DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the proposed tilapia aquaponics project, on plot 413 of the farm Bosplaas West, north of the town of Hammanskraal, in the Moretele Municipality in Bojanala District, North West Province

DRAFT BASIC ASSESSMENT REPORT

Prepared for: Blue-Green Aquaculture (Pty) Ltd

CSIR Report No.: CSIR/02100/EMS/IR/2017/15674/A

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SEPTEMBER 2017

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September 2017

Prepared for:
Blue-Green Aquaculture (Pty) Ltd
Mr Pule Hlahane
pule@blue-green.co.za

Prepared by:
CSIR
P O Box 320, Stellenbosch, 7599
Tel: +27 21 888 2482
Fax: +27 21 888 2473
Email: Kmashabela1@csir.co.za

Authors:
Karabo Mashabela, Minnelise Levendal & Paul Lochner

REPORT DETAILS

Title:	**Basic Assessment for the proposed tilapia aquaponics farm project, plot 413 on the farm Bosplaas West located north of Hammanskraal, in the Moretele Municipality in Bojanala District of the North West Province**
Purpose of this report:	The purpose of this BA Report is to: • Present the proposed project and the need for the project; • Describe the affected environment at a sufficient level of detail to facilitate informed decision-making; • Provide an overview of the BA Process being followed, including public consultation; • Assess the predicted positive and negative impacts of the project on the environment; • Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the project; • Provide an Environmental Management Programme (EMPr) for the proposed project. This BA Report is being made available to all Interested and Affected Parties (I&APs) and stakeholders for a 30-day review period. All comments submitted during the review of the BA Report will be incorporated into the finalised BA Report as applicable and where necessary. This finalised BA Report will then be submitted to the North West Department of Rural, Environment and Agricultural Development (READ) for decision-making.
Prepared for:	Blue-Green Aquaculture (Pty) Ltd
Prepared by:	CSIR P O Box 320, Stellenbosch, 7599 Tel: +27 21 888 2408 Fax: +27 21 888 2493
Authors:	Karabo Mashabela, Minnelise Levendal and Paul Lochner
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OPPORTUNITY FOR REVIEW

Opportunity for Review:

This Draft Basic Assessment Report, including the Draft Environmental Management Programme (EMPr), is hereby released for a 30-day review period by stakeholders.

This review period closes on 16 October 2017

Comments are to be submitted to the CSIR at the contact details below.

Project Manager – Karabo Mashabela

Council for Scientific and Industrial Research (CSIR)
Postal Address: P.O. Box 320, Stellenbosch, 7599
Phone: 021 888 2482
Fax: 021 888 2693
Email: Kmashabela1@csir.co.za

EXECUTIVE SUMMARY

INTRODUCTION AND BACKGROUND

Blue-Green Aquaculture (Pty) Ltd is a small scale commercial fish farming enterprise that was established in 2013 and is proposing to establish an aquaculture production facility to farm Mozambique tilapia (*Oreochromis mossambicus*), commonly known as Blue kurper. Blue-Green Aquaculture has leased land, i.e. Plot 413 in Bosplaas West, from Mr T J Kgomo for the establishment of this aquaculture production farm.

The proposed project will produce 20 000 kg per annum of tilapia fish in phase 1, increasing to 100 000 kg/year of fish in phase 2 and 200 000 kg/year of fish in phase 3. In all phases, lettuce will be produced from the aquaponics component of the project. This Basic Assessment includes all three phases of the project. The project will have a total footprint of approximately 2 hectares (20 000 m^2) and employ up to 24 people at full production.

ENVIRONMENTAL ASSESSMENT PROCESS

The Council for Scientific and Industrial Research (CSIR) was appointed by the national Department of Environmental Affairs (DEA) to manage the Special Needs and Skills Development Programme which is aimed at providing *pro-bono* environmental services to small-scale businesses. Under this programme, CSIR undertakes Basic Assessments (BAs) for applicants who can demonstrate that they have “special needs”, in particular, where applicants cannot afford to undertake the necessary BA process. This led to the CSIR undertaking this BA for the proposed tilapia aquaponics farm project on Plot 413 on the Farm Bosplaas West, located north of Hammanskraal in the Moretele Municipality in the Bojanala District of the North West province.

The proposed development triggers listed activities in terms of the Environmental Impact Assessment (EIA) Regulations, Government Regulations (GNR) 327 and 324 of April 2017 promulgated under the National Environmental Management Act (NEMA) (Act no 107 of 1998). In terms of these Regulations, a Basic Assessment should be undertaken for the proposed project. The CSIR is providing the Environmental Assessment Practitioners (EAPs) and is managing the BA process on behalf of the project applicant.

In terms of the amended NEMA EIA Regulations published in GNR 324, 325, 326 and 327 on the 7 April 2017 Government Gazette Number 40772, a BA process is required as the project triggers the following listed activities (detailed in Table 1 below).

Table 1: Listed activities relating to this proposed tilapia aquaponics project

Relevant notice	Activity No. (in terms of the relevant notice):	Description of each listed activity as per the Government Notice
GN.327,7 April 2017	3.(iii)	The development and related operation of facilities or infrastructure for the slaughter of animals with a — (iii) wet weight product throughput of fish, crustaceans or amphibians exceeding 20 000 kg per annum.
GN. R 327, 7 April 2017	6. (i)	The development and related operation of facilities, infrastructure or structures for aquaculture of: (i) finfish, crustaceans, reptiles or amphibians, where such facility, infrastructure or structures will have a production output exceeding 20 000 kg per annum (wet weight);
GN. R 327, 7 April 2017	8	The development and related operation of hatcheries or agri-industrial facilities outside industrial complexes where the development footprint covers an area of 2 000 square metres or more.
GN. R 327, 7 April 2017	27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for: i) the undertaking of a linear activity; or ii) maintenance purposes undertaken in accordance with a maintenance management plan.

These listed activities require Environmental Authorisation from the provincial Department of Rural, Environment and Agricultural Development (READ) of the North West province.

AUTHORITY INVOLVEMENT AND PUBLIC PARTICIPATION

The Basic Assessment process was announced in the public domain in May 2017 via:

- placing Site Notices (in English and Setswana) on the farm fence (refer to Appendix I),
- posting and emailing written notices and a Background Information Document (BID) regarding the proposed development to Interested and Affected Parties, including neighbours, the competent authority and other relevant Government departments and agencies;
- placing an advertisement in the Brits POS on 14 September 2017 that invited potential Interested and Affected Parties to register and submit comments regarding the BA for the proposed project (refer to Appendix I).

The CSIR team has obtained inputs from a range of relevant authorities, including the Department of Water and Sanitation (DWS) and Department of Agriculture, Fisheries and Forestry (DAFF). A stakeholder database has been prepared that includes the community members, neighbours, industry and government stakeholders.

The Comments and Responses report has been compiled and it is included in Appendix I. All comments raised by I&APs during the review of the BID have been captured and addressed within

the Draft BA Report. The Draft BAR is being distributed for a 30 day review period and all registered I&APs and relevant organs of state have been informed.

For the public review, a copy of the draft BAR has been placed at the Hammanskraal Public Library and Mphe Batho primary school; and letters notifying I&APs of the release of the Draft BA Report for a 30 day review period have been distributed. The Draft Basic Assessment Report is also available on the project website: https://www.csir.co.za/environmental-impact-assessment.

IMPACT ASSESSMENT AND MITIGATION

The BA Report is informed by two specialist studies, an Ecological Impact Assessment and a Heritage Impact Assessment, together with inputs sourced by the environmental scientists in the CSIR team.

No negative impacts have been identified within this BAR that, in the opinion of the EAP, should be considered as “fatal flaws”.

The main negative impacts of the Blue-Green Aquaculture project are predicted to be:

- Borehole collapsing at 30 metres
- Waste water management during the production phase and the waste from the processing fish house

The main positive benefits of the project are predicted to be:

- Employment of up to 24 persons during the construction and operation phases of the project
- Food security from the production of 200 000 kg per annum of tilapia as well as lettuce.

Mitigation actions have been included in the EMPr. The most important mitigation actions are:

- Development should be contained within the proposed 2 hectare footprint of the project and unnecessary disturbance adjacent to the site should be avoided
- Minimise clearance of natural vegetation and disturbance at the site
- Use existing and dedicated access roads to limit disturbance of the natural vegetation.

All relevant mitigation measures required to ensure that the project is planned and conducted in an environmentally responsible manner are listed in the EMPr. The EMPr is a dynamic document that should be updated as required and provides clear and implementable measures for the proposed project.

OPINION OF THE EAP

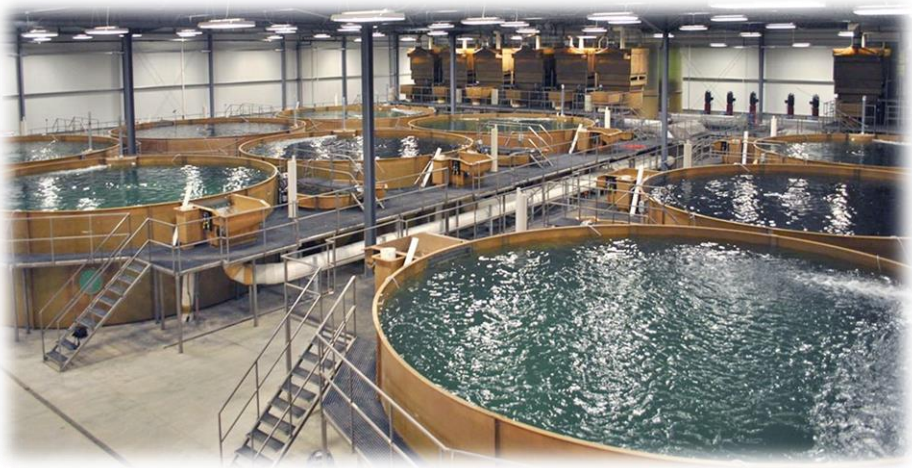
Based on the findings of the Basic Assessment process for Blue Green Aquaculture, it is recommended by the EAPs on the CSIR team that this project be authorised, subject to the conditions captured in the management actions in the EMPr (Appendix J). The EMPr must therefore form part of the conditions of the Environmental Authorisation and be adhered to by the applicant. This includes the recommendations of the ecological specialist that development must be contained within the proposed 2 hectare footprint of the project and unnecessary disturbance adjacent to the site should be avoided.

The project proponent, i.e. Blue Green Aquaculture, is being assisted under the DEA Special Needs and Skills Development Programme on a pro bono basis as the proponent qualifies as having “special needs”, in particular, in that they do not have the financial means to conduct with BA process without financial support. Furthermore, the applicant does not have the resources to negotiate alternative sites other than the preferred site which was leased to them by Mr Kgomo.

Given that the site is of low environmental sensitivity, it is therefore recommended by the EAPs that the proposed layout and preferred site (this proposal) be included in the Environmental Authorisation (should such authorisation be granted for the proposed project).

CONCLUDING STATEMENT FROM EAP

Provided that the specified mitigation measures outlined in the EMPr are applied effectively, it is the opinion of the EAPs in the CSIR team that the benefits of the project outweigh the negative impacts and the project should receive Environmental Authorisation in terms of the EIA Regulations promulgated under the NEMA.



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GLOSSARY

Aquaponics	**A** combination of aquaculture and hydroponics, i.e. an aquaculture system in which the waste produced by farmed fish (or other aquatic creatures) supplies the nutrients for plants grown hydroponically, which in turn purify the water.
Aquaculture	the cultivation of aquatic animals and plants, especially fish, shellfish, and seaweed, in natural or controlled marine or freshwater environments
BA	Basic Assessment
BAR	Basic Assessment Report
BID	Background Information Document
CA	Competent Authority
CV	Curriculum Vitae
CSIR	Council for Scientific and Industrial Research
DEA	National Department of Environmental Affairs
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
Hydroponics	soil-less growing of plants in water
HSSE	Health, Security, Safety and Environment
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMBA	National Environmental Management Biodiversity Act (Act 10 of 2004)
NEM: AQA	National Environment Management: Air Quality Act (Act 39 of 2004)
NHRA	National Heritage Resources Act (Act 25 of 1999)
Recirculation aquaculture system (RAS)	are used in home aquaria and for fish production where water exchange is limited and the use of biofiltration is required to reduce ammonia toxicity
PPP	Public Participation Process
READ	Department of Rural, Environmental and Agricultural Development for the North West province
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANS	South African National Standards
SDF	Spatial Development Framework
Tilapia	Tilapia is the common name for nearly a hundred species of cichlid fish from the tilapiine cichlid tribe. Tilapia are mainly freshwater fish inhabiting shallow streams, ponds, rivers and lakes and less commonly found living in brackish water. Tilapia can feed on algae or any plant-based food, which reduces the cost of tilapia farming.
Tons	meaning metric tons, where 1 ton = 1000 kilograms (kg)
ToR	Terms of Reference

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DRAFT BASIC ASSESSMENT REPORT

read
Department:
Rural, Environment and Agricultural Development
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

AgriCentre Building
Cnr. Dr. James Moroka and Stadium Rd
Private Bag X2039,
Mmabatho 2735
Republic of South Africa
Tel: +27 (18) 389 5156
Fax: +27(18) 384 0104
E-mail:oskosana@nwpg.gov.za

CHIEF DIRECTORATE: ENVIRONMENTAL SERVICES

DIRECTORATE: ENVIRONMENTAL QUALITY MANAGEMENT

(For official use only)

Provincial Reference Number:	
NEAS Ref Number:	
Date Received:	

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 and is meant to streamline applications.
2. This report format is current as of **December 2014**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. The use of "not applicable" in the report must be done with circumspection. An incomplete report or that does not meet the requirements in terms of Regulation 19 of the NEMA EIA Regulations, 2014, will be rejected to be revised and be resubmitted.
6. The report must be handed in at offices of the relevant competent authority as determined by each authority.
7. No faxed or e-mailed reports will be accepted.
8. The signature of the Environmental Assessment Practitioner (EAP) on the report must be an original.
9. The report must be compiled by an independent EAP.
10. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
11. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
12. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.
13. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
14. Shape files (.shp) for maps must be included on the electronic copy of the report submitted to the competent authority.

SECTION A: ACTIVITY INFORMATION

A.1 Project description

a) Describe the project in association with the listed activities applied for

Overview of the proposed tilapia aquaculture project with lettuce grown using hydroponics

In South Africa, the aquaculture industry is still in its developmental stage in comparison to the global aquaculture community, however, it has the potential to grow and contribute towards job creation, food security, economic development and export opportunities. Blue-Green Aquaculture Pty Ltd is a small scale commercial fish farming enterprise that was established in 2013 and it is proposing to establish an aquaculture production facility for tilapia. Blue-Green Aquaculture has leased two hectares of land, i.e. Plot 413 in Bosplaas West, from Mr T J Kgomo for the establishment of an aquaculture production farm. The lease agreement includes the utilisation of a borehole on the farm Bosplaas West that is located north of Hammanskraal, in the Moretele Municipality in Bojanala District North West Province.

Blue-Green Aquaculture's production plan is set to increase production with three different phases over a period of five to ten years. The first phase will be the aquaponics with 20 metric tons of production (i.e. 20 000 kg) of Mozambique tilapia fish together with approximately 20 tonnes of lettuce; in the second phase the aquaculture increases to 100 tons of production of Mozambique tilapia fish together with approximately 20 tonnes of lettuce; and in the third phase on the fish production increases to 200 tons of tilapia together with approximately 20 tonnes of lettuce. The site has existing access from the R101 road.

The water requirement for Blue Green will be approximately 250 m^3 per annum for phase one for production of 20 tons of tilapia, increasing to 500 m^3 per annum for phase two of 100 tons of fish production, and lastly for phase three will be approximately 1500m^3 per annum for 200 tons of fish production. A water use licence general authorisation for phase one was obtained from the Department of Water Affairs in 07 July 2017 (Appendix I.3c). For phase two and three, the water use licence was logged with the Department of Water and Sanitation in 10 July 2017. Blue-Green Aquaculture Pty Ltd aims to produce approximately 20 tonnes of vegetables (lettuce from all phases). The vegetables will be produced annually from the waste water generated by the fish.

The greenhouse facility will have 18 deep water culture tanks (7.5m x 30m) for growing lettuce hydroponically; and the aquaculture component will include 10 tanks with the capacity to rear up to 200 metric tons per annum of Mozambique tilapia as production increases over 10 years through to phase three. The facility consists of a fish packing house, fish hatchery and a fish processing facility. During phase one, the project will transport live fish to a nearby fish processing facility. During phase two and three, Blue-Green aquaculture will develop their own fish processing facility to clean and freeze fish.

Mozambique tilapia (*Oreochromis mossambicus*), commonly known as blue kurper is native to southern Africa and is a popular fish species for aquaculture. It naturally occurs in coastal regions and the lower reaches of rivers in southern Africa and it generally prefers slow moving water bodies such as lagoons, rivers and impoundments, but can also colonise faster-flowing rivers and streams.

Technology choice and water management

The enterprise will start as an aquaponics facility (i.e. system of aquaculture in which the waste produced by farmed fish or other aquatic creatures supplies the nutrients for plants grown hydroponically, which in turn purify the water) and later it will be separated into an aquaculture farm and a hydroponics farm (where hydroponics is the process of growing plants in sand, gravel, or liquid, with added nutrients but without soil). Water will be sourced from the existing borehole on site and the effluent will be used to grow vegetables (i.e. lettuce) hydroponically. The technology to be employed on the farm is a recirculating aquaculture system (RAS) linked to hydroponic growbeds. Figure 1 is a simplified overview of the technology employed in an aquaponics system. The fish are grown in the fish rearing tanks (caption 1 in figure 1) and then the fish waste (faeces and uneaten food) flows into the settling tank (caption 2), where the process of biofiltration results in the conversion of toxic ammonia into plant friendly nitrates (caption 3) before the nitrate rich water is fed to the plants (caption 4). In the Deep Water Culture (DWC) beds (caption 5), the plants grow and take up the nitrates and other micronutrients thereby cleaning the water

(caption 6). The last step (caption 7) is the collection of clean water before being pumped back to the fish tanks.

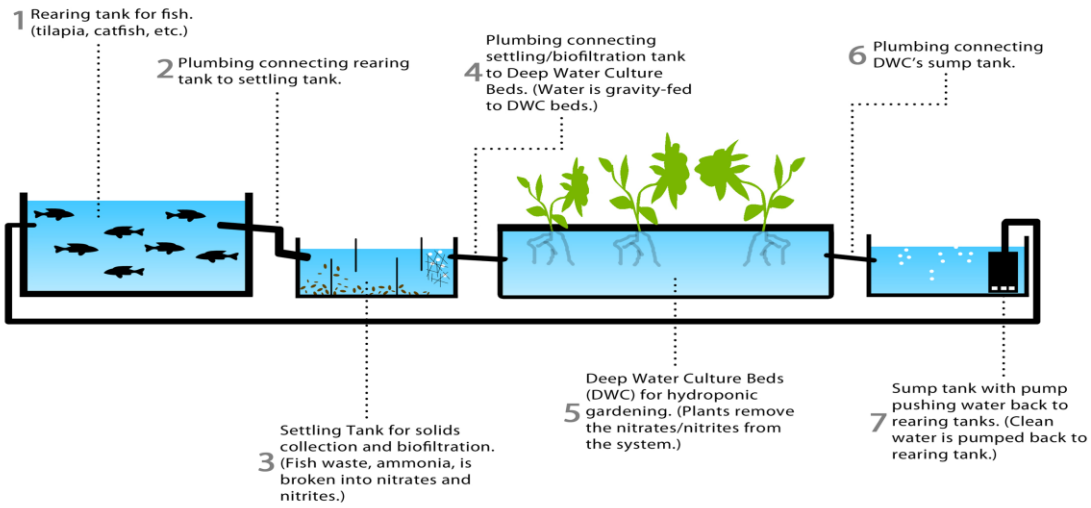

Figure 1: Simplistic overview of aquaponics technology

Proposed project components and layout

The main project components and the proposed layout plan for the full three phases of the project up to 200 000 kg per annum fish production is shown in Figure 2.

Figure 2: Layout plan for the proposed aquaculture facility

The proposed infrastructure of the aquaponics facility will entail the following:

- Pure tank 5000 litres with water supply
- 10 fish rearing tanks, consisting of:
  - Five 5000 litre fish rearing tanks of 2700 mm diameter
  - Five 2500 litre fish rearing tanks of 2200 mm diameter and 900 mm height
- 3 fish houses (30m length x 10m breadth)
  - Hatchery
  - Processing fish house
  - Packing of fish
- 9 greenhouses (30m length x 15m breadth), containing 18 deep water culture tanks for growing lettuce (each tank is 7.5m breadth x 30m length)
- Four clarifiers that are used to remove solid particulates or suspended solids from liquid for clarification and (or) thickening
- Sump that also serves as a reservoir
- Workers facilities (kitchen, toilet etc) (80m length x 40m breadth)
- Existing borehole and water storage dam.

On the layout plan for the aquaculture facility (Figure 2), the water from the fish tanks moves via gravity to the setting tanks (clarifiers) for the first step in removing solid waste. Water is further filtered and the conversion of toxic ammonia into nitrates and nitrites (plant food). The nitrate/nitrite rich food is fed to

the plants in the greenhouses. The plants clean the water for the fish. The clean water is stored in the pure tank. The lettuce is grown in hydroponic tanks (Deep Water Culture beds) in the greenhouses.

Construction phase activities

Quality of the water from the borehole is alkaline with a value of 230.75. The waste water produced from the proposed facility will contain fish excretions, nitrogenous waste products by diffusion and ion exchange through the gills, urine and feces. This facility will recycle water by running it through filters to remove fish waste and food and then recirculating it back into the tanks. The water from the system will be fed to a hydroponic system where the by-products are broken down by bacteria into nitrate and ammonium which are utilized by the plants as nutrients. The electricity demand will be minimal during construction phase, with a budget of approximately R 5000 to R 10 000 per month for electricity. The proposed facility during construction phase will create employment for 30 people and different construction companies will be hired from the Moretele local municipality e.g. drilling of a borehole.

Operations phase activities

During phase one, the proposed facility will transport live fish to a nearby processing facility and Pretoria markets. During phase 2 and phase 3, the proposed facility will process the fish onsite. This will include cleaning, gutting and storing the fish. During cleaning, the caught first are fish washed thoroughly in cold, clean water to remove bacteria, slime, blood, faeces, and mud, etc. from the body surface of the fish. After cleaning, the fishes are cut along their mid ventral side, and their visceral organs are removed. thereafter, the fish is preserved by methods like freezing and drying.

Water supply from an on-site borehole

Water for the aquaculture (for tilapia) and hydroponics (for lettuce) will be sourced from groundwater using a borehole on the site. A technical study was conducted that confirmed the potential for the borehole to provide a sustainable supply of water (ENVASS, 2017). Thereafter, a water use license application was the applicant submitted by the applicant to the Department of Water & Sanitation (DWS) for approval. A desktop level groundwater reserve determination for the site was completed by ENVASS and the CSIR in May 2017 to form part of the water use license application. The recharge for the site area was determined using two methods, namely extraction of values from the DWS dataset and the chloride mass balance (CMB) method. The values for recharge as per the GRDM dataset (DWS, 2012) are between 1% and 2% of mean annual precipitation (MAP). For the site, it was assumed that dry deposition was 10% of the chloride in rainfall value, which was taken as 1 mg/l. Based on the water quality data available for borehole at the site, the chloride in groundwater is 160.8 mg/l. Thus, the effective recharge for the site according to the CMB method is 3.7 mm/a which is 0.6% of MAP. The recharge values from both methods are similar; however the CMB method recharge value of 0.6% MAP was chosen to be representative for the site and was considered realistic and conservative. The applicable groundwater recharge for the site was calculated as 45 510 m^3/a, i.e. 0.045 Mm^3/a.

Water availability and use and management of liquid wastes

According to ENVASS, 2017 the water level of the on-site borehole was measured at 11.85 m below ground level (bgl) and the average water levels for the region varied between 1 and 60 m bgl, with an average water level of 15 m bgl. Water quality samples were taken at the site borehole following aquifer testing and submitted to a SANAS-accredited laboratory for analysis. The majority of parameters were compliant with the SAWQG guideline values, with the exception of total hardness, alkalinity and iron (as Fe). These elevated parameters are likely to be caused by natural rock-water interactions at the site with the exception of:

Alkalinity: 20-100: 230.75
Iron (as Fe): <0.01 0.02
Total Hardness: 20-100: 301

The proposed facility needs 1500 cm^3 of water for the production of 200 000 kg of fish in phase 3. This water will be abstracted from the existing borehole.

The site falls within the A23F quaternary catchment, and several boreholes are registered in this area.

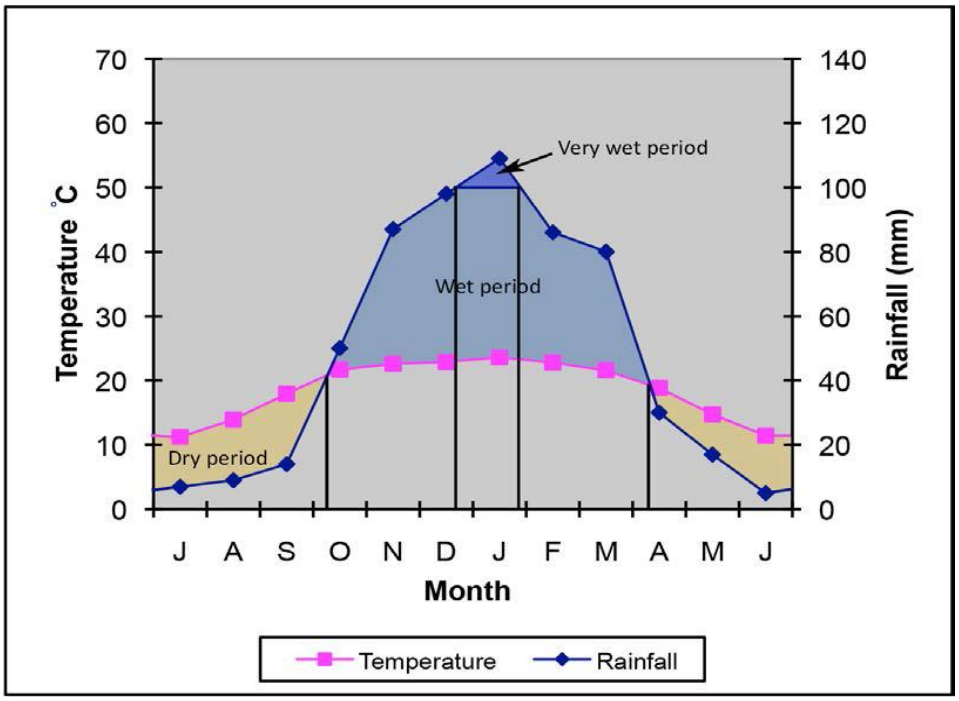

Figure 3: Temperature and rainfall within the area of the Moretele Municipality

Current land use planning and soils and agricultural potential

The current land use on the site and surrounding area is agriculture and the current zoning for the land is agricultural IDP Moretele, 2017). The soils on the site are rated as "moderate" and "moderate-high" on the national database (DAFF, 2016) as shown in Figure 4.

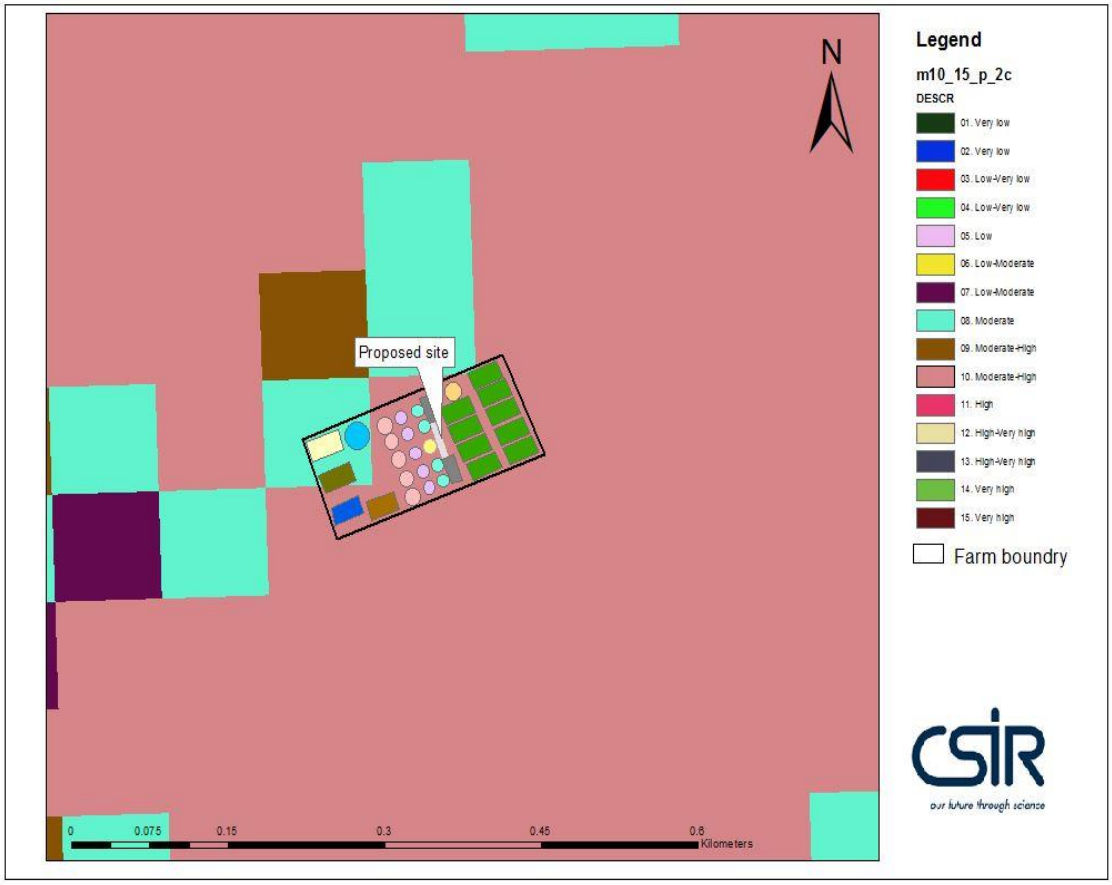

Figure 4 : Soils and land capability potential as provided by the national DAFF database

Determining the sustainable groundwater yield from the borehole on site

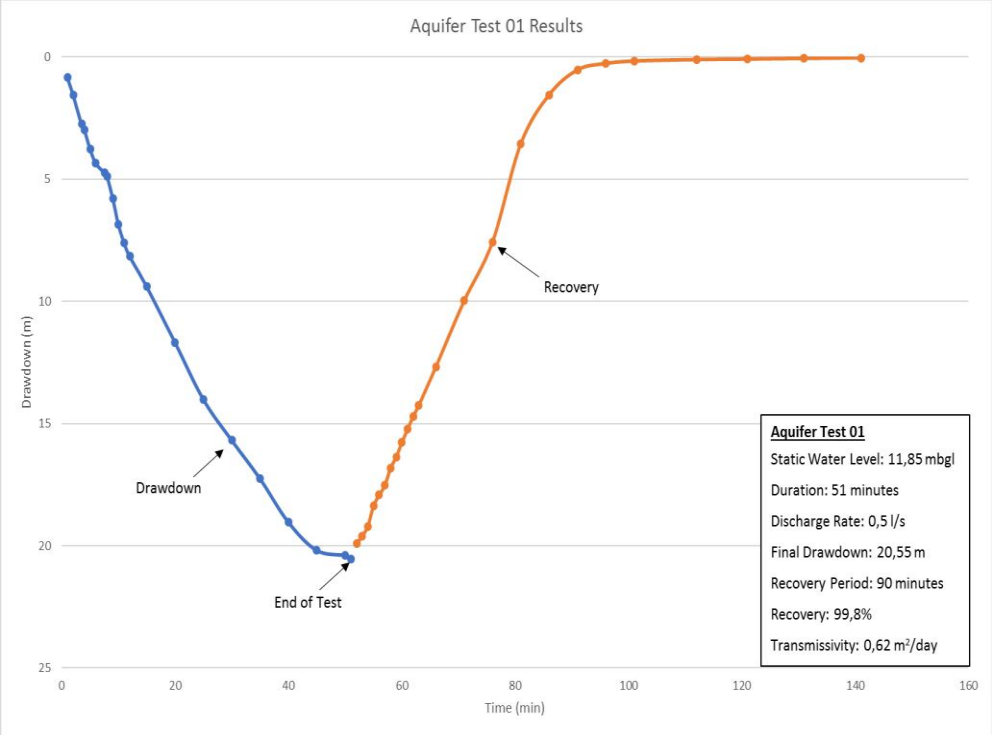

Figure 5: Aquifer Test 01 from the borehole on site

The first aquifer test was conducted on 8th June 2017 using the existing pump equipment at the site, which was installed to a depth of 33 m below ground level (bgl). The static water level for the test was 11.85 m bgl and the available drawdown was 21.15 m. The rate at which groundwater flows horizontally through an aquifer (an average transmissivity) was 0.62 m^2/day). The sustainable borehole yield was determined using the flow characteristic method and was determined to be 0.1 l/s for a 20-hour pumping cycle, or 0.2 l/s for an 8-hour pumping cycle. The sustainable yield of the borehole 8 hours pumping cycle was 5760 life/cycle.

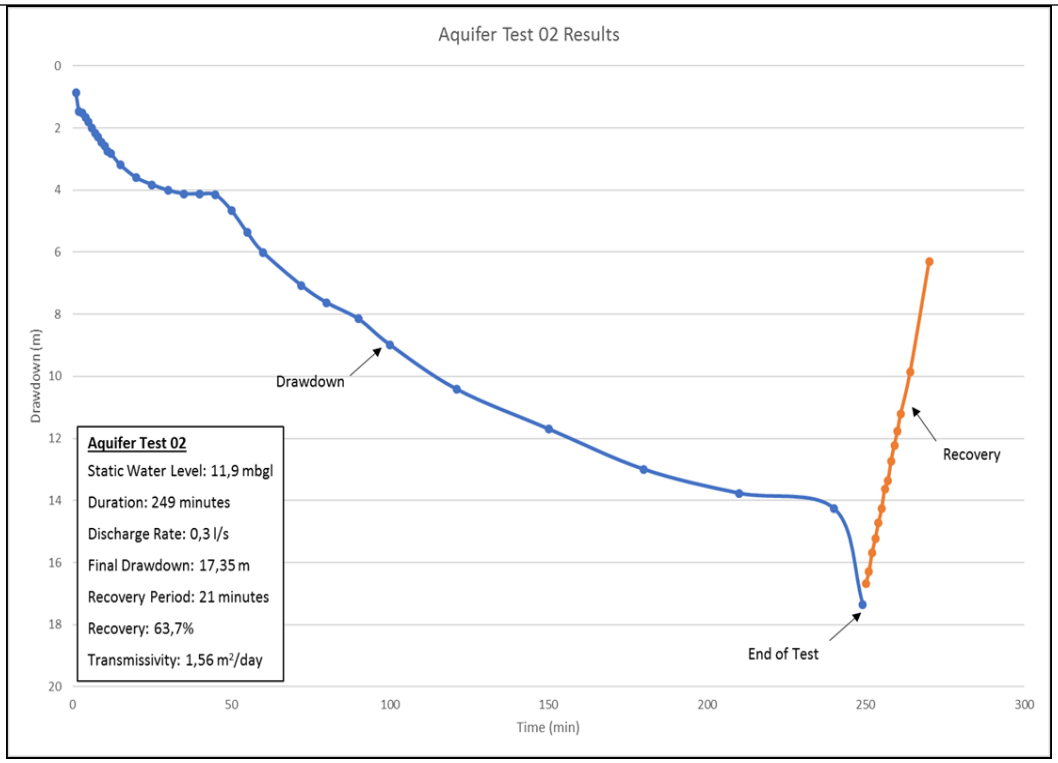

Figure 6: Aquifer Test 02 from the borehole on site

The second aquifer test was conducted on 8th June 2017 using the existing pump equipment at the site, which was installed to a depth of 33 m bgl. A ball valve was installed at the pump outlet to control the flow rate from the borehole. The static water level for the test was 11.9 m bgl and the available drawdown was 21.1 m. The test was conducted for 249 minutes at a constant rate of 0.3 l/s (i.e. 1.1 m3/hour). The final drawdown for the test was 17.35 m, and the sustainable yields are the same as the Aquifer test one.

b) Provide a detailed description of the listed activities associated with the project as applied for

Listed activity as described in GN R.324, 325 and 327	Description of project activity
GN. R 327, 7 April 2017 Activity 6 The development and related operation of facilities, infrastructure or structures for aquaculture of— (i) finfish, crustaceans, reptiles or amphibians, where such facility, infrastructure or structures will have a production output exceeding 20 000 kg per annum (wet weight);	The concentration of 200 000 kg Tilapia production per annum
GN. R.327, 7 April 2017 Activity 8 The development and related operation of hatcheries or agri-industrial facilities outside industrial complexes where the development footprint covers an area of 2 000 square meters or more.	The development of a 2 hectare Aquaculture facility with associated infrastructure including a, storage unit, workers quarters and office
GN.R.327, 7 April 2017 Activity 27: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- i) the undertaking of a linear activity; or ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The development of a 2 hectare Aquaculture facility with associated infrastructure including a, storage unit, workers quarters and office.

c) Property description/physical address

Province	North West
District Municipality	Bojanala Platinum district
Local Municipality	Moretele Local Municipality
Ward Number(s)	Ward 22
Farm name and number	Bosplaas West
Portion number	Portion 413
21 digit Surveyor General Code	B0JR00000000009100413

Where a large number of properties are involved (e.g. linear activities) please attach a full list to this application including the same information as indicated above

A.2 Feasible and reasonable alternatives

"alternatives", **in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—**

(a) the property on which or location where it is proposed to undertake the activity;

(b) the type of activity to be undertaken;

(c) the design or layout of the activity;

(d) the technology to be used in the activity;

(e) the operational aspects of the activity; and

(f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by EIA Regulation, 2014 Appendix 1(h). Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds using the Hartebeeshoek94 WGS84 co-ordinate system.

a) Site alternatives

List alternative sites, if applicable.

Site Alternatives	Description
Alternative Site 1 (preferred or only site alternative)	The applicant does not have an alternative site. To understand the reason for this, it is important to understand the context. DEA commissioned the CSIR to run the "Special Needs and Skills Development (SNSD) Programme" which is aimed at providing *pro bono* Environmental Impact Assessments (EIAs) for people who are classified as special needs clients/applicants. This specifically applies to applicants such as Small, Medium and Micro Enterprises (SMMEs), Community Trusts, Individuals or Government Programmes that cannot afford the cost for obtaining the Environmental Authorisation. The CSIR received an application from Blue-Green Aquaculture (Pty) Ltd under the SNSD Programme. The CSIR identified Blue-Green Aquaculture (Pty) Ltd as a client or a special needs applicant and has agreed to assist them with acquiring Environmental Authorization for the project on a *pro bono* basis, including the cost of the basic assessment, specialist studies and associated site visits. Blue-Green Aquaculture is a 100% black owned entity. The applicant has applied for funding through the Land Bank but he was advised to provide an Environmental Authorization as such there is a need for a Basic Assessment. The Land Bank provides support to previously disadvantaged individuals who do not have the start-up capital to launch their own enterprise. Thus, the site which is being investigated in this report is the only site available to this entity and there are no available alternative sites to be considered as Blue Green leased the land from Mr Kgomo for the period of 10 years with a high possibility of renewal.
Alternative Site 2	
Alternative Site 3	

Site Co-ordinates

	Latitude (S):			Longitude (E):		
Alternative S1 (preferred or only site alternative)	28°	14′	36.848′′	25°	19′ ′	38.9418″
Alternative S2 (if any)						
Alternative S3 (if any)						

In the case of linear activities:

Alternative:	**Latitude (S):**			**Longitude (E):**		
Alternative S1 (preferred or only route alternative)						
• Starting point of the activity						
• Middle/Additional point of the activity						
• End point of the activity						
Alternative S2 (if any)						
• Starting point of the activity						
• Middle/Additional point of the activity						
• End point of the activity						
Alternative S3 (if any)						
• Starting point of the activity						
• Middle/Additional point of the activity						

- End point of the activity

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 metres along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A.

b) Lay-out alternatives

Alternatives	Description
Alternative 1 (preferred or only alternative)	The layout of the proposed project has been carefully informed by the findings of the Ecological Impact Assessment and the Heritage Impact Assessment (Appendix G) so as to avoid sensitive areas and loss of species of conservation concern. Furthermore the development is within areas that have already been transformed previously to limit the disturbance of natural habitats.
Alternative 2	
Alternative 3	

c) Technology alternatives

Alternatives	Description
Alternative 1 (preferred or only alternative)	The project uses aquaponics technology (refer to the project description).Heating technology to maintain suitable water temperatures for tilapia is a core part of the project technology. Electricity and solar will be used in winter to warm the water since Mozambique tilapia (*Oreochromis mossambicus*) prefers warm water environment. The optimal temperature range needed by Mozambique tilapia for growth and reproduction is 22–30°C. The species can, however, survive at temperatures between 16 and 39°C.
Alternative 2	
Alternative 3	

d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)

Alternatives	Description
Alternative 1 (preferred or only alternative)	The proposed development is within the vicinity of and existing transformed agricultural land, thus suitable for agricultural related projects such as an Aquaculture Tilapia farm. The nature of the project was determined based on the farming experience, need and knowledge of the applicant in terms of Tilapia production, the need of fish as well as funding opportunities available for the development. Furthermore the operating plan for the proposed project has been informed by extensive market research and an assessment of the need of the products that will be produced.
Alternative 2	
Alternative 3	

e) No-go alternative

Should the No-Go Option be implemented, the site would maintain its status quo. The site is currently used for agriculture crop production. As such, the No-Go Option would not be environmentally, socially or economically feasible in the long-term and is thus not deemed feasible. However, the No-Go Option is nevertheless considered and assessed in relation to the potential implications of the proposed project, as required in terms of NEMA and its EIA Regulations

f) Please motivate for preferred site, activity and technology alternative

Motivation for the proposed site alternative as well as exclusion of alternatives:

Site location and layout alternatives

The applicant does not have an alternative site. To understand the reason for this, it is important to understand the context. The Department of Environmental Affairs DEA commissioned the CSIR to run the "Special Needs and Skills Development (SNSD) Programme" which is aimed at providing pro bono Environmental Impact Assessments (EIAs) for people who are classified as special needs clients/applicants, specifically Small, Medium and Micro Enterprises (SMMEs), Community Trusts, Individuals or Government Programmes. The CSIR received an application from Blue-Green (Pty) Ltd under the SNSD Programme. The CSIR identified Blue-Green as a client or a special needs applicant and has agreed to assist them with acquiring Environmental Authorization for the project on a pro bono basis, including the cost of the basic assessment, specialist studies, site visits and human resource. The layout of the proposed project has been carefully informed by the findings of the Ecological Impact Assessment, the Heritage Impact Assessment and the geohydrology (Appendix G) so as to avoid sensitive areas and loss of species of conservation concern. Furthermore the development is within areas that have already been transformed previously to limit the disturbance of natural habitats.

Design, technology & activity alternatives

The proposed development falls in the previously transformed agricultural land thus suitable for agricultural related projects such as Tilapia farming. The nature of the project was determined based on the farming experience, need and knowledge of the applicant in terms of fish production, the need of fish as well as funding opportunities available for the development. Furthermore the operating plan for the proposed project has been informed by extensive market research and an assessment of the need of the products that will be produced. In terms of the economic viability, the project does not make use of major technologies, which in turn results in the proposed development requiring very little energy. The following measures will be used as part of the resource efficiency of the proposed development:

Warming and lighting efficiency

Hydro Royal Solar water heating technology will be used in winter together with the electricity to minimise power usage and to warm up the water in order to sustain the lives of the fish. The sun will harvest heat and transfer it to the tank to reduce heating expenses in the fish farm and the Air Source Heat Pump. This water warming technology will be used in winter only to sustain the lives of the fish.

Waste water

Mozambique tilapia is opportunistic omnivores and will eat algae, plant matter, organic particles, small invertebrates (Morgan DL, 2004). Such a broad diet enables them to colonise different environments, since they don't rely on any particular food source. All waste water from the Aquaculture farm will be used to irrigate vegetables (lettuce) in the greenhouse. The jobs being created by the proposed development will be sourced to local communities. The operations of this facility will be under constant supervision.

Paragraphs 3 – 13 below should be completed for each alternative.

A.3 Physical size of the activity

a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:	**Size of the activity:**
Alternative A1[1] (preferred activity alternative)	20 000m^2
Alternative A2 (if any)	
Alternative A3 (if any)	

or, for linear activities:

Alternative:	**Length of the activity:**
Alternative A1 (preferred activity alternative)	
Alternative A2 (if any)	
Alternative A3 (if any)	

b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:	**Size of the site/servitude:**
Alternative A1 (preferred activity alternative)	
Alternative A2 (if any)	
Alternative A3 (if any)	

A.4 Site access

Does ready access to the site exist?	**YES**
If NO, what is the distance over which a new access road will be built	

Describe the type of access road planned:

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

The proposed project is located north of the town of Hammanskraal, west of the N1 national road, with access from the R101 road (refer to Figures 7 and 8).

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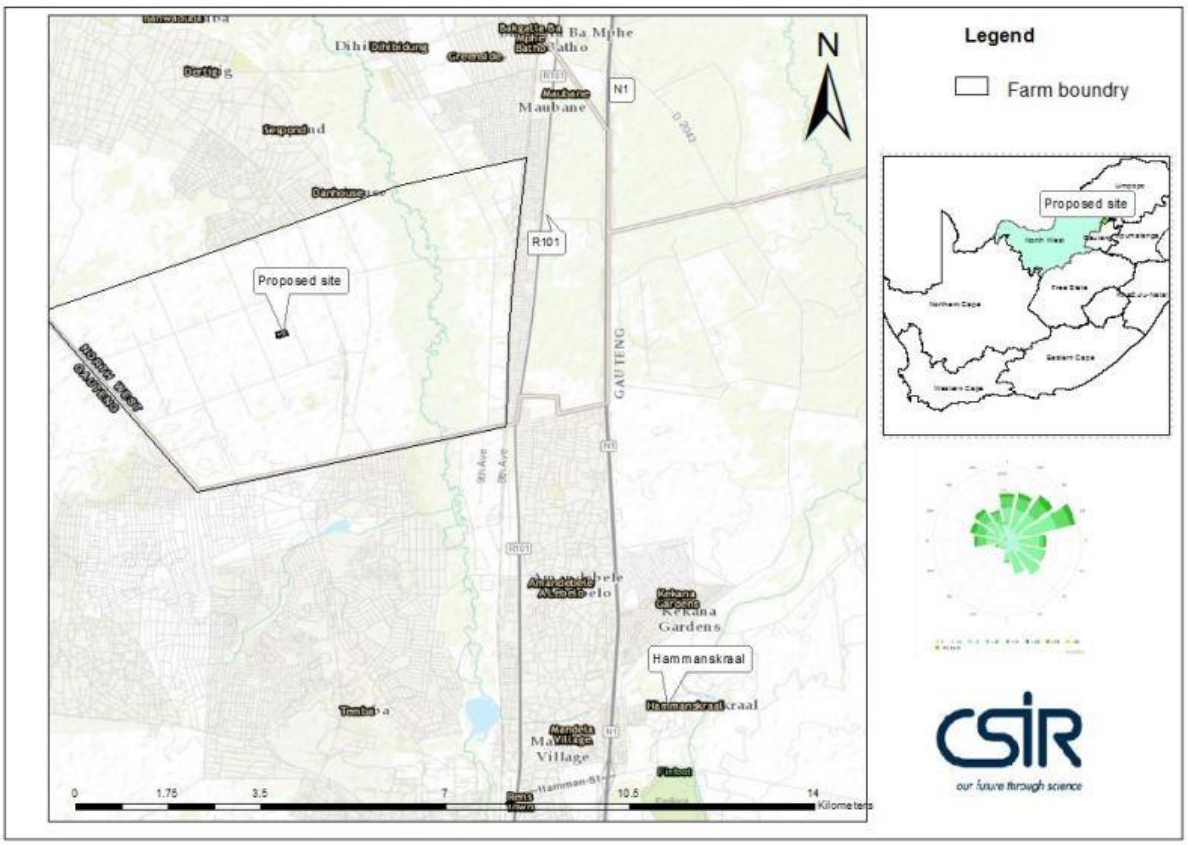


Figure 7: Map showing the locality of the site in the North West province

A.5 Locality map

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s;)
- the accurate indication of the site in relation to closest protected environments or national parks (i.e. within 2.5 km)
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds using the Hartebeeshoek94 WGS84 co-ordinate system

A.6 Layout/route map

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix B to this document.
The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

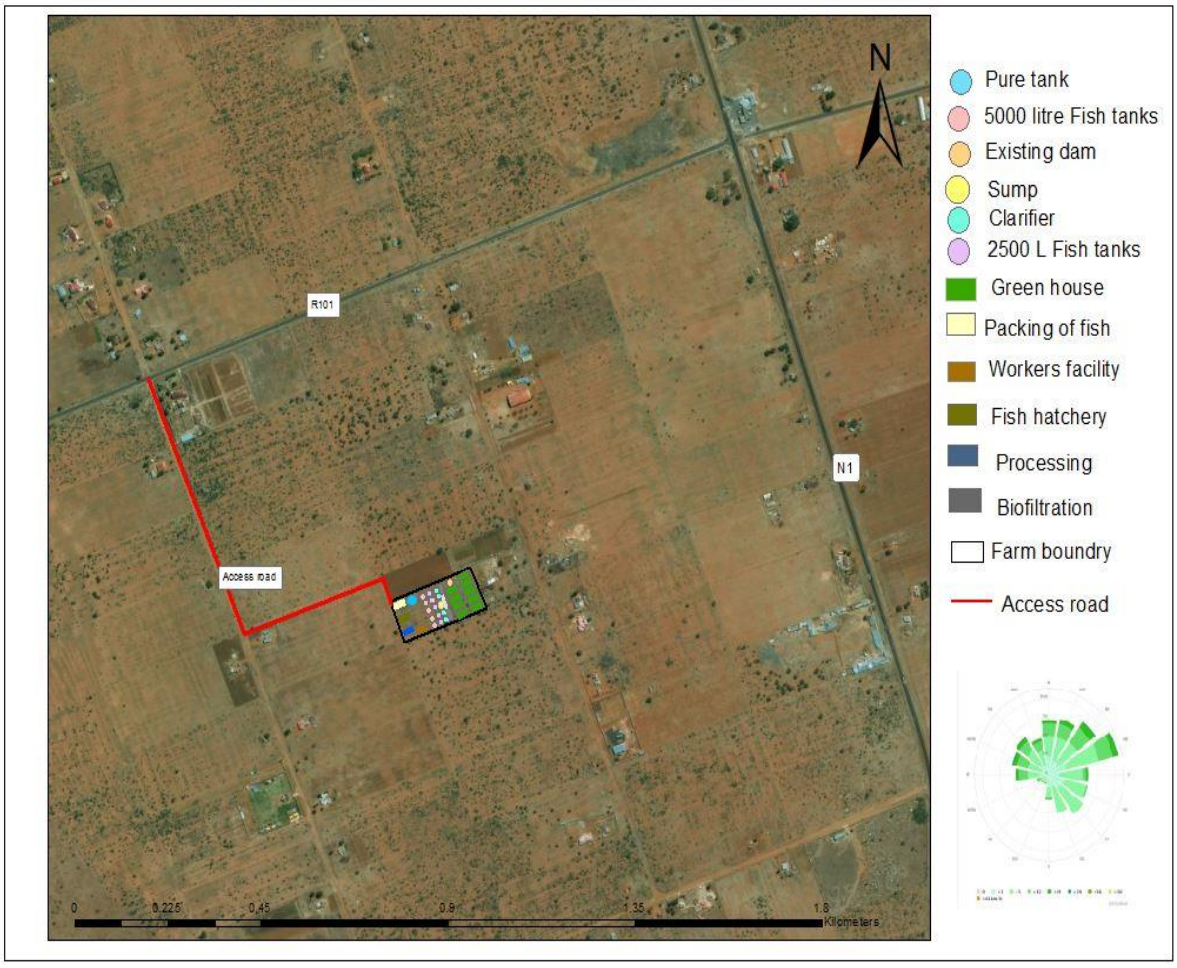


Figure 8: Map showing the location of the proposed aquaculture facility on the farm Bosplaas West Plot 413

A.7 Sensitivity map

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by Department of Water and Sanitation);
- ridges;

- for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas and ecological support area.
- protected areas (e.g Magaliesberg Protected Environment, Pilanesberg National Park etc.)

The sensitivity map must also cover areas within 100m of the site and must be part of Appendix B.

A.8 Site photographs

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix C to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

A.9 Facility illustration

A detailed illustration of the activity must be provided at a scale of at least 1:200 as Appendix D for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

A.10 Activity motivation

Motivate and explain the need and desirability of the activity (including demand for the activity):

1. Is the activity permitted in terms of the property's existing land use rights?	**YES**	**NO**	**Please explain**
The proposed development site falls within agricultural zoning of the municipality			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	**YES**		
The agricultural sector in North West has been identified as the backbone of rural economy; this is mainly because it has the potential to improve food security as well as to stimulate economic growth within the province. The proposed development will contribute towards the agricultural growth of the province in terms of job creation, positive trade balance for agricultural growth as well as skills development. The framework also acknowledges the significant role of emerging farmers towards agricultural production.			
(b) Urban edge / Edge of Built environment for the area		**NO**	
The proposed development is situated within the rural area Thaba ya Batho (Bosplaas).			
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	**YES**		
The proposed development promotes agricultural development and aligns with these objectives. According to the IDP of Moretele Local municipality, agriculture has become a focal point in all economic development prospects for the municipality. Furthermore, the strategic objectives outlined in the IDP have identified agricultural development within the municipality as key performance indicator to achieving economic growth			
(d) Approved Structure Plan of the Municipality			**Please explain**
The proposed site falls within agricultural transformed zone according to the municipal SDF the area is a local Agri-economic development			

(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	**NO**	
According to the Draft environmental management By Law of the Moretele Municipality the municipality is yet to develop a sensitive habitat management and conservation plan. In addition, the environmental management By law also outlines the principles of NEMA which promotes development that is socially, economically and environmentally sustainable. The undertaking of the Basic Assessment ensures that negative environmental impacts are avoided and minimised where possible.		
(f) Any other Plans (e.g. Guide Plan)	**NO**	
The proposed development site falls in the cultivated land according to the North West Spatial Development Plan		
Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?		
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	**YES**	
Agriculture is currently a focal point in developmental prospects within the municipality. As such the proposed development of Aquaponics aligns with the priorities identified in the IDP.		
4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	**YES**	
According to the IDP, 2017 the communities within this municipality have identified Aquaculture as a priority need that contributes towards local economic development and job creation.		
5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix E.)	**YES**	
The applicant shall lodge an application with Eskom for electricity needs of the project. Furthermore the applicant will use groundwater. An application for a Water use License shall be lodged with the Department of Water and Sanitation.		
6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)		**Please explain**
No additional connection shall be required, the site already has infrastructure for the supply of electricity. The applicant shall lodge an application for additional capacity.		
7. Is this project part of a national programme to address an issue of national concern or importance?	**YES**	
The proposed development aims to address challenges of food security in South Africa on a local scale. This shall be done through rural economic growth, maintenance of positive trade balance for primary agricultural products as well as skills development and training for the local community.		

8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	**YES**	
The proposed development is within low-moderate environmental sensitive area; furthermore it has a history of agricultural practices as such providing a suitable location for the fish tanks		
9. Is the development the best practicable environmental option for this land/site?	**YES**	
The proposed development site is not pristine; it has already been transformed as a result of past agricultural practices. The development footprint of the site has been carefully informed by the sensitivities on site and will occur in areas of low-moderate sensitivities ensuring minimal destruction of important flora and fauna.		
10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	**YES**	
The project benefits outweigh the negative impacts; the project will make a positive contribution to sustainable economic growth, skills development and employment opportunities in the Moretele Local Municipality. Furthermore it will be undertaken in a manner that aims to minimise environmental impacts of the Aquaponics farm.		
11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	**YES**	
The proposed development is within low-moderate environmental sensitive area; furthermore it has a history of agricultural practices as such providing a suitable location for the aquaculture facility		
12. Will any person's rights be negatively affected by the proposed activity/ies?		**NO**
The project will not affect the rights of the local community; in fact it will economically benefit the local community by creating job opportunities.		
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?		**NO**
The proposed project is located outside the urban edge.		
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?		**NO**
The proposed development is on a small scale and does not contribute towards the Strategic Integrated projects.		
15. What will the benefits be to society in general and to the local communities?		**Please explain**
The benefit of the project entails 100 permanent employment at during phase 3, food security, skills development and training for the local community.		
16. Any other need and desirability considerations related to the proposed activity?		**Please explain**
No		
17. How does the project fit into the National Development Plan for 2030?		**Please explain**
According to StatsSA, the Bosplaas community is poverty stricken with above 20% of the households with no income. The proposed development aims to maintain and increase South Africa's ability to meet its national food requirements, and also seeks to eliminate inequalities and poverty amongst households in Bosplaas and Moretele local municipality. According to Stats SA, about 14.3 million South Africans are vulnerable to food insecurity. As such the proposed development feeds into the food security stream. In addition, the main goals highlighted in the NDP which relate to the proposed project are employment and adequate nutrition. Chapter 6 of the National Development Plan highlights an "inclusive rural economy" and the objectives of this plan are to create jobs in agriculture, maintain a positive trade balance for primary and processed agricultural products and activating rural economies through service to small and micro farmers.		

18. Please describe how the general objectives of Integrated Environmental Management as set out in Section 23 of NEMA as amended have been taken into account.
The general objectives of Integrated Environmental Management were taken into account by considering all the potential negative and positive impacts of the proposed project on both the biophysical and socio-economic environments. In order to avoid potentially significant impacts, specialist inputs were obtained in relation to terrestrial and aquatic ecology. Based on the findings of the specialist studies a number of recommendations / mitigation measures have been identified for consideration in further project design and implementation. A Public Participation Process is being conducted for the project, where local farmers, landowners, communities and the local authority (Interested and Affected Parties) are being consulted from the throughout the Environmental Basic Assessment process in order to receive their views about the proposed development. The public and authorities will be given adequate opportunity to comment on the proposed project and to participate in the Basic Assessment Process. The Environmental Basic Assessment report together with the Environmental Management Programme will be submitted to the Department of Environmental Affairs for review and approval prior the implementation of the project.
19. Please describe how the principles of environmental management as set out in Section 2 of NEMA as amended have been taken into account.
All efforts are being made to ensure that the project achieves sustainability, environmental justice and that the environmental rights of Interested and Affected Parties (local stakeholders, communities and the construction employees) are protected. The basic needs of landowners and the public were taken into account during the planning phase of the proposed project, which aims to stimulate economic growth, create employment opportunities and make significant contribution towards food security. Minimisation of potential negative impacts and optimisation of potential positive impacts will be ensured by way of effective implementation of the Construction EMPr. Thus the proposed project is deemed to be socially, environmentally and economically sustainable.

A.11 Applicable legislation, policies or guidelines

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
The Constitution of the Republic of South Africa (No. 108 of 1996)	The constitution states that "everyone has the right to an environment that is not harmful to their health or well-being".	National and Provincial	1996
National Environmental Management Act, 1998 (Act 107 of 1998).	The proposed development triggers listed activities within this act	National Government, and National Department of Environmental Affairs	1998
National Environmental Management Act EIA Regulations (7 April 2017)	A number of listed activities have been identified that have triggered the need for a Basic Assessment in terms of these regulations	National Government, and National Department of Environmental Affairs	2017
National Water Act, 1998 (Act 36 of 1998).	The proposed development uses groundwater	Department of Water Affairs	1998
National Environmental Management: Waste Act (Act 59 of 2008) (as amended)	Protection of the surrounding environment through efficient waste management by the appointed Contractor.	National Government, and National Department of Environmental Affairs	2008
The National Heritage Resources Act, 1999 (Act No	The proposed development site has graves.	South African Heritage Resource	1999

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
25 of 1999) as amended, particularly Chapter II, Section 38		Agency	
National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)	The NEMBA aims to conserve and provide management of biodiversity in the country. The proposed development site is within a critical biodiversity area.	National Government, and National Department of Environmental Affairs	2004
Local Municipal By-Laws.	Any municipal by laws that may have jurisdiction over this project.	Rustenburg Local Municipality	

A.12 Waste, effluent, emission and noise management

a) Solid waste management

	YES	NO
Will the activity produce solid construction waste during the construction/initiation phase?		
If YES, what estimated quantity will be produced per month?	200m^3	

How will the construction solid waste be disposed of (describe)?

Waste generated during the construction activities will be collected by the trucks of the appointed Contractor and disposed of at the registered Bosplaas West landfill facility

Where will the construction solid waste be disposed of (describe)?

- Waste generated will be disposed of at the Bosplaas west landfill facility.
- Recyclable materials will be collected or delivered to haulers (recyclers): Who in turn give monetary remuneration for materials such as scrap metal.
- Debris such as brick, asphalt and concrete to be scattered over road to avoid muddiness during rain
- Assign dumpsters (bins) by reputable waste management companies e.g. Waste Group who will periodically pick the bin when it's full for disposing. This will remove materials from the construction site that is otherwise left behind by the haulers.

	YES	
Will the activity produce solid waste during its operational phase?		
If YES, what estimated quantity will be produced per month?	8m^3	

How will the solid waste be disposed of (describe)?

Most of the solid waste will be from fish carcases and it will be used to supply the plants with nutrients

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

Municipal waste collected and dumped at the Bosplaas West landfill (dumpsite)

Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?

If for some reason the municipal waste is not collected periodically then the local authority will be immediately called to collect the waste and the councillor asked to intervene and investigate.

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA?	NO

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility?	NO

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	NO
If YES, what estimated quantity will be produced per month?	
Will the activity produce any effluent that will be treated and/or disposed of on site?	NO

If YES, describe the type of effluent and the disposal mechanism/method

The waste water will be used for irrigation of cultivated cash crops on site

Will the activity produce effluent that will be treated and/or disposed of at another facility?	NO

If YES, provide the particulars of the facility:

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

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other that exhaust emissions and dust associated with construction phase activities?	NO
If YES, is it controlled by any legislation of any sphere of government?	

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the emissions in terms of type and concentration:

d) Waste Licence/Registration

Will any aspect of the activity produce waste that will require a waste licence/registration in terms of the NEM:WA?	NO

If YES, please submit evidence that an application for a waste licence/registration has been submitted to the competent authority

e) Generation of noise

Will the activity generate noise?	YES
If YES, is it controlled by any legislation of any sphere of government?	NO

If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the noise in terms of type and level:

Noise during construction by trucks However, the noise will be of a short term, temporary, localised nature and will last only during the construction phase of the project. The EMPr specifies that the appointed Contractor should liaise with affected communities during construction to minimise noise impacts.

A.13 Water use

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

	Groundwater

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:	10 000 litres (note that the groundwater extracted will be re-circulated and re-used, as explained in the project description)
Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water and Sanitation?	YES

If YES, please provide proof that the application has been submitted to the Department of Water and Sanitation.

A.14 Energy efficiency

Describe the design measures, if any that have been taken to ensure that the activity is energy efficient:

The following measures will be used as part of the resource efficiency of the proposed development:

Warming efficiency

Hydro Royal Solar water heating technology will be used in winter to warm up the water in order to sustain the lives of the fish. The sun will harvest heat and transfer it to the tank to reduce heating expenses in the fish farm and the Air Source Heat Pump. This water warming technology will be used in winter only to sustain the lives of the fish.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

[redacted]

Has a specialist been consulted to assist with the completion of this section? [redacted] NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix F.

SECTION B: SITE / AREA / PROPERTY DESCRIPTION

Important notes:

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, as it appears on the Site Plan.

2. Paragraphs 1 - 6 below must be completed for each alternative.

Current land-use zoning as per local municipality IDP/records:	Agricultural

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required? YES

B.1 Gradient of the site

Indicate the general gradient of the site.

Alternative S1:

Flat

Alternative S2 (if any):

Flat

Alternative S3 (if any):

Flat

B.2 Location in the landscape

Indicate the landform(s) that best describes the site:

2.1 Ridgeline 2.2 Plateau 2.3 Side slope of hill/mountain		2.4 Closed valley 2.5 Open valley 2.6 Plain	
		2.7 Undulating plain / low hills 2.8 Dune 2.9 Seafront	

B.3 Groundwater, soil and geological stability of the site

Is the site(s) located on any of the following?

	Alternative S1:	Alternative S2 (if any):	Alternative S3 (if any):
Shallow water table (less than 1.5m deep)	NO		
Dolomite, sinkhole or doline areas	NO		
Seasonally wet soils (often close to water bodies)	NO		
Unstable rocky slopes or steep slopes with loose soil	NO		
Dispersive soils (soils that dissolve in water)	NO		
Soils with high clay content (clay fraction more than 40%)	NO		
Any other unstable soil or geological feature	NO		
An area sensitive to erosion	YES		

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

B.4 Groundcover

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition[E]	Natural veld with scattered aliens[E]

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

B.5 Surface water

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River	YES	
Non-Perennial River		NO
Permanent Wetland		NO
Seasonal Wetland	YES	
Artificial Wetland		NO

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

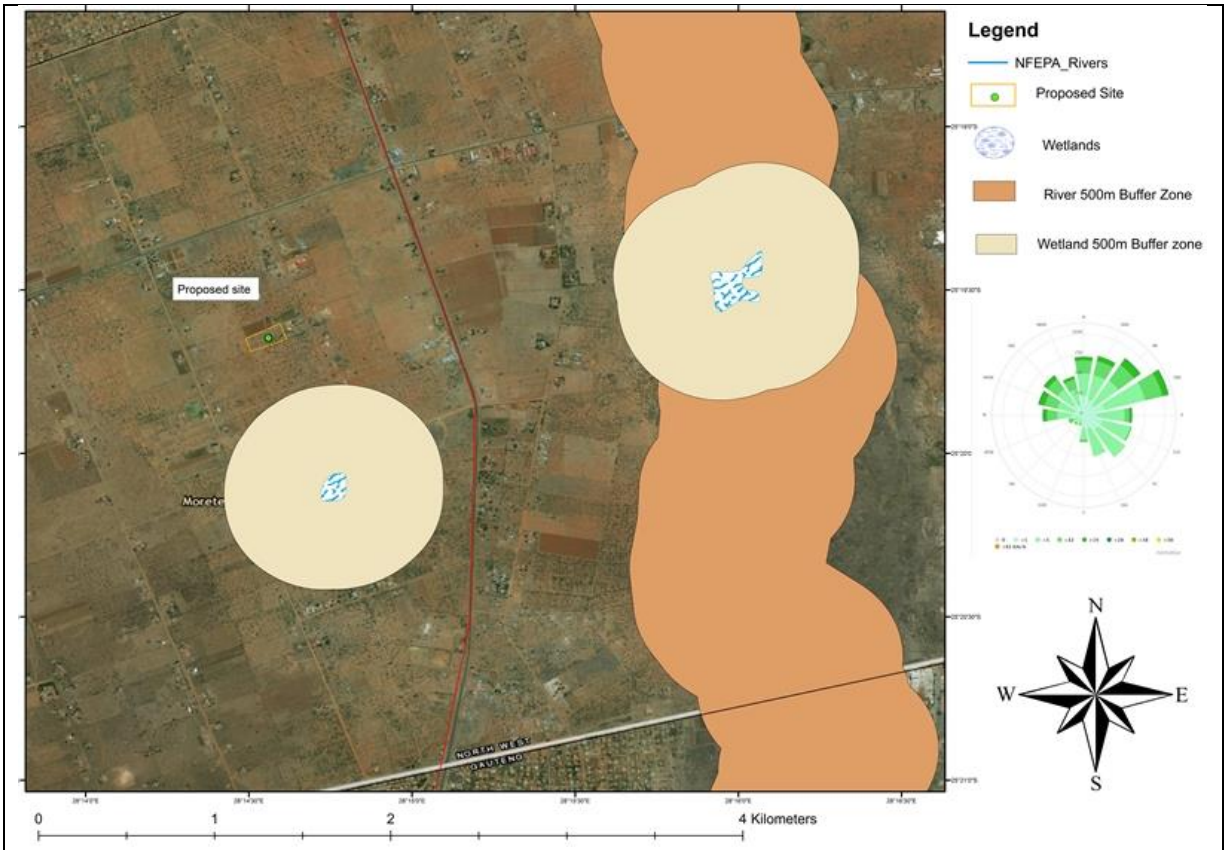


Figure 9: Watercourse Buffered map

The nearby wetland is located approximately 1km to the south of the proposed development site and as such does not trigger any listed activity in terms of NEMA or NFEPA

B.6 Land use character of surrounding area

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

Natural area	
Low density residential	
	Plantation
	Agriculture

If any of the boxes marked with an "[N] "are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain

If any of the boxes marked with an "AN" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)		NO
Core area of a protected area?		NO
Buffer area of a protected area?		NO
Planned expansion area of an existing protected area?		NO
Existing offset area associated with a previous Environmental Authorisation?		NO

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix B (as part of sensitivity map).

B.7 Biodiversity

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult http://bgis.sanbi.org or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix B to this report.

a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)

Systematic Biodiversity Planning Category	**If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan**
	According to B GIs 2015 data the proposed site does not fall in any CBA or ESA

b) Indicate and describe the habitat condition on site

Habitat Condition	**Percentage of habitat condition class (adding up to 100%)**	**Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).**
Near Natural (includes areas with low to moderate level of alien invasive plants)	5%	Possible Acacia- Springbokvlakte Tree and 1 *Combretum imberbe* and 2 *Sclerocarya birrea*
Transformed (includes cultivation, dams,	95%	

urban, plantation, roads, etc)		

c) Complete the table to indicate:

(i) the type of vegetation, including its ecosystem status, present on the site; and
(ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems		Aquatic Ecosystems
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	**Vulnerable**	**Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands)**
		NO

d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)

From the field investigations the study area was largely monospecific and almost the entire site had been previously farmed (over 95%). Available aerial imagery from Google Earth dated back to 2009 and still showed past farming practices. Therefore it was very difficult to distinguish a diversity of habitat types. Large trees that have significance as roosting sites for species such as Owls and Raptors were mapped.

According to the specialist ecological study by Ekotrust (2017), a total of 116 indigenous and 37 alien species (32% of all species) were recorded on site. Fourteen declared invasive plant species were recorded on site. These include nine Category 1b species, two Category 2 species and three Category 3 species. Twenty-three other alien plant species were recorded on site.

The main findings of the habitat survey can be summarised as follows:

- About 80% of the site has been transformed by human activities in the past (ploughing).
- The site is not located in a protected area according to NEM:PAA.
- None of the listed North West province protected or specially protected plant species or the Red Data species listed for the 2528AC grid were recorded on site. Due to the relatively degraded state of the site, the chances of finding any of these species is regarded as negligible.
- None of the plant species recorded on site are listed in the NEM:BA (ToPS) lists of critically endangered, endangered or vulnerable species.
- All plant species recorded on site are considered as 'least concern'.
- None of the species are listed in CITES 2016 appendices.
- No protected tree species were recorded on the footprint of the proposed project site, but *Combretum imberbe* and *Sclerocarya birrea* do occur on the residential section of the property.
- No endemic species were recorded on site.

Faunal survey

No Red Data faunal species were recorded on the site.

Sensitivity

No sensitive terrestrial habitats occur on site and therefore the general sensitivity of the area is regarded as very low. Although the site was not cultivated within the last 10 years, the effect is still visible with the result that the sensitivity of the site was rated as very low (Table A).

Table A: Sensitivity assessment of the site

Environmental parameter (x weighting)	Score
Threatened status (x5)	10
% Red data species (x4)	0
% North West rare species (x4)	0
Number protected trees (x3)	0
% Endemic species (x2)	0
Conservation value (x4)	0
Species richness (x2)	6
Connectivity (x2)	6
Erosion (x2)	2
Resilence (x3)	6
Sum:	**30**
Sensitivity rating:	**Very low**

Very low sensitivity was recorded on site by EKOTRUST (2017) which means it is usually applicable to habitats that have been transformed, especially by human activities

Table 2: Vegetation units within the proposed development site

Vegetation Community	Conservation Significance	Area - Ha	Area -%
Drainage Habitat			
Possible Artificial Drainage	Low negative	0	0
Tree Clumps			
Combretum imberbe and Sclerocarya birrea	High	0.19	1.99
Transformed Habitat			
Transformed - *Springbokvlakte Thornveld*	Moderate-Low	5.92	20.28
Disturbed			
Built-up Areas	Low	0	0
Track	Low	0.14	1.54

According to the NFA (2016): List of Protected Tree Species, two protected tree species were recorded on the property (*Combretum imberbe* and *Sclerocarya birrea*) figure below 5.The site falls in the Springbokvlakte Thornveldd, which is classified as 'Vulnerable ' with less than 1% conserved in statutory reserves (Mucina & Rutherford 2006, NEMBA 2011). Almost half of the vegetation type has already undergone transformation primarily by cultivation, is already transformed by cultivation and urban sprawl, with dense rural populations in certain areas. Although the significance of habitat loss on the development site is low, the rating should be seen from the point of view of the history of land-use on the site.

Figure 10: Photographs of Conservation Important plant tree *Combretum imberbe and sclerocarya berera*

NB: These protected trees are not within the proposed development footprint but they are within the 4.4 hectare of the land

Fauna:

Most of the plains have an open woody and grass layer and is marginally favourable for faunal occupation. However, the proximity of the site to the surrounding townships, the grazing by livestock and other farming activities, and the movement of people through the area will contribute to a sparse faunal population. However, the indigenous and endemic trees and shrubs should be protected as far as possible because they form important food sources and habitats for various fauna. The underbrush normally associated with these species also forms an important micro-habitat for a number of animal species.

B.8 Cultural/Historical Features

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:	YES

A **heritage specialist study** (including archaeology, palaeontology, graves and cultural-historical features) was conducted as part of this Basic Assessment and the results are included in this section.

Palaeontology

The archaeological field study reported a flat, sandy land surface devoid of bedrock exposure. This lack of bedrock has meant that geological and palaeontological knowledge in this area stems largely from analysis of borehole data. Almond (2016:1) reports that the study area overlies the Irrigasie Formation which is comprised of "reddish-brown, readily-weathered mudrocks with subordinate sandstones and minor conglomerates". The kinds of fossils known to occur in the area are primarily trace fossils, while fossil pollens and spores and very rare dinosaur bones have also been reported. No fossils were seen during the archaeological survey.

Archaeology

The survey showed that a very low density scatter of Stone Age artefacts was present throughout the general area. There was no focus to these artefacts and no 'site' could be delineated; the artefacts can be ascribed to background scatter. Most were made from quartzite and some displayed cobble cortex indicating that they were made from river cobbles. Because of their very widespread distribution and very low density, these finds are of minimal heritage significance.

A ruined structure was located along the north-eastern boundary of the property. It was made from cement bricks. It is almost certainly less than 100 years of age and thus is not considered to be a heritage resource. It probably dates to the 1950s because historical aerial photography reveals that the area seemed unaltered in 1948-50 (the earliest available series), but by 1961 a number of 'bright spots' had appeared on the landscape. These spots indicate higher reflectivity from areas cleared of vegetation. One of these spots corresponds with the ruin. Another corresponds with the cement slab noted alongside the corrugated iron shack.

Graves

Two small informal cemeteries were located on the property. Each had three graves in it. The graves of the first were surrounded by cement bricks that were no doubt obtained from a nearby ruined structure made with the same bricks and located some 35 m away to the northwest. The graves are surrounded by a wire fence and aligned east-west. Because the ruin is relatively recent, the graves are also necessarily recent and must post-date the collapse of the brick structure. These graves are very likely less than 60 years of age and would thus not be regarded as heritage resources in terms of the NHRA. The second cemetery also has three graves in it. These graves are covered by stone mounds and are not enclosed by any fence. Two graves appear to be full (i.e. adult) size, while the third is far smaller and is likely that of a child. Larger stones have been placed at the head and foot of each grave. They are aligned east-west. These three graves are very likely older and perhaps completely unrelated to those in 'Cemetery 1'.

Cultural landscape

A survey of historical aerial photography reveals that the landscape on the site was little used during the mid-twentieth century. However, the wider region does show evidence of occupation with small cultivated lands and (presumably stone-built) structures in the south and north respectively.

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

Will any building or structure older than 60 years be affected in any way?	NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	NO

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

B.9 Socio-economic character

a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

The Moretele Local Municipality has a total population of 186 947. According to STATSsa Moretele Local Municipality is located in an area called Moretele, which is situated far north of Pretoria in the North West province. The Municipality comprises of 24 wards, which are made up of 66 villages and plots. Most villages are ruled by 4 traditional leaders (Dikgosi) who are recognised by law and who all represent their respective tribes/communities in council. The municipality was built in 2000, and covers an area of 1 369 km^2. It is located strategically to join four provinces, namely North West, Gauteng, Mpumalanga and Limpopo. Moretele is the Setswana name for a river that runs through the area, namely Noka ya Moretele (the Moretele River).The proposed site falls within Bosplaas in Moretele Local municipality. Bosplaas is Afrikaans name for 'bush farm'. The original name of the area was Boschplaats, and was under kingship of Moepi (GPS coordinates: 25.3274 S, 28.249 E). Bosplaas has a total population of 2670 people and 837 households. Majority of households in this community has electricity for lighting which is 81% and 22.8% water piped inside dwellings. Bosplaas has 52.40 % of male and 47.60% of female.

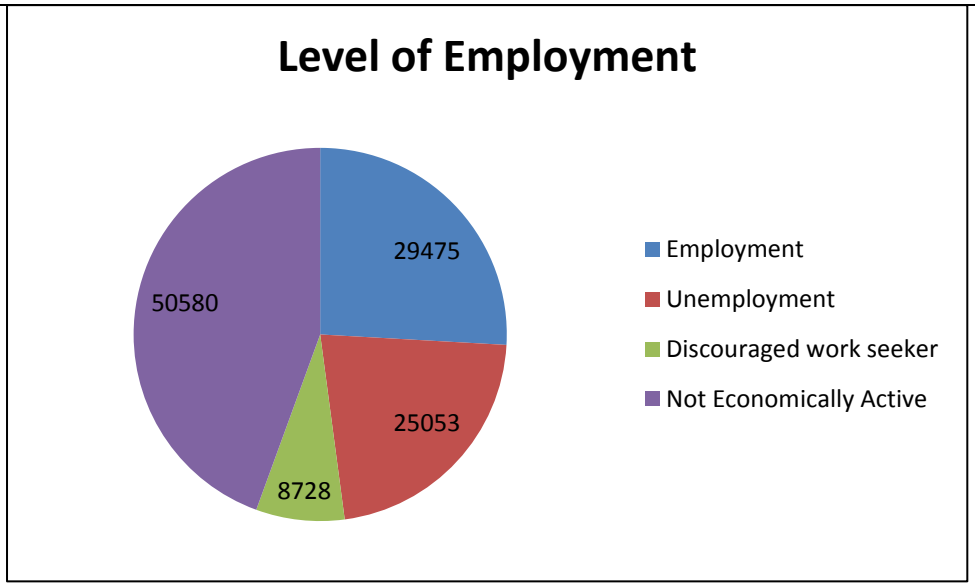


Figure 11: Level of unemployment

The Figure 11 above depicts the numbers employment status of Moretele municipality in numbers. According to the figure above majority of the Moretele municipality population 50580 are not economically active, 29475 of the population are employed whereas 25053 of the population are unemployed.

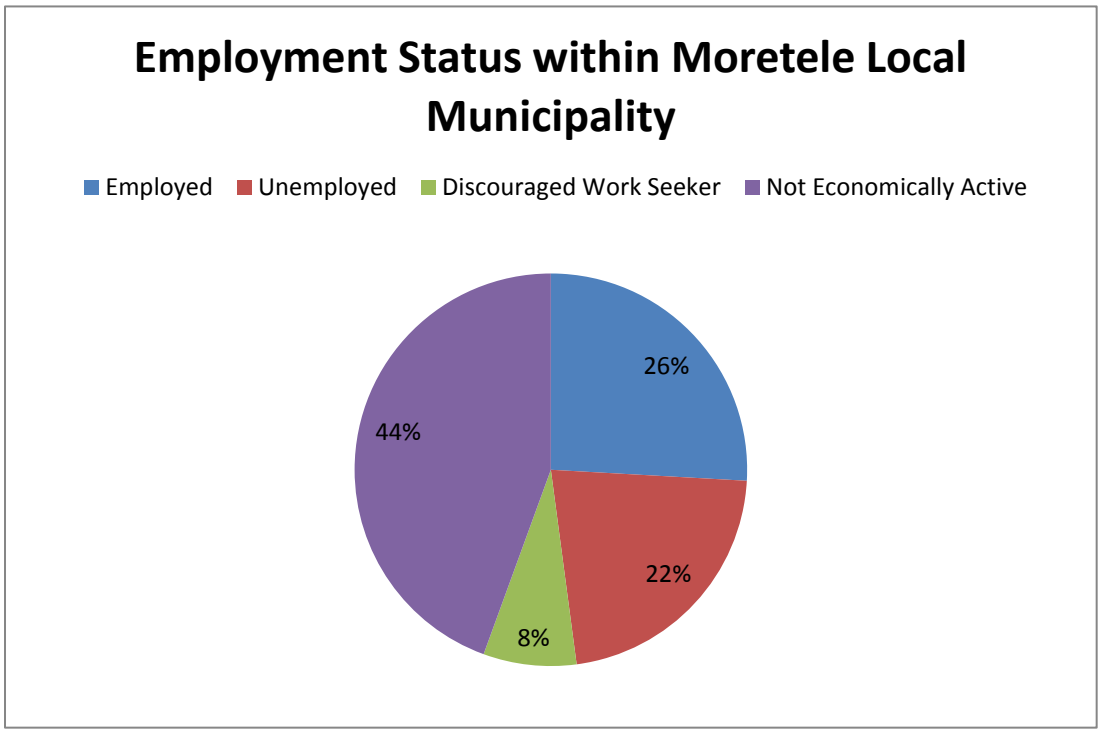


Figure 12: Employment status of Moretelele local municipality

The figure above depicts the percentage of employment status of Moretele municipality. According STATS S job creations need to be prioritised because majority of the population 44% are not economically active only 26% of the population are employed. The proposed development of an aquaculture facility will boost the economic growth of the municipality.

Figure 11: Level of education

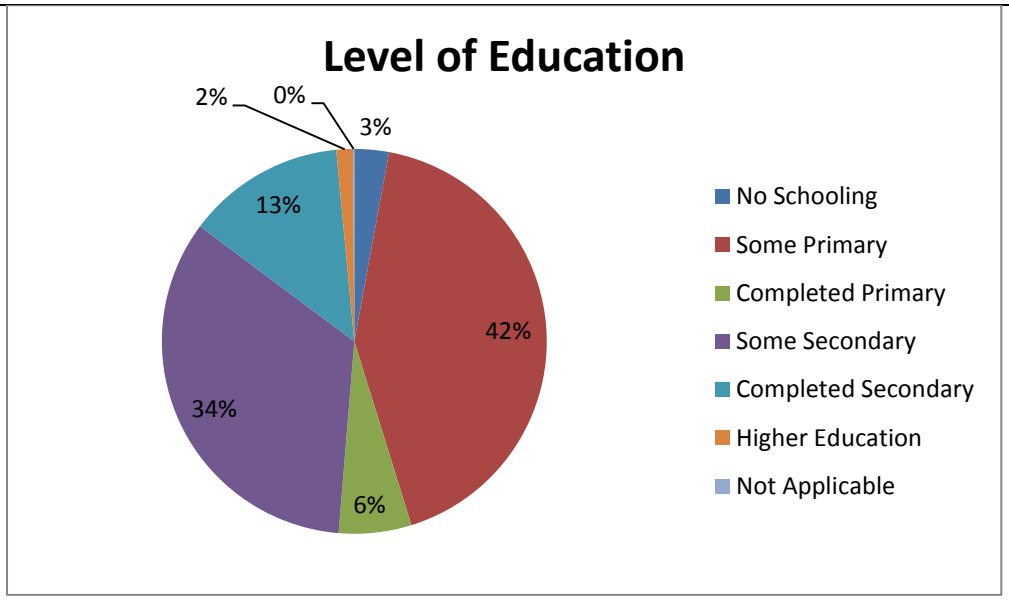


Figure 13: Level of education within Moretele Local Municipality

According to the figure above majority of the population in Moretele municipality had primary schooling or no schooling at all. Only 2% percent of the population have higher education. There is a need for education empowerment in the municipality.

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R 11 586 180.00
What is the expected yearly income that will be generated by or as a result of the activity?	R 1 414 274.00
Will the activity contribute to service infrastructure?	NO
Is the activity a public amenity?	YES
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	+-200
What is the expected value of the employment opportunities during the development and construction phase?	R1 414 274.00
What percentage of this will accrue to previously disadvantaged individuals?	60%
How many permanent new employment opportunities will be created during the operational phase of the activity?	11 permanent employees
What is the expected current value of the employment opportunities during the first 10 years?	R2 591 380.00
What percentage of this will accrue to previously disadvantaged individuals?	100%

B.10 Specialist(s) consultation

Has a specialist been consulted to assist with the completion of this section?	**YES**	

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix F. All specialist reports must be contained in Appendix G and must meet the requirement in Appendix 6 of EIA Regulations, 2014.

SECTION C: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

C.1 Impacts that may result from the planning and design, construction, operational, decommissioning and closure phases as well as proposed management of identified impacts and proposed mitigation measures

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

Activity	Impact summary	Significance	Proposed mitigation
Construction Phase			
Direct Impacts	*Loss of indigenous vegetation on the footprint of development*	Low (Negative)	• Development should be contained within the proposed footprint of the development and unnecessary disturbance adjacent to the site should be avoided. • No rare plant species were recorded on site and although the species richness of the plant community is fairly high most of the species are herbaceous and/or weedy species. No special measures are therefore necessary for the conservation of individual species. • Indigenous trees and shrubs should be established in the place of alien species • The denuded and disturbed areas on site should be landscaped and re-vegetated as soon as possible with indigenous plants
	Soil disturbance	Low (Negative)	• Dust control measures should be implemented during construction • Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation. • Approved soil stabilisers may be utilised to limit dust generation. • Ensure that construction vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour. • Limit vehicles, people and materials to the construction site • Adequate dust control strategies should be applied to minimise dust deposition, for example: Periodic spraying of water on the entrance road when necessary
	Increased noise and dust levels	Low	• Limit vehicles, people and materials to the construction site. • Commence (and preferably complete) construction during winter, when the risk of erosion should be least. • Revegetate denude areas with locally indigenous flora a.s.a.p. • Vegetation of areas not to be developed. • Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting.
	Loss of faunal habitat.	Low	• Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least. • Check open trenches for trapped animals (e.g. hedgehogs, reptiles and frogs), and relocate trapped animals. • Prohibit disturbance and persecution (e.g. poaching) of fauna, and introduction of pets and other alien fauna (apart from the fish production). • Provide notices and training to inform workers about dangerous animals (e.g. venomous snakes and scorpions) and prohibited activities (e.g. poaching) • Walk fence lines to remove snares.
	Introduction and proliferation of alien species	Low	• Carefully regulate / limit access by vehicles and materials to the construction site. Demarcate or fence in the construction area. • Prohibit the introduction of domestic animals such as dogs and cats. • Remove any woody alien species that germinate. • Plant only locally indigenous flora if landscaping needs to be done • Keep construction activities neat and tidy. When complete, remove all sand piles and landscape all uneven ground while re-establishing a good topsoil layer • Remove Category species using mechanical methods, and minimize soil disturbance as far as possible.
	Stress Level Determination of a Groundwater Resource Unit	Moderate	• Another borehole should be implemented in the expansion of the project
	Present Status Category based on vulnerability and land use impact	Moderate	• Deterioration of water quality needs to be avoided and the current PES must be maintained or improved upon
	Present Ecological Status based on Current and Expected Contamination, Land Use and Vulnerability • Water Quality	Low Impact	• Protected areas (e.g. nature reserves) require a B class in water quality to ensure sustainability of protected ecology; • Deterioration of water quality needs to be avoided and the current PES must be maintained or improved upon • Adhere to the site groundwater management plan • The domestic waste would have a low impact on the receiving environment, however it should be disposed of at a suitable landfill site only and good housekeeping practices should be implemented and maintained at the site.
	• Water Quantity	Moderate	

Activity	Impact summary	Significance	Proposed mitigation
	• Combined	Moderate	
	Reduction in available groundwater quantity in the local area as a result of usage by the project during construction	Low	• Although unlikely to occur, should any local groundwater user's resource be impacted on by operations at the site the affected party should be provided with an alternative water source at the operator's cost. • Groundwater levels should be monitored regularly and should any negative trends in groundwater levels be observed suitable mitigation should be implemented. • Discharge water from the processing operations should be disposed of in a safe manner, should the water become contaminated over time it should either be stored in dedicated PCD's for reuse at the processing plant or treated prior to discharging into the environment.
	Destruction of palaeontological material	Very Low (Negative)	• If any archaeological material, palaeontological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.
	Destruction of archaeological artefacts	Very Low (Negative)	• If any archaeological material, palaeontological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.
	Destruction of graves	Low (Negative)	• The two graveyards should be fenced off clearly and pointed out to all construction workers and other staff on site to ensure that impacts to them are avoided; • No construction work should occur within 10 m of any of the graves;
	Potential spillage of by spillage or discharge of construction waste water	Low (Negative)	• Ensure that adequate containment structures are provided for the storage of construction materials on site. • Ensure the adequate removal and disposal of construction waste and material
	Potential Pollution of the surrounding water and ground as a result of generation of building rubble and waste scrap material	High (Negative)	• Ensure that adequate containment structures are provided for the storage of construction materials on site. • Ensure the adequate removal and disposal of construction waste and material
	Opportunities for employment and skills development	Medium (Positive)	• Enhance the use of local labour and local skills as far as reasonably possible. • Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained. • Ensure that an equitable percentage allocation is provided for local labour employment as well as specify the use of small-to-medium enterprises and training specifications in the Contractors contract. • Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.
	Potential visual impacts as the result of construction activities	Low (Negative)	• No specific mitigation measures are required other than standard construction site housekeeping and dust suppression. These are included below: • The contractor(s) should maintain good housekeeping on site to avoid litter and minimise waste. • Litter and rubble should be timeously removed from the construction site and disposed at a licenced waste disposal facility. • The project developer should demarcate construction boundaries and minimise areas of surface disturbance. • Appropriate plans should be in place to minimise fire hazards and dust generation. • Night lighting of the construction site should be minimised within requirements of safety and efficiency.
	Potential impact on the safety of construction workers and Health injuries to construction personnel as a result of construction work	Medium (Negative)	• Ensure that a skilled and competent Contractor is appointed during the construction phase. The Contractor must be evaluated during the tender/appointment process in terms of safety standards. • The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate. • The Contractor must undertake a Construction Phase Risk Assessment. • A Construction Site Manager or Safety Supervisor should be appointed, in conjunction with the project manager, to monitor all safety aspects during the construction phase. This could be the same person that is assigned to co-ordinate the construction traffic.
	Traffic, congestion and potential for collisions	Low (Negative)	• Ensure that roads are not closed during construction, which may restrict access for emergency services. • The Contractor must ensure that all construction personnel are provided with adequate PPE for use where appropriate

Activity	Impact summary	Significance	Proposed mitigation
Indirect Impact	Loss of biodiversity	Low (Negative)	• Development should be contained within the proposed footprint of the development and unnecessary disturbance adjacent to the site should be avoided. • No rare plant species were recorded on site and although the species richness of the plant community is fairly high, most of the species are herbaceous and/or weedy species. No special measures are therefore necessary for the conservation of individual species. • Indigenous trees and shrubs should be established in the place of alien species
	Enhanced spread of alien vegetation	Low (Negative)	• Removal of alien species and the rehabilitation of the habitat may favour indigenous plant species. • Disturbance will favour alien species and without follow-up control, alien species may spread through the area. • Development should be restricted to the proposed development site and the disturbance to them surrounding natural or indigenous vegetation be kept to a minimum. • Establish a monitoring program for the early detection and control of alien invasive plant species. • No alien invasive species should be used in landscaping or gardens on the site.
	Destruction, displacement or disturbance of indigenous fauna	Low (Negative)	• Limit disturbance to the proposed site and ensure that minimum disturbance takes place in the, surrounding area. • Rehabilitate disturbed areas with indigenous species as soon as possible following construction of the facility. • Poaching of animals should be prohibited
	Some additional disturbance will inevitably occur in the direct surroundings of the site.	Medium (Negative)	• Development should be contained within the proposed footprint of the development and unnecessary disturbance adjacent to the site should be avoided.
	Increased dust levels during construction might negatively affect the plant growth.	Low (Negative)	• Dust control measures should be implemented during construction. • The denuded and disturbed areas on site should be landscaped and re-vegetated as soon as possible with indigenous plants
Cumulative impacts: Additional infrastructure development, for example, water pipelines, power lines and access roads and the spread of alien invaders due to loss of natural vegetation will exacerbate the negative impact of the development on the vegetation and will lead to a loss of habitat for indigenous fauna and flora.			
Residual impacts: Despite mitigation measures some loss of the natural vegetation will occur. The Springbokvlakte Thornveld vegetation type is considered “vulnerable” and should be conserved where possible. However, it covers 8797 km2 and the site, covering 1.5 ha, is already degraded and overall impact on the vegetation unit will therefore be small.			
Operational Phase			
Direct Impacts	Impact on natural vegetation	Medium (Negative)	• Development should be contained within the proposed footprint of the development and unnecessary disturbance adjacent to the site should be avoided. The indigenous vegetation, and especially the trees, should be retained as far as possible and buildings should be placed between trees. Protected trees should be conserved and not destroyed. The denuded and disturbed areas should be re-vegetated with indigenous species as soon as possible. • No trees may be damaged or cut. • No exotic trees may be planted in the gardens, use only indigenous plants. • Existing and dedicated roads should be marked and utilised by vehicles
	Dewatering Abstraction of water	Medium (negative)	• Groundwater depletion may take place at the abstraction borehole if not managed correctly as such the borehole should be managed constantly • Groundwater levels should be monitored regularly • Discharge water from the processing operations should be disposed of in a safe manner, should the water become contaminated over time it should either be stored in dedicated PCD's for reuse at the processing plant or treated prior to discharging into the environment.
	Bore hole yield (the volume of water that can be abstracted from a borehole)	Medium (negative)	• The borehole yield is most likely to be significantly lower than the original yield (when the borehole was 150 m deep), thus it is recommended that the borehole is redrilled/rehabilitated to its original depth and undergoes further aquifer testing to determine the sustainable yield. The borehole should be constructed using a combination of slotted and solid uPVC casing and have gravel pack installed in the annulus between the casing and borehole wall. This would prevent any further collapse of the borehole; • Should the rehabilitation of the borehole to 150 m not be feasible, it is recommended that uPVC casing (both solid and slotted) be installed at the existing borehole (at 33 m depth) to prevent further borehole collapse. This will ensure

Activity	Impact summary	Significance	Proposed mitigation
			sustainability of the borehole for site operations and prevent loss of equipment; • It is recommended that a new borehole pump is installed at the site, as per recommendations in section 35 of the Ground water report , and an automated control system with timers and float level switches installed to ensure the recommended pump cycles are strictly adhered to. The system should also include a flow meter to monitor abstraction volumes and preferably have an electronic diver installed with telemetry to monitor groundwater levels at the site; and • The water quality at the site was generally compliant with the SAWQG guidelines, however it is recommended that an appropriate water treatment plant is installed at the borehole to soften the water and remove excess iron prior to use. It is also recommended that a UV treatment unit is installed to remove microbiological parameters from the water prior to use.
	Water quality (the chemical, physical, biological, and radiological characteristics of water)	Medium	• Water softener unit is installed at the site to treat the water prior to use for production purposes • In-line UV treatment unit is placed between the borehole and end use tank to prevent any issues with fish production
	Hydrocarbon spills (oil spill released from a liquid petroleum of the transportation cars	Medium	• Staff and supervisors at workshops, yellow metal laydown areas and fuel storage areas should be trained in hydrocarbon spill response and each of these areas should be equipped with the appropriate spill response kits • Contaminated soil must be disposed of correctly at a suitable location. Should these management measures be put in place the impact on the receiving environment would be reduced to a low impact
	Environmental contamination from waste water produced and fish waste	Medium (Negative)	• Ensure that the facility is designed in accordance with international best practice norms, and with advice from an appropriate specialist, to ensure that there is no environmental contamination from effluent, fodder, carcasses and other waste, and to ensure that there is also effective storm water management • Adhere to best practice of waste disposal norms • Establish appropriate emergency procedures for accidental contamination of the surroundings. Waste recycling should be incorporated into the facility's operations as far as possible. Designate a secured, access restricted, signposted room for the storage of potentially hazardous substances such as herbicides, pesticides dips and medications. All hazardous waste should be disposed of at an appropriate licensed facility for this. • Rehabilitate contaminated areas a.s.a.p. in accordance with advice from appropriate contamination and environmental specialists • Educate workers regarding the handling of hazardous substances and about waste management and emergency procedures with regular training and notices and talks.
	Waste from fish Processing	High (Negative)	• The fish will be mobilised into the processing plant by a conveyor that drops the fish into a holding bin from there the fish are orientated correctly for effective head removal by a band saw.
	Fish carcases waste management	Medium (Negative)	• An offal collector and utilizer must be hired in order to collect offal from fish separating it into edible and inedible offal by the process of cutting, trimming, and skinning.
	Sewage management	Medium (Negative)	• All wastewater application on land must be in accordance with the Department of Water and Sanitation's guidelines in terms of wastewater use. • Ensure adherence to wetland buffer zones and soil quality monitoring requirements as stipulated in these guidelines. • The depth to aquifer must be more than 5m for dewatered sludge application and must be more than 10m for liquid sludge application. The distance from surface water or borehole must be more than 400m. • Mortalities must be stored in an enclosed area prior to being taken to the mortality pit. • The mortality pit must be regularly monitored and maintained, avoiding exceeding the capacity of the pit.
	Soil and water pollution as a result of poor waste management	Low (Negative)	• Construction waste must be disposed of at a licensed landfill site. • Waste containers must be available on site at all times. • A waste management plan must be adopted and implemented. This plan should consider the type of waste, storage, disposal method and facility as well as methods to reduce waste on site. • Ensure compliance with waste management legislation
	Impact on disease	Medium (Negative)	• Eggs or fish stocked in the facility must be absolutely disease free and preferably from a certified disease free strain. • Water used must be disease free or sterilised before going into the system; it is far better to use water from a borehole, a well, or a similar source than to use water coming directly from the sea, river or lake. • No visitors or stuff should enter the farm sick
	Impact on oxygen control	Medium (Negative)	• In cold water there is much more oxygen available for the fish to consume than in warm water, thus farming fish in warm water requires even more intense oxygen monitoring and control than farming in cold water
	Impact on water temperature regulation	Impact on water	• Using the intake water is a fairly simple way of regulating the temperature from day to day.

Activity	Impact summary	Significance	Proposed mitigation
		temperature regulation	• Heat pumps are an environmental friendly heating solution, and can utilize energy for heating from the river, a well or the air. • Hydro Royal Solar water heating technology should be used in winter to warm up the water in order to sustain the lives of the fish.
	Impact on waste water treatment	Medium (Negative)	• Faeces from the fish tanks should flow immediately to the mechanical filter without being crushed on the way. • The higher the rate of recirculation the less new water will be used, and the less discharge water will need to be treated.
	Impact on biosecurity and transmission of diseases.	Medium (Negative)	• Fish mortalities must be identified and removed immediately from the fish tank. • Training of workers to effectively handle sick and dead animals. • Emergency procedures that aim to address the potential for disease outbreaks must be developed and implemented where applicable.
	Storm water discharge into the surrounding environment during operations	Medium (Negative)	• Stormwater measures should be inspected regularly to ensure proper functioning of stormwater structures. • An operational phase Stormwater Management Plan should be designed and implemented, with a view to prevent the passage of concentrated flows from hardened surfaces and onto natural areas.
	Poor / Inappropriate control of animal pests	High (Negative)	• Ensure that there is effective storm water drainage around the facility • Ensure that the facility is sufficiently ventilated to keep floors, bedding, and fodder as dry as possible. • Prevent and manage unwanted animal access to fodder. • Check that fan louvers (if installed) work properly, and close fans completely when off. • Ensure that floors are sloped and slatted to facilitate drainage. • Screed concrete floors properly to seal all cracks and limit the pooling of effluent and water. • Effectively maintain and seal all pipes and reservoirs containing slurry, to prevent animals from accessing the effluent. • Clean floors regularly. • Clean up excess fodder regularly from under troughs and feed bins. • Keep areas surrounding the facility free of spilled manure and litter. • Remove all trash, and sources of feed and water for pests from the outside perimeter of the facilities. • Keep weeds and grass mowed to 5cm or less immediately around the facilities, to reduce the prevalence of insects. • Electrocution devices are available to kill flies, while other mechanical devices include traps, sticky tapes or baited traps. • Control rodents through effective sanitation, rodent proofing and (as humane as possible) extermination. • Rodenticides are not advised. • Ensure that measures to control pests are tightly restricted to areas where these are problematic. Pest control measures should be taxon-specific. If necessary, advice should be sought from an appropriate specialist.
	Disease transmission	Medium (Negative)	• Maintain appropriate pest control measures • Effectively maintain and seal all pipes and reservoirs containing slurry, to prevent animals from accessing the effluent.
	Altered burning	Medium (Negative)	• Create safe storage on the premises for flammable materials. If artificial burning is considered necessary, establish and implement a fire management plan with emergency fire procedures. • Maintain an effective fire break between the facility and the surrounding natural environment. • Educate workers about the fire plan and emergency procedures with regular training and notices
	Introduction and proliferation of alien species	High (Negative)	• Carefully regulate / limit access by vehicles and materials to the site • Prohibit the introduction of domestic animals such as dogs and cats. • Plant only locally indigenous flora if landscaping needs to be done. • Employ best practices regarding tilling of soil and weed management • Minimize the accumulation or dispersal of excess fodder on site. • Remove Category species using mechanical methods, and minimize soil disturbance as far as possible. Alien debris could be donated to a local community
	Loss of CI or medicinal flora	Medium (Negative)	• Educate the personnel prior to operation, and with yearly refresher talks.
	Sensory disturbance of fauna	Medium (Negative)	*Minimize essential lighting.* • Ensure that all outdoor lights are angled downwards and/or fitted with hoods. • Avoid using metal halide, mercury or other bulbs that emit high UV (blue-white) light that is highly and usually fatally attractive to insects. • Use bulbs that emit warm, long wavelength (yellow-red) light, or use UV filters or glass housings on lamps to filter out UV. *Minimize unavoidable noise* • Conduct regular maintenance of machinery and ventilation systems / fans (if any).

Activity	Impact summary	Significance	Proposed mitigation
	Destruction of palaeontological material	Very Low (Negative)	• If any archaeological material, palaeontological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.
	Destruction of archaeological artefacts	Very Low (Negative)	• If any archaeological material, palaeontological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.
	Destruction of graves	Low (Negative)	• The two graveyards should be fenced off clearly and pointed out to all construction workers and other staff on site to ensure that impacts to them are avoided; • No construction work should occur within 10 m of any of the graves;
	Emissions into the atmosphere as a result of staff vehicles.	Medium (Negative)	• Efficient movement of traffic through the entrance and exit in order to reduce congestion and vehicle emissions. • Ensure that the facility is operated in such a manner whereby potential odours are minimised.
	Improved service delivery with regards poultry products	Medium (Positive)	• Ensure that the proposed infrastructure is maintained appropriately to ensure that all facilities and infrastructure operate within its design capacity to deliver as the market requires.
	Opportunities for employment and skills development	Medium (Positive)	• Enhance the use of local labour and local skills as far as reasonably possible. • Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained. • Ensure that an equitable percentage allocation is provided for local labour employment as well as specify the use of small-to-medium enterprises and training specifications in the Contractors contract. • Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible.
	Night lighting of the development on the nightscape of the surrounding landscape	Medium (Negative)	• No specific mitigation measures are recommended as it is assumed that night lighting of the proposed storage facility will be planned in such a manner so as to minimize light pollution such as glare and light spill (light trespass) by: • Using light fixtures that shield the light and focus illumination on the ground (or only where light is required). • Avoiding elevated lights within safety/security requirements. • Using minimum lamp wattage within safety/security requirements. • Where possible, using timer switches or motion detectors to control lighting in areas that are not occupied continuously (if permissible and in line with minimum security requirements). • Switching off lights when not in use in line with safety and security
	Potential noise impact from operations and road transport of products	Medium (Negative)	• It is recommended that the drivers of the vehicles be discouraged from using air brakes at night. • Limit the effects of noise associated disturbances from operational activities on sensitive fauna such as owls and medium-large mammals (especially carnivores), potentially occurring hedgehogs and large terrestrial birds such as Korhaans and Secretary birds.
	Minor accidents to the public and moderate accidents to operational staff	Medium (Negative)	• An Emergency Plan should be compiled in order to deal with potential spillages and fires. Records of practices should be kept on site. • Scheduled inspections should be implemented by operating personnel in order to assure and verify the integrity of hoses, piping and storage lagoon. • Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the facility as required.
	Atmospheric pollution due to fumes, smoke from fires	Medium (Negative)	• Portable fire extinguishers and fire water hydrants (i.e. appropriate fire-fighting equipment) should be provided at the terminal as required. Mobile fire-fighting equipment should be provided at the berths as a safety precaution during the vessel offloading process. It should be noted that the products planned to be stored at the terminal have high flash points and low volatility. As a result, fires are unlikely, unsustainable, and can be extinguished with basic fire water and portable fire extinguishers.
Indirect impacts	Impact on natural vegetation	Low (Negative)	• Development should be contained within the proposed footprint of the development and unnecessary disturbance adjacent to the site should be avoided. The indigenous vegetation, and especially the trees, should be retained as far as possible and buildings should be placed between trees. Protected trees should be conserved and not destroyed. The denuded and disturbed areas should be re-vegetated with indigenous species as soon as possible. • No trees may be damaged or cut. • No exotic trees may be planted in the gardens, use only indigenous plants

Activity	Impact summary	Significance	Proposed mitigation
	Impact on alien vegetation	Low (Negative)	• Development should be restricted to the footprint of the proposed development site and the disturbance to the surrounding natural or indigenous vegetation be kept to a minimum. • Rehabilitate disturbed areas with indigenous species as soon as possible following construction of the facility. • Establish a monitoring program for the early detection and control of alien invasive plant species. • No alien invasive species should be used in landscaping or gardens on the site.
	Impact on fauna		• Limit disturbance to the proposed site and ensure that minimum disturbance takes place in the surrounding area. • Noise levels should be kept to a minimum at all times. • Rehabilitate disturbed areas with indigenous species as soon as possible following construction of the facility. • Poaching of animals should be prohibited
Decommission			
Direct Impacts	Introduction and proliferation of alien species	High (Negative)	• Remove Category species using mechanical methods, and minimize soil disturbance as far as possible.
	Increased dust and erosion	Medium (Negative)	• Limit vehicles to the construction site • Commence (and preferably complete) decommissioning during winter, when the risk of erosion should be least. • Revegetate denude areas with locally indigenous flora a.s.a.p. • Implement erosion protection measures on site to reduce erosion and sedimentation of the local drainage system. Measures could include bunding around soil stockpiles, and vegetation of areas not to be developed. • Implement effective and environmentally-friendly dust control measures, such as mulching or periodic wetting of the entrance road.
	Sensory disturbance of fauna	Low (Negative)	• Commence (and preferably complete) demolition / rehabilitation during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least. • Minimize noise to limit its impact on sensitive fauna. • Limit demolition activities to day time hours • Minimize or eliminate security and other lighting, to reduce the disturbance of nocturnal fauna.
	Destruction of palaeontological material	Very Low (Negative)	• If any archaeological material, palaeontological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.
	Destruction of archaeological artefacts	Very Low (Negative)	• If any archaeological material, palaeontological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an appropriate specialist. Such heritage is the property of the state and may require excavation and curation in an approved institution.
	Destruction of graves	Low (Negative)	• The two graveyards should be fenced off clearly and pointed out to all construction workers and other staff on site to ensure that impacts to them are avoided; • No construction work should occur within 10 m of any of the graves;
	Discharge of contaminated stormwater into the surrounding environment	Medium (Negative)	• The appointed Contractor should compile a Method Statement for Stormwater Management during the decommissioning phase. • Provide secure storage for oil, chemicals and other waste materials to prevent contamination of stormwater runoff.
	Emissions from decommissioning vehicles and generation of dust	Medium (Negative)	• Ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water (obtained from an approved source) to minimise dust generation. • Approved soil stabilisers may be utilised to limit dust generation. • Ensure that decommissioning vehicles travelling on unpaved roads do not exceed a speed limit of 40 km/hour.
	Noise generation from demolition activities	Medium (Negative)	• A method statement, including detailed procedures, must be drawn up prior to any decommissioning of existing tanks. • Decommissioning personnel must wear proper hearing protection, which should be specified as part of the Decommissioning Phase Risk Assessment carried out by the Contractor. • The Contractor must ensure that all decommissioning personnel are provided with adequate PPE, where appropriate.
	Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste	Medium (Negative)	• General waste (i.e. building rubble, demolition waste, discarded concrete, bricks, tiles, wood, glass, plastic, metal, excavated material, packaging material, paper and domestic waste etc.) and hazardous waste (i.e. empty tins, paint and paint cleaning liquids, oils, fuel spillages and chemicals etc.) generated during the decommissioning phase should be stored temporarily on site in suitable (and correctly labelled) waste collection bins and skips (or similar). Waste collection bins and

Activity	Impact summary	Significance	Proposed mitigation
			skips should be covered with suitable material, where appropriate. • Should the on-site storage of general waste and hazardous waste exceed 100 m3 and 80 m3 respectively, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to • Ensure that general waste and hazardous waste generated are removed from the site on a regular basis and disposed of at an appropriate, licensed waste disposal facility by an approved waste management Contractor. Waste disposal slips or waybills should be kept on file for auditing purposes as proof of disposal. • Ensure that sufficient general waste disposal bins are provided for all personnel throughout the site. These bins must be emptied on a regular basis. • Appropriately time demolition / rehabilitation activities to minimise sensory disturbance to fauna.
Indirect impacts: *Cumulative impacts:*			
No-go option Direct impacts: Indirect impacts: Cumulative impacts:	*Direct impacts:* ▪ None of the impacts mentioned above will occur. ▪ If the proposed project does not proceed, increased income and economic spin-off activities will not be realised. ▪ Approximately 11 new permanent jobs will not be created during the operational phase. ▪ If the proposed project does not proceed, the industries that rely on the supply of poultry products could experience hindered economic growth potential. *Indirect impacts:* ▪ There are no indirect impacts during the construction phase for the No-go Option. *Cumulative impacts:* ▪ There are no cumulative impacts during the construction phase for the No-go Option		

A complete impact assessment which include process undertaken to identify, assess and rank the impacts, the activity will impose on the site through the life of the activity in terms of EIA Regulation 2014, Appendix 1(i) and (j) of GN R.327 must be included as Appendix H.

A complete impact assessment which include process undertaken to identify, assess and rank the impacts, the activity will impose on the site through the life of the activity in terms of EIA Regulation 2014, Appendix 1(i) and (j) of GN R.982 must be included as Appendix H.

C.2 Environmental impact statement

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Alternative A (preferred alternative)

The proposed development area is mostly transformed as a result of past agricultural practices (Tilling). About 60% of the habitat has been transformed in the past, mainly by agriculture. There is also an ongoing habitat loss due to expanding rural settlements, overgrazing and alien plant invasion. The main environmental impacts associated with the proposed project include:

Site clearance of previously transformed land and cultivated, this may lead to loss of destruction of an already transformed habitat and habitat destruction. Of most concern however is the number of trees that could be lost. These trees provide roosting and nesting habitat for birds and small raptors. The probability is however, considered to be low with mitigation. Furthermore the proposed development site shall ensure minimal removal of trees from site.

Earth-moving activities during the clearing of vegetation for the construction of the aquaponics facility are likely to increase the susceptibility of the site to soil erosion as the result of increased bare ground and dust generation. The potential impact of continued and increased dust during construction with mitigation was rated of low significance.

Graves are of heritage importance and could be easily destructed as a result of clearing of land and construction of the aquaponics facility. The initial layout of the proposed development site was within the buffer of the graves as such posing a high risk of the destruction of graves, the probability of occurrence of this impact was very likely. However this layout was amended to ensure that the proposed development does not affect the graves and a 10 meter buffer is respected. The potential impact of with mitigation was rated of very low significance.

Waste will be generated through-out the life cycle of the development. However with proper waste disposal measures, waste impacts will be of low probability post mitigation.

Please see Appendix H for full impact assessment and their significance.

Alternative B

Alternative C

No-go alternative (compulsory)

The 'No-Go' option assumes that a conservative approach that would ensure that the environment is not disturbed. It is important to state that this assessment is informed by the current condition of the area. Should the Competent Authority decline the application, the 'No-Go' option will be followed and the status quo of the site will remain.

SECTION D: PUBLIC PARTICIPATION

D.1 Advertisement and Notice

Publication name	**Brits Pos**	
Date published	**14 September 2017**	
Site notice position	**Latitude**	**Longitude**
	25^0 21' 45''	**28^0 13' 55''**
Date placed	**15 May 2017**	

Include proof of the placement of the relevant advertisements and notices in Appendix I.1.

D.2 Determination of appropriate measures

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN R.982.

Key stakeholders (other than organs of state) identified in terms of Regulation 40(2)(d) of GN R.982:

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
PP Mahlangu	Neighbouring Landowner- Plot 521 Bosplaas	0603480809
Nelson	Neighbouring Landowner- Plot 471 Bosplaas	0730339158
Elias	Neighbouring Landowner- Plot 410 Bosplaas	0723542007
Dumisani	Neighbouring Landowner- Plot 414 Bosplaas	0606109577
Tshiaison j	Neighbouring Landowner- Plot 413 Bosplaas	0715352505
Mr Ngema	Community Chairman- Plot 260 Jonathan	0791407720
P Mahlangu	Councillor	

Include proof that the key stakeholder received written notification of the proposed activities as Appendix I.2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

D.3 Issues raised by interested and affected parties

Summary of main issues raised by I&APs	Summary of response from EAP
The issue of criminal activity and tree removal were raised as a concern in the running of the project.	The proposed development shall ensure minimal removal of trees from the site but the protected trees shall remain protected. Furthermore security officers shall be hired to address this concern.

D.4 Comments and response report

The practitioner must make report (s) available to I&APs record all comments received from I&APs and respond to each comment before is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA Regulations and be attached to the Final BAR as Appendix I.3.

D.5 Authority participation

Authorities and organs of state identified as key stakeholders. Key stakeholders identified in terms of Regulation 7(1) and (2) and Regulation 40(2) (a)-(c) of GN R.982:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
Moretele Local Municipality	Amogelang Sefara	0127161327		amogelang.sefara@moretele.org.za	Private Bag X367, Makapanstad, North West, 0404
Bojanala Platinum District Municipality	Goitsimosimo Tau	0145904500	014592 6085	innocents@bojanala.gov.za	P O Box 1993, Rustenburg,0300
North West READ	Rhuleni Mathebula	0183895122		rmathebula@nwpg.gov.za	Private Bag X2039 Mmabatho 2735
North West Provincial Heritage Resources Authority	Natasha Higgitt	0214624502	021462 4509	nhiggitt@sahra.org.za	11 Harrington Street, Cape Town, 8001
Department of Agriculture Forestry and Fisheries	Mabule R	012 319 7634		MabuleR@daff.gov.za	Private bag X120 Pretoria 0001
North West READ	Ouma Skosana			oskosana@nwpg.gov.za	Private Bag X2039 Mmabatho 2735
DWS	Khuthadzo Mulaudzi	012 392 1363	012392 1408	mulaudzik@dws.gov.za	Private Bag X995, Pretoria, 0001

Include proof that the Authorities and Organs of State received written notification and draft reports of the proposed activities as Appendix I.4.

D.6 Consultation with other stakeholders

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as Appendix I.5.

Copies of any correspondence and minutes of any meetings held must be included in Appendix I.6.

SECTION E: RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?	YES	

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

This Draft BA Report has investigated and assessed the significance of the predicted positive and negative impacts associated with the proposed development of an Aquaponics facility. No negative impacts have been identified within this BA that, in the opinion of the Environmental Assessment Practitioner who conducted this BA Process, should be considered "fatal flaws" from an environmental perspective, and thereby necessitate substantial re-design or termination of the project. The fact that development occurs on previously transformed land minimises the impacts on the proposed development site.

Taking into consideration the findings of the BA Process, including the findings of the specialist studies, it is the opinion of the Environmental Assessment Practitioner, that the project benefits outweigh the costs and that the project will make a positive contribution to sustainable economic growth, skills development and employment opportunities in the Moretele Local Municipality.

It is recommended that the project receive Environmental Authorisation in terms of the EIA Regulations promulgated under the National Environmental Management Act (Act 107 of 1998, as amended) subjected to the following conditions:

- The EMPr of the proposed development must be adhered to during all phases of the development
- A Water use license must be obtained
- All the recommendations of the specialists must be implemented for the proposed project

In order to ensure the effective implementation of the mitigation and management actions, a Draft EMPr has been compiled and is included in Appendix F of this Draft BA Report. The mitigation measures necessary to ensure that the project is planned, constructed, operated and decommissioned in an environmentally responsible manner are listed in this Draft EMPr. The EMPr is a dynamic document that should be updated regularly and provides clear and implementable measures for proposed development of an aquaponics facility.

The EMPr that meet the requirements of EIA Regulation,2014, Appendix 4, must be attached as Appendix J.

Is an EMPr attached?	YES	NO

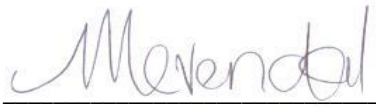
The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix K.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix F.

any other information relevant to this application and not previously included must be attached in Appendix L.

SECTION F: AFFIRMATION BY EAP

I Minnelise Levendal (name of person representing EAP) of Council for Scientific and Industrial Research declare that the information provided is correct and relevant to the activity/ project and that, the information was made available to interested and affected parties for their comments. All specialist (s) reports are relevant for the competent authority to make informed decision.



SIGNATURE OF EAP

14 September 2017
DATE

Basic Assessment for the proposed tilapia aquaponics project, on plot 413 of the farm Bosplaas West, north of the town of Hammanskraal, in the Moretele Municipality in Bojanala District, North West Province

SECTION G: APPENDICES

SECTION G: APPENDICES

The following appendices are attached to this BA Report:

Appendix A	A3 Locality Map
Appendix B	Layout Plan and Sensitivity Maps
Appendix C	Photographs
Appendix D	Facility illustration(s)
Appendix E	Confirmation of services by Municipality (servitude and infrastructure planning)
Appendix F	Details and expertise of Specialist and Declaration of Interest
Appendix G	Specialist reports (including terms of reference)
Appendix H	Impact Assessment
Appendix I	Public Participation
Appendix J	Environmental Management Programme (EMPr)
Appendix K	Details of EAPs and expertise
Appendix L	Any other Information
Appendix M	Financial Provision (if applicable)
Appendix N	Closure Plan (where applicable) as described in Appendix 5 of EIA Regulations, 2014