Ecosense

Consulting Environmentalists
Konsulterende Omgewingskundiges

Proposed Organic Fish Aquaculture Project

PRE-APPLICATION DRAFT BASIC ASSESSMENT REPORT

June 2017

Prepared for:
ORGANIC FISH DIRECT

Ecosense CC 1998/22840/23
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Statement of Ecosense CC Independence

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Report prepared by Kozette Myburgh, Ecosense		Report reviewed by Mark Sasman, Ecosense *(Pr Sci Nat)*	

Contents

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Abbreviations

BAR	Basic Assessment Report
EC	Electrical Conductivity
GDARD	Gauteng Department of Agriculture and Rural Development
IDP	Integrated Development Plan
HTSS	High total suspended solids
LTSS	Low total suspended solids
NEMA	National Environmental Management Act 107 of 1998
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework'
WULA	Water Use License Application

GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014 (Version 1)

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2014.

2. This application form is current as of 8 December 2014. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.

3. **A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken.**

4. **A draft Basic Assessment Report (1 hard copy and two CD's) must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application.**

5. Five (5) copies (3 hard copies and 2 CDs-PDF) of the final report and attachments must be handed in at offices of the relevant competent authority, as detailed below.

6. 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.

7. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.

8. An incomplete report may lead to an application for environmental authorisation being refused.

9. **Any report that does not contain a titled and dated full colour large scale layout plan of the proposed activities including a coherent legend, overlain with the sensitivities found on site may lead to an application for environmental authorisation being refused.**

10. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the application for environmental authorisation being refused.

11. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.

12. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.

13. Although pre-application meeting with the Competent Authority is optional, applicants are advised to have these meetings prior to submission of application to seek guidance from the Competent Authority.

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the of the Environmental Affairs Branch
P.O. Box 8769
Johannesburg
2000

Administrative Unit of the of the Environmental Affairs Branch
Ground floor Diamond Building
11 Diagonal Street, Johannesburg

Administrative Unit telephone number: (011) 240 3377
Department central telephone number: (011) 240 2500

(For official use only)

NEAS Reference Number:	
File Reference Number:	**Gaut 002/17-18/E0004 Online reference no: GAUT 002/17-18/E2008**
Application Number:	
Date Received:	

If this BAR has not been submitted within 90 days of receipt of the application by the competent authority and permission was not requested to submit within 140 days, please indicate the reasons for not submitting within time frame.

Not applicable to this document - this is the pre-application draft BAR.

Is a closure plan applicable for this application and has it been included in this report? No

If not, state reasons for not including the closure plan.

This is not a mining application.

Has a draft report for this application been submitted to a competent authority and all State Departments administering a law relating to a matter likely to be affected as a result of this activity? Yes

Is a list of the State Departments referred to above attached to this report including their full contact details and contact person? Yes

If no, state reasons for not attaching the list.

Not applicable

Have State Departments including the competent authority commented? No

If no, why?

This is the pre-application draft BAR for the first round of comment. Authorities will have the opportunity to comment on this report, as well as subsequent revised reports.

DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Environmental Assessment Practitioner (EAP):	Ecosense cc		
Contact person:	Kozette Myburgh / Mark Sasman		
Postal address:	PO Box 12697 Die Boord, 7613		
Telephone:	(021) 866 4056	Cell:	082 783 9860
E-mail:	kozette@ecosense.co.za	Fax:	086 547 4221
EAP Qualifications	*MPhil / NDip / BTech*		
EAP Registrations/Associations	*Pr Sci Nat (M Sasman and E Cerff) IAIA (K Myburgh)ELA (KMyburgh) IWMSA (Ecosense)*		

This report has been compiled according to Chapter 4 and Appendix 2 of the Environmental Impact Assessment Regulations, GN R 982 of 4 December 2014 as amended.

Section A: Activity Information

1. Proposal or Development Description

Project title (must be the same name as per application form):

Organic Fish Aquaculture project

Select the appropriate box

The application is for an upgrade of an existing development	X	The application is for a new development		Other, specify	

Does the activity also require any authorisation other than NEMA EIA authorisation?

