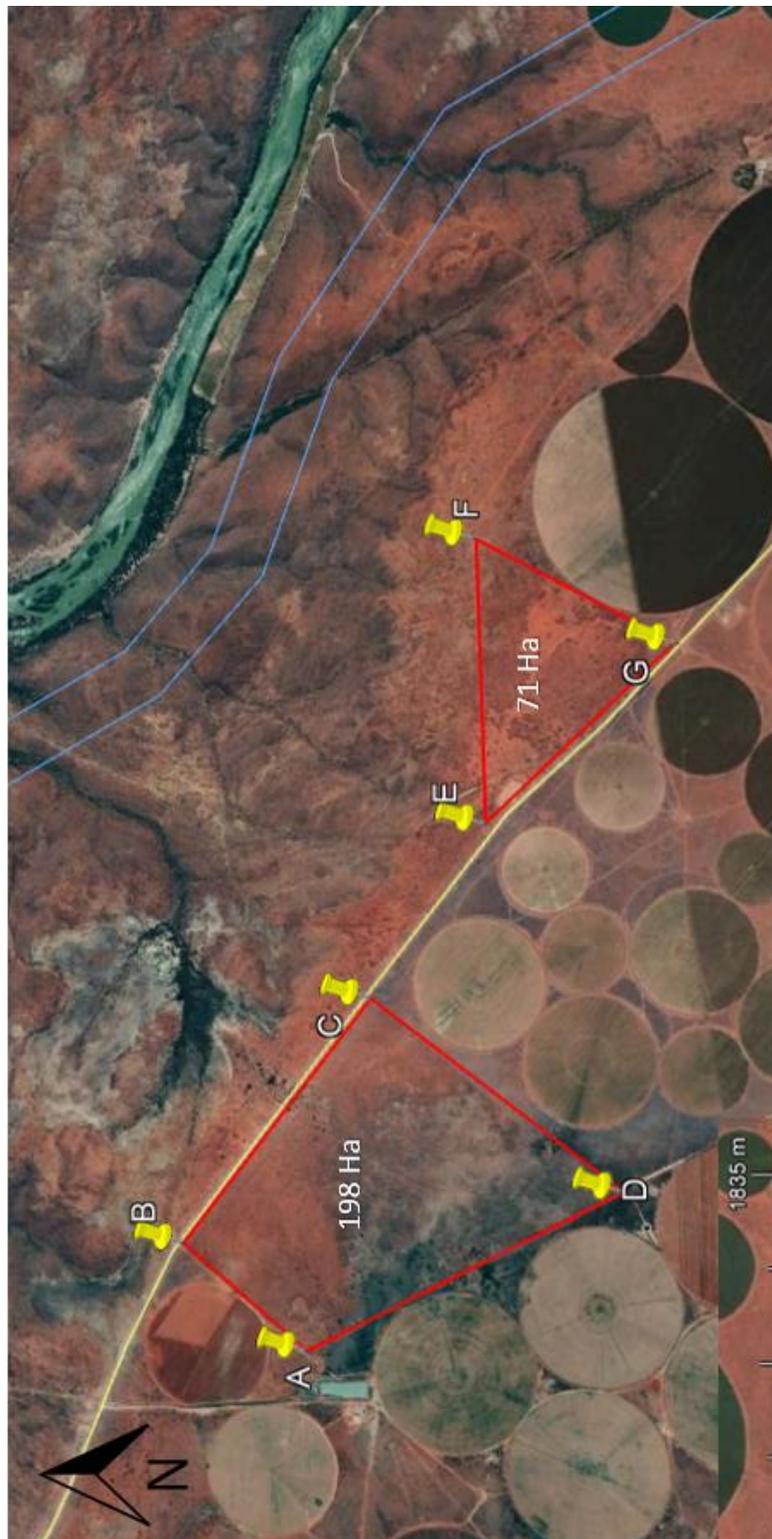


BLOKKEERTSEIN
DIE 06/21
1904-2004

12/4/2019

Handwritten signature: M

APPENDIX B – SITE PLAN



Coordinates of the site

	Site A
A	29° 30' 28.13"S 23° 56' 9.65"E
B	29° 30' 7.73"S 23° 56' 30.13"E
C	29° 30' 40.38"S 23° 57' 16.54"E
D	29° 31' 20.77"S 23° 56' 39.93"E
	Site B
E	29° 31' 0.18"S 23° 57' 48.92"E
F	29° 31' 59.66"S 23° 58' 42.51"E
G	29° 31' 31.84"S 23° 58' 21.44"E

Site A: 198 Ha

Site B: 71 Ha

APPENDIX C – PUBLIC PARTICIPATION

Two Notice Boards were erected along the proposed boundary next to the R3112, on 27 August 2021 in accordance to NEMA Regulations. Below is an aerial photo indicating the location of placing the boards. The red polygon represents the study area under application, while the blue drop pins represent the location of the boards.

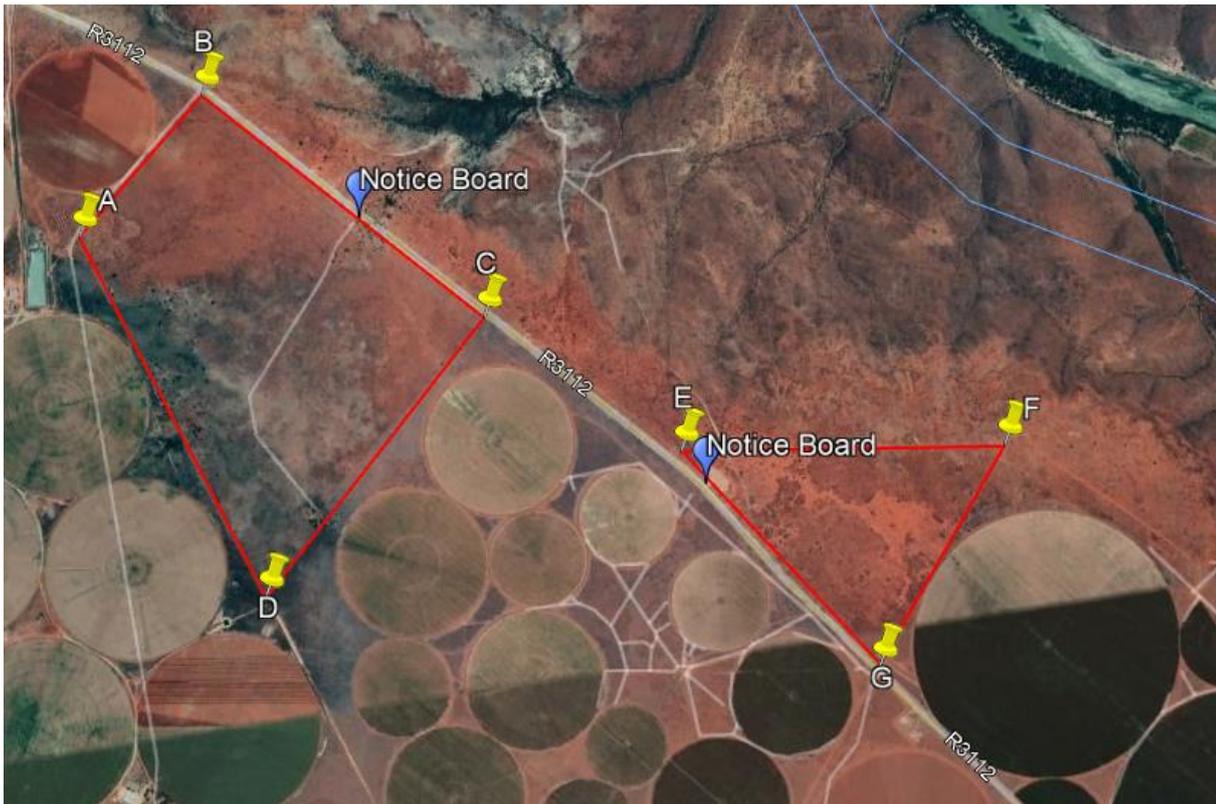


FIGURE 30: THE RED POLYGON REPRESENTS THE STUDY AREA UNDER APPLICATION, WHILE THE BLUE DROP PINS REPRESENT THE LOCATION OF THE TWO NOTICE BOARDS.

Response for potential I&AP's was requested to be submitted by 27 September 2021 and those who registered / commented will be recorded in the I&AP registry.



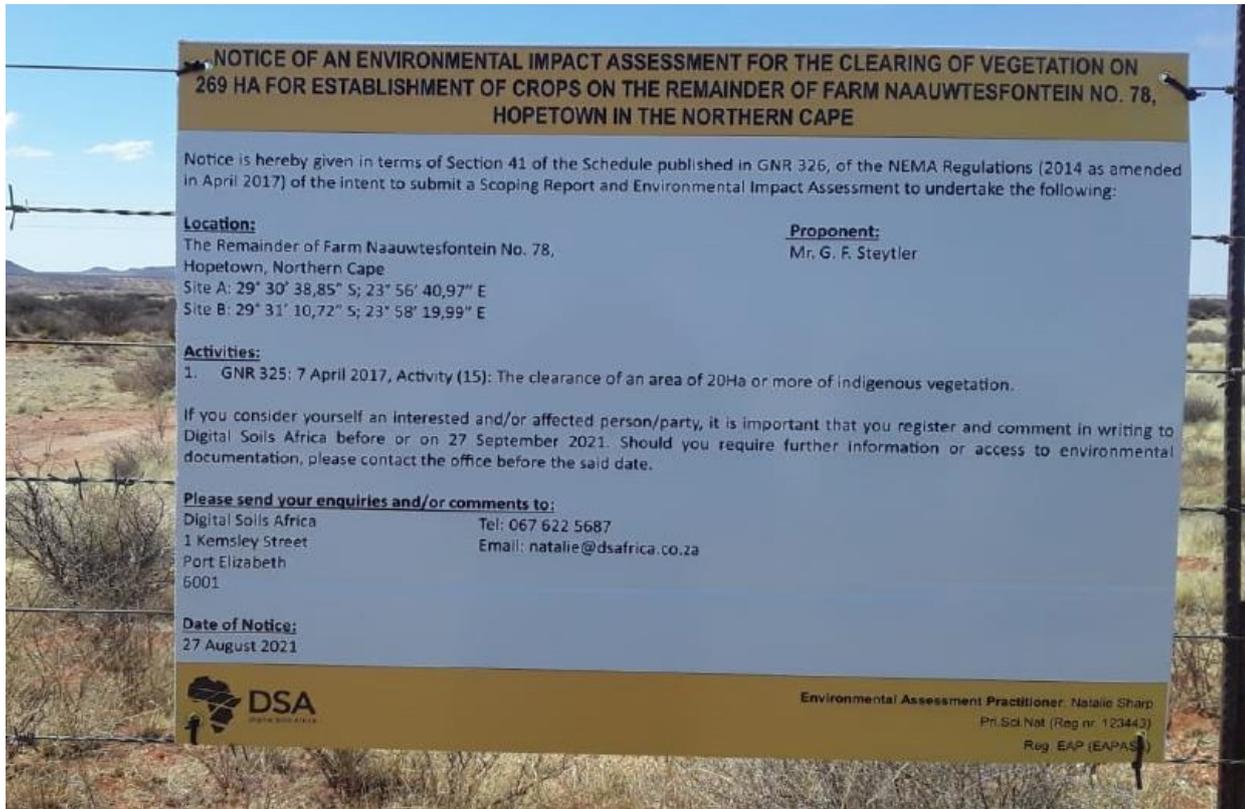


FIGURE 31: NOTICE BOARD THAT WAS PLACED ABUTTING THE SITE ALONG THE R3112 AT SITE A AND SITE B.

Public Participation advert placement in the Diamond Fields Advertiser (DFA) Newspaper in accordance with the NEMA Regulations, on 27 August 2021, time to register is given until 27 September 2021.

Proof of Full Scoping Report couriered to Department of Agriculture, Environmental Affairs, Rural Development, and Land Reform:

Styler

CONSIGNOR
SHIPMENT NUMBER
3885314

3885314JKJ

HEAD OFFICE
P.O. Box 19, 6017
LEIGH / 1021 874-3216
ALL - R/S/ 1011 874-3215
Fax: (011) 874-3215
Reg. No. 201572652487
WT Reg. No. 4120191307

J&J EXPRESS
THE COURIER COMPANY

FROM: CONSIGNOR
COMPANY NAME: Digital Soils Africa
ADDRESS: 1 Kemsley Street Port Elizabeth

TO: CONSIGNEE
COMPANY NAME: Department of Agriculture, Environmental Affairs
Rural Development & Land Reform
STREET ADDRESS: 90 King Street, Soko Building
Kimberly 8300

PLEASE USE A BALLPOINT PEN AND PRESS HARD

ACCOUNT No: **P19 003**

CONTACT: Gail Keimela (053) 807 7300 / 462

BIUS TEL: HOME TEL:

QUANTITY	DESCRIPTION OF CONTENTS	MASS	VOL.	INSURANCE	CHARGES
1	Draft Scoping Report	1	40 x 30 x 1	YES <input type="checkbox"/>	FREIGHT
			X X	NO <input type="checkbox"/>	AFTER HOURS SAT COLLECTION DELIVERY
			X X	VALUE	OUTLYING AREA
				R	DAWN DELIVERY
					FUEL SURCHARGE
					INSURANCE
					NON-DOC HANDLING FEE
					DOC SURCHARGE
					TOLL FEES
					SUB TOTAL
					V.A.T.
					TOTAL

Signature: *[Signature]* DATE: 27/8/21

Signature: *[Signature]* DATE: 27/8/21

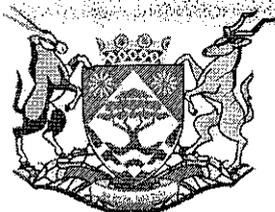
RECEIVED IN GOOD ORDER BY CONSIGNEE

RECEIVED BY JKJ EXPRESS

I AGREE TO BE BOUND BY THE STANDARD CONDITIONS OF CARRIAGE OVERLEAF

Sender's Reference: **NK/ETA/12/PA/1/THE/HOP/2021**

Acknowledge of Draft Scoping Report received for public participation review from the Department of Agriculture, Environmental Affairs, Rural Development, and Land Reform:



agriculture, environmental affairs,
rural development and land reform

Department:
agriculture, environmental affairs,
rural development and land reform
NORTHERN CAPE PROVINCE
REPUBLIC OF SOUTH AFRICA

SASKO Building
90 Long Street
Private Bag X6102
Kimberley
8300

Tel. 053-8077300
Fax: 053-8077328

Enquiries
Dipatlisiso
Imibuzo
Navrae

I Gwija

Date
Leshupelo
Umhla
Datum

08th September 2021

Reference
Tshupelo
Isalathiso
Verwysing

NC/EIA/12/PIXTHE/HOP1/2021

Ms. Natalie Sharp
DIGITAL SOILS AFRICA (PTY) LTD
1 Kemsley Street
PORT ELIZABETH
6001

Email: natalie@dsafrica.co.za

Dear Sir/Madam

APPLICATION FOR ENVIRONMENTAL AUTHORISATION: CLEARING OF VEGETATION FOR THE ESTABLISHMENT OF CROP FARMING ON THE REMAINDER OF FARM NAAUWTESFONTEIN NO 78 IN HOPETOWN: THEMBELIHLE LOCAL MUNICIPALITY, PIXLEY KA SEME DISTRICT MUNICIPALITY.

The Department confirms having received the **draft scoping report** for the abovementioned project on the 31st August 2021 as required in terms of the Environmental Impact Assessment Regulations, 2014 as amended.

The reference number for this project is: NC/EIA/12/PIX/THE/HOP1/2021. Kindly quote this reference number in any future correspondence in respect of the application.

Please draw the applicant's attention to the fact that the activity may not commence prior to an environmental authorization being granted by the Department.

Kindly note the responsible officer for this project is **Mr. I Gwija** and can be contacted at this numbers, Cell: **060 9898 441** or **053 631 0601**.

APPLICATION FOR ENVIRONMENTAL AUTHORIZATION OF FARM NAAUWTESFONTEIN NO 78 IN HOPETOWN: THEMBELIHLE LOCAL MUNICIPALITY, PIXLEY KA SEME DISTRICT MUNICIPALITY.

Regards

G. Letimela

Senior Administration Clerk

The reference number for this project is: NC/EIA/12/PIX/THE/HOP1/2021

Example of consultation letter sent to DWS and Department of Agriculture during the Scoping Phase

2021-08-27

Department of Water and Sanitation
Private Bag X5912
Upington
8800
Attention: Mr. Byron Fortuin

Byron Fortuin

ENVIRONMENTAL IMPACT APPLICATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998, FOR THE CLEARING OF VEGETATION ON THE REMAINDER OF FARM NAAUWTESFONTEIN NO. 78, HOPETOWN. APPLICANT: MR. G.F. STEYTLER. Scoping Public Participation Phase.

Mr. Steytler appointed Digital Soils Africa (Pty) Ltd (DSA) to conduct the necessary environmental impact assessment and public participation for the above-mentioned project.

In terms of Section 41 of NEMA Regulations, you have been identified as an Interested and Affected Party and are invited to participate in the public participation. All written comments will be responded to and forwarded to the relevant departments, in the form of a Public Participation Report.

This communication, therefore, serves to inform you of the intention of Mr. Steytler to clear vegetation to the extent of 177Ha Ha to establish crops. You have been identified as an interested and affected party (I&AP) in the project and the purpose of this letter is therefore to:

- Inform you of the locality of the proposed site.
- Allow you to raise any informed comments you might have in respect of the proposed development.
- Incorporate any written comments in the Interested & Affected Parties' Register and Scoping Report to be submitted to the Department of Agriculture, Environmental Affairs, Rural Development and Land Reform in terms of Regulation 19 published in GNR 326 on 7 April 2017 under NEMA 107 of 1998.

This consultation process is important as it raises your awareness as to the nature of the proposed development and grants you the opportunity to raise any comments/observations/concerns you might have thereon and submit such in writing. Should any observation/concern be identified as a definite and significant environmental/social impact, the relevant matter will be further investigated, assessed and where necessary, mitigation measures will be developed and captured in the Final Scoping Report to satisfactorily address any identified impact.

To ensure that your detailed written comments are captured in the I&AP Register and submitted to all applicable Regulating Authorities as an integral part of the environmental assessment process, your response is required in writing **not later than 27 September 2021** until 5pm. This is done in accordance with GNR 326, chapter 2, Regulation 3, of the Environmental Impact Assessment Regulations (2014), as amended on 7 April 2017, of the National Environmental Management Act of 1998. Below is the link to the Scoping Report for your attention.

Where we are in the process

- A Draft Scoping Report has been submitted for Public Participation to other Departments, the Municipality (Local and District), ward councilor, and I&AP's (general public).

Way Forward

1. The outcome of this consultation process will be submitted to the Department of Agriculture, Environmental Affairs, Rural Development and Land Reform as part of the Final Scoping Report.
2. On completion of the Scoping process, the EIA process will commence.
3. The Draft EIA & EMP document will be submitted for public review and the outcome of that consultation process will be submitted to the said Department as part of the final EIA & EMP.
4. If the said Departments decision-making process results in approval of the clearance of vegetation an Environmental Authorization will be issued and the EMP approved. All registered Interested & Affected Parties will be notified of the issue of the Environmental Authorization.
5. The approved activities would then proceed and be conducted in accordance with the approved EMP.
6. Environmental audits should be conducted and submitted to the said Department for evaluation and any appropriate decision-making.

Due to the **Covid pandemic** and in an attempt to lower the risk of infection, the Draft Scoping Report will not be forwarded as a hard copy. Instead, the document will be made available on the DSA website, www.dsafrica.co.za. Please follow the link to Services, Environmental Services, Documents, and choose the Steytler link. To access the loaded documents use the password: SteY@gf78. Alternatively, you may request that the document be sent via 'We Transfer' app, in such a case, please provide the email address.

Yours sincerely



Natalie Sharp
Pri.Sci.Nat (Reg nr. 123443)
Reg. EAP (EAPASA)

Background Information document sent to all I&AP's as identified during the Scoping Phase.

2021-08-27

Dear Interested and Affected Party

ENVIRONMENTAL IMPACT APPLICATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998, FOR THE CLEARING OF VEGETATION ON THE REMAINDER OF FARM NAAUWTESFONTAIN NO. 78, HOPETOWN. APPLICANT: MR. G.F. STEYTLER. [Scoping Public Participation Phase.](#)

Mr. Steytler appointed Digital Soils Africa (Pty) Ltd (DSA) to conduct the necessary environmental impact assessment and public participation for the above-mentioned project.

In terms of Section 41 of NEMA Regulations, you have been identified as an Interested and Affected Party and are invited to participate in the public participation. All written comments will be responded to and forwarded to the relevant departments, in the form of a Public Participation Report.

The purpose of this letter and attached document is therefore to:

- Inform you of the locality of the proposed environmental authorization application.
- Allow you the opportunity to raise concerns or comments in respect of the proposed project detailed in the attached Background Information Document.

Public Participation Process

The purpose of the Background Information Document is to provide you with *basic information* regarding the proposed project and does not replace the Scoping Report or EIA. You are provided the opportunity to register as interested and affected parties and grant you the opportunity to raise any comments you might have on the proposed project.

If you would like to participate in the process, please register as an interested and affected party (I&AP), in writing. Comments/registration must be received **on or before 27 September 2021** before 5pm. If no comments are received from you, it will then be regarded that you do not have any comments.

Way Forward

- The outcome of this consultation process will be submitted to the Department of Agriculture, Environmental Affairs, Rural Development and Land Reform as part of the Final Scoping Report.
- On completion of the Scoping process, the EIA process will commence.
- The Draft EIA & EMP document and required specialist reports will be subjected to review by all registered I&AP's and relative governmental departments, following the time frames as stipulated in Section 3 (1) & (8) of the NEMA regulations (30 days) as part of the **[EIA Public Participation Phase.](#)**

- The outcome of the EIA Phase consultation process will be submitted to the Department of Agriculture, Environmental Affairs, Rural Development and Land Reform as part of the final EIA& EMP.
- Please note that due to the **Covid pandemic** and in an attempt to lower the risk of infection, the Draft Scoping Report will not be placed in a public place as a hard copy. Instead, the documents will be made available on the DSA website, www.dsafrica.co.za. Please follow the link to Services, Environmental Services, Documents, and choose the Steytler link. To access the loaded document use the password: SteY@gf78.
- All required documents will be submitted to the relevant department for decision-making.
- If the application is accepted, the relevant department will either issue or reject the Environmental Authorisation.
- As an I&AP's, you will be notified of the final decision of the relevant departments.

Yours sincerely



Natalie Sharp
Pri.Sci.Nat (Reg nr. 123443)
Reg. EAP (EAPASA)



BACKGROUND INFORMATION
REGARDING CLEARING OF
VEGETATION ON THE
REMAINDER OF FARM
NAAUWTESFONTEIN NO. 78,
HOPETOWN

MR. G.F. STEYTLER

AUGUST 2021



DSA
Digital Soils Africa

 +27 82 414 0472

 www.dsafrica.co.za

 natalie@dsafrica.co.za

 1 Kemsley Street

Port Elizabeth

Directors:

Prof Pieter le Roux

Dr George van Zijl

Dr Darren Bouwer

Dr Johan van Tol

PURPOSE OF THIS DOCUMENT

The purpose of this document is to provide all I&AP's with information about the intent of Mr. Steytler to apply for 269 Ha but clear about 177 Ha of vegetation on this area to establish pivot areas for crop production on the Remainder of farm Naauwtesfontein No. 78, Hopetown in the Northern Cape Province.

As an identified I&AP, you are invited to register and comment on any aspect related to the proposed development between the 27th of August 2021 and 27th of September 2021.

BRIEF PROJECT DESCRIPTION

The site is situated north-west from Hopetown in the Northern Cape (**Site A:** 29° 30' 38.85"S; 23° 56' 40.97"E and **Site B:** 29° 31' 10.72"S; 23° 58' 19.99"E) on the Remainder of Farm Naauwtesfontein No. 78, within the Thembelihle Local Municipal area. The farm can be reached by traveling along the R3112 (old Douglas road) north-west from Hopetown for about 16km until the farm road of Site A is reached.



Figure 1: Site location is indicated as the red polygons along the R3112 (old Douglas road). The site further north is Site A and the site further south is Site B.

The property involves, belongs to Mr. Jennings who has a lease agreement with the Applicant (Mr. Steytler). Digital Soils Africa (Pty) Ltd. (DSA) was tasked by Mr. Steytler to conduct environmental investigations and complete the environmental application for the clearing of natural veld used for grazing purposes and to apply for the cultivating of virgin soil (known as ploughing certificate), to establish crops.

NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT NO. 107 OF 1998) AS AMENDED

Environmental Assessment

DSA was appointed by Mr. Steytler as the independent environmental assessment practitioner (EAP) to undertake the Environmental Application and apply for GNR 325 listed activities and the submission of a Scoping Report and Environmental Impact Assessment.

According to the latest Government Notice No. 324; 325 & 327, the following Listed Activities were triggered:

<i>GNR 325 (15) – Clearing of vegetation of 20 Ha or more of indigenous vegetation.</i>	<i>The site is 269 Ha in size, but only the pivot areas will be cleared from vegetation to establish crops, which amounts to about 177Ha in total pivot areas. Therefore the transformation of grazing land to cropland will be applicable.</i>
---	---

POTENTIAL ENVIRONMENTAL ISSUES

The full impact on all environmental parameters will be concluded in the EIA and EMP phases. For background information, the most important potential environmental issues that will be addressed in the assessment include, but is not limited to:

Soil Suitability:

A soil survey was conducted on the farm to determine whether the land would be suitable for cultivation and irrigation. 269 ha of land was investigated and soil forms included:

- Coega (covering about 21Ha of the study area),
- Glenrosa (covering about 36Ha of the study area),
- Kimberley (covering about 57Ha of the study area),
- Olienhout (covering about 9Ha of the study area),
- Nkonkoni (covering about 97Ha of the study area), and
- Plooyburg (covering about 65Ha of the study area).

The Nkonkoni, Glenrosa, Olienhout, and Kimberley soil forms were generally considered suitable for irrigation, while portions of the Nkonkoni, Glenrosa, and Plooyburg soil forms were only moderately suitable due to the depth of limiting material. The Coega soil form and portion of the Olienhout soil forms were considered not suitable for irrigation.

Ultimately the soil report concluded that most of the surveyed area is suitable for irrigation, due to the free-draining soils and cracked rock underlying most profiles.

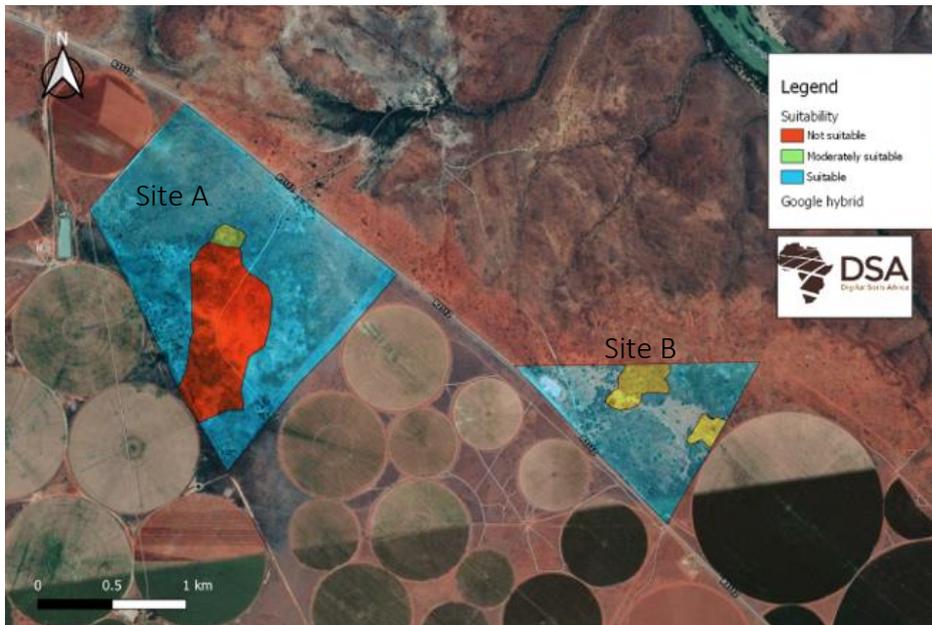


FIGURE 2: SUITABILITY AREAS FOR CROP PRODUCTION ACCORDING TO THE SOIL REPORT

The area not suitable for irrigation is limited by external drainage. The soil report recommended that in Site A, the pivot placement does not exceed more than 10% of unsuitable soil in a pivot. Since Site B has small areas of moderately suitable soils for irrigation, these can be incorporated into pivots, and thus the pivot placement is not affected by suitability.

Loss of on-site fauna and flora:

The site, according to Mucina and Rutherford (2006), hosts the Kimberley Thronveld (SVk4) vegetation type which has a Least Threatened conservation status. However, a vegetation survey will be conducted by a SACNASP registered botanist to evaluate the sensitivity of the site in terms of the flora component and ecological status.

The occurrence of faunal species within the proposed area is likely, however, it is farm properties and generally fenced-in camps, which will hinder the mobility of some of the larger wildlife that cannot jump a fence or the smaller wildlife that cannot borrow. Typically, many of the species encountered in the region are species such as the Common Duiker (*Sylvicapra grimmia*), Springbok (*Antidorcas marsupialis*), Steenbok (*Raphicerus campestris*), Blesbok, (*Damaliscus pygargus phillipsi*), Smiths red rock rabbit (*Pronolagus rupestris*), Scrub Hare (*Lepus saxatilis*), Spring Hare (*Pedetes capensis*), Meerkat (*Suricata suricatta*), Ground Squirrel (*Xerus inauris*), Rock elephant shrew (*Elephantulus myurus*), Suricate or Stokstertmeerkat (*Suricata suricatta*), Rock dassie (*Procavia capensis*), Yellow Mongoose (*Cynictis penicillata*), and Aardvark (*Orycteropus afer*).

The clearing of vegetation would be restricted to limited areas and the slow clearance rate would provide adequate time for migration of any animals remaining on-site to be sustained in similar adjoining habitats. Also, noise generated by vehicles will cause most animals to vacate

the site temporarily. If certain species were to be affected they would simply vacate the proposed cleared areas during the day and return during the night.

Sensitive Sites:

According to the Northern Cape Biodiversity Conservation Plan, the site falls does not fall within a Terrestrial Critically Biodiversity Area (CBA).

The Thembelihle Municipality does not have a Spatial Development Framework, but the Pixley Ka Seme District Municipality has a Spatial Development Framework. According to this SDF, the site falls within an area that is rated as a low sensitivity area.

To assess the sensitivity of the environment the onsite verification is therefore essential. The preliminary investigation indicates that the study area is not regarded as a site of ecological importance nor does the site have any high conservation value, thus the SDF rating and the CBA rating are applicable and aligns with onsite conditions.

The clearing of vegetation will be restricted to the pivot areas only and there are no water features on either Site A or B.

The site is also more than 1.7km from the Orange River, thus no surface water systems will be impacted.

Photo record of the study area:

Below are photos of Site A, representing Kimberley Thronveld that has been impacted through grazing.





Below are photos of Site B, representing Kimberley Thronveld that appears to be more impacted through grazing.





PUBLIC PARTICIPATION

In terms of the NEMA, public participation forms an integral part of the environmental assessment process. The public participation process provides people who may be affected by the proposed development with an opportunity to provide comments and raise issues of concern about the project or to make suggestions that may result in enhanced benefits for the project.

For this application, there will be two phases of public participation.

1. **Scoping Phase**
2. **EIA Phase.**

During the **Scoping Phase**, *potential* interested and affected parties (I&APs) are given notice via a notice board and local newspaper advertisement informing the public of the application. The *registered* I&APs are considered directly abutting neighbours and organs of state that have jurisdiction of the area, e.g. the Municipality, Ward councilor, etc. and would be provided with a Background Information Document and given access to a digital copy of the Scoping Report on Digital Soils website for comment.

Comments and issues raised during the Scoping Phase of the public participation process will be captured, evaluated, and included in a Public Participation Report. These issues will be addressed and included in the final Scoping Report, which will be submitted to the Department of Agriculture, Environmental Affairs, Rural Development, and Land Reform.

During the **EIA Phase** of public participation, only those I&AP's that are registered would be given notice and access to a digital copy of the Environmental Impact Assessment Report on Digital Soils website for comment.

Comments and issues raised during the EIA Phase of the public participation process will be captured, evaluated, and included in a Public Participation Report. These issues will be addressed and included in the final EIA Report, which will be submitted to the Department of Agriculture, Environmental Affairs, Rural Development, and Land Reform.

To register and/or submit a comment as an Interested and Affected Party, please respond in writing to the following email: natalie@dsafrica.co.za on or before **27 September 2021** till 5pm.

Please note that due to the **Covid pandemic** and in an attempt to lower the risk of infection, the Draft Scoping Report will not be placed in a public place as a hard copy. Instead, a copy of the Draft Scoping Report is also available on the DSA website at www.dsafrica.co.za. Please follow the link to Services, Environmental Services, Documents, and choose the Steytler link. To access the loaded documents use the password:
SteY@gf78.

If you have any other questions or inquiries, please do not hesitate to contact the office at 067 622 5687 or 082 414 0472. If no comments are received from you, it will then be regarded that you do not have any comments.

Response from Mr Jennings

I.J. Jennings

● Lizana Magagula Street

Belfast

1100

Tel nr: 0●●●3 7020

e-mail: ●●●●●ing●@gmail.com

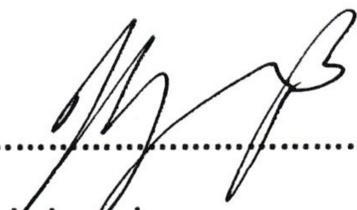
Date: 02 August 2021

**APPLICATION FOR THE CLEARING OF NATURAL VEGETATION ON THE
REMAINDER OF NAAUWTESFONTEIN NO. 78, HOPETOWN FOR ESTABLISHING
A MAIZE CROP AND PASTURE LAND**

I, I.J. Jennings, ID nr: ●●●●●2●2●●88....., are the owner of the
abovementioned property and are aware of the application to clear vegetation
for the establishing of a maize crop production and pasture land.

I would like to indicate that I support the application and have no objection for
the proposed development.

Kind regards,


.....
I.J. Jennings

Date: 02 August 2021

Proof of consultation sent via register post and email:

Register post:

(Please take note, that:

- The Northern Cape Department of Roads and Public Works;
- The Office of the Regional Land Claims Commissioner Land Restitution Support: Northern Cape;
and
- The Pixley Ka Seme District Municipality

Were the only 3 departments that failed to provide a contact person after numerous attempts of contact. The contacts used during this public participation were obtained from the Department's websites and therefore these 3 Departments were sent and email and register post to ensure the BID was delivered to the Departments.)

Emails:

Public Participation for crop production project_farm Naauwtesfontein 78, Hopetown_Applicant: Mr. Steytler Message 15 of 19

From: Natalie Sharp 
To: cfo@thembelihlemunicipality.gov.za 
Copy: mmpa@thembelihlemunicipality.gov.za 
Date: Fri 12:38

Dear Mr. Shuping,

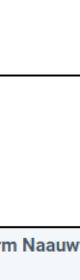
I trust you are well.

As per our ZOOM meeting on 10 August 2021, please find attached documents as part of the public participation for the project of Mr. Steytler who would like to clear vegetation on the Remainder of Farm Naauwtesfontein No. 78, Hopetown to establish crops.

Attached to this email please find the cover letter and background information document, should you wish to comment.

Kind regards

--



Natalie Sharp
Environmental Assessment Practitioner

✉ natalie@dsafrica.co.za
☎ +27 82 414 0472
🌐 www.dsafrica.co.za

 Cover letter for BID.pdf (~178 KB) ▾

 Background Information Docum... ▾

Download all attachments

RE: Public Participation for crop production project_farm Naauwtesfontein78, Hopetown_Applicant: Mr. Steytler Message 4 of 19

From: Radiile Shuping 
To: Natalie Sharp 
Date: Fri 15:30
Priority: Normal

Good day Natalie

There don't seem to be any attachments to the mail. Copy me to my private mail account just to be safe, its radiile.shuping@gmail.com

Thanks

Radiile Shuping
Chief Financial Officer

 6343662E99444B31B5FF2DED6... ▾

Re: Public Participation for crop production project_farm Naauwtesfontein78, Hopetown_Applicant: Mr. Steytler Message 5 of 1678

From: Natalie Sharp 
To: Radiile Shuping 
Copy: radiile.shuping@gmail.com 
Date: Today 08:10

Dear Mr Shuping,

Please see if the attachments came through now.

Kind regards



Natalie Sharp
Environmental Assessment Practitioner

✉ natalie@dsafrica.co.za
☎ +27 82 414 0472
🌐 www.dsafrica.co.za

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 Cover letter for BID.pdf (~178 KB) ▾

 Background Information Docum... ▾

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Public Participation for crop production project_farm Naauwtesfontein 78, Hopetown_Applicant: Mr. Steytler Message 15 of 20

From: Natalie Sharp ⁺
To: CRobertson@ncpg.gov.za ⁺
Date: Fri 12:41

Dear Robertson,

Please find attached background information documents for a proposed farming project near Hopetown, should your department wish to comment.

Kind regards

  01cd3357.jpeg (~46 KB)
  Cover letter for BID.pdf (~178 KB)
  Background Information Docum...
[Download all attachments](#)



Natalie Sharp
Environmental Assessment Practitioner

✉ natalie@dsafrica.co.za
☎ +27 82 414 0472
🌐 www.dsafrica.co.za

Public Participation for crop production project_farm Naauwtesfontein 78, Hopetown_Applicant: Mr. Steytler Message 14 of 20

From: Natalie Sharp ⁺
To: sinenhlanhla.xulu@dalrrd.gov.za ⁺
Date: Fri 12:42

Good day,

Please find attached background information documents for a proposed farming project near Hopetown, should your department wish to comment.

Kind regards

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  01cd3357.jpeg (~46 KB) ▾
  Cover letter for BID.pdf (~178 KB) ▾
  Background Information Docum... ▾
[Download all attachments](#)



Natalie Sharp
Environmental Assessment Practitioner

✉ natalie@dsafrica.co.za
☎ +27 82 414 0472
🌐 www.dsafrica.co.za

Public Participation for crop production project_farm Naauwtesfontein 78, Hopetown_Applicant: Mr. Steytler Message 13 of 20

From: Natalie Sharp ⁺
To: [REDACTED] ⁺
Date: Fri 12:45

Good day Me. Marosane,

Please find attached background information documents for a proposed farming project near Hopetown. Could you please forward the information to your Ward Cllr 2, Mr. Tallies, should he wish to comment.

Kind regards

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Natalie Sharp
Environmental Assessment Practitioner

✉ natalie@dsafrica.co.za
☎ +27 82 414 0472
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Public Participation for crop production project_farm Naauwtesfontein 78, Hopetown_Applicant: Mr. Steytler Message 12 of 20

From: Natalie Sharp 
To: pixley@telkomsa.net 
Date: Fri 12:46

Good day,

Please find attached background information documents for a proposed farming project near Hopetown, should your department wish to comment.

Kind regards



Natalie Sharp
Environmental Assessment Practitioner
✉ natalie@dsafrica.co.za
☎ +27 82 414 0472
🌐 www.dsafrica.co.za

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 Cover letter for BID.pdf (~178 KB)

 Background Information Docum...

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Public Participation for crop production project_farm Naauwtesfontein 78, Hopetown_Applicant: Mr. Steytler Message 11 of 20

From: Natalie Sharp 
To: FortuinB@dws.gov.za 
Date: Fri 12:47

Good day,

Please find attached background information documents for a proposed farming project near Hopetown, should your department wish to comment.

Kind regards



Natalie Sharp
Environmental Assessment Practitioner
✉ natalie@dsafrica.co.za
☎ +27 82 414 0472
🌐 www.dsafrica.co.za

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 Cover letter for BID.pdf (~178 KB)

 Background Information Docum...

[Download all attachments](#)

Public Participation for crop production project_farm Naauwtesfontein 78, Hopetown_Applicant: Mr. Steytler Message 10 of 20

From: Natalie Sharp 
To: [REDACTED] 
Date: Fri 12:48

Good day Mr. Ferreira,

Please find attached background information documents for a proposed farming project near Hopetown, should you wish to comment.

Kind regards



Natalie Sharp
Environmental Assessment Practitioner
✉ natalie@dsafrica.co.za
☎ +27 82 414 0472
🌐 www.dsafrica.co.za

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 Background Information Docum... ▾

[Download all attachments](#)

FW: Public Participation for crop production project_farm Naauwtesfontein 78, Hopetown_Applicant: Mr. Steytler Message 1 of 20

From: Leon Ferreira 
To: natalie@dsafrica.co.za 
Copy:   
Date: Today 14:54

Dear Natalie

Please copy Okkie in with all future correspondence regarding the application.

I am concerned with the natural slope and drainage of water towards the river and this should not be negatively influenced.

We will obviously not want to jeopardise our neighbour's plans but caution must be taken to prevent future issues.

Regards

Leon Ferreira
Managing Director
T: +27 53  07 9245

 Cover letter for BID.PDF (~183 K...
 Background Information Docum...
[Download all attachments](#)

Re: FW: Public Participation for crop production project_farm Naauwtesfontein 78, Hopetown_Applicant: Mr. Steytler

From: Natalie Sharp 
To: Leon Ferreira 
Copy: 'Okkie Gmail' , 'Gerrie Scholtz' 
Date: 2021-08-30 16:09

Dear Mr. Ferreira,

Thank you kindly for your prompt response.

We have taken note of your concerns and will investigate the impact during the Environmental Impact Assessment. We will also consult the Soil Scientist, Dr. D. Bouwer who conducted the soil studies and drainage issues for his recommendations.

Please take note that Mr. Roux from the Department of Agriculture has also been consulted, and I will bring this to his attention, as he is the authority for decision-making on the application for a ploughing certificate.

I take note that you do not wish to jeopardize your neighbour's development, however, you also have environmental rights and your concern will be investigated.

I have added Okkie to the list of Interested and Affected Parties.

May I ask for his surname and cell number?

Kind regards

 **Natalie Sharp**

Public Participation for crop production project_farm Naauwtesfontein 78, Hopetown_Applicant: Mr. Steytler Message 9 of 20

From: **Natalie Sharp** 
 To: 
 Date: **Fri 12:49**

Good day Mr. Scholtz,
 Please find attached background information documents for a proposed farming project near Hopetown, should you wish to comment.
 Kind regards



Natalie Sharp
 Environmental Assessment Practitioner
 ✉ natalie@dsafrika.co.za
 ☎ +27 82 414 0472
 🌐 www.dsafrika.co.za

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-  Background Information Docum... ▾

[Download all attachments](#)

Good day Mr. Jennings,

We have received your letter of support for the proposed development on your property on 2 August 2021, thank you.
 We have progress into the public participation phase of this project and since you are the landowner, we have to consult you.
 Please find attached background information documents for the proposed farming project on your property for your information. If you would like to raise any additional comments you are welcome to contact me.
 Kind regards



Natalie Sharp
 Environmental Assessment Practitioner
 ✉ natalie@dsafrika.co.za
 ☎ +27 82 414 0472
 🌐 www.dsafrika.co.za

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-  Background Information Docum... ▾

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Public Participation for crop production project_farm Naauwtesfontein 78, Hopetown_Applicant: Mr. Steytler Message 7 of 20

From: **Natalie Sharp** 
 To: **Roux Hannes** 
 Date: **Fri 13:07**

Good day Mr. Roux,
 Please find attached background information documents for a proposed farming project near Hopetown, should your department wish to comment.
 Kind regards



Natalie Sharp
 Environmental Assessment Practitioner
 ✉ natalie@dsafrika.co.za
 ☎ +27 82 414 0472
 🌐 www.dsafrika.co.za

-  01cd3357.jpeg (~46 KB) ▾
-  Cover letter for BID.pdf (~178 KB) ▾
-  Background Information Docum... ▾

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Proof of registry post:

REGISTERED LETTER GEREGISTREERDE BRIEF (with an insurance option/met 'n versekeringsopsie)		Post Office	
Full tracking and tracing/Volledige volg en spoor		ORDINARY PARCEL ShareCall 0800 111 502 www.sapo.co.za PE 948 574 453 ZA CUSTOMER COPY 301016 Total amount paid R _____ C Total amount paid R _____ C Total amount paid R _____ C Total amount paid R _____ C	
Addressed to/Geadresseer aan PKSDM Private Bag X 1012 Postcode Postkode 7000		Insured value of contents Versekerde waarde van inhoud R _____ C	
The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2 000.00 is available and applies to domestic registered letters only. Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.		Enquiries/Navrae Toll-free number Tolvry nommer 0800 111 502 Affix Track and Trace customer copy Plate Volg-en-Spoor-kliëntafskrif	
		Initial of accepting officer Date stamp 	

REGISTERED LETTER GEREGISTREERDE BRIEF (with an insurance option/met 'n versekeringsopsie)		Post Office	
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Addressed to/Geadresseer aan Northern CPR PO Box 3132 Kimberly Postcode Postkode 8300		Insured value of contents Versekerde waarde van inhoud R _____ C	
The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2 000.00 is available and applies to domestic registered letters only. Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.		Enquiries/Navrae Toll-free number Tolvry nommer 0800 111 502 Affix Track and Trace customer copy Plate Volg-en-Spoor-kliëntafskrif	
		Initial of accepting officer Date stamp 	

REGISTERED LETTER GEREGISTREERDE BRIEF (with an insurance option/met 'n versekeringsopsie)		Post Office	
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Addressed to/Geadresseer aan TORLC PO Box 2458 Kimberly Postcode Postkode 8300		Insured value of contents Versekerde waarde van inhoud R _____ C	
The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2 000.00 is available and applies to domestic registered letters only. Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.		Enquiries/Navrae Toll-free number Tolvry nommer 0800 111 502 Affix Track and Trace customer copy Plate Volg-en-Spoor-kliëntafskrif	
		Initial of accepting officer Date stamp 	

Response and Comments

	Interested and Affected Party Name	Contact details (phone or email)	Address	Date received	Comments	Concerns raised	Response
1	Thembelihle Local Municipality Att: Mr. Radiile Shuping (Acting Municipal Manager)	083 348 6461 cfo@thembelihlemunicipality.gov.za or radiile.shuping@gmail.com	Private Bag X 3 Hopetown 8750	On 10 August 2021 a Zoom meeting was carried out.		During the Zoom meeting the Acting Municipal Manager and the Technical Manager (Mr. Steven Marufu) were present. They requested information regarding the proposed project and indicated that since this development falls on private property, they do not have any objections or concerns at this stage.	Background information was provided during the meeting and the Background Information Document (BID) was sent on 27 August 2021 and access to Draft Scoping Report for comment and for more information.
2	Ward Councilor Ward 2: Jacobus Tallies (Me. Nomsa Marosane handles the administration)	0 171 (Mr. Tallies) or 0 335 3 (Me. Marosane) @yahoo.com	Did not provide an address			No comment was received.	BID was sent on 27 August 2021 and access to Draft Scoping Report for comment.

	for all councilors in Hopetown). There are currently only 4 wards, after local elections (27 Oct 2021) there will be 6 wards of which this site will then fall within Ward 6.					
3	Pixley Ka Seme District Municipality Attention: Municipal Manager	(053) 631-0891 pixley@telkomsa.net	Private Bag X1012 De Aar 7000		No comment was received.	BID was sent on 27 August 2021 and access to Draft Scoping Report for comment.
4	Department of Water and Sanitation (Bloemfontein) Attention: Byron Fortuin	(051) 405 9000 FortuinB@dws.gov.za	P O Box 528 Bloemfontein 9300		No comment was received.	BID was sent on 27 August 2021 and access to Draft Scoping Report for comment.
5	Department of Agriculture: Directorate Land Use & Soil Management	053 807 2600 hrouxx@gmail.com	P O Box 2303 Kimberley 8300		No comment was received	Application for a ploughing certificate was submitted on 16 August 2021.

	Attention: Mr. H. Roux					BID was sent on 27 August 2021 and access to Draft Scoping Report for comment.
6	Department of Agriculture, Environmental Affairs, Rural Development and Land Reform For Att: Mr. I. Gwija Sub-Directorate Impact Management	053 807 7300/462 or 060 989 8441 / 053 631 0601 Email: GLetimela@ncpg.gov.za or mr.gwija@gmail.com	90 Long Street, Sasko Building Kimberley 8300		No comment was received	Draft Scoping Report was couriered to the Department on 27 August 2021.
7	Northern Cape Department of Roads and Public Works Contact person: Crystal Robertson (Communication Officer)	083 839 2183 CRobertson@ncpg.gov.za	P O Box 3132 Kimberley, 8300		No comment was received	BID was sent on 27 August 2021 and access to Draft Scoping Report for comment.
8	The Office of the Regional Land Claims	053 807 5700	P O Box 2458 Kimberley 8300		No comment was received	BID was sent on 27 August 2021 and access to

	Commissioner Land Restitution Support: Northern Cape	sinenhlanhla.xulu@dalrrd.gov.za				Draft Scoping Report for comment.
9	SAHRIS Contact Person: Natasha Higgitt	nhiggitt@sahra.org.za	www.sahra.org.za			The online SAHRIS application online will be submitted once the Heritage Report is completed.
10	Land Owner: Mr. Jennings	021 450 1100 ninnin@gmail.com	88 Lizana Magagula Street Belfast 1100	2 August 2021	Mr. Jennings indicated that he supports the project.	BID was sent on 27 August 2021 and access to Draft Scoping Report for comment.
11	Neighbour: Leon Ferreira	021 450 1100 @vodamail.co.za		30 August 2021	Mr. Ferreira phoned and emailed. Mr. Ferreira requested that Okkie should also be consulted, as his pivot area is also neighboring the application area. He raised a concern regarding the natural slope and drainage of water towards the river and this should not be negatively influenced. He did indicate that he would wish to jeopardise our	BID was sent on 27 August 2021 and access to Draft Scoping Report for comment. DSA responded and indicated that this will be investigated

					neighbour's plans but caution must be taken to prevent future issues.	during the EIA phase. However, an application for cultivating virgin soil has been submitted to the Department of Agriculture and as such drainage will be investigated.
12	Neighbour: Gerrie Scholtz	0●●●●6 ●●●●@icloud.com			No comment was received	BID was sent on 27 August 2021 and access to Draft Scoping Report for comment.
13	Neighbour (not directly abutting) Okkie Vermeulen	0●●●●2 ●●●●@gmail.com			No comment was received	BID was forwarded by Mr. Ferreira on 27 August 2021 and access to the Draft Scoping Report for comment. Mr. Vermeulen was

						contacted via whatsapp on 31 August 2021 to inform him that he has been listed on the IA&P, but to date, he has not directly contacted DSA or submitted any comments.
--	--	--	--	--	--	---

- No person registered or contacted the EAP during the pre-application consultation period as a result of the Notice Board. The Notice Board was removed from the site on 28 September 2021.
- No person registered or contacted the EAP during the pre-application consultation period as a result of the advertisement.

APPENDIX D – SCREENING TOOL REPORT AND SITE VERIFICATION REPORT

The Screening Tool does not allow one report for two sites on one farm. Therefore two Screening Tool Reports were generated, one for Site A and another for Site B.

**SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION AS
REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE
ENVIRONMENTAL SENSITIVITY**

EIA Reference number:

Project name: Crop Production_Site A

Project title: Steytler Crop Production

Date screening report generated: 19/07/2021 14:33:50

Applicant: George Steytler

Compiler: Digital Soils Africa (Pty) Ltd

Compiler signature:



Application Category: Agriculture_Forestry_Fisheries|Crop Production

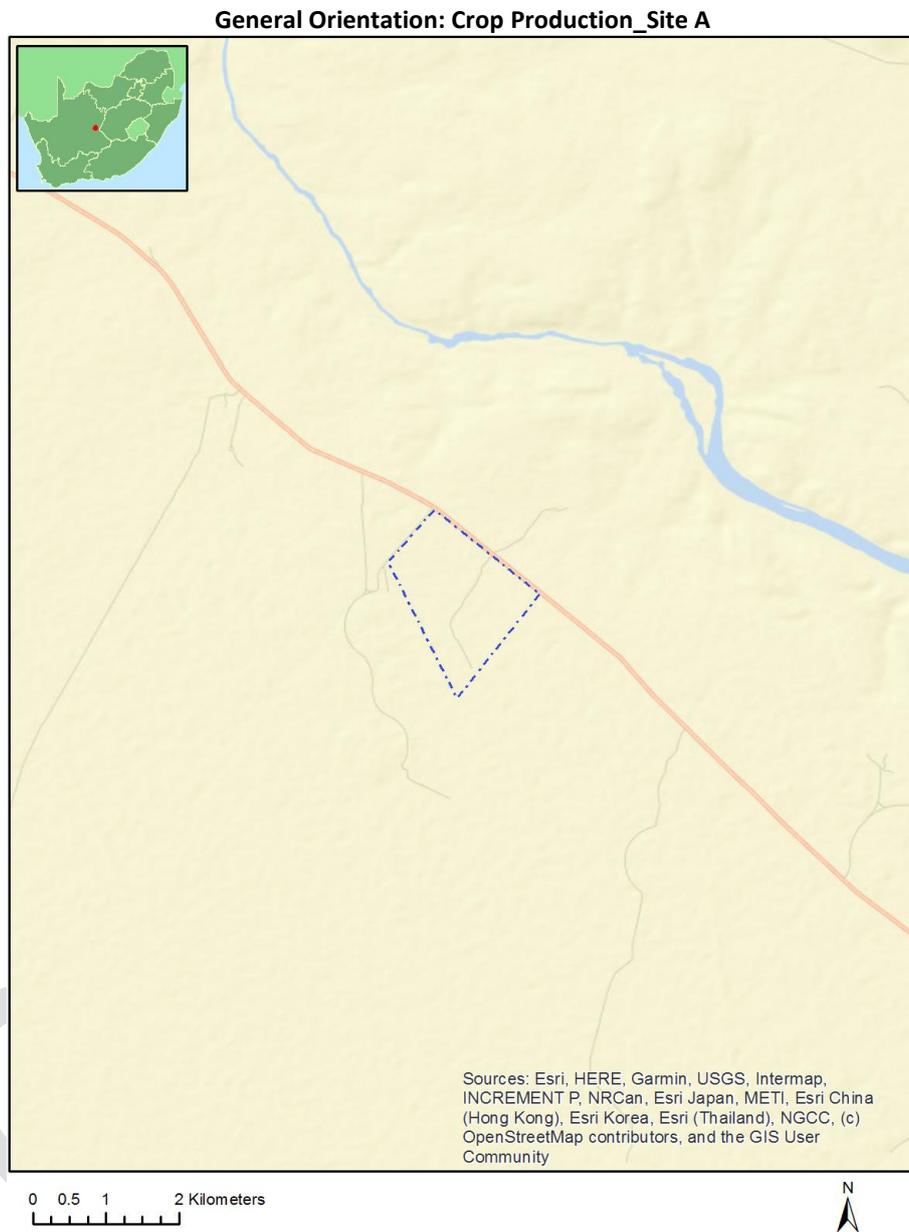


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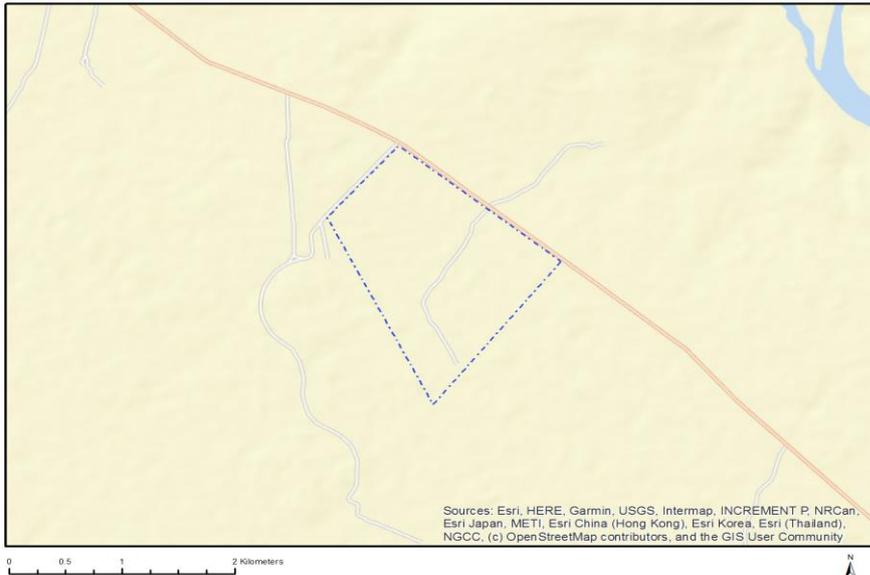
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Proposed Project Location

Orientation map 1: General location



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	NAAUWTES FONTEIN	78	0	29°31'32.94S	23°56'42.38E	Farm
2	NAAUWTES FONTEIN	78	0	29°30'45.78S	23°57'35.75E	Farm Portion

Development footprint¹ vertices:
No development footprint(s) specified.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No	EIA Reference No	Classification	Status of application	Distance from proposed area (km)
1	12/12/20/2682	Solar PV	Approved	0
2	14/12/16/3/3/2/283	Solar PV	Approved	6.6
3	14/12/16/3/3/1/825	Solar PV	Approved	8.9

¹ “development footprint”, means the area within the site on which the development will take place and includes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

Environmental Management Frameworks relevant to the application

No intersections with EMF areas found.

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development site as well as the most environmental sensitive features on the site based on the site sensitivity screening results for the application classification that was selected. The application classification selected for this report is:

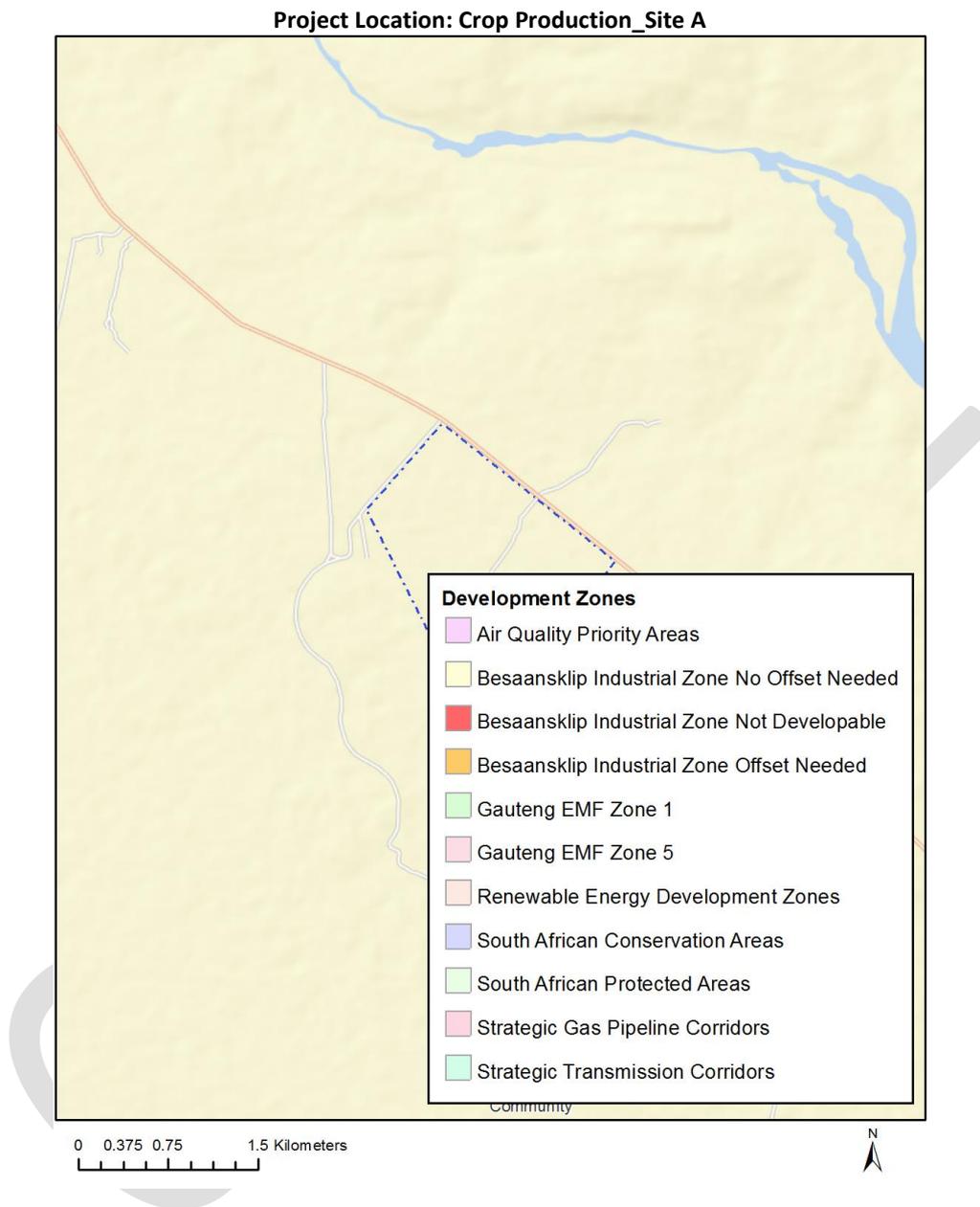
Agriculture_Forestry_Fisheries|Crop Production.

Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this site are indicated below.

No intersection with any development zones found.

Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones



Proposed Development Area Environmental Sensitivity

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme			X	
Animal Species Theme			X	

Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme				X
Defence Theme				X
Paleontology Theme			X	
Plant Species Theme				X
Terrestrial Biodiversity Theme				X

Specialist assessments identified

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

N o	Special ist assessm ent	Assessment Protocol
1	Agricultural Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Agriculture_Assessment_Protocols.pdf
2	Landscape/Visual Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
3	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
4	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
5	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf
6	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Aquatic_Biodiversity_Assessment_Protocols.pdf
7	Hydrology	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols

	Assessment	/Gazetted General Requirement Assessment Protocols.pdf
8	Socio-Economic Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted General Requirement Assessment Protocols.pdf
9	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted Plant Species Assessment Protocols.pdf
10	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted Animal Species Assessment Protocols.pdf

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Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

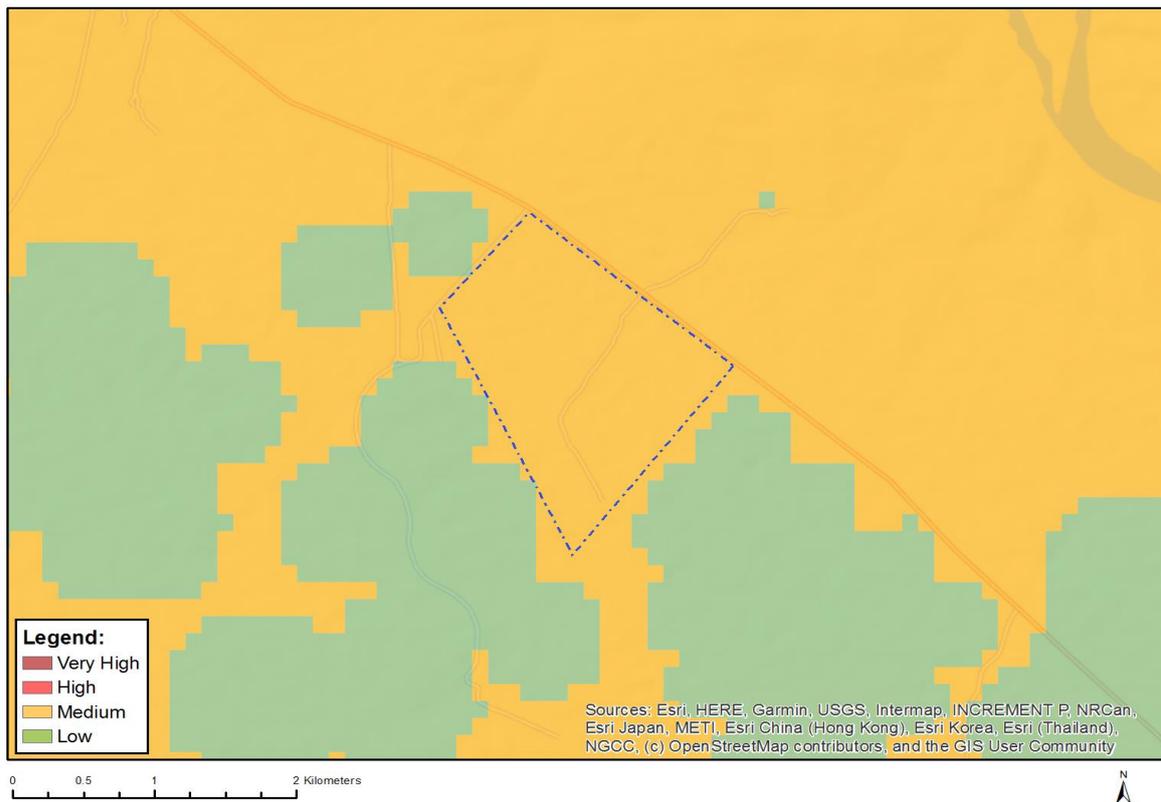


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

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

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Medium	Aves-Neotis ludwigii

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY

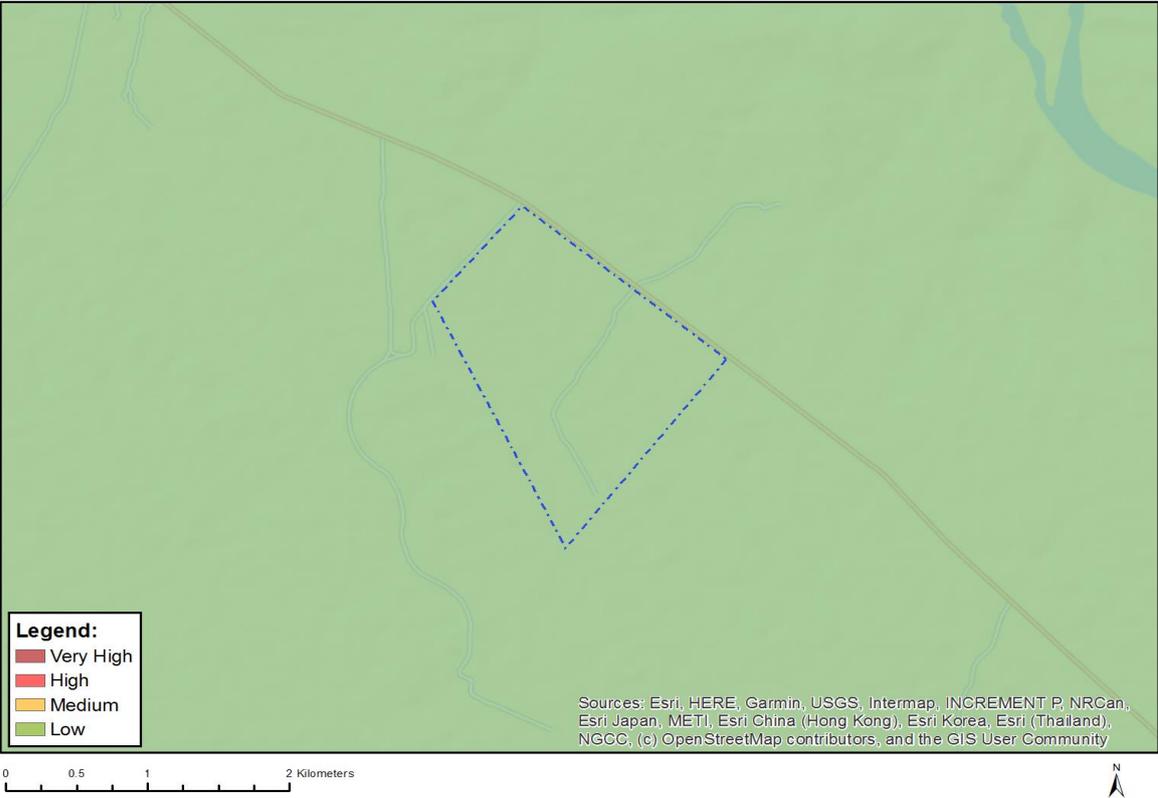


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE DEFENCE THEME SENSITIVITY

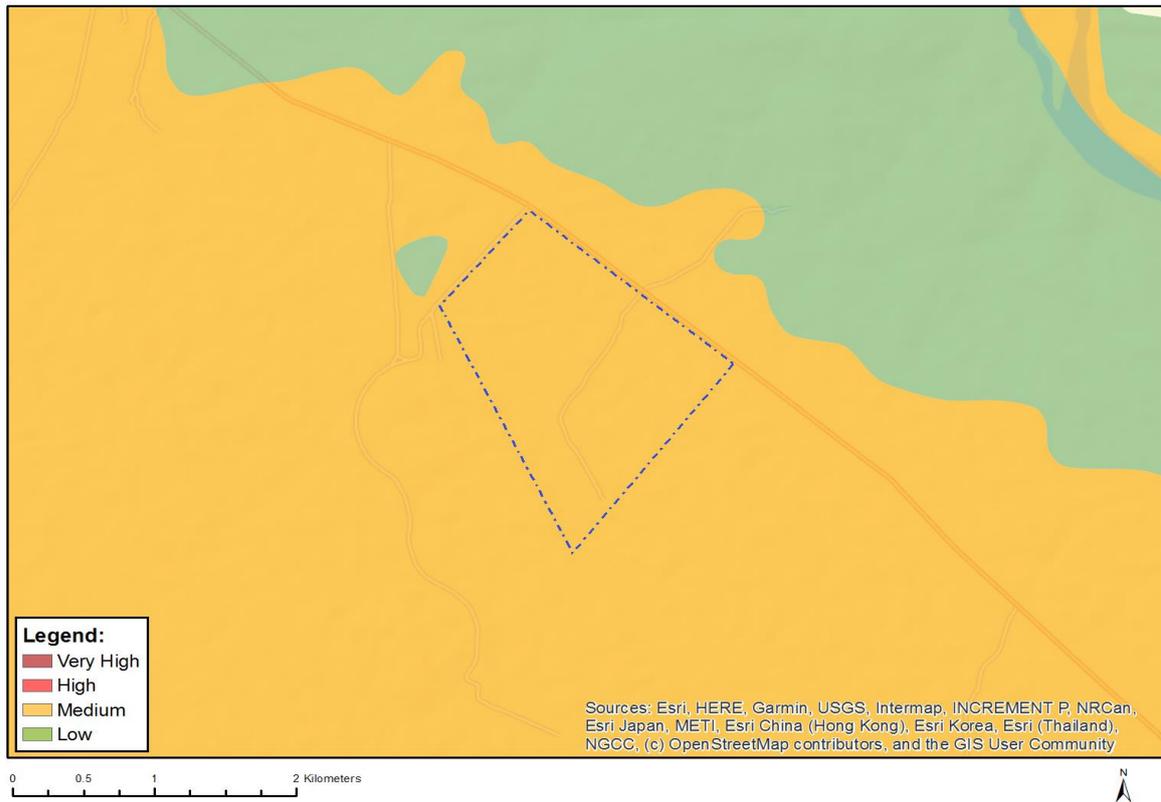


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Features with a Medium paleontological sensitivity

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

**SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION AS
REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE
ENVIRONMENTAL SENSITIVITY**

EIA Reference number:

Project name: Crop Production_Site B

Project title: Steytler Crop Production

Date screening report generated: 19/07/2021 15:14:58

Applicant: George Steytler

Compiler: Digital Soils Africa (Pty) Ltd

Compiler signature:



Application Category: Agriculture_Forestry_Fisheries|Crop Production

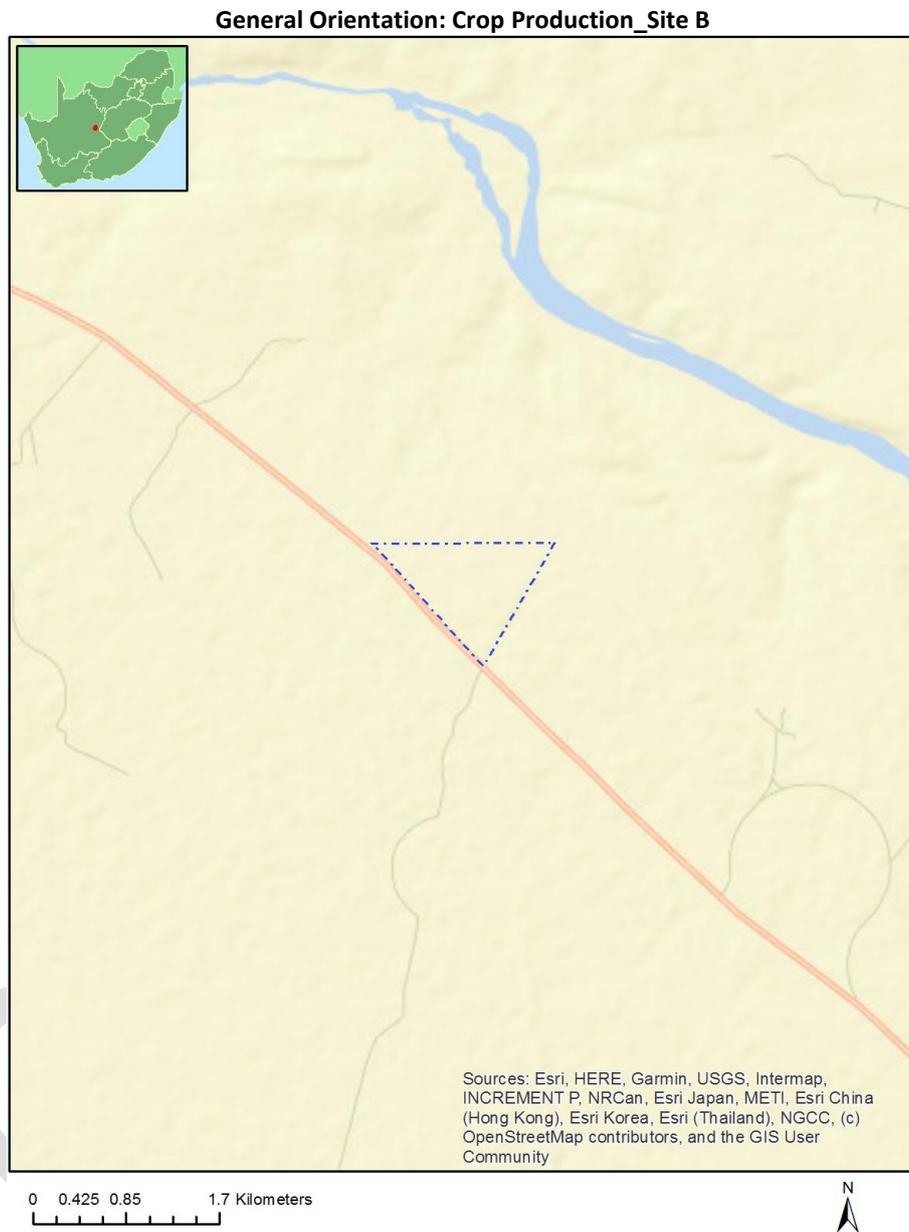


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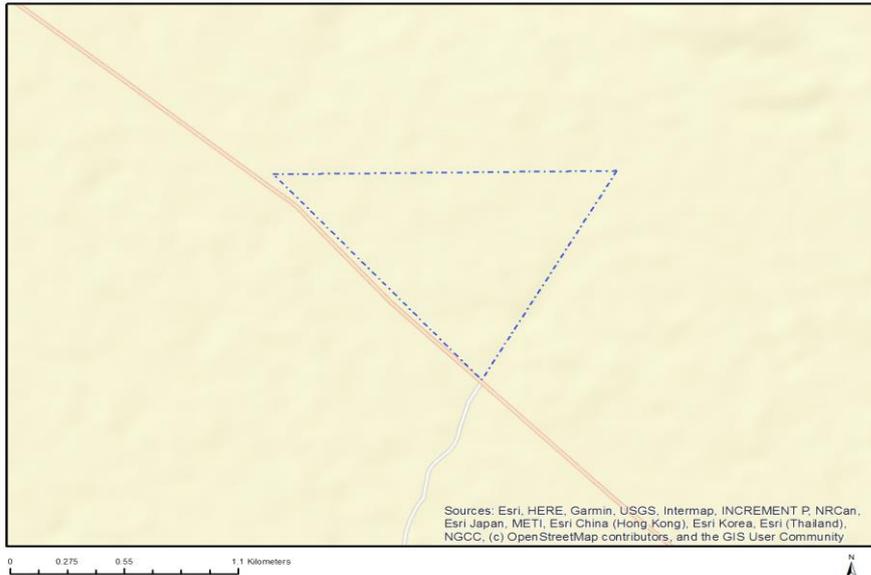
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MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY	16
MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY	17

Proposed Project Location

Orientation map 1: General location



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	STOFFELS HOEK	81	0	29°33'53.86S	23°57'35E	Farm
2	NAAUWTES FONTEIN	78	0	29°31'32.94S	23°56'42.38E	Farm
3	NAAUWTES FONTEIN	78	0	29°30'45.78S	23°57'35.75E	Farm Portion
4	STOFFELS HOEK	81	1	29°31'8.9S	23°58'57.9E	Farm Portion

Development footprint¹ vertices:
No development footprint(s) specified.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No	EIA Reference No	Classification	Status of application	Distance from proposed area (km)
1	12/12/20/2682	Solar PV	Approved	3.1
2	14/12/16/3/3/2/283	Solar PV	Approved	3.9
3	14/12/16/3/3/1/825	Solar PV	Approved	6.2

¹ “development footprint”, means the area within the site on which the development will take place and includes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

Environmental Management Frameworks relevant to the application

No intersections with EMF areas found.

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development site as well as the most environmental sensitive features on the site based on the site sensitivity screening results for the application classification that was selected. The application classification selected for this report is:

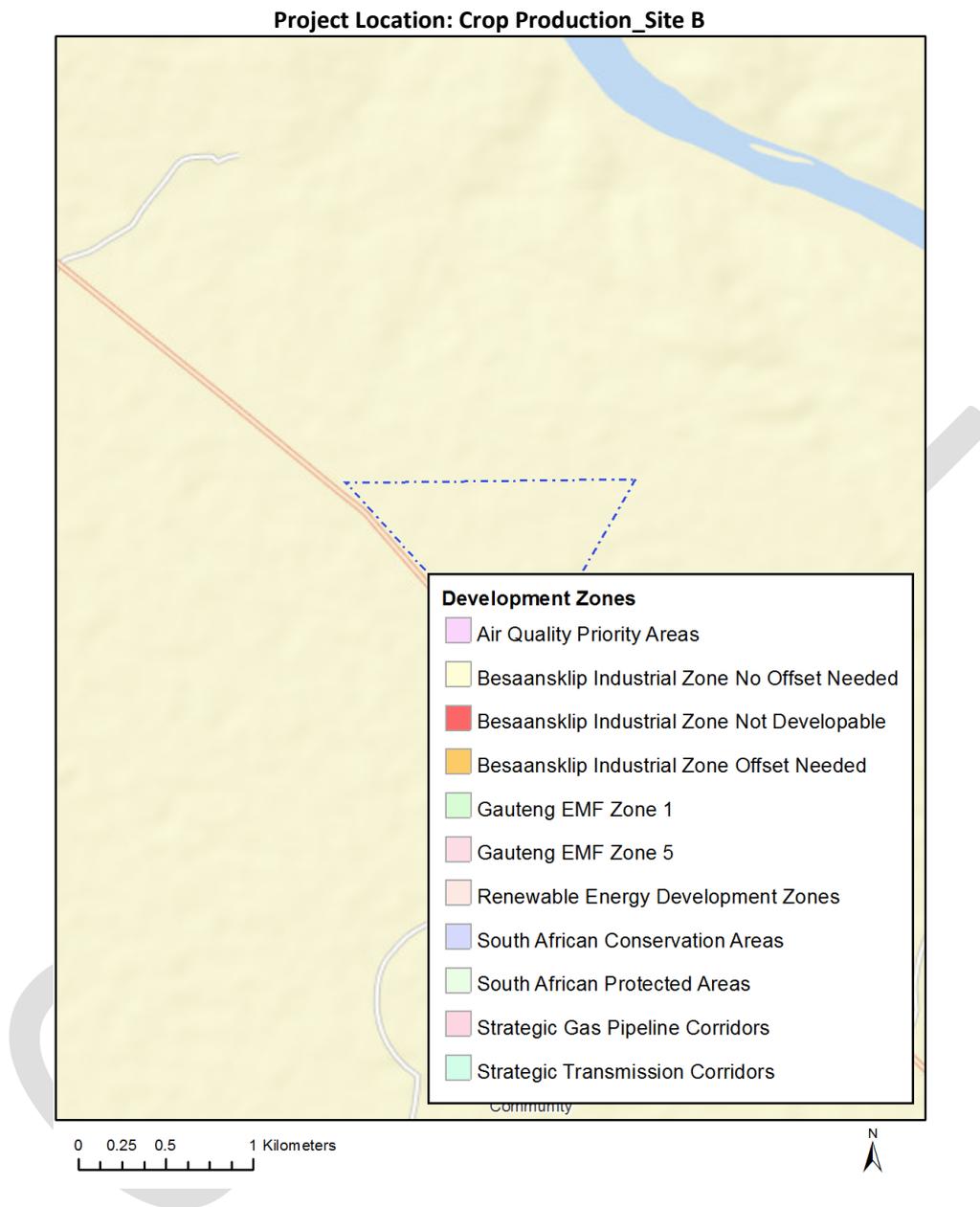
Agriculture_Forestry_Fisheries | Crop Production.

Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this site are indicated below.

No intersection with any development zones found.

Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones



Proposed Development Area Environmental Sensitivity

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme			X	
Animal Species Theme			X	

Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme				X
Defence Theme				X
Paleontology Theme			X	
Plant Species Theme			X	
Terrestrial Biodiversity Theme				X

Specialist assessments identified

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

N o	Specialist assessment	Assessment Protocol
1	Agricultural Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Agriculture_Assessment_Protocols.pdf
2	Landscape/Visual Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
3	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
4	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
5	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf
6	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Aquatic_Biodiversity_Assessment_Protocols.pdf
7	Hydrology	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols

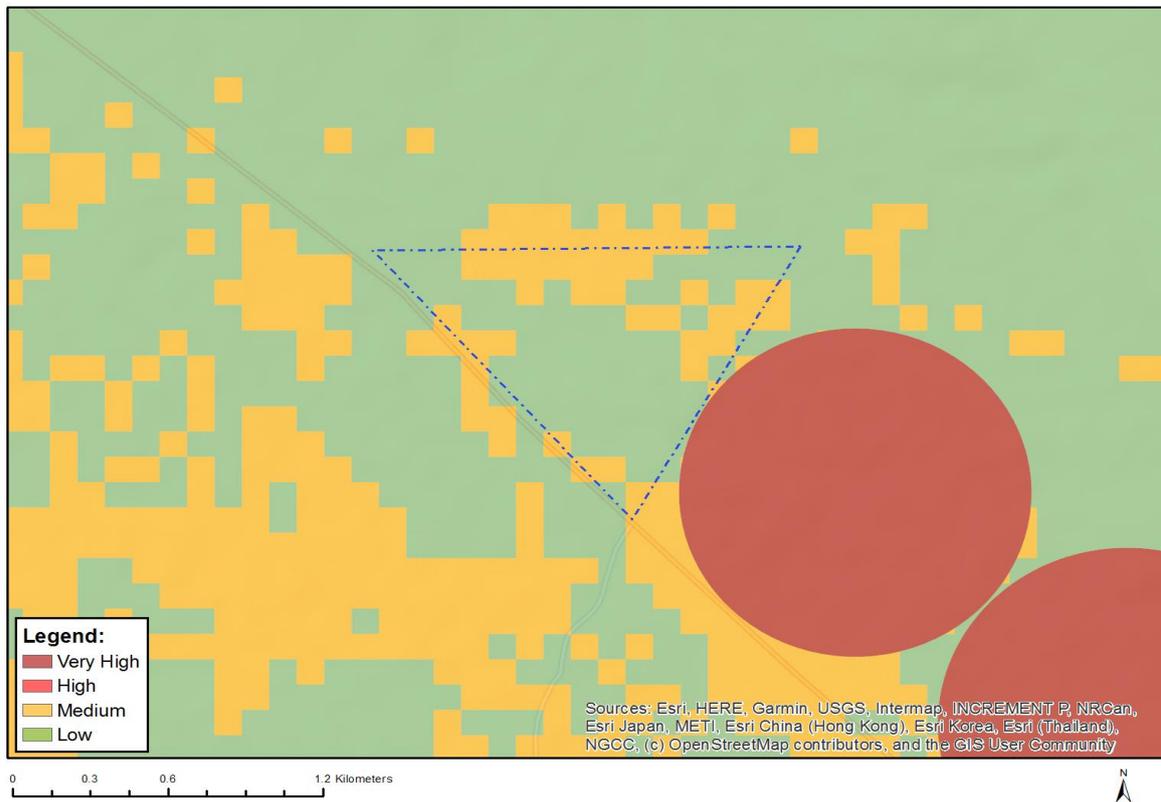
	Assessment	/Gazetted General Requirement Assessment Protocols.pdf
8	Socio-Economic Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted General Requirement Assessment Protocols.pdf
9	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted Plant Species Assessment Protocols.pdf
10	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted Animal Species Assessment Protocols.pdf

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Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

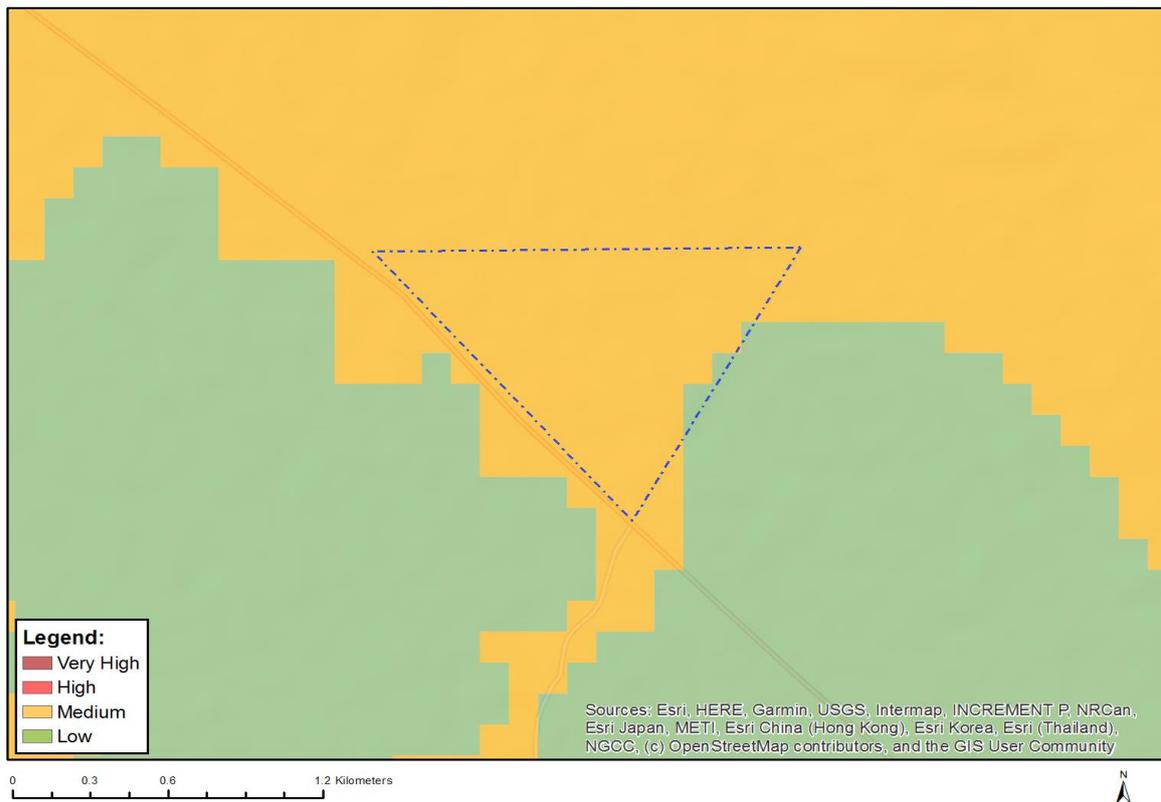


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

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

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Medium	Aves-Neotis ludwigii

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY

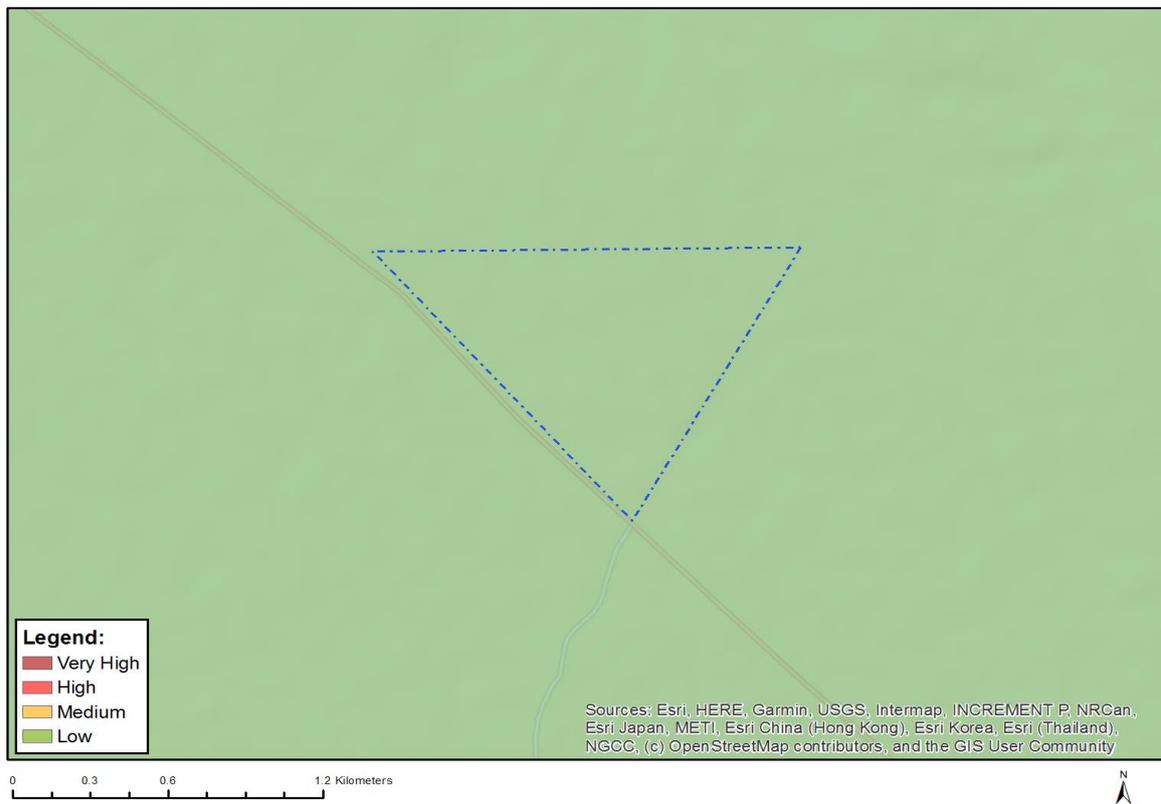


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE DEFENCE THEME SENSITIVITY

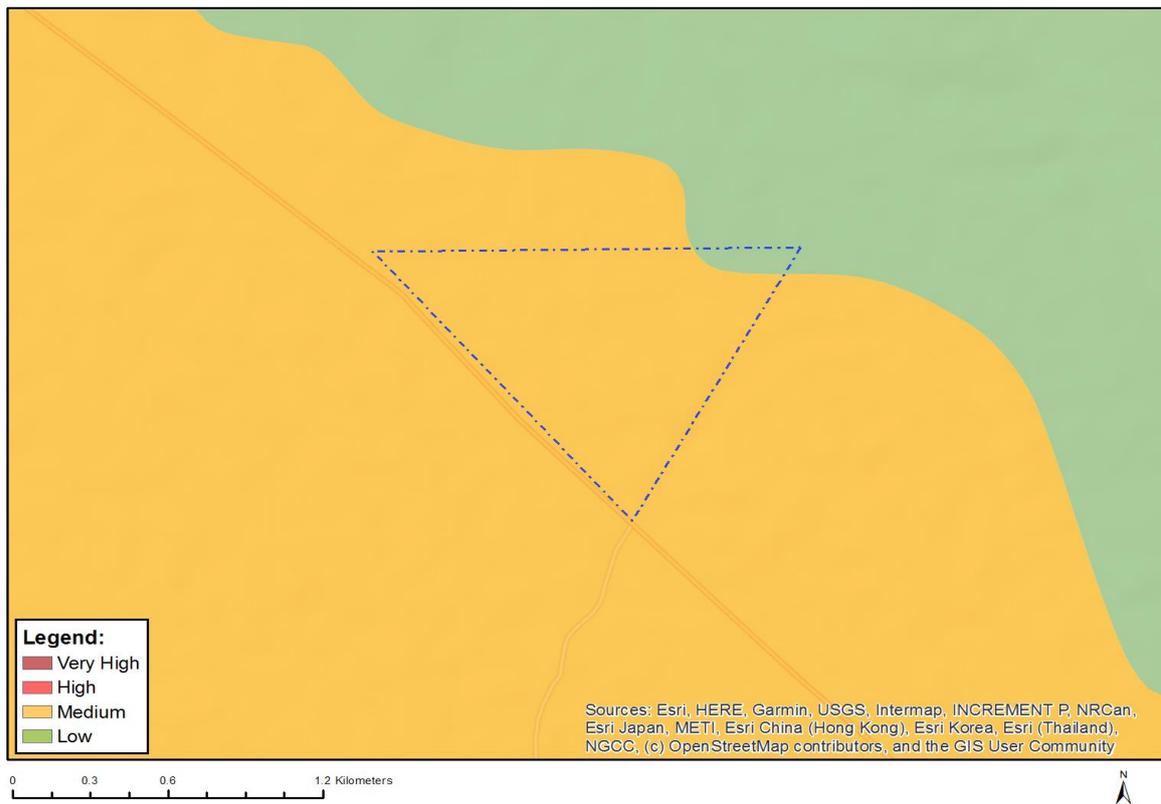


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY

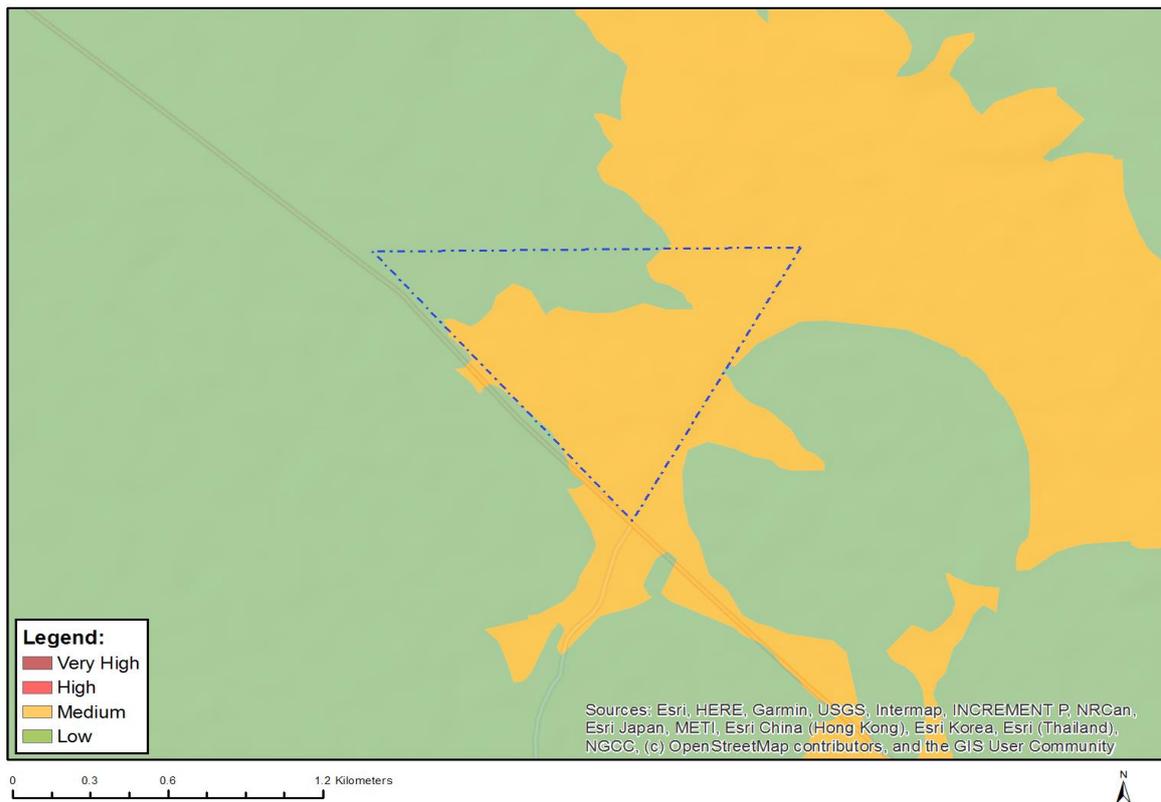


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Features with a Low paleontological sensitivity
Medium	Features with a Medium paleontological sensitivity

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



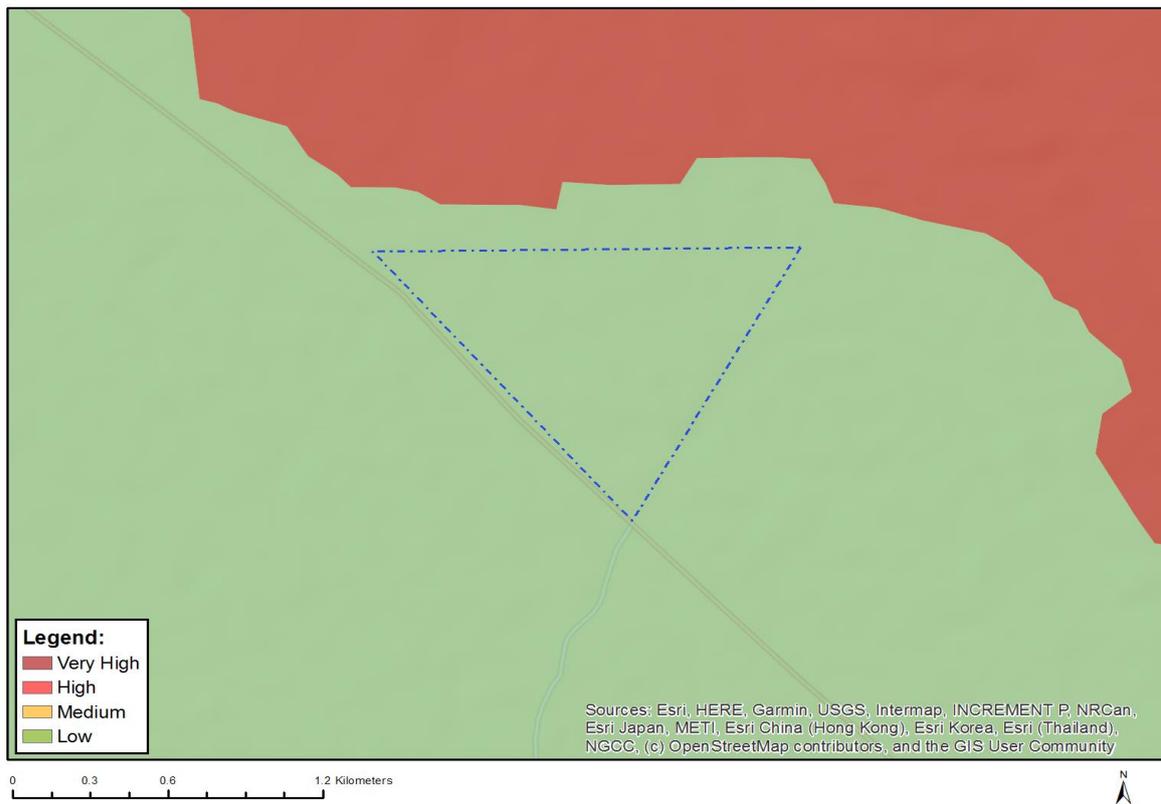
Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Sensitive species 972

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity



APPENDIX D

SITE SENSITIVITY REPORT

For the

Application for Environmental Authorisation for the
clearing of vegetation on the Remainder of Farm
Nauwtesfontein No. 78, Hopetown

Prepared for

MR. G.F. STEYTLER

AUGUST 2021



DSA
Digital Soils Africa

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 www.dsafrica.co.za

 natalie@dsafrica.co.za

 1 Kemsley Street
Port Elizabeth

Directors:

Prof Pieter le Roux
Dr George van Zijl
Dr Darren Bouwer
Dr Johan van Tol

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BACKGROUND

Digital Soils Africa (Pty) LTD (DSA) was tasked by Mr. George Frank Steytler to conduct environmental investigations and complete the Environmental Authorisation Application for the authorisation of clearing 269Ha of vegetation on the Remainder of the Farm Naauwtesfontein No. 78, Hopetown in the Northern Cape.

In terms of the National Environmental Management Act 107 of 1998 (“NEMA”), environmental authorisation must be obtained before any person can conduct activities that cause damage to the environment.

DSA was appointed by Mr. Steytler (also referred to as the Applicant) as the independent environmental assessment practitioner (EAP) to undertake the Environmental Authorisation Application for the commencement of a listed activity in terms of the Environmental Impact Assessment Regulations 2014, as amended in 2017.

Mr. Steytler would like to develop 269Ha of which about 177Ha of vegetation will be cleared to establish pivots for irrigating maize and wheat crops and pasture. Two sites on the same farm were chosen for this development, which will be referred to henceforth as Site A (198Ha in total) and Site B (71Ha in total).

Currently the site host intact vegetation with some evidence of overgrazing. Soil samples were taken and analysed to investigate if the soil is suitable for establishing crops. The soil study indicated that at Site A, the pivot placement does not exceed more than 10% of unsuitable soil in a pivot area. However, Site B has small areas of moderately suitable soils for irrigation, which can be incorporated into pivots, and thus the pivot placement is not affected by suitability.

In terms of the drainage, the A and B horizons of the sites are characteristically sandy and therefore will facilitate good drainage. Most of the soils are very high-potential irrigation soils.

From an environmental point of view, the larger 269Ha area should be under application, although only 177 Ha would most likely be disturbed, the rest of the 92Ha that are located between the proposed pivot areas should be used as an off-set area and to preserve if for conservation purposes and possible transplant of vegetation, depending on the outcome of the vegetation report.

An application to cultivate virgin soil (or commonly known as a plough certificate) will also be applied for at the Department of Agriculture to ensure all legal requirements for such a development are met.

There are existing water use rights for the property and therefore do not require additional applications for a Water Use Right. In the future, they might apply for an increase in usage, however, at this stage, it is not required.

From an environmental point of view, since the unsuitable soils for crops are located in the central area of Site A, it would be excluded from the pivot areas through the correct placement of pivots.

The Screening Tool Report has been generated for the proposed development. According to the screening tool report, the following specialist assessments were identified:

1. Agricultural Impact Assessment;
2. Landscape/Visual Impact Assessment;
3. Archaeological and Heritage Impact Assessment;
4. Palaeontological Impact Assessment;
5. Terrestrial Biodiversity Impact Assessment;
6. Aquatic Biodiversity Impact Assessment;
7. Hydrology Assessment;
8. Socio-Economic Assessment;
9. Plant Species Assessment; and
10. Animal Species Assessment.

Therefore, this site sensitivity verification report is compiled to determine whether Specialist Assessments or Compliance Statements for the abovementioned specialist studies are required for the proposed development.

SCREENING TOOL

The Screening Tool does not allow two sites to be screened if they are not within 500m from each other, therefore two Screening Tool Reports were generated to screen the sensitivity of the sites.

The Screening Tool Report for Site A & B, identified the same sensitivities for all the themes, except for the Plant Species Themes.

Three medium sensitivities were identified for the Agricultural Theme, the Animal Sensitivity Theme, and the Paleontology Theme, for both Sites A and B, with the addition of Plant Sensitivity Theme for Site B.

All other themes, such as the Aquatic Biodiversity Theme, Archaeological and Cultural Heritage Theme, Civil Aviation Theme, the Defence Theme and Terrestrial Biodiversity Theme all scored a low sensitivity, including the Plant Sensitivity Theme for Site A.

The site is on a private farm, divided into camps for grazing and crop production.

LOCATION

The site is situated north-west from Hopetown in the Northern Cape (**Site A:** 29° 30' 38.85"S; 23° 56' 40.97"E and **Site B:** 29° 31' 10.72"S; 23° 58' 19.99"E) on the Remainder of Farm Naauwtesfontain No. 78, within the Thembelihle Local Municipal area. The farm can be reached by traveling along the R3112 (old Douglas road) north-west from Hopetown for about 16km until the farm road of Site A is reached.

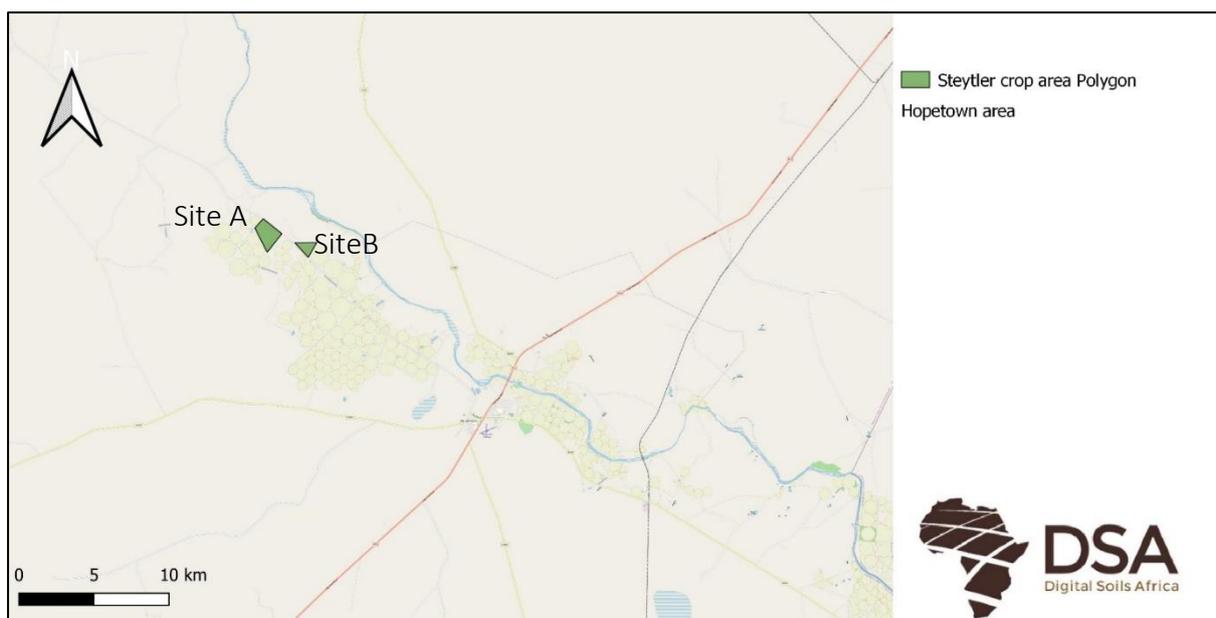


FIGURE 1: SITE LOCATION

The 21 digit Surveyor General code:

C03300000000007800000

The Remainder of Farm Naauwtesfontein No. 78 belongs to Mr. Jennings, with whom the Applicant has a rental agreement.

DESKTOP ANALYSIS OF THE SITE

LAND USE

The study area is zoned agricultural and as can be seen in the below image, the areas south, east, and west of both Site A and B are used for commercial irrigation. Overall the site itself can be mostly described as an area with a mix of shrubland and unimproved natural grassland.



FIGURE 2: LAND USE (SOURCE GOOGLE EARTH). THE RED POLYGON REPRESENTS SITE A AND B.

Onsite inspection indicates that the current status of the site has a low conservation value, and it is the author's view that this particular development can be integrated with the surrounding land uses. The development of agricultural land from grazing into crop production would also not compromise the needs and the wellbeing of future generations.

SITE INSPECTION

During the site inspection, it was clear that the site is used for grazing and is mostly surrounded by cultivation. The proposed area is used for grazing and signs of overgrazing were noted, especially in Site B.

PHOTO RECORD OF SITE A

Below are photos of Site A, representing Kimberley Thronveld that has been impacted through grazing.





PHOTO RECORD OF SITE B

Below are photos of Site B, representing Kimberley Thronveld that appears to be more impacted through grazing.





ENVIRONMENTAL SENSITIVITY THEMES

The Screening Tool Report identified certain environmental sensitivity themes and depending on the level of scoring (High, Medium, or Low) will determine what protocol criteria for specialist assessments and minimum report content should be provided.

As previously discussed, the Agricultural Theme, the Animal Sensitivity Theme, and the Paleontology Theme, for both Sites A and B were scored a medium sensitivity. In addition, the Plant Sensitivity Theme for Site B has also scored a medium sensitivity but low sensitivity for Site A.

All other themes, such as the Aquatic Biodiversity Theme, Archaeological and Cultural Heritage Theme, Civil Aviation Theme, the Defence Theme and Terrestrial Biodiversity Theme all scored a low sensitivity for both Sites A and B.

AGRICULTURAL THEME

The Agricultural Theme was given a medium sensitivity score for both Sites A and B. Considering the activity, clearing of vegetation to establish crops, the soil must be evaluated to conclude whether it is suitable for 1) irrigation and 2) the proposed crops to be planted. If the soil survey indicates that one of these is not feasible, the clearing of vegetation would be futile and the impact a highly negative result. In the Northern Cape, ploughing and irrigating soil can lead to serious degradation of soils.

The soil survey must aim to determine which areas would be suitable for irrigation. When land is irrigated it is necessary to understand the risks of waterlogging and salinization for it to be sustainable. Salinization is defined as the process where salts are accumulated within the soil, causing a white salt crust at the soil surface. This occurs due to insufficient rainfall not being able to flush out the salts from the crop root zone. Irrigated lands are more prone to salinization because of added salts brought in by irrigation water. The water is applied faster than it can be drained this causing salinization to increase. If this is not negated by proper management, the soil could reach the extent where it cannot be vegetated anymore.

It is for this reason that the properties of soil must be evaluated. The adherence of properties refers to the infiltration of water through the soil as well as the built-up of sodium and salt. The study area was thus investigated by a SACNASP registered soil scientist, to investigate the sustainability of the soil properties as well as areas where irrigation would be manageable whilst being sustainable.

In summary, the report found that the A and B horizons are characteristically sandy and therefore will facilitate good drainage. Most of the soils are very high-potential irrigation soils.

The soil texture results confirm the morphological interpretations and good drainage is expected on the soils.

The laboratory results indicate that the chemical parameters are manageable. The exchangeable sodium percentage (ESP) values are high. Thus, it indicates that although sodicity is not a general threat to irrigation on this site, Na in relation to other cations is high. On these soils this can be rectified with irrigation and fertilization on soils with adequate drainage, the Na should leach out and be replaced with Ca, Mg and K, lowering the ESP. This is confirmed by the very low E_c values.

Ultimately the soil report concluded that most of the surveyed area is suitable for irrigation, due to the free-draining soils and cracked rock underlying most profiles. The central area in Site A that is not suitable for irrigation is limited by external drainage. The soil report recommended that in Site A, the pivot placement does not exceed more than 10% of unsuitable soil in a pivot. Since Site B has small areas of moderately suitable soils for irrigation, these can be incorporated into pivots, and thus the pivot placement is not affected by suitability.

The soil suitability report is submitted with the Scoping Report that has evaluated the agricultural potential of the study area. It is recommended that the impact on the soil be discussed in the Environmental Impact Assessment.

ANIMAL SPECIES THEME

Animals play an important role in maintaining the functioning of any ecosystem, for example, pollination, spreading of seeds, removing of pests, trimming of vegetation, etc. The largest part of the Northern Cape falls within the Nama-Karoo biome with a vegetation of low shrubland, grass and trees limited to watercourses. The region is typically an arid environment and the terrain and general landscape do not represent much topographical variation. Therefore faunal species are generally widespread across the region, although some key biotopes such as rivers or pans, or the presence of a particular plant species can become an obvious niche for particular animal species that can result in a concentrate of species at a certain location.

The Animal Species Theme was given a medium sensitivity score for both Sites A and B. It should be noted that the proposed development will completely transform the vegetation and thus habitat on site.

The occurrence of faunal species within the proposed area is likely, however, the current status of animal diversity at the site is fairly limited due to the anthropogenic impact of the surrounding farming activities. It is farm properties and generally fenced-in camps, which will hinder the mobility of some of the larger wildlife that cannot jump a fence or the smaller wildlife that cannot borrow.

On the day of site inspection, the following animal species were noted at the site, steenbok (*Raphicerus campestris*), springbok (*Antidorcas marsupialis*) was within the abutting crop fields, mongoose (*Herpestidae*), and various common birds. A few burrows were noted and diggings out of old termite hills, which could indicate the presence of aardvark (*Orycteropus afer*). Thus the few wild animals remaining on-site have grown accustomed to human activities, but the movement is limited due to camp fencing.

The clearing of vegetation would be restricted to limited areas and the slow clearance rate would provide adequate time for migration of any animals remaining on-site to be sustained in similar adjoining habitats and therefore no detailed faunal survey would be recommended. Also, noise generated by vehicles will cause most animals to vacate the site temporarily. If certain species were to be affected they would simply vacate the proposed cleared areas during the day and return during the night. It is therefore not expected that the proposed development will have any impacts on sensitive animal species.

Due consideration has been given to the potential impact on the animal species and it is the EAP's professional opinion that a specialist survey and assessment is not required, however, the impact must still be discussed in the Environmental Impact Assessment.

PLANT SPECIES THEME

The Plant Species Theme was given a medium sensitivity score for both Sites B, but a low sensitivity score for Site A. According to Mucina and Rutherford (2006), the study area hosts the Kimberley Thronveld (SVk4) vegetation type, which in terms of conservation status is considered Least Threatened.

The site photos included in this verification report and preliminary investigation confirm that neither of the two Sites (A or B) is regarded as a site of ecological importance, nor does the study area have any high conservation value. According to desktop studies, the site does not fall within any CBA area. However, it is important to ground-truth the status, and a botanical

evaluation of the proposed development site will be conducted by a SACNASP registered botanist scientist.

The outcome of the Botanical evaluation report can also be applied to both the Plant Species theme, as well as the Terrestrial Biodiversity Theme and will be submitted with the Scoping Report. It is the EAP's professional opinion that the specialist's survey and assessment will be sufficient. It is recommended that the impact on the flora be discussed in the Environmental Impact Assessment.

ARCHAEOLOGICAL & HERITAGE IMPACT AND PALAEOONTOLOGICAL THEME

The Palaeontological Theme was given a medium sensitivity score for both Sites A and B. For this reason, a Heritage and Palaeontology report will be completed by Paleo Field Services, of which Dr. Lloyd Rossouw has a BA(Hons) (SU); MSc (Wits), Ph.D. (UFS) and is ASAPA registered and an application to SAHRIS will also be made online.

Due consideration has been given to the potential impact of the proposed development on heritage and palaeontological resources. It is the opinion of the EAP that all factors regarding the heritage and palaeontological theme have been taken into account in this site sensitivity verification report. It is recommended that the impact on heritage be discussed in the Environmental Impact Assessment.

AQUATIC BIODIVERSITY THEME

The proposed site falls within Lower Orange Water Management Area, in the D33G and the site is located within a Fish Support Area of the *Barbus anoplus*.

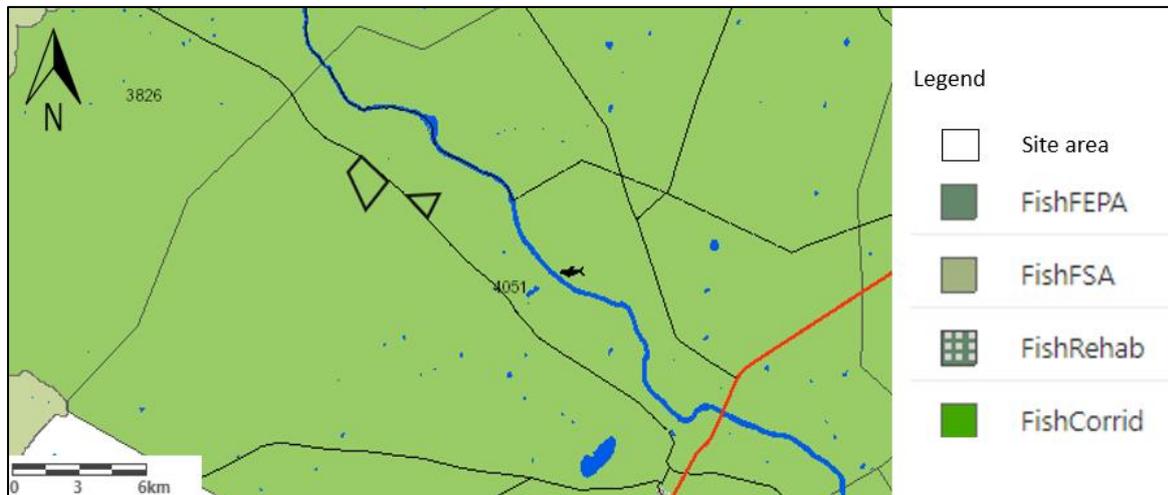


FIGURE 3: THE SITE FALLS WITHIN A FISH SUPPORT AREA.

The back fish symbol on the map (see Figure 3) indicates the presence of vulnerable or near-threatened fish populations. If it was a red fish symbol, it would have indicated that there is at least one 13 population of a critically endangered or endangered fish species within that sub-quaternary catchment. Some fish sanctuaries are FEPAs, with their associated sub-quaternary catchments shown in dark green; others are Fish Support Areas, with their associated sub-quaternary catchments shown in medium green, such as the proposed site.

A goal of NFEPA is to keep further freshwater species from becoming threatened and to prevent those fish species that are already threatened from going extinct. To achieve this, there should be no further deterioration in river condition in fish sanctuaries and no new permits should be issued for stocking invasive alien fish in farm dams in the associated sub-quaternary catchment. Since both Sites A and B do not host any water feature (wetland, drainage line, stream, or river) and are situated more than 1.8km from the Orange River, there is no impact expected on the *Barbus anoplus* fish sanctuary.

In terms of the possible impact on the fish sanctuary, the proposed development of crops, and the fact that both Site A & B is more than 1km from the Orange River, it is not foreseen that the proposed clearing of vegetation will have an impact on the water sources surrounding the site or the fish sanctuary.

The Aquatic Biodiversity Theme was also given a low sensitivity score for both Sites A and B. To assess the sensitivity of the site with regards to aquatic biodiversity, one has to establish what watercourses are present on the site, the functionality thereof, and if no watercourses are

present on the site, what impact would a development have on abutting watercourses, and the sensitivity and functionality thereof.

The study area is fairly flat with the majority of the area having an elevation of between 1114 and 1082 m and the study area does not host any watercourse.

Site A is situated more than 1.9km from the Orange River and about 244m south-west from a drainage line that drains towards the Orange River.

From a potential Na leaching point of view, small areas situated in the middle of Site A had a southern slope, however, due to the natural topography of the site, the drainage would be to the riverside (northeast). Furthermore, Site A is separated from these drainage lines with the R3112 and it is expected that any possible drainage from Site A will be diverted by the R3112 into the road reserve and not reach any natural drainage lines or the river.

Site B is situated more than 1.7km from the Orange River and more than 400m south of several drainage lines that drain towards the Orange River. The general slope of the area is northeast and drainage would occur in the north-eastern direction and could potentially drain into those drainage lines. Although a slope is present, it is insignificant due to the slope being too level and thus the sensitivity score being low.

From a potential Na leaching point of view and impact on abutting farms, it can also be concluded that farms close to the study area would possibly not be affected by drainage. Site A and B both showed a downward movement of the slope.

In conclusion, due consideration has been given to the potential impact of the proposed development on the aquatic environment. It is the opinion of the EAP that all factors regarding the aquatic theme were taken into account in this sensitivity verification report. The proposed development will pose a very limited if any impact on the drainage lines and Orange River.

Therefore, it is not required for an Aquatic Biodiversity Compliance Statement to be compiled, although the impact on surface water must still be discussed in the Environmental Impact Assessment.

CIVIL AVIATION THEME

The Hopetown airstrip is about 16km southeast of the proposed site. The landowner has a private landing strip about 200m east of Site B on the same property that is not under development. The proposed development is to transform grazing land into crops.

The proposed activity does not involve the construction of wind turbines, solar panels, high buildings/towers, or infrastructure. It is a development of maize/wheat/lucerne cropland. There will be no industrial factories that might cause air emissions to impair the vision of flight. The clearing of vegetation and the establishment of crops will not restrict the airspace.

It is the opinion of the EAP that the development will not have any impact on civil aviation and since the sensitivity of the Civil Aviation Theme, is regarded as 'low', it is therefore proposed that no further assessment is required.

DEFENCE THEME

There are no navy- or army bases, airforce bases, or special forces in or near Hopetown. The closest army bases are in Kimberley, Upington and Lohatla. According to the Defence Theme Protocol, the sensitivity is regarded as 'low'.

The proposed activity of agriculture will not impact any defense procedures (e.g. training, deployment, etc.) or could negatively impact defense protocols (e.g. intelligence, communications, etc.). It is therefore proposed that no further assessment is required.

TERRESTRIAL BIODIVERSITY THEME

Terrestrial Biodiversity can be defined as the variety of life on land that includes the fauna, flora, and habitat connectivity of an area. High biodiversity is often used as an indication of ecosystem health.

Desktop studies must be completed and the site must be plotted against various biodiversity plans, Province or Local related biodiversity plans, and maps. Thereafter, the onsite assessment must be completed to either confirm or refute the findings of the desktop studies.

In terms of this project, the locality of the proposed area was cross-referenced with the following conservation plans: the National Protected Area Expansion Strategy (NPAES); the Northern Cape Protected Area Expansion Strategy (NCPAES); the Northern Cape Biodiversity Conservation Plan; and the Spatial Development Framework of the Pixley Ka Seme District Municipality, since the Thembelihle Municipality does not have an SDF.

In terms of the NPAES, the proposed study area does not fall within any National Protected area, nor is close to any formal or informal protected area. In terms of the NCPAES the site does not fall within a focus area; and according to the Northern Cape Biodiversity Conservation Plan, the site does not fall within a Terrestrial CBA area.

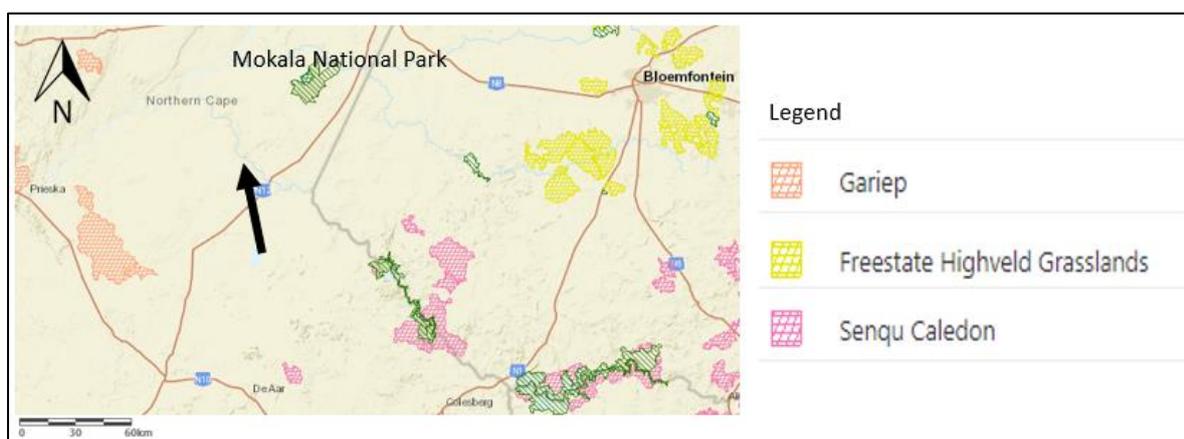


FIGURE 4: THE NATIONAL PROTECTED AREAS EXPANSION STRATEGY (NPAES) INDICATES THAT THE GARIEP FOCUS AREA, THE SENQU CALEDON FOCUS AREA, AND THE MOKALA NATIONAL PARK IS SITUATED MORE THAN 60KM FROM THE SITE. THE BLACK ARROW INDICATES THE LOCATION OF THE SITE.

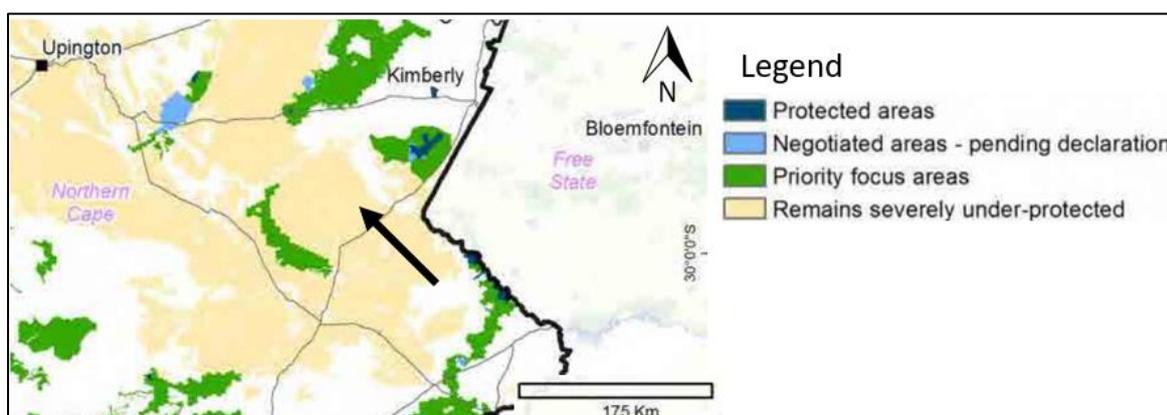


FIGURE 5: PRIORITY AREAS FOR THE PROTECTED AREA EXPANSION IN THE NORTHERN CAPE. THE BLACK ARROW INDICATES THE LOCATION OF THE SITE.

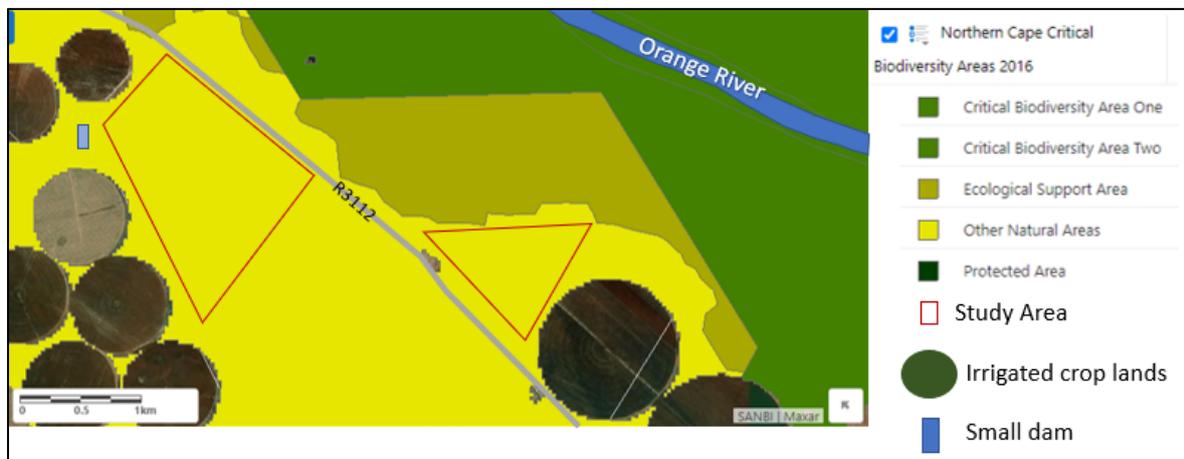


FIGURE 6: THE SITE FALLS WITHIN ‘OTHER NATURAL AREAS’ ACCORDING TO THE BGIS OF THE NORTHERN CAPE BIODIVERSITY CONSERVATION PLAN.

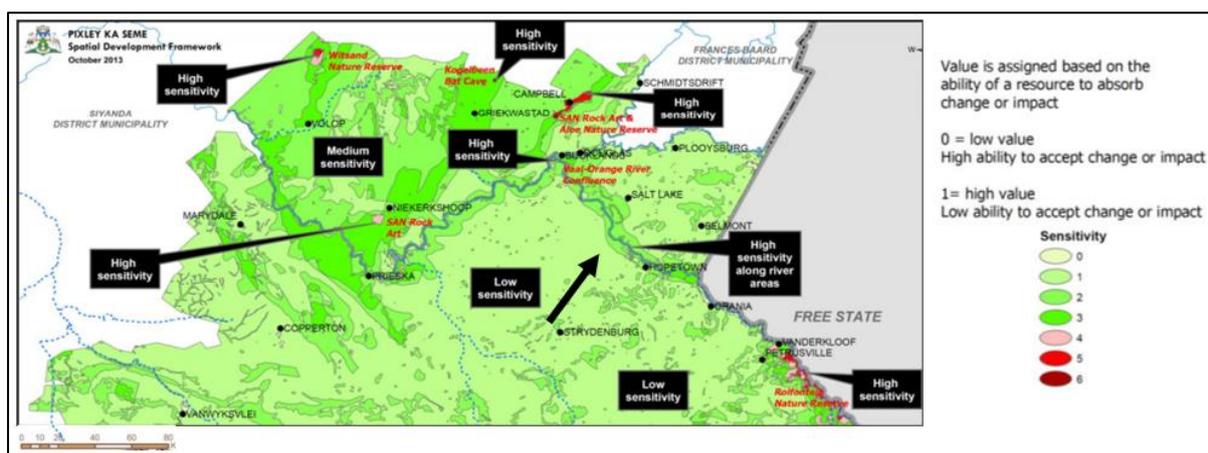


FIGURE 7: SENSITIVITY MAP OF THE PIXLEY KA SEME DISTRICT MUNICIPALITY. THE BLACK ARROW INDICATES THE LOCATION OF THE SITE.

The Thembelihle Municipality does not have a Spatial Development Framework, but the Pixley Ka Seme District Municipality has a Spatial Development Framework. According to this SDF, the site falls within an area that is rated as a low sensitivity area.

Considering all the maps available and data presented, it must be concluded that the NPAES, the Northern Cape PAES, the Northern Cape Biodiversity Conservation Plan (NCBCP), and the Pixley Ka Seme SDF all indicate that the proposed site does not fall within any biodiversity-sensitive area. While most of these plans are broad-based, regional/national plans are wide-scale plans and do not consider the land-use of the area and surround or site-specific features and locations. Others are more regionally specific, for example, if the Thembelihle Municipality had an SDF, it would have been considered a localised plan. Thus broad-based,

regional/national plans might indicate that a site is not sensitive, but localised plans might indicate otherwise, or *vice versa*.

To assess the sensitivity of the environment the onsite verification is therefore essential. The preliminary onsite investigation indicated that the site does not host sensitive fauna or flora, and could be preliminarily aligned with the desktop findings.

Nevertheless, in terms of the flora or habitat representation of the site, a Botanical evaluation of the proposed development site will be conducted by a SACNASP registered scientist, to assess if any natural vegetation is present on the proposed development site. The report would suffice to consider the impact on the ecology from a flora point of view, but will also be indicative of the ecological state and sensitivity. This will then be regarded as the localised plan and evaluation of onsite conditions.

In terms of the faunal component, the occurrence of faunal species within the proposed area is likely, however, it is farm properties and generally fenced-in camps, which hinders the mobility of some of the larger wildlife that cannot jump a fence or the smaller wildlife that cannot borrow, thus the corridor movement of animals has already been hindered, especially at Site A, which is separated from the intact northern areas by the R3112.

That said, on the day of the site visit a few springboks and a steenbokkie were noted on the farm feeding off the residue of the crops after harvest. Thus animals have become accustomed to human activity.

To minimise the impact on animals, the clearing of vegetation would be restricted to limited areas and the slow clearance rate would provide adequate time for migration of any animals remaining on-site to be sustained in similar adjoining habitats and therefore no detailed faunal survey would be recommended. Also, noise generated by vehicles will cause most animals to vacate the site temporarily. If certain species were to be affected they would simply vacate the proposed cleared areas during the day and return during the night.

The Screening Tool Report indicates that this site has the potential for low terrestrial biodiversity, most likely due to the anthropogenic impact, and therefore cannot fully function as a terrestrial biodiversity area unless the following is addressed:

- The immediate and surrounding land needs to be upgraded from agricultural land use to conservation, which will be a problem since the Applicant does not own all the abutting land is not in a position to enforce this transformation. In areas that do belong

to the Applicant the transformation from agriculture to conservation will result in income loss generated from farming and job losses will occur for farmworkers.

- All neighboring property owners must agree to conserve their properties and fences must be removed to ensure a suitable size area that is a viable conservation area that can host biodiversity and act as a corridor for animal movement.
- All alien vegetation must be removed and indigenous vegetation must be established.

In conclusion, the site has a low terrestrial biodiversity rating and for a conservation area to be successful it needs to interrelate with the broader landscape and socio-economic context within which they are situated. If surrounding areas are not going to change, the conservation of this section will be futile.

Since this development is not a wind turbine or solar farm application that could impact avifauna species, nor will it produce any pollutants or effluent that will impact terrestrial animals. Therefore, it is not required for a Terrestrial Biodiversity Compliance Statement to be compiled, although the impact should still be discussed in the Environmental Impact Assessment.

SPECIALIST ASSESSMENTS IDENTIFIED

Bases on the selected classification and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report, according to the Screening Tool Report. However, it is the responsibility of the EAP to confirm the list and to motivate with reason, for not including any of the identified specialists' studies in the report.

As previously indicated, the following specialist assessments were identified:

1. Agricultural Impact Assessment;
2. Landscape/Visual Impact Assessment;
3. Archaeological and Heritage Impact Assessment;
4. Palaeontological Impact Assessment;
5. Terrestrial Biodiversity Impact Assessment;
6. Aquatic Biodiversity Impact Assessment;
7. Hydrology Assessment;

8. Socio-Economic Assessment;
9. Plant Species Assessment; and
10. Animal Species Assessment.

AGRICULTURAL IMPACT ASSESSMENT

As discussed in detail under the heading 'Agricultural Theme', it was identified that a soil evaluation must be completed and was done by a SACNASP registered soil scientist. This specialist assessment will therefore be included in this study and is submitted with the Scoping Report.

LANDSCAPE/VISUAL IMPACT ASSESSMENT

The proposed development will result in the transformation of grazing land to crops. Site A and Site B directly abut cultivation land and the proposed development will be perceived as a continuation of such cultivation. Since the site is situated along the R3112 and the establishment of crops is proposed, it could very well fit in with the agricultural land use of the area from a scenic point of view, thus the development will tie in with the visual characteristics of the overall farming area.

Due consideration has been given to the potential visual impacts of the proposed development and it is the EAP's professional opinion that a specialist assessment is not required, however, the visual impact must still be discussed in the Environmental Impact Assessment.

ARCHAEOLOGICAL AND HERITAGE IMPACT ASSESSMENT & PALAEOLOGICAL IMPACT ASSESSMENT

An impact on the Palaeontological Heritage will only take place should any fossils be disturbed, damaged, destroyed, or permanently sealed-in at or below the ground surface and then no longer be available for scientific study.

A Heritage report will be completed by Paleo Field Services, of which Dr. Lloyd Rossouw has a BA(Hons) (SU); MSc (Wits), Ph.D. (UFS) and is ASAPA registered.

TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT

As discussed in detail under the heading 'Terrestrial Biodiversity Theme' it is not required for a Terrestrial Biodiversity Compliance Statement to be compiled, although the impact should still be discussed in the Environmental Impact Assessment.

AQUATIC BIODIVERSITY IMPACT ASSESSMENT

As discussed in detail under the heading 'Aquatic Biodiversity Theme', it is not required for an Aquatic Biodiversity Compliance Statement to be compiled, although the impact on surface water must still be discussed in the Environmental Impact Assessment.

HYDROLOGY ASSESSMENT

The overall proposed development will have a very limited, if any, impact on the hydrological systems. The development will not result in any generation of sewage, soil pollutants, extraction of borehole water, excavation resulting in exposing groundwater, or establishment of any activity on site that could potentially pollute or impact groundwater (e.g. underground storage tanks).

The leaching of Na is discussed under the 'Soil' heading of the Scoping Report, but considering the conclusions of the Soil Report, the leaching can be mitigated and no impact on abutting farms is expected.

It is the EAP's professional opinion that the proposed development will have no impact on groundwater and that most factors regarding the hydrology impacts have been taken into account in this site sensitivity verification report. Therefore, as the proposed development will have insignificant hydrological impacts, and a Hydrological Impact Assessment is thus not recommended.

SOCIO-ECONOMIC ASSESSMENT

During the construction phase, the development will provide permanent and casual work for several people, whether it is renting a bulldozer from a local company, employing workers to 1) remove the vegetation, 2) remove stones, 3) constructing the irrigation infrastructure, or 4) fencing the camps, etc. Once in operation and the crops are harvested, it will create job opportunities for harvesters, transport companies, etc. and must be seen as a positive contributor to upliftment of inhabitants of the Thembelihle Municipal area.

In terms of the socio-economic benefit, it is no secret that South Africa has one of the world's highest unemployment rates. While the Thembelihle Municipality 2017/2022 IDP indicating that the unemployment rate was about 28%, which is a very good variable in light of the 43% provincial unemployment figure, creating employment in the agricultural section is a step towards ensuring sustainable jobs. The agricultural industry plays a key role to generate economic activity, create jobs, earn foreign currency and stimulate rural economies in general.

It is thus clear that the proposed crop production, as proposed by the Applicant, will contribute to a small portion of the economic growth within the Thembelihle Municipal area. This development will not only benefit the Applicant but will also create job opportunities for 8-12 low-income households that will assist in poverty alleviation.

In terms of the negative impacts, it could potentially pose some social impacts on residents in terms of safety and security issues, nuisance factors such as dust & noise generation. However, the Applicant is a farmer and has a close relationship with the local community. Most of the families employed on the farm will be from families that have been on the farm for generations, which is the basis of their mutual trust between each other. The Applicant will therefore employ local community members known to the farming community, which is in line with current farming practices.

Due consideration has been given to the potential socio-economic impact of the proposed development. It is EAP's professional opinion that most factors regarding the socio-economic impact have been taken into account in this site sensitivity verification report. Therefore, as the proposed development will have a positive socio-economic impact, a Socio-Economic Impact Assessment is thus not required, although the impact on socio-economic must still be discussed in the Environmental Impact Assessment.

PLANT SPECIES ASSESSMENT

As discussed in detail under the heading 'Plant Species Theme', it was identified that a botanical evaluation must be completed and was done by a SACNASP registered botanical scientist. This specialist assessment will therefore be included in the EIA Report.

ANIMAL SPECIES ASSESSMENT

As discussed in detail under the heading 'Animal Species Theme', it is not required that a specialist survey and assessment be conducted, however, the impact must still be discussed in the Environmental Impact Assessment.

CONCLUSION OF SITE SENSITIVITY VERIFICATION REPORT

Digital Soils Africa (DSA) was appointed by Mr. G.F. Steytler to facilitate the Scoping and Environmental Assessment Report (EIA) for the proposed development of transforming grazing land into crop fields.

The proposed development will result in the establishment of about 177Ha of maize/wheat and lucerne on rotating years.

There will be environmental impacts, but all could be mitigated and reduced to limited impacts on the surroundings. The proposed development will have a positive socio-economic outcome on the surrounding community. A Screening Tool Report has been generated for the proposed development and various themes were rated and specialist studies listed.

As mentioned above soil suitability (agricultural impact)-, botanical survey- and archaeological assessment were identified as specialist studies to be completed for the proposed development.

According to the professional opinion of the EAP and the outcome of this Site Verification Report the remaining specialist assessments identified in the Screening Tool Report do not require further specialist input. It is recommended to the Department of Agriculture, Environmental Affairs, Rural Development and Land Reform that the listed specialist studies

are not necessary to be conducted, rather all direct, indirect and cumulative impacts must still be discussed in the EIA.

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SANBI National Land Cover, 2014. http://bgisviewer.sanbi.org/Html5Viewer/Index.html?configBase=http://bgisviewer.sanbi.org/Geocortex/Essentials/REST/sites/2013__14_South_African_National_Landcover/viewers/2014_National_Landcover/virtualdirectory/Resources/Config/Default&user=&extent=&layerTheme= 02/08/2021, 11:30.

Thembelihle Municipality IDP 2017/2022: Integrated Development Plan (Final).

Pixley Ka Seme District Municipality Spatial Development Plan.

APPENDIX E – SPECIALIST REPORTS

At this stage, only the Soil report was completed. During the EIA Phase, a vegetation report and Heritage Report will be completed and available for comment during the Draft EIA Phase of the public participation process.

A vegetation survey and report will be completed and a Heritage and Paleontology report.



Irrigation potential of Naauwtesfontein 78, Hopetown, Northern Cape Province

June 2021

Dr D Boucher



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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

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.

JAN-DIRK MARX

EDUCATION

B.Sc. Soil Science	University of the Free State	2019
Matric certificate	Secunda High School	2015

PROFESSIONAL AFFILIATIONS

WORK EXPERIENCE

- **Digital Soils Africa** / Soil Scientist -January 2020– Present

SPECIALIST DECLARATION

I, Jan-Dirk Marx, 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.

Jmarx

Jan-Dirk Marx

- SACNASP- 132344

EXECUTIVE SUMMARY

A soil survey was conducted at Naauwtesfontein 78 Farm on approximately 288 ha of land near Hopetown in the Northern Cape to determine whether the land would be suitable for irrigation. The soil forms observed included the Coega, Glenrosa, Kimberley, Olienhout, Nkonkoni, and Plooyburg. The Nkonkoni, Glenrosa, Olienhout, and Kimberley soil forms were generally considered suitable for irrigation, while portions of the Nkonkoni, Glenrosa, and Plooyburg soil forms were only moderately suitable due to the depth of limiting material. The Coega soil form and portion of the Olienhout soil forms were considered not suitable for irrigation.

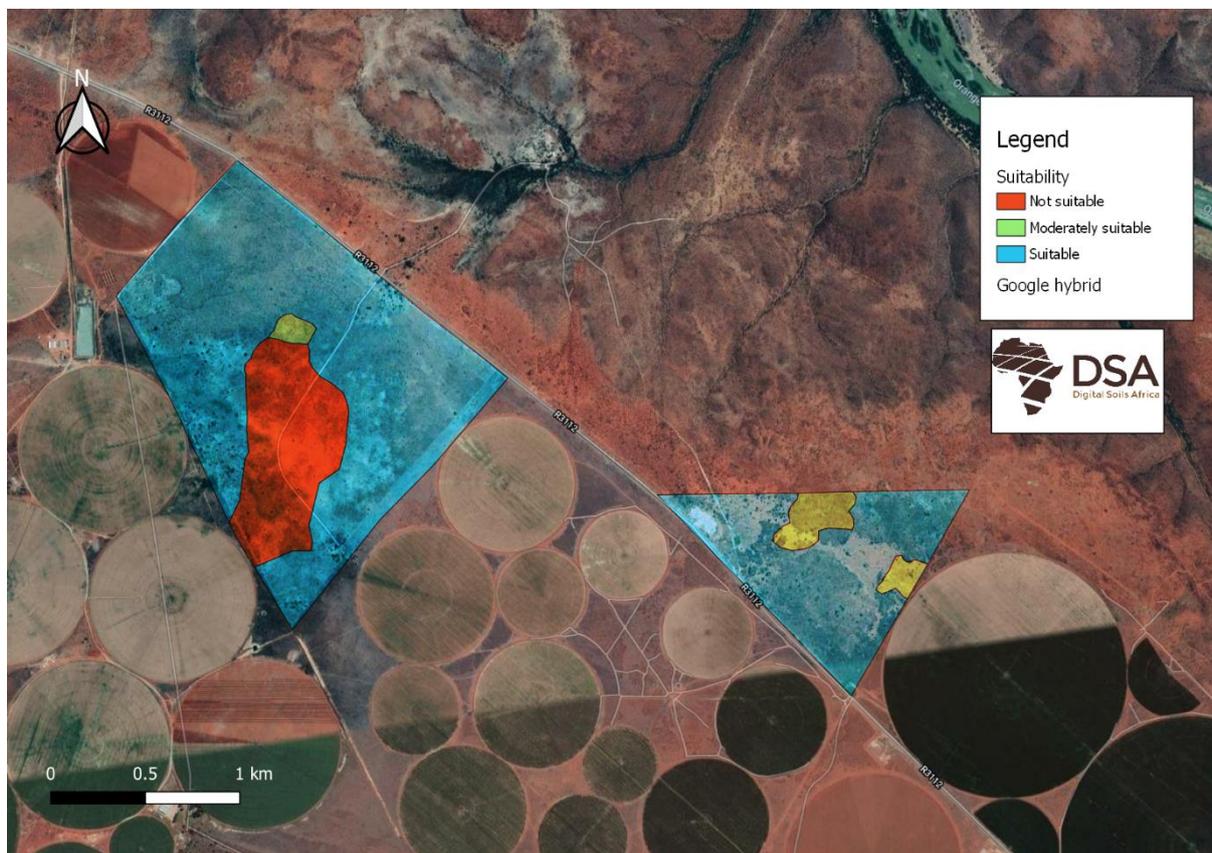


FIGURE 15: SUITABILITY OF THE STUDY AREA.

INTRODUCTION

Digital Soils Africa conducted a soil Survey on approximately 288 ha on the farm Naauwtesfontein 78 near Hopetown in the Northern Cape Province. The survey aimed to determine which areas would be suitable for irrigation. When land is irrigated it is necessary to understand the risks of waterlogging and salinization for it to be sustainable. Salinization is defined as the process where salts are accumulated within the soil, causing a white salt crust at the soil surface. This occurs due to insufficient rainfall not being able to flush out the salts from the crop root zone. Irrigated lands are more prone to salinization because of added salts brought in by irrigation water. The water is applied faster than it can be drained, thus causing salinization to increase. If this is not negated by proper management, the soil could reach the extent where it cannot be vegetated anymore. It is for this reason that the Department of Agriculture, Northern Cape has provided guidelines to which the properties of soil must adhere before a ploughing license can be granted. The adherence of properties refers to the infiltration of water through the soil as well as the built-up of sodium and salt. The focus site was thus investigated for the sustainability of the soil properties as well as areas where irrigation would be manageable whilst being sustainable (Gupta, et al., 2008).

LOCATION

The farm Naauwtesfontein 78 is situated approximately 21 km outside of Hopetown. The area is southeast of Douglas on the R3112. The coordinates of the study area are presented in Table 1.

TABLE 1: COORDINATES OF SELECTED POINTS ON THE PERIMETER OF THE STUDIED AREA

Name	X	Y
1	23.9416904222	-29.5019396933
	23.9356086947	-29.5079316023
	23.9553100656	-29.5115377591
	23.9444743116	-29.5226163365
	23.9356086947	-29.5079316023

TABLE 2: COORDINATES OF SELECTED POINTS ON THE PERIMETER OF THE STUDIED AREA

Name	X	Y
2	23.9628265670	-29.5166718848
	23.9785448347	-29.5164482623
	23.9725915943	-29.5255232140



FIGURE 1: The farm Naauwtesfontein 78 near Hopetown.

METHODOLOGICAL APPROACH

DESKTOP SURVEY

A field visit was conducted on the 5th and 6th of May 2021. A total of 73 profiles were opened by the client using a TLB, the profiles were opened to 2 m or until a restricted layer was reached. Soils were classified according to Soil Classification: A Natural and Anthropogenic System for South Africa (2018) which is now the officially recognized classification system for South African soils. Soil depth, freely drainable depth, and limiting material were noted and mapped. Samples were taken at 4 profiles due to the soil being homogenous. The profiles sampled were 8, 48, 58, and 71. A total of 8 samples were analyzed which included 4 topsoil horizons (0-300 mm) and 4 subsoil horizons (300-700 mm). The texture was measured with the pipette method, basic cations from a 1:10 NH₄OAc extract (White 2006), and soil pH in a 1:2.5 KCl extract. Phosphorus was measured with Bray I method.

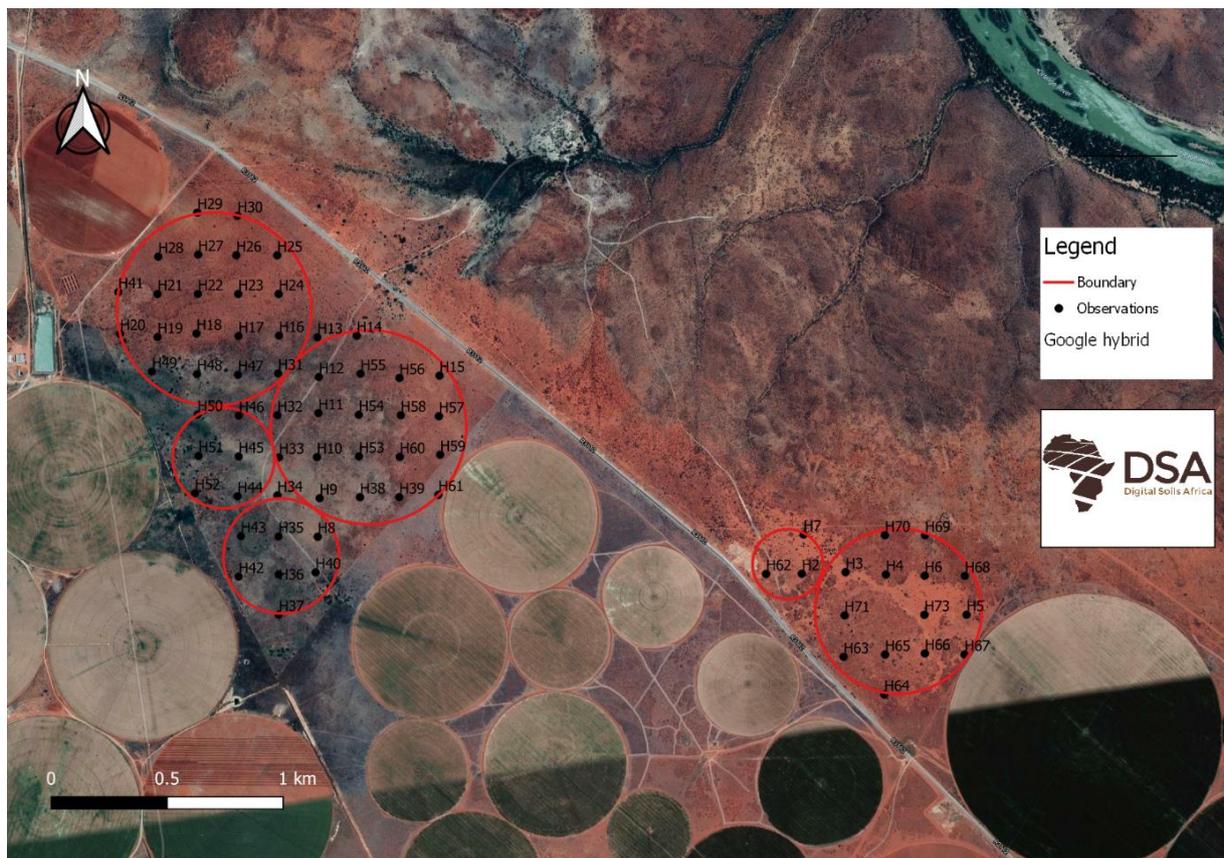


FIGURE 2: THE LOCATION OF THE OBSERVATIONS.

RESULTS

SOIL FORMS

The Nkonkoni (97 ha) and the Plooyburg (65 ha) soil forms are the dominant soil forms in the study area (Figure 3). The Kimberley soil form was found in the northern and southern sides of the study areas and covered approximately 57 ha. The Glenrosa soil form (36 ha) was observed in the northern and eastern sides. The Coega and Olienhout soil forms occurred the least in the study area with the Coega covering 21 ha and the Olienhout 9 ha.

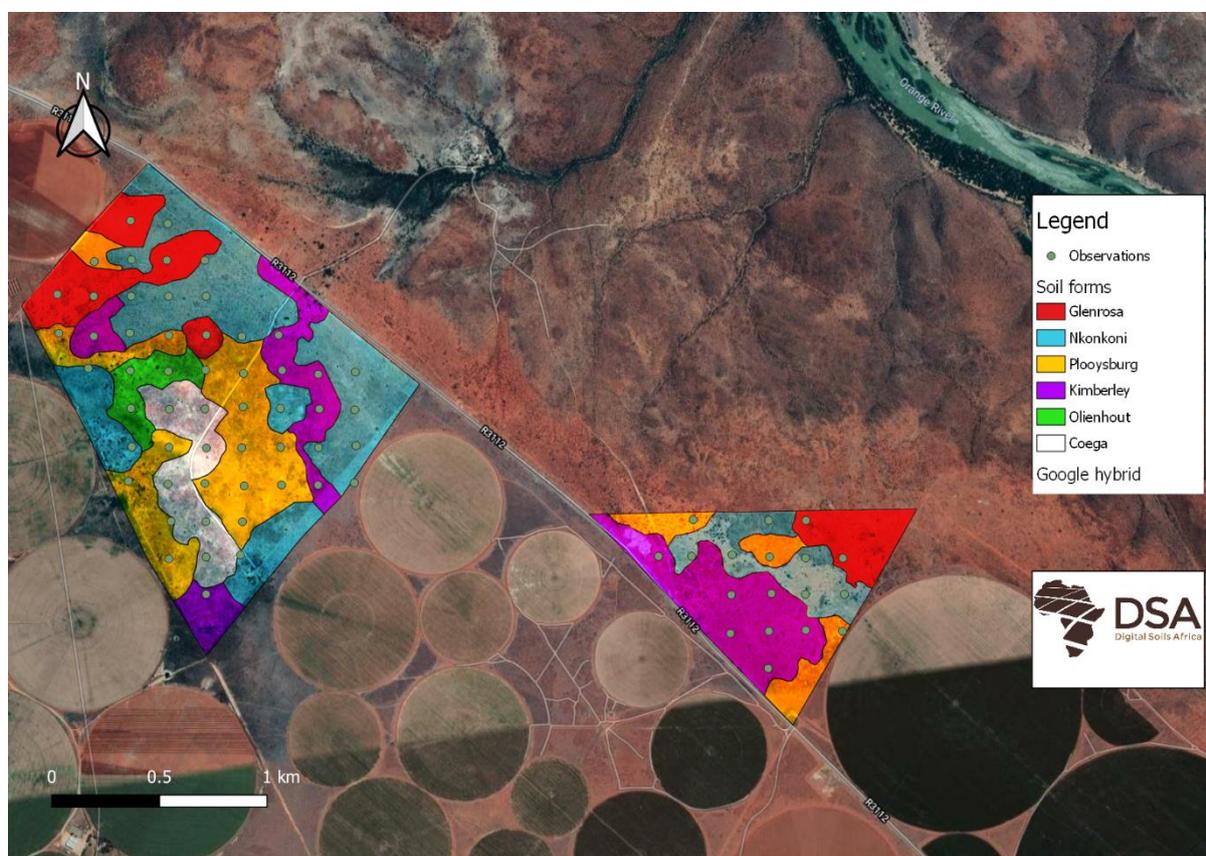


FIGURE 3: SOIL FORMS IN THE STUDY SITE.

NKONKONI 2111

The Nkonkoni soil form consists of an Orthic A (200 mm for the study area) overlying a Red Apedal horizon on a Lithic horizon. The thickness of the Red Apedal varied between 500-1800 mm. The Lithic horizon varied between 700 and 2000 mm. The 2311 soil family has a Chromic topsoil horizon and a Dystrophicphic, aluvic subsoil horizon on a saprolithic horizon. The depths of the Nkonkoni soil form were the main indicator used for the suitability of irrigation. The Nkonkoni soil forms were the most dominant soil in the study area, and only 13 % of the Nkonkoni soil forms weren't suitable for irrigation practices due to depth.

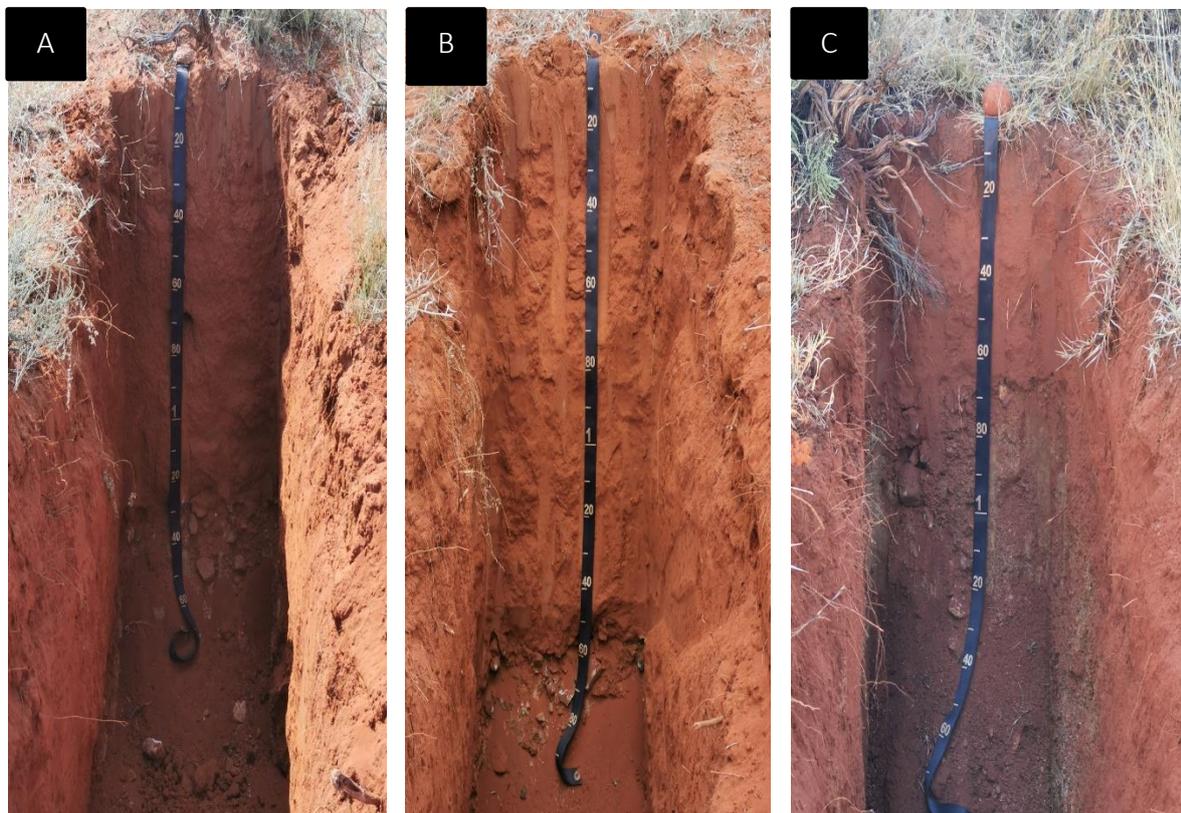


FIGURE 4: NKONKONI SOIL FORMS.

PLOOYSBURG 2100

The Plooyburg soil form consists of an Orthic A, overlaying a Red Apedal horizon on Hard Carbonate. The Orthic A thickness ranged from 200-300 mm and the Red Apedal ranged from 400-2000 mm. The 2100 family consists of a Chromic topsoil horizon overlaying Dystrophic, aluvic Red Apedal horizon on Hard Carbonate. About 36 % of the Plooyburg soil forms were too shallow for irrigation with depths of 600-700 mm.

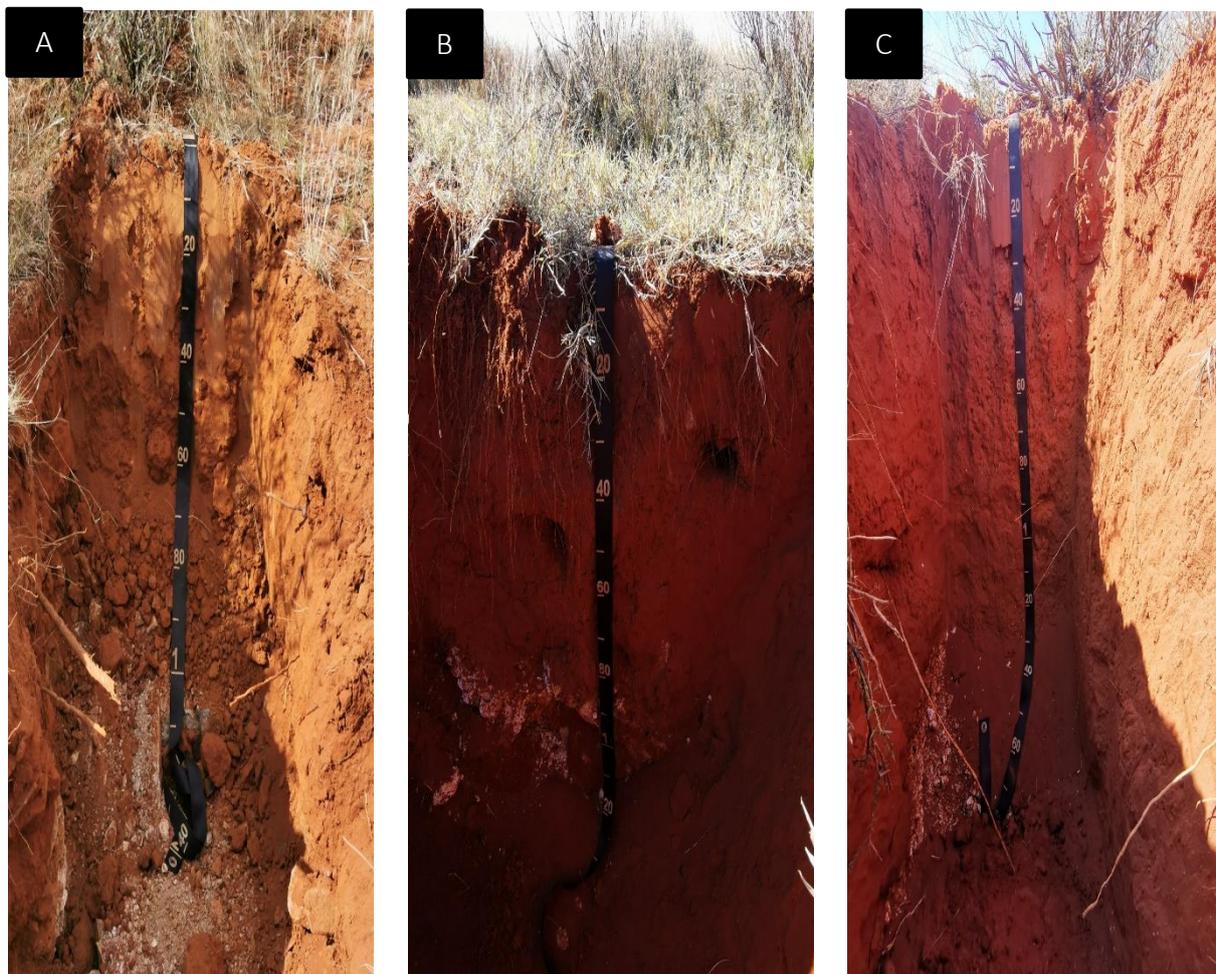


FIGURE 5: PLOOYSBURG SOIL FORMS.

COEGA 2100

The Coega soil form consists of an Orthic A with Hard Carbonate underlying it. The Coega soils found on site had a maximum depth of 400 mm. Sepiolite was not present within the hard carbonate. Hard carbonate is massive, vesicular, or platy and has a hard to extremely hard consistency. It was observed that the majority of hard carbonate of the Coega's could not be broken to such an extent that irrigation would be suitable thus giving the reason that the hard carbonate would not be able to be mechanically ripped.

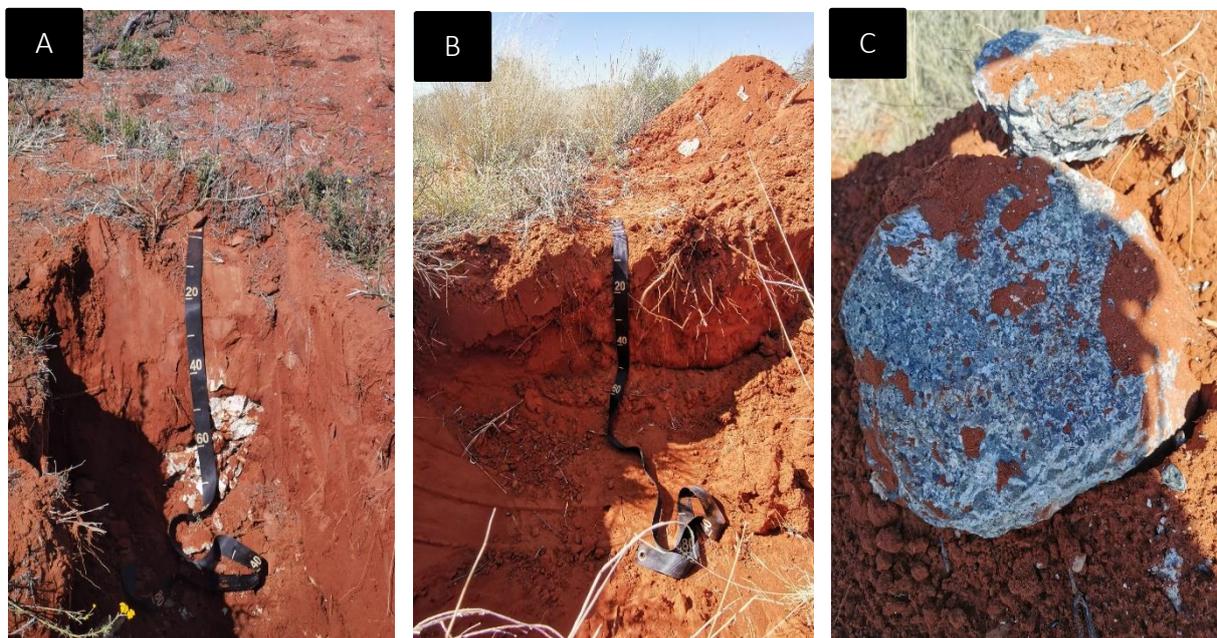


FIGURE 6: COEGA SOIL FORMS.

GLENROSA 2210

The Glenrosa soil consists of an Orthic A horizon on a Lithic horizon. The Lithic horizon was classified as calcareous, Saprolithic which is a highly weathered rock material with a friable to slightly hard consistence. The Glenrosa was only found on a small part of the study area and had a maximum depth of 1200 mm. Calcareous concretions were present within the Lithic horizon. Glenrosa soils are characterized by weathering shale parent material. If the material is soft, weathered, and/or layering is vertically positioned, it will favor root penetration to greater depths. The Glenrosa soils were classified as suitable and moderately suitable for irrigation if the depths were more than 1 m. Where depths didn't exceed 1 m it was observed that the lithic horizon was of such extent that although the profile did not exceed 1 m, infiltration would still be possible to such depths.

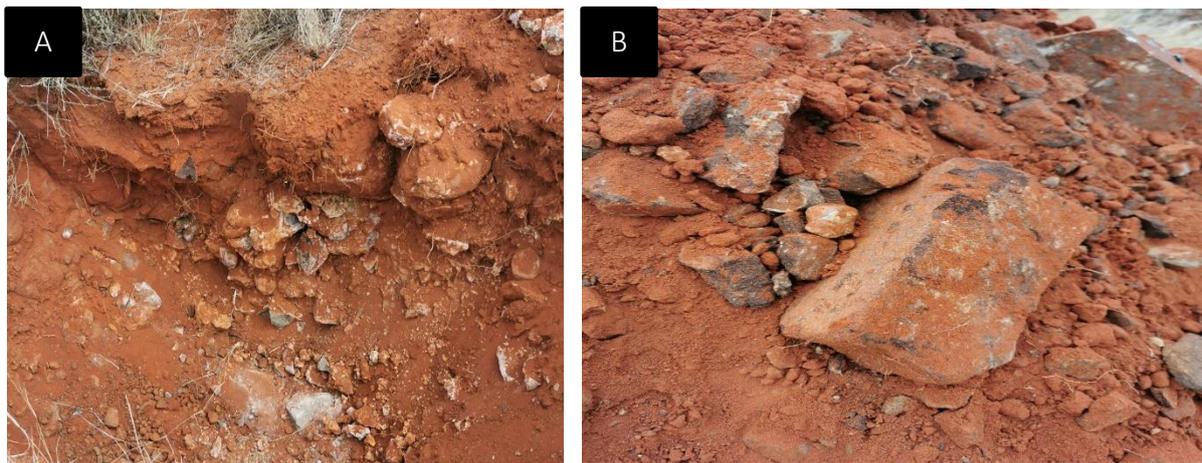


FIGURE 7: GLENROSA SOIL FORMS.

KIMBERLEY 2100

The Kimberley soil form consists of an Orthic A overlaying a Red apedal on Soft Carbonate. The 2100 family has a Chromic A horizon overlaying an Aluvic Red Apedal. The Kimberley soil form was only found on a small part of the focus area and had depths of 1200-2000. The Kimberley soils were considered suitable for irrigation.

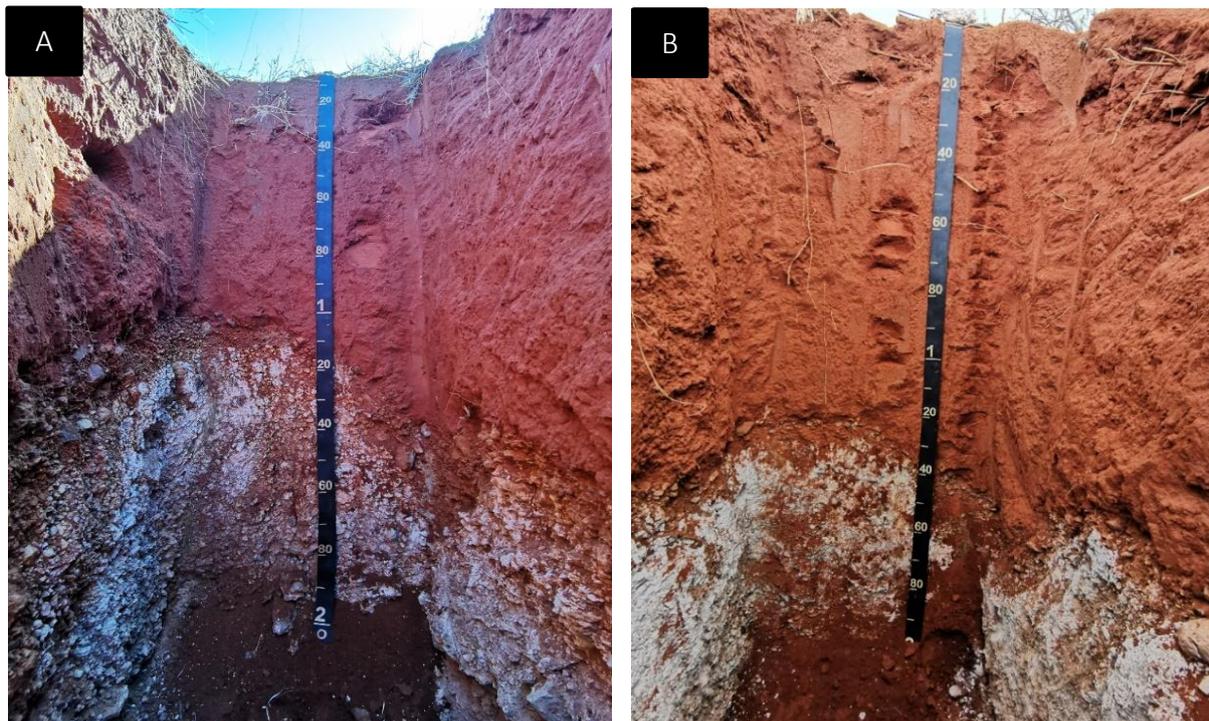


FIGURE 8: KIMBERLEY SOIL FORMS.

OLIENHOUT 2200

The Olienhout soil form consists of an Orthic A on Soft Carbonate on Hard Carbonate. The topsoil also contained carbonate. The depths of the Olienhout ranged between 800-1200 mm. The Hard Carbonate for the Olienhout soil form started at 800- 1200 mm thus only leaving the Soft Carbonate which is easily ripped. 40 % of the Olienhout soil form was not suitable for irrigation due to the soil not meeting the required depths.

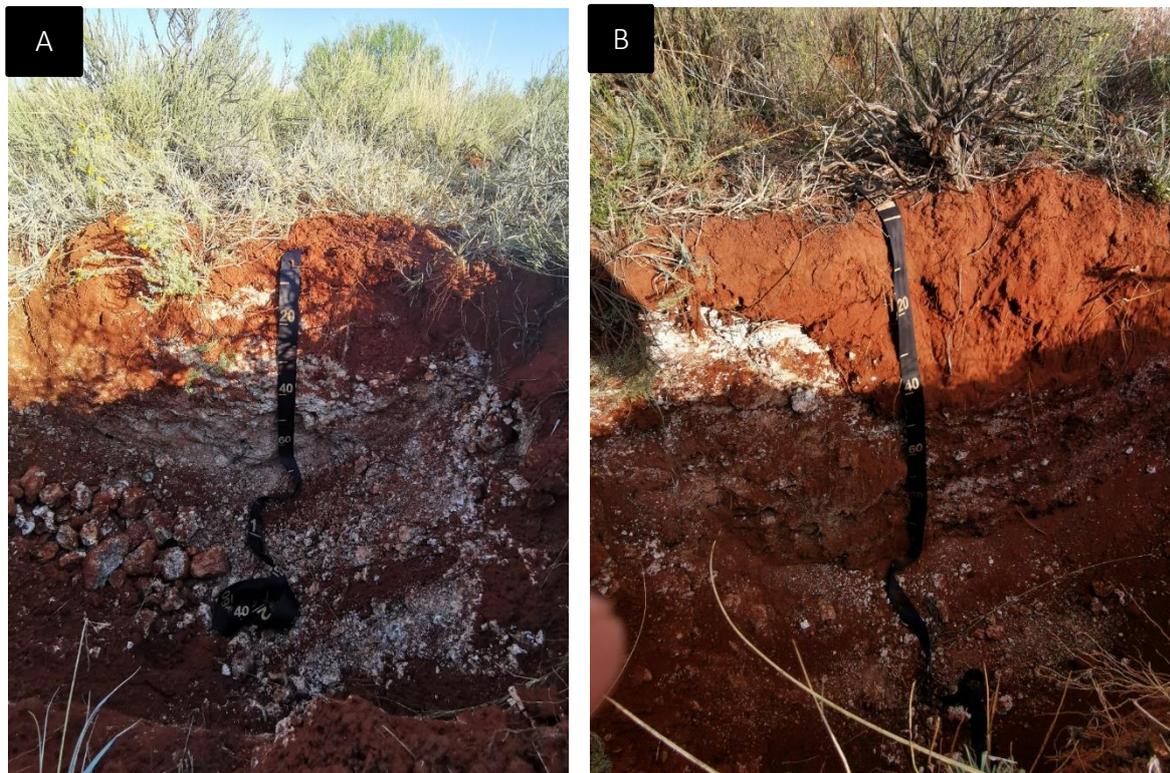


FIGURE 9: OLIENHOUT SOIL FORMS.

SOIL DEPTHS

The soils of the study area are quite deep with most of the soils ranging from 1.01-2 m in depth. A small portion of the area had depths below 0.5 m (Figure 10). The Coega soils were associated with the 0-0.5 m soil depths. The only restricting layers were hard carbonate and the lithic horizons. The hard carbonate was found within the Coega, Plooyburg, and Olienhout soil forms, while the lithic was found within the Nkonkoni and Glenrosa soil forms. The Lithic horizon had a restricting layer at 800 mm depths at certain profiles where the TLB did not go further. Upon further inspection of the profiles, it was found that the lithic horizon could be ripped and thus giving way to depths more suitable for irrigation (Figure 11).

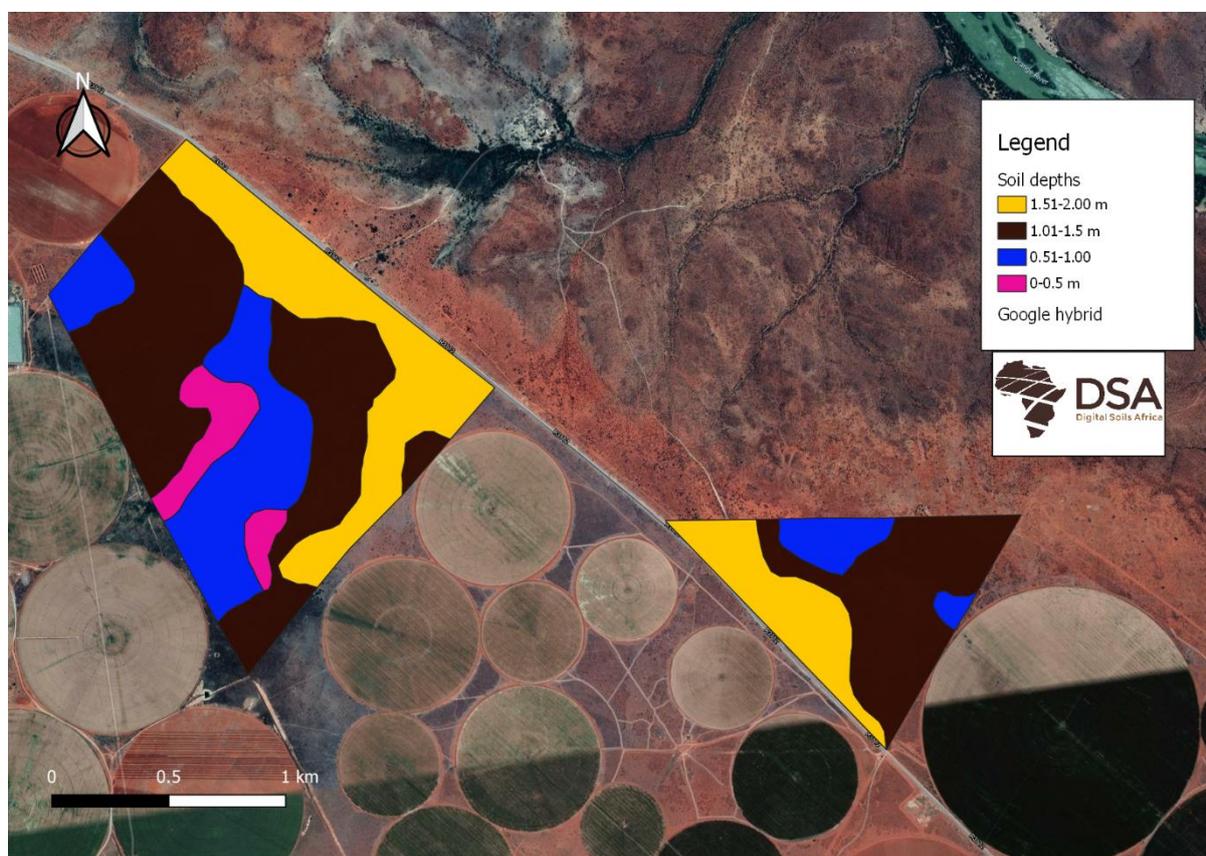


FIGURE 10: TOTAL SOIL DEPTHS.

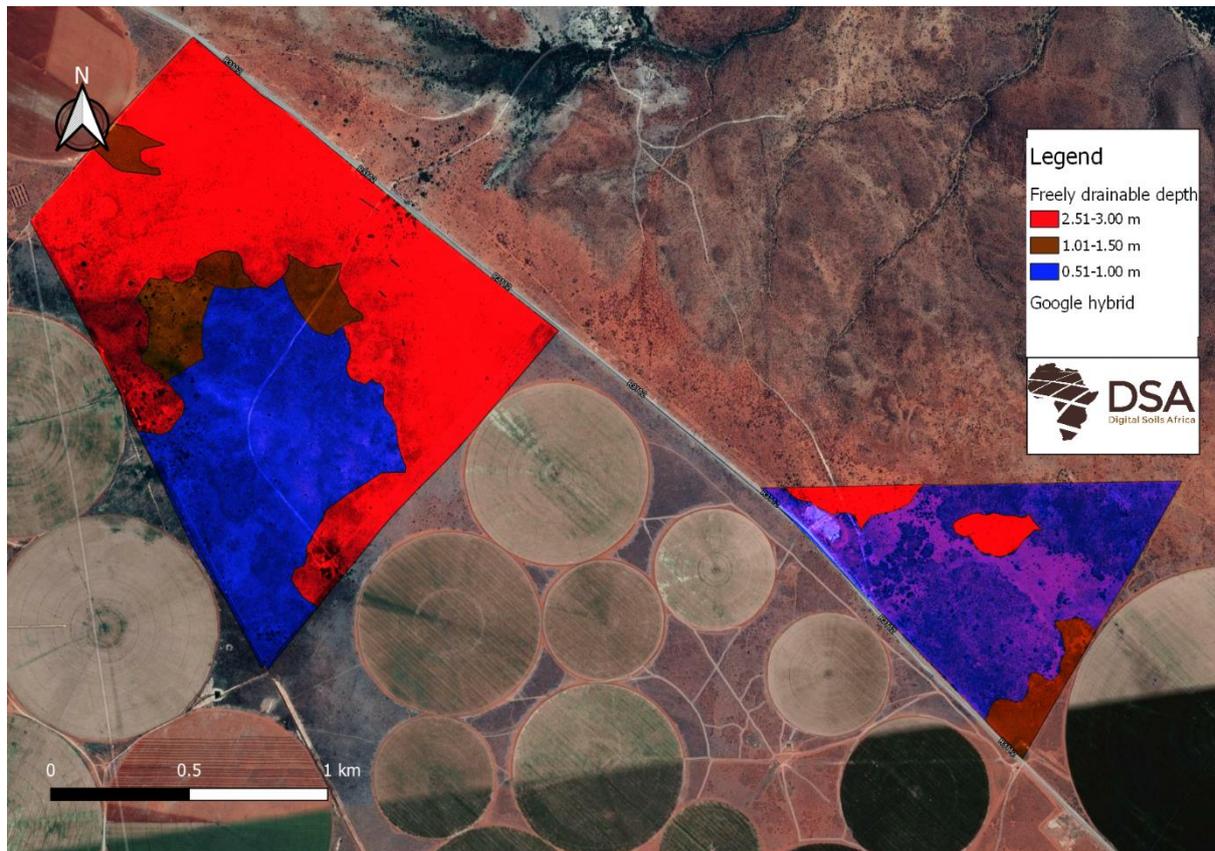


FIGURE 11: FREELY DRAINED DEPTH FOR STUDY AREA.

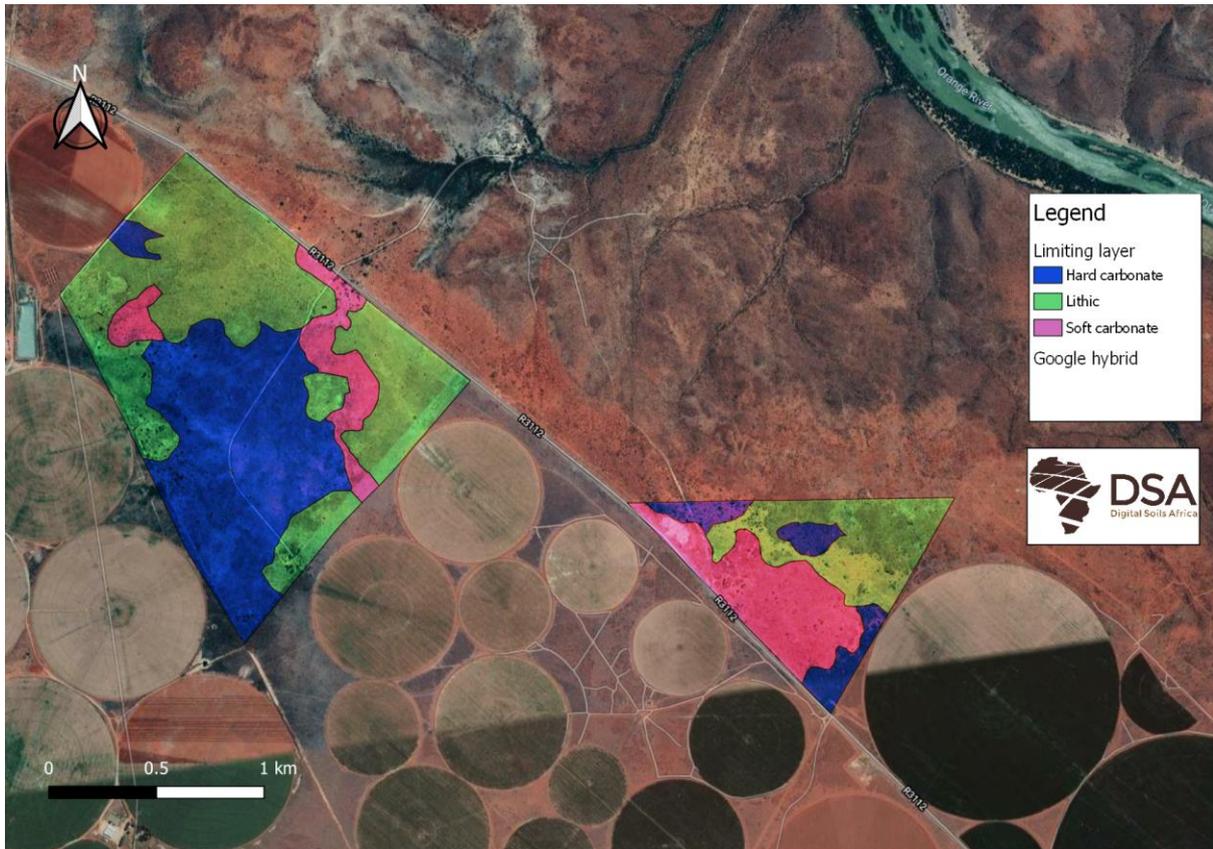


FIGURE 12: LIMITING LAYERS.

SLOPE

The topography of the area was relatively flat with the majority of the area having an elevation of between 1114 and 1082 m. The only area where a decrease in elevation can be seen is on the North-eastern side closer to the river (Figure 13). The slope was northeast and drainage would occur in the north-eastern direction. Although a slope was present, it was insignificant due to the slope being too level. It can thus be concluded that farms close to the study area would possibly not be affected by drainage. Small areas situated in the middle of site 1 had a southern slope. As seen in Figure 13, the drainage would be to the riverside (northeast). Site 1 and 2 both showed a downward movement of the slope.

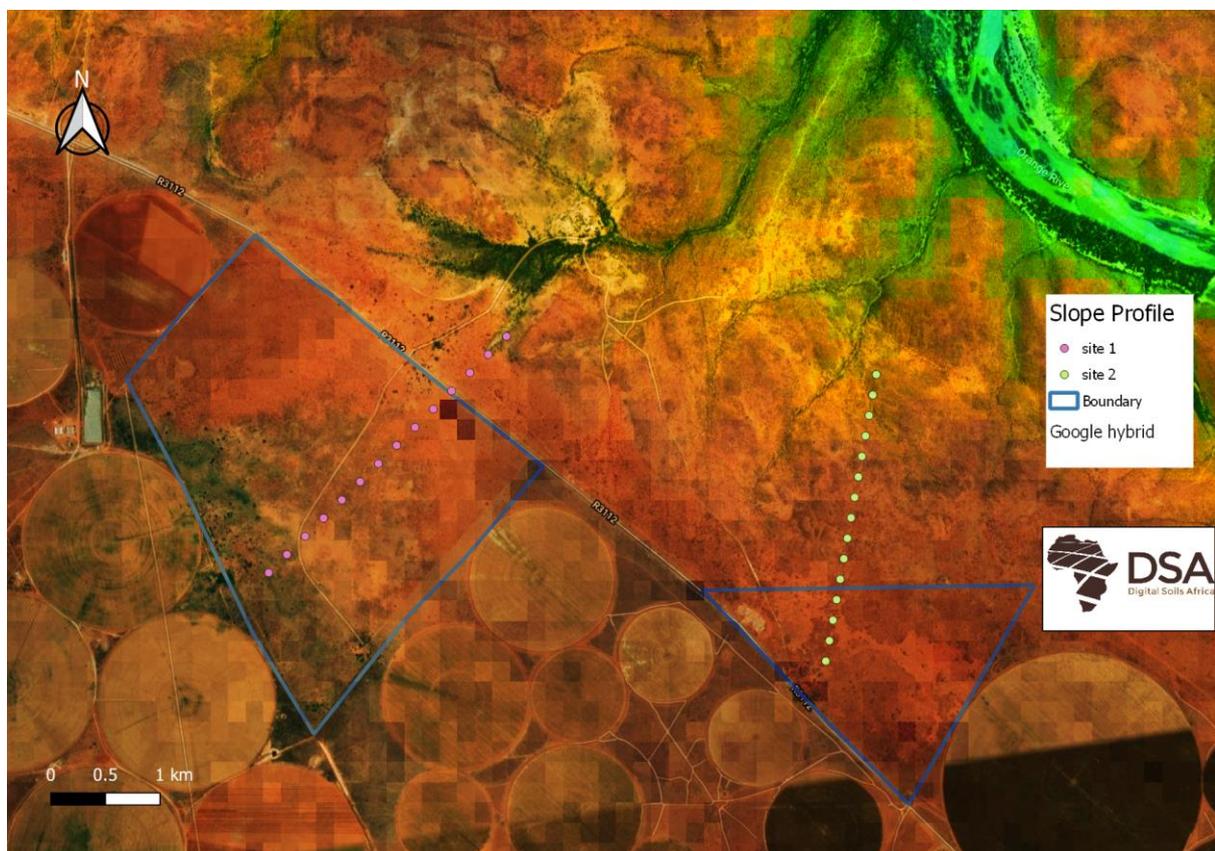


FIGURE 13: DIGITAL ELEVATION MODEL.

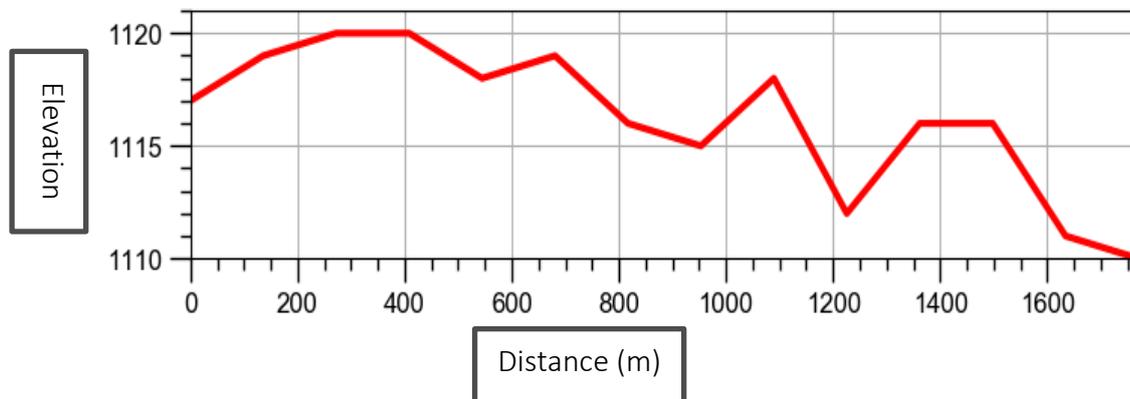


FIGURE 14 A: SLOPE FOR SITE 1.

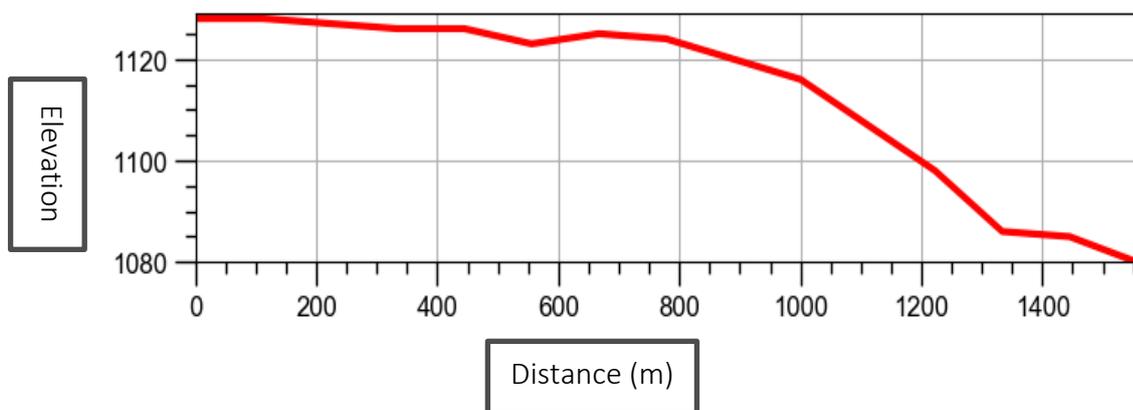


FIGURE 14 B: SLOPE FOR SITE 2.

CHEMICAL AND TEXTURAL ANALYSIS

The chemical properties of the soils are similar with small variations. The A and B horizons are chemically very similar. The pH is slightly acidic and ranges from 5.56 to 5.94, indicating that there is no salinity evident from the pH values. The pH values can be altered from a fertility perspective.

The Cation Exchange Capacity (CEC) is extremely low (2.63-4.38 $\text{cmol}(+)/\text{kg}$), this, in turn, has a pronounced effect on the Exchangeable Sodium Percentage (ESP). The ESP is very high and especially high for a red apedal soil. Since ESP is a percentage of the Na to CEC, the low CEC can exaggerate the ESP. An exaggerated ESP is supported by the low Electrical Conductivity of the soils. The irrigation threshold of EC for water is 400 mS/m . These soils can be rectified with irrigation and fertilization on soils with adequate drainage, the Na should leach out and be replaced with Ca, Ma and K, lowering the ESP.

TABLE 3: SELECTED CHEMICAL PROPERTIES FOR MODAL SOIL PROFILES

Sample	Soil Form	Diagnostic	pH	CEC	ESP	E _{ce}
		Horizon	KCl	cmol (+)/kg	%	mS/m
H8	Plooyburg	Orthic A	5.56	3.00	28.60	31.5
		Red apedal B	5.72	2.63	26.94	82.2
H48	Plooyburg	Orthic A	5.69	3.37	25.05	38.7
		Red Apedal B	5.68	3.47	28.88	35.9
H58	Kimberley	Orthic A	5.65	2.79	24.07	24.45
		Red Apedal B	5.82	2.85	25.77	20.59
H71	Kimberley	Orthic A	5.69	2.80	25.51	19.37
		Red Apedal B	5.94	4.38	21.60	25.15

Clay percentages are generally low and very sandy. Most soils will have good drainage, but soil water holding capacity and fertility will be low and will require good management. Since the soils are generally sandy, the soil depth would be the biggest contributing factor to drainage.

The laboratory results indicate that the chemical parameters are manageable, provided there is sufficient physical drainage. The texture results show that in general, the soils do have sufficient drainage.

TABLE 4: PARTICLE SIZE DISTRIBUTION OF MODAL SOIL PROFILES

Sample	Soil Form	Diagnostic	Texture		
		Horizon	% Clay	% Silt	% Sand
H8	Plooyburg	Orthic A	8.6	2.4	89.9
		Red apedal B	7.2	2.8	91.3
H48	Plooyburg	Orthic A	6.4	3.4	91.8
		Red Apedal B	6.6	3.2	91.6
H58	Kimberley	Orthic A	6.8	3.0	92.0
		Red Apedal B	6.8	2.4	91.6
H71	Kimberley	Orthic A	9.6	2.4	88.5
		Red Apedal B	9.2	4.0	87.7

SUITABILITY

Most of the surveyed area is suitable for irrigation, due to the free-draining soils and cracked rock underlying most profiles. Both areas not suitable for irrigation are limited by external drainage. One area is underlain by a hardpan carbonate horizon, which is an indication of water accumulation in arid climates, and the other by hard rock. The area suitable for irrigation's perimeter points is given in Table 5.

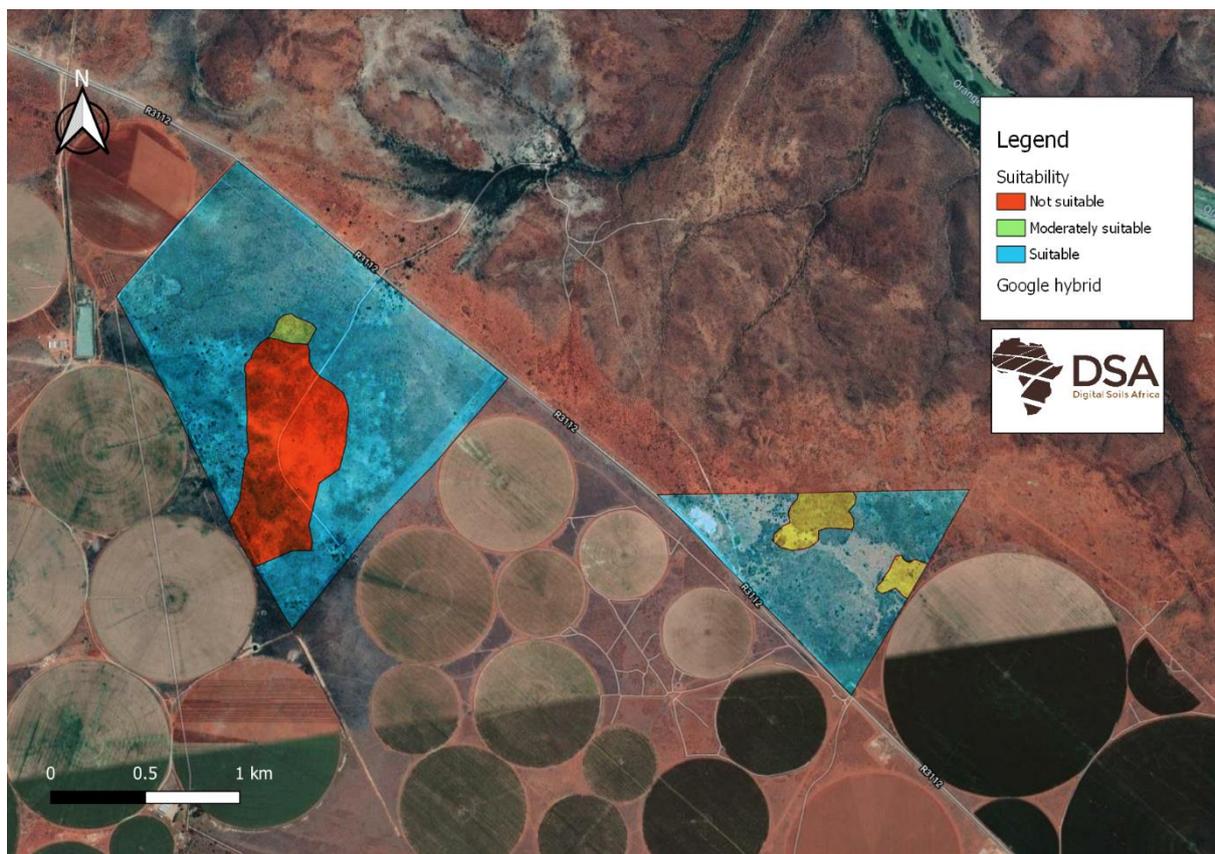


FIGURE 15: SUITABILITY OF THE STUDY AREA.

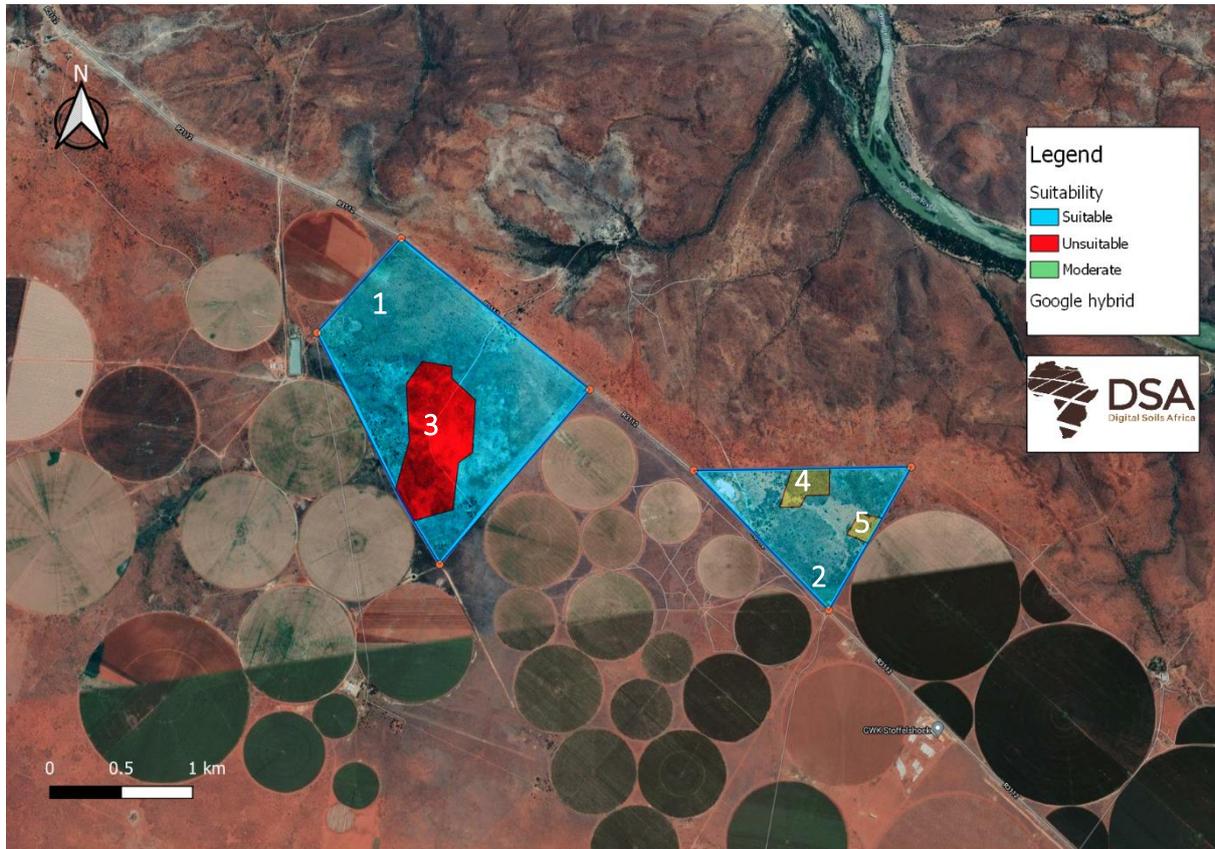


FIGURE 16: SUITABILITY WITH COORDINATE POINTS.

TABLE 5: THE COORDINATES OF THE CORNERS OF THE PERIMETER OF SUITABLE AREA

Area	Suitability	X	Y
1	Suitable	23.9356086946617	-29.5079316022946
		23.9416904222249	-29.5019396933396
		23.9553100656412	-29.5115377591355
		23.9444743116025	-29.5226163365083
		23.942564687835	-29.519864542138
		23.9454292038002	-29.5191380063374
		23.9458229050467	-29.5161628961117
		23.9468354412982	-29.5155431525144
		23.947052655779	-29.5122036586304
		23.9453330411395	-29.5108174212612
		23.9453511423462	-29.5100770367071
		23.9432163312773	-29.5097595164061
		23.9420578540465	-29.5111772737663
		23.9422750685273	-29.5148003412485
		23.9412795021571	-29.51788772249
23.9356086946617	-29.5079316022946		
2	Suitable	23.9785448346769	-29.5164482622502
		23.9764501468361	-29.5197070280442
		23.9748210382303	-29.519376247649
		23.9738797754802	-29.5207151140077
		23.9754183780524	-29.521266406771
		23.9725915943157	-29.5255232139541
		23.9628265669606	-29.5166718848036
		23.9699291871111	-29.5166000124269
		23.9690286520762	-29.5189982115877
		23.9705310522349	-29.5189667085188
		23.9709473799898	-29.5182578868766
		23.9726262669141	-29.5182224456641
		23.9726624693276	-29.5165370047862
23.9785448346769	-29.5164482622502		

RECOMMENDATION

It is recommended that in Area 1, the pivot placement does not exceed more than 10% of unsuitable soil in a pivot. Since Area 2 has small areas of moderately suitable soils for irrigation, these can be incorporated into pivots, and thus the pivot placement is not affected by suitability.

CONCLUSIONS

The A and B horizons are characteristically sandy and therefore will facilitate good drainage. Most of the soils are very high-potential irrigation soils.

The soil texture results confirm the morphological interpretations and good drainage is expected on the soils.

The laboratory results indicate that the chemical parameters are manageable. The exchangeable sodium percentage (ESP) values are high. Thus, it indicates that although sodicity is not a general threat to irrigation on this site, Na in relation to other cations is high. On these soils this can be rectified with irrigation and fertilization on soils with adequate drainage, the Na should leach out and be replaced with Ca, Mg and K, lowering the ESP. This is confirmed by the very low ECe values.

REFERENCE

Gupta, R. K., Abrol, I. & Finkl, C. W., 2008. Soil salinity and salinization. In: W. Chesworth, ed. *Encyclopedia of Soil Science*. Chesworth, Ward ed. Dordrecht: Springer, pp. 611-613.

Soil Classification Working Group, 2018. Soil classification – a Taxonomical System for South Africa.

White R E, 2006. Principles and Practice of Soil Science: The Soil as a Natural Resource. 4th ed. Blackwell Science, Oxford, UK.

DISCLAIMER

Digital Soils Africa cannot be held responsible for any advice given based on incorrect laboratory analysis given by our providers. Although all care is taken to ensure that the results reported are correct, we are dependent on services from other companies

APPENDICES

General Information

Site:	NAAUWTESFONTEIN 78			Soil form:	Nkonkoni	
Map/Photo example:	GPS Figure 4			Soil family:	2111	
Position:	23.944476	-29.509143		Colour	Red/Brown	
Surface stones:	0%			Occurrence of flooding:	Low	
Altitude:	1117 m			Wind erosion potential:	Medium	
Terrain unit:	Upper slope			Water erosion potential:	High	
Slope:	1%			Vegetation/Land use:	Grasses	
Slope shape:	Planform	Straight	Profile	Straight	Water table:	None
Aspect:	None			Described by:	JD Marx	
Micro-relief:	None			Date described:	2021-07-09	
Parent material solum:	Dolomite/mudstone			<u>Weathering of underlying material:</u>	<u>low</u>	
Geological group:	Kalahari group					

Profile Information

<i>Horizon Depth (mm)</i>	<i>Diagnostic Horizon</i>	<i>Colour</i>	<i>Structure</i>	<i>Redoximorphic features</i>	<i>Lime</i>	<i>Transition</i>
A 200	Orthic A	Brown	Moderate, medium, SANBL	None	Present	Clear
B 600	Lithic	Brown	Moderate, weak, SANBL	None	Present	Clear

General Information

Site:	NAAUWTESFONTEIN 78			Soil form:	Plooyburg	
Map/Photo example:	Figure 5			Soil family:	2100	
GPS Position:	23.939103	-29.506064		Colour:	Red/Brown	
Surface stones:	0%			Occurrence of flooding:	Low	
Altitude:	1115m			Wind erosion potential:	low	
Terrain unit:	Upper slope			Water erosion potential:	moderate	
Slope:	1%			Vegetation/Land use:	Grasses	
Slope shape:	Planform	Straight	Profile	Straight	Water table:	600-800 mm
Aspect:	None			Described by:	JD Marx	
Micro-relief:	None			Date described:	2021-07-09	
Parent material solum:	Dolomite			<u>Weathering of underlying material:</u>	<u>low</u>	
Geological group:	Kalahari group					

Profile Information

<i>Horizon Depth (mm)</i>	<i>Diagnostic Horizon</i>	<i>Colour</i>	<i>Structure</i>	<i>Redoximorphic features</i>	<i>Lime</i>	<i>Transition</i>
A 200	Orthic A	Brown	Moderate, medium, SANBL	None	None	Clear
B 800	Red apedal	Red/Brown	Moderate, medium, SANBL	None	None	Clear
C 900	Hard Carbonate	White	Strong	None	Present	Clear

General Information

Site:	NAAUWTESFONTEIN 78			Soil form:	Kimberley
Map/Photo example:	Figure 8			Soil family:	2100
GPS Position:	23.949895	-29.512249		Colour	Red
Surface stones:	0%			Occurrence of flooding:	Low
Altitude:	1110 m			Wind erosion potential:	Medium
Terrain unit:	Foot slope			Water erosion potential:	Medium
Slope:	1.5%			Vegetation/Land use:	Grasses
Slope shape:	Planform	Straight	Profile	Water table:	None
Aspect:	None				
Micro-relief:	None			Described by:	JD Marx
Parent material solum:	Dolomite			Date described:	2021-07-09
Geological group:	Kalahari group			<u>Weathering of underlying material:</u>	Moderate

Profile Information

<i>Horizon Depth (mm)</i>	<i>Diagnostic Horizon</i>	<i>Colour</i>	<i>Structure</i>	<i>Redoximorphic features</i>	<i>Lime</i>	<i>Transition</i>
A 300	Orthic A	Red	Moderate, medium, SANBL	None	None	Clear
B 1100	Red apedal	Red	Moderate, weak, SANBL	None	None	Clear
C 2000	Soft Carbonate	White	Moderate	None	Present	Clear

Appendix 2: Soil forms

Observation	X	Y	Soil Form	Limiting layer	Freely depth	Drainable depth
H1	23.0350180000	-28.2785610000	Plooyburg	Hard Carbonate	1.01-1.50 m	1.51-2.00 m
H2	23.9677400000	-29.5184320000	Nkonkoni	Lithic	2.51-3.00 m	0.51-1.00 m
H3	23.9696860000	-29.5183730000	Nkonkoni	Lithic	2.51-3.00 m	0.51-1.00 m
H4	23.9714800000	-29.5184630000	Plooyburg	Hard Carbonate	0.51-1.00 m	1.00-1.51 m
H5	23.9750700000	-29.5200300000	Nkonkoni	Lithic	0.51-1.00 m	0.51-1.00 m
H6	23.9732070000	-29.5185090000	Nkonkoni	Lithic	2.51-3.00 m	1.51-2.00 m
H7	23.9678189395	-29.5169012728	Plooyburg	Hard Carbonate	1.00-1.51 m	1.00-1.51 m
H8	23.9462030000	-29.5169880000	Plooyburg	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H9	23.9462860000	-29.5154870000	Plooyburg	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H10	23.9461670000	-29.5138840000	Plooyburg	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H11	23.9462330000	-29.5121660000	Plooyburg	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H12	23.9462520000	-29.5107570000	Plooyburg	Hard Carbonate	1.01-1.50 m	1.01-1.50 m
H13	23.9461830000	-29.5092060000	Nkonkoni	Lithic	2.51-3.00 m	1.01-1.50 m
H14	23.9479350000	-29.5091480000	Kimberley	Soft Carbonate	2.51-3.00 m	1.01-1.50 m
H15	23.9516200000	-29.5107030000	Nkonkoni	Lithic	2.51-3.00 m	1.51-2.00 m
H16	23.9444760000	-29.5091430000	Glenrosa	Lithic	2.51-3.00 m	0.51-1.00 m
H17	23.9426760000	-29.5091590000	Plooyburg	Hard Carbonate	1.01-1.50 m	1.01-1.50 m
H18	23.9408060000	-29.5090630000	Nkonkoni	Lithic	2.51-3.00 m	1.01-1.50 m
H19	23.9390750000	-29.5091970000	Kimberley	Soft Carbonate	2.51-3.00 m	1.51-2.00 m
H20	23.9374050290	-29.5090708849	Plooyburg	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H21	23.9390728504	-29.5075201584	Glenrosa	Soft Carbonate	2.51-3.00 m	0.51-1.00 m
H22	23.9408694809	-29.5075201584	Nkonkoni	Lithic	2.51-3.00 m	1.01-1.50 m
H23	23.9426661115	-29.5075201584	Nkonkoni	Lithic	2.51-3.00 m	1.01-1.50 m
H24	23.9444627421	-29.5075201584	Nkonkoni	Lithic	2.51-3.00 m	1.51-2.00 m

H25	23.9443970000	-29.5060130000	Nkonkoni	Lithic	2.51-3.00 m	1.51-2.00 m
H26	23.9425760000	-29.5060090000	Glenrosa	Lithic	2.51-3.00 m	0-0.50 m
H27	23.9408810000	-29.5059830000	Olienhout	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H28	23.9391030000	-29.5060640000	Plooyburg	Hard Carbonate	1.01-1.50 m	1.01-1.50 m
H29	23.9408400000	-29.5043460000	Glenrosa	Lithic	2.51-3.00 m	0-0.50 m
H30	23.9426290000	-29.5044710000	Nkonkoni	Lithic	2.51-3.00 m	1.51-2.00 m
H31	23.9444360000	-29.5106150000	Plooyburg	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H32	23.9444050000	-29.5122490000	Coega	Hard Carbonate	0.51-1.00 m	0-0.50 m
H33	23.9444720000	-29.5138910000	Plooyburg	Hard Carbonate	0.51-1.00 m	0-0.50 m
H34	23.9444070000	-29.5153770000	Plooyburg	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H35	23.9444560000	-29.5169770000	Coega	Hard Carbonate	0.51-1.00 m	0-0.50 m
H36	23.9401974277	-29.5210609597	Coega	Hard Carbonate	0.51-1.00 m	0-0.50 m
H37	23.9444627421	-29.5200281177	Plooyburg	Hard Carbonate	0.51-1.00 m	1.01-1.50 m
H38	23.9480820000	-29.5154460000	Kimberley	Soft Carbonate	2.51-3.00 m	1.51-2.00 m
H39	23.9498290000	-29.5154470000	Nkonkoni	Lithic	2.51-3.00 m	1.51-2.00 m
H40	23.9461051622	-29.5183799022	Glenrosa	Soft Carbonate	2.51-3.00 m	0.51-1.00 m
H41	23.9373290644	-29.5074405347	Plooyburg	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H42	23.9426810000	-29.5185450000	Plooyburg	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H43	23.9427810000	-29.5169680000	Coega	Hard Carbonate	0.51-1.00 m	0-0.50 m
H44	23.9426360000	-29.5154100000	Plooyburg	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H45	23.9426810000	-29.5138570000	Coega	Hard Carbonate	0.51-1.00 m	0-0.50 m
H46	23.9426930000	-29.5122680000	Olienhout	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H47	23.9426540000	-29.5106720000	Plooyburg	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H48	23.9408280000	-29.5106460000	Nkonkoni	Lithic	1.01-1.50 m	1.01-1.50 m
H49	23.9388190000	-29.5105460000	Olienhout	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H50	23.9408540000	-29.5122240000	Nkonkoni	Lithic	1.01-1.50 m	1.01-1.50 m
H51	23.9408950000	-29.5138380000	Plooyburg	Hard Carbonate	0.51-1.00 m	0.51-1.00 m

H52	23.9407360000	-29.5152900000	Plooyburg	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H53	23.9480350000	-29.5138540000	Nkonkoni	Lithic	1.01-1.50 m	1.01-1.50 m
H54	23.9480280000	-29.5122290000	Kimberley	Soft Carbonate	0.51-1.00 m	0.51-1.00 m
H55	23.9481040000	-29.5106280000	Nkonkoni	Lithic	2.51-3.00 m	1.01-1.50 m
H56	23.9498390000	-29.5107940000	Nkonkoni	Lithic	2.51-3.00 m	1.51-2.00 m
H57	23.9515930000	-29.5122880000	Kimberley	Soft Carbonate	2.51-3.00 m	1.51-2.00 m
H58	23.9498950000	-29.5122490000	Nkonkoni	Lithic	2.51-3.00 m	1.01-1.50 m
H59	23.9516490000	-29.5137910000	Nkonkoni	Lithic	2.51-3.00 m	1.51-2.00 m
H60	23.9498530000	-29.5138740000	Nkonkoni	Lithic	2.51-3.00 m	1.01-1.50 m
H61	23.9515710000	-29.5153530000	Kimberley	Soft Carbonate	2.51-3.00 m	1.51-2.00 m
H62	23.9661490000	-29.5184370000	Kimberley	Soft Carbonate	2.51-3.00 m	1.51-2.00 m
H63	23.9695980000	-29.5216730000	Kimberley	Soft Carbonate	2.51-3.00 m	1.01-1.50 m
H64	23.9714110000	-29.5231440000	Kimberley	Soft Carbonate	2.51-3.00 m	1.01-1.50 m
H65	23.9714440000	-29.5215830000	Kimberley	Soft Carbonate	2.51-3.00 m	1.51-2.00 m
H66	23.9732150000	-29.5215390000	Plooyburg	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H67	23.9749780000	-29.5215790000	Glenrosa	Lithic	1.01-1.50 m	1.01-1.50 m
H68	23.9749930000	-29.5185170000	Glenrosa	Lithic	2.51-3.00 m	1.01-1.50 m
H69	23.9732220000	-29.5169340000	Nkonkoni	Lithic	2.51-3.00 m	0.51-1.00 m
H70	23.9714380000	-29.5169320000	Kimberley	Soft Carbonate	2.51-3.00 m	1.51-2.00 m
H71	23.9696430000	-29.5200560000	Olienhout	Hard Carbonate	0.51-1.00 m	0.51-1.00 m
H73	23.9731950000	-29.5200330000	Nkonkoni	Lithic	2.51-3.00 m	1.01-1.50 m



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Department:
Environment & Nature Conservation
NORTHERN CAPE PROVINCE
REPUBLIC OF SOUTH AFRICA

Private Bag X6102, Kimberley, 8300, Metlife Towers, T-Floor, Tel: 053 807 7300, Fax: 053 807 7328

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

Application for authorization in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014 as amended.

File Reference Number:
NEAS Reference Number:
Date Received:

(For official use only)

1. Project title:

Clearing of vegetation for the establishment of crop farming on the Remainder of Farm Naauwtesfontein No. 78 in Hopetown, in the Northern Cape.

2. Details of the specialist:

Project Specialist:	Dr. Darren Bouwer		
Trading name (if any):	Digital Soils Africa (Pty) Ltd		
Business reg. no./ID. no.:	2012/111217/07		
Contact person:	D. Bouwer		
Physical address:	1 Kemsley Street, Richmond Hill, Port Elizabeth		
Postal address:	1 Kemsley Street, Richmond Hill, Port Elizabeth		
Postal code:	6000	Cell:	083 703 3002
Telephone:	067 622 5687	Fax:	
E-mail:	Darren@dsafrica.co.za		
Qualifications:	PhD in Soil Science		
Professional affiliation (s) (if any)	SACNASP; SASSO		

3. Details of the consultant

Project consultant/firm:	Digital Soils Africa (Pty) Ltd		
Business reg. no./ID. no.:	2012/111217/07		
Contact person:	Natalie Sharp		
Postal address:	1 Kemsley Street, Richmond Hill, Port Elizabeth		
Postal code:	6000	Cell:	082 414 0472
Telephone:	067 622 5687	Fax:	
E-mail:	natalie@dsafrica.co.za		

4. Declaration by the specialist appointed in terms of the Environmental Impact Assessment Regulations, 2014 as amended.

I, Dr. D. Bouwer, 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.

Bouwer.

Signature of the specialist:

Digital Soils Africa (Pty) Ltd

Name of company (if applicable):

6/9/2021

Date:

Hloso

Signature of the Commissioner of Oaths:

06-09-2021

Date:

Professional Accountant (RSA)

Designation:

Official stamp (below):

.....
HENDRIK DU PLESSIS
52 ALIWAL STREET, BFN, 9301
EX OFFICIO COMMISSIONER OF OATHS
PROFESSIONAL ACCOUNTANT (RSA)