YES X	NO

If yes, describe the legislation and the Competent Authority administering such legislation

S21 Water Use Authorisation under the National Water Act 36 of 1998. Department of Water and Sanitation. S38 National Heritage Resources Act (Act 25 of 1999), and the Competent Authority is the South African Heritage Resources Agency (SAHRA).

If yes, have you applied for the authorisation(s)?	YES	NO X
If yes, have you received approval(s)? (attach in appropriate appendix)	YES	NO

2. Applicable legislation, policies and/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:

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998 as amended).	National & Provincial	27 November 1998
NEMA Environmental Impact Assessment Regulations GNR 982 of 4 December 2014, amended by GN 326 of 7 April 2017	National & Provincial	7 April 2017
National Water Act 36 of 1998	National & Provincial	26 August 1998
National Development Plan	National	2012
City of Tshwane Metropolitan Municipality IDP and SDF	Provincial	2014/2015 & 2011-2016

Description of compliance with the relevant legislation, policy or guideline:

Legislation, policy of guideline	Description of compliance
Department of Environmental Affairs guidelines on integrated environmental management	Need and desirability Public Participation
National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998 as amended).	An application for Environmental Authorisation for the proposed development is required by the Regulations due to the listed activities triggered in terms of S24(O) of the Act.
GNR 982 of NEMA EIA Regulations, 4 December 2014, as amended by GN	To promote integrated environmental management, contents of this BAR adhere to the requirements of the EIA Regulations.

326 of 7 April 2017	Appendix H includes the Environmental Management Programme that the project will adhere to if authorisation is received. Appendix E refers to the Public participation followed thus far in undertaking this assessment.
National Water Act, 1998 (Act 36 of 1998)	Water Use License Application (WULA) for irrigation with effluent. (only a GA registration will apply if under thresholds)
National Heritage Resources Act, 1999 (Act 25 of 1999)	An application to SAHRA of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) as amended is required due to the change in character of a site exceeding 10 000m2 in extent.
National Development Plan, 2012	The South African Government through the Presidency has published a National Development Plan. The Plan aims to eliminate poverty and reduce inequality by 2030. The Plan has the target of developing people's capabilities to improve their lives through education and skills development, health care, better access to public transport, jobs, social protection, rising income, housing and basic services, and safety. It proposes to implement the following strategies to address the above goals: Creating jobs and improving livelihoods; Expanding infrastructure; Transition to a low-carbon economy; Transforming urban and rural spaces; Improving education and training; Providing quality health care; Fighting corruption and enhancing accountability; Transforming society and uniting the nation.
Aquaculture framework 2013	In line with the policy, aquaculture should contribute to national food security, poverty alleviation and job creation; be sustainable aquaculture development that is profitable; the policy recognizes the need to support commercial and small-scale emerging farmers, and promote the value-chain approach. Whilst there is no particular legislation governing freshwater aquaculture, the policy promotes proper evaluation and mitigation of impacts. The policy encourages integrated water use and polyculture (aquaculture and hydroponics in this case) to reduce waste loads.
City of Tshwane Metropolitan Municipality IDP and SDF 2011-2016	The Spatial Development Framework (SDF) is the legislated component of the municipality's Integrated Development Plan (IDP) that prescribes development strategies and policy guidelines to restructure and reengineer the urban and rural form. The SDF is the municipality's long-term vision of what it wishes to achieve spatially, and within the IDP programmes and projects. The proposed project has considered and is guided by the Regions' SDF (RSDF) and IDP priorities of the area. The RSDF is not the sole mechanism in determining the suitability of any potential change in land use, but should be used in conjunction with requirements as may be determined by infrastructure and other relevant aspects that may not be contained in the RSDF. The Tshwane Rural component promotes measures to ensure food security by maximizing the use and management of natural and other resources (RSDF: 69)

3. Alternatives

Describe the proposal and alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The determination of whether the 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.

The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not** include the no go option into the alternative table below.

Note: 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.

Please describe the process followed to reach (decide on) the list of alternatives below

The applicant has an existing Rainbow trout recirculation facility on Farm 369, Boschkop, as well as some greenhouses for vegetables and herbs. Current production and footprints are under legislated NEMA thresholds and the applicant has a permit for farming the specific species. The applicant wishes to expand the current operations facility, which would be more profitable. In order to achieve this, site selection and technology were the main factors considered for the project.
The current property has low agricultural potential, thus aquaculture would be suited for it, as it would not require cultivation of the land, but would still contribute to food production. As a small facility is already operational on the current property, it would make sense to expand the existing facility to start producing commercially instead of starting new facilities on a different property.
A different property approximately 0,5km north of the preferred property was considered, but would entail construction of new infrastructure, which would not be desirable as the property is intended for another use and would entail some duplication of infrastructure that already exists.
In terms of other farming methods, open pond and flow-through raceway systems were contemplated but rejected very early as, the environmental issues associated with these are generally of greater concern (especially water resource and discharge management) than with enclosed recirculation systems and would not be best practical environmental option for the project in its locality. These alternatives were therefore not investigated further.

Provide a description of the alternatives considered

No.	**Alternative type**, either alternative: site on property, properties, activity, design, technology, energy, operational or other (provide details of "other")	**Description**
1	Proposal - layout	The project would entail the following: • Expansion of current aquaculture activities (Rainbow trout / (*Onchorhynchus mykiss*) to 200t • Expansion of current greenhouses for vegetables and herbs by more than 2000m^2 • Conversion of fish and plant waste to fertiliser. • RAS technology will be applied to accommodate a proven biocompatible water purification filtration and cooling system that is part of the circulation between production tanks and the system pumps(s). The activity will have a containment wall build around the RAS system which will be specked to retain the systems total water volume. • The project would be located on Plot 19, Boskop 369, Tshwane. • In total the project would consist of: • 12 greenhouses totalling approximately 5250m2 • 3 Fish farm facilities totalling approximately 1800m2 • 1 building for processing, storage, ablution and living quarters totalling approximately 375m2 • 700m internal access road, totalling about 4000m2 The site layout as depicted in **Appendix A1** is applicable to the preferred alternative (enlarged version of figure 1 below)

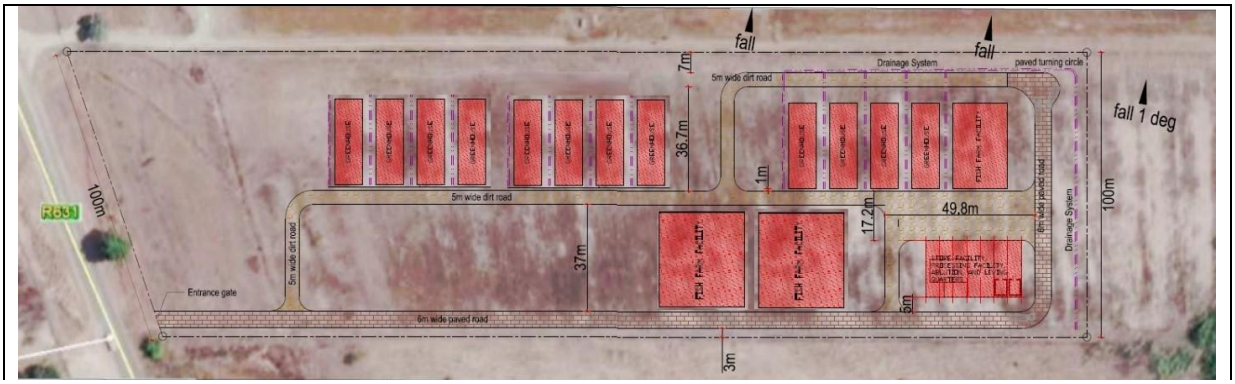


Figure 1: Proposed layout for the site (preferred)

2	Alternative 1 - layout	The project would entail the same components as described above, albeit with a different layout. The site layout as depicted in **Appendix A2** is applicable to Alternative 1 (enlarged version of Figure 2 below). This layout was first considered, but the preferred alternative (proposal) would result in slightly improved internal access for trucks and parking / loading areas closer to the facility. Fish farm facilities would be located slightly furhter away from the processing facility

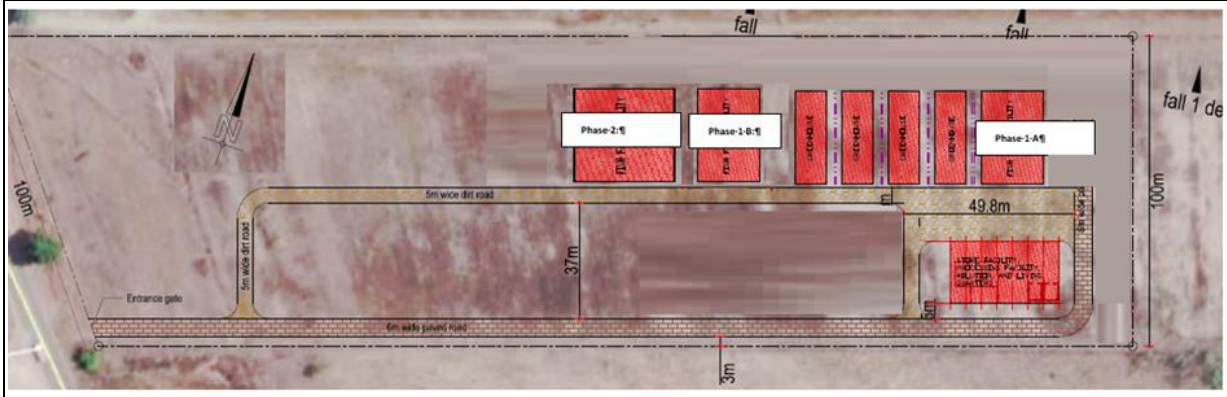


Figure 2: Alternative layout, which is also acceptable from an internal circulation point of view

3	Alternative 2	Not applicable

In simple terms, the project would consist of recirculation system, bio-remediation system and aquaponics where excess production water will be utilised:

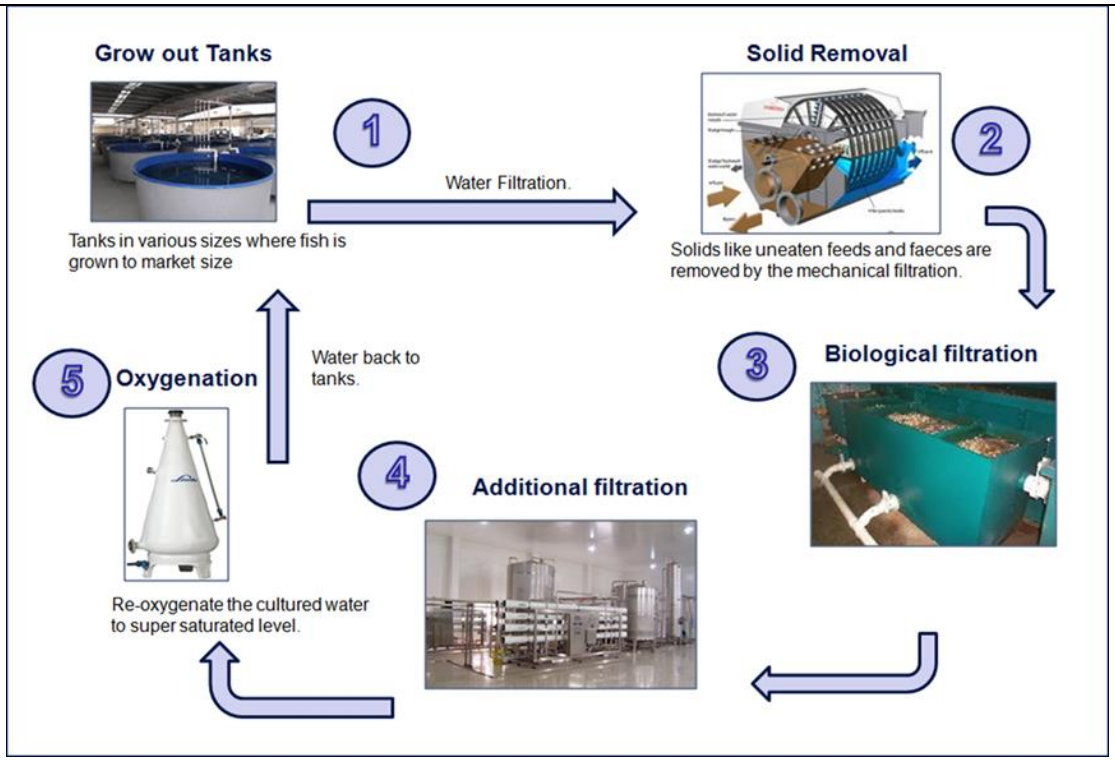


Figure 3: RAS system (source Organic Fish)

Bio-remediation is defined as any process that uses plants or microorganisms (bacteria, fungi) or their enzymes to return the natural environment altered by contaminants to its original condition. Bio-remediation is a natural process used to reduce, sequester, or eliminate:

- Suspended organic matter
- Soluble inorganic compounds like nitrates
- Settled organic solids and organic sludge

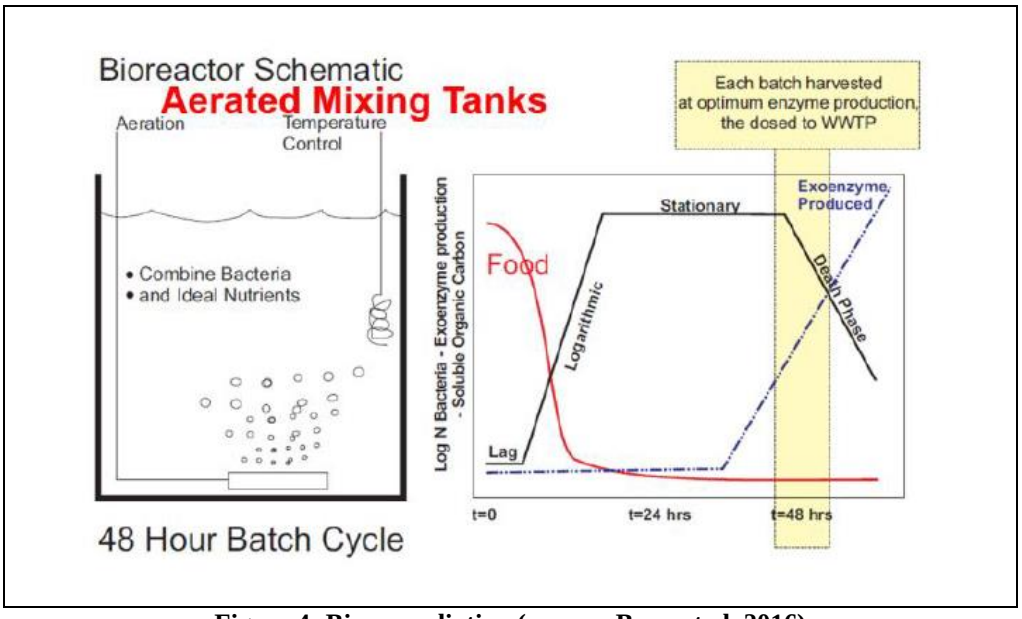


Figure 4: Bio-remediation (source: Bam, et al. 2016)

For any of the above alternatives, the GENERAL OPERATIONAL DESIGN would entail the following:

AQUACULTURE

a. System Flow Dynamics

The system re-circulates at a flow rate of 120m3/hr for the six-tank system, therefore there is a full volume

exchange rate of once per hour. Lower frequency exchange rates are normally connected with pure oxygen transfer or oxygenation. The latter is more efficient than aeration – which competes with atmospheric nitrogen (80%) during diffusion of these gasses in the water. Pure oxygen can also increase water oxygen to more than 5-fold - when compared to only atmospheric air (aeration) transfer into system.

b. System Water Circulation and Filtration Technical Data

1. Pressure loop

The six tanks are serviced by a central filtration system at a flow rate of 120kl per hour. The system pump abstracts water from the sump bottom and pumps it back to the tanks.

2. Gravity loop

The head-differential between tanks and sump is relatively narrow, but is positively increased by the system pump which abstracts water from the sump and pumps it into the tanks.
Gravity return water of HTSS line (bottom drain) enters the swirl filter then the drum filter at a rate of 72kl per hour (60% of total water value). The water flows by means of gravitation out of the drum filter and into a sump. A bypass pipe must be installed on the pump side of the drum filter to allow surplus water to flow directly into the sump.
The Head indifference potential is used to increase gravity head through drum filter.
LTSS enter the swirl and then into the sump. There is an alternative bypass through a smaller swirl and a heterotrophic filter which flows into the final sump.

3. Central sump

The sump is equipped with a drain valve as well as the degasser tower. On an independent loop water is pumped from the sump and through a cascading biofilter. The levels in the sump are controlled by means of 10m3 water storage tanks and by means of valve control balanced through the biofilter.

4. Operative principles of degasser/trickle tower:
   - Pressurized system water enters the UV and is then passed into the top of tower and is distributed through a sprinkler plate before entering the bio-blocks of the tower.
   - The bio-blocks are composed of corrugated PVC sheets which are cross laminated to enhance cross-flow of water through bio-block column.
   - The expanded surface and space channels in bio-blocks promote the spreading of water as a thin layer or film on the bio-block surface areas. Approximately 1200 square meters are available per cube of bio-blocks. The surface area and tower height are increased pending the respective proportional bio-load and concomitant CO2 load in system and system water.
   - The gasses (CO_2 and N_2) in the bio-film are driven off by counter current gas flow induced by the squirrel cage blower between the bio-block unit and the sump water level. This area is encircled by the tower casing and the surface water of sump, therefore the gas is forced upwards in bio-block column towards the exit duct in the top of tower.
   - The degasser also mediates the following advantageous actions: a) The bio-blocks act as a surface for the secondary growth of bio-filter bacteria and b) as an aeration device for the trickled water.

5. Filters Back Wash
   - The drum filter back wash waste outlet connects with the system waste line duct (open connection).
   - The moving biofilter sludge and swirl sludge is removed manually by opening the sludge valve (closed connection). The sludge is deposited in the common system waste line duct
   - The sump drain is valve controlled and connected to the common system waste line duct.
   - The filters are scaled to biometric requirements.
   - The static filter in the sump is a secondary mechanical filter, and heterotrophic filter, and is only there to "polish" filtered water, since bio waste is introduced from the degasser and MBB.

6. Gasses
   - Oxygen is introduced by pressure assisted Venturi inlets into oxygen cone line from HTSS and LTSS (to be discussed) pump to biofilter (HTSS) and sump.
   - Carbon dioxide and excess nitrogen is driven off in degasser tower and displaced by blower energy to the outside of the building. The degasser also assists with chilling the system water.

7. Biometrical Data

By means of mass balanced biometric data we have specked the mechanical features, biological filters, oxygenation and CO2 degassing tower to maintain excellent water quality at the given stocking density within a rotational cycle. See Biometrical data attached in **Appendix G**.

AQUAPONICS

The aquaponic agricultural setup would greatly benefit the farm's financial success to expand operations and do on site plant processing.

The aquaponic system is designed as a recirculation system therefore the water is continuously reused. Aquaponics entail a farming system that circulates wastewater from animal aquaculture to hydroponically cultivated plants, whereby the plants draw nutrients from the waste and filter the water, allowing for its recycled use by the aquatic animals. The net loss of water is evaporation and what the plants use.

If the fish get sick or stressed, the first response is to add salt to the water. The salinity in the water help the fish to excrete a mucus layer on their skin, which protect them from any bacteria. These actions add to the recirculation water salinity. If the salinity of the aquaculture farm is too high for the plants, then the plants are grown hydroponically.

However, it is the intention to use the fish farm's water in aquaponics which can then be reused in the fish farm. Due to source water being hard, salt would be added to soften the water to levels acceptable for use by these species.

There is an $8m^3$ sump from which the four greenhouses are fertigated from (fertigate means to fertilize and irrigate at the same time, by adding fertilizers to the water supply). The electrical conductivity (EC) of the water in the sump is measured daily and should the EC's not be in order (±1.6mS/cm) it is corrected by adding hydroponic mix into the sump per calculated amounts. See Hydroponic programme as example in **Appendix G**.

In the event that no alternative(s) has/have been provided, a motivation must be included in the table below.

Only two layout alternatives have been considered. There is no site alternative, as the property belongs to the applicant and they do not have another appropriate site to consider. The site has already been partially developed with aquaculture and hydroponic facilities on a trial proof basis and the proposed project is therefore an expansion project.

Due to the level of control and enclosed nature of recirculation systems, environmental issues are generally less of a concern than those of other aquaculture systems such as pond and flow-through/ raceway systems.

Compared to other aquaculture technologies, the higher levels of water reuse in RAS lowers water consumption per ton of fish production, which is a great consideration in water scarce country.

For the above reasons, no other alternatives were considered.

4. Physical Size of the Activity

Indicate the total physical size (footprint) of the proposal as well as alternatives. Footprints are to include all new infrastructure (roads, services etc.), impermeable surfaces and landscaped areas:

	Size of the activity:
Proposed activity ***(Total environmental (landscaping, parking, etc.) and the building footprint)***	Total footprint would be approximately 1,1ha
Alternatives:	
Alternative 1 (if any)	Total footprint would be approximately 1,1ha
Alternative 2 (if any)	Not applicable

Or, for linear activities:

	Length of the activity:
Proposed activity	Not applicable
Alternatives:	
Alternative 1 (if any)	Not applicable
Alternative 2 (if any)	

m/km

Indicate the size of the site(s) or servitudes (within which the above footprints will occur):

	Size of the site/servitude:
Proposed activity	4,3 ha property
Alternatives:	
Alternative 1 (if any)	4,3 ha property
Alternative 2 (if any)	Not applicable

Ha/m^2

5. Site Access

Proposal

Does ready access to the site exist, or is access directly from an existing road?	YES X / NO
If NO, what is the distance over which a new access road will be built	Not applicable

Describe the type of access road planned:

Internal site traffic circulation will be by means of a 6m wide paved road and 5m wide dirt roads between structures / buildings. No new access road is required and there is an existing dirt access road from the R631 onto the property.

Include the position of the access road on the site plan (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Alternative 1

Does ready access to the site exist, or is access directly from an existing road?	YES / NO
If NO, what is the distance over which a new access road will be built	m

Describe the type of access road planned:

Same as for proposal.

Include the position of the access road on the site plan. (If the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Alternative 2 - not applicable

Does ready access to the site exist, or is access directly from an existing road?	YES / NO
If NO, what is the distance over which a new access road will be built	m

Describe the type of access road planned:

Not applicable

Include the position of the access road on the site plan. (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

PLEASE NOTE: Points 6 to 8 of Section A must be duplicated where relevant for alternatives

Section A 6-8 has been duplicated nil Number of times

(only complete when applicable)

6. Layout or Route Plan

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

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
  - **A4 size for activities with development footprint of 10sqm to 5 hectares;**
  - A3 size for activities with development footprint of > 5 hectares to 20 hectares;
  - A2 size for activities with development footprint of >20 hectares to 50 hectares);
  - A1 size for activities with development footprint of >50 hectares);
- The following should serve as a guide for scale issues on the layout plan:
  - A0 = 1: 500
  - A1 = 1: 1000

- A2 = 1: 2000
- A3 = 1: 4000
- **A4 = 1: 8000 (±10 000)**

- shapefiles of the activity must be included in the electronic submission on the CD's;
- the **property boundaries** and Surveyor General numbers of all the properties within 50m of the site;
- the **exact position of each element of the activity** as well as any other structures on the site;
- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, septic tanks, storm water infrastructure;
- servitudes indicating the purpose of the servitude;
- sensitive environmental elements on and within 100m of the site or sites (including the relevant buffers as prescribed by the competent authority) including (but not limited thereto):
  - Rivers and wetlands;
  - the 1:100 and 1:50 year flood line;
  - ridges;
  - cultural and historical features;
  - **areas with indigenous vegetation (even if it is degraded or infested with alien species);**
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the position of the relevant **buffer from the bank** to be clearly indicated)

A layout plan overlain on an aerial image have been included in **Appendix A.** Items in **BOLD** have been included on the plan, the rest is not applicable

It should be noted that the watercourse is located on the eastern boundary of the site and will not be affected, as construction activities would take place more than 32m from its bank. The evaporation pond (existing) is located approximately 120m from the river.

FOR LOCALITY MAP (NOTE THIS IS ALSO INCLUDED IN THE APPLICATION FORM REQUIREMENTS)

- the scale of locality map must be 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 locality map and all other maps must be in **colour**;
- locality map must show property boundaries and numbers within 100m of the site, and for poultry and/or piggery, locality map must show properties within 500m and prevailing or predominant wind direction;
- for gentle slopes the 1m contour intervals must be indicated on the map and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the map;
- areas with indigenous vegetation (even if it is degraded or infested with alien species);
- locality map must show **exact position of development site** or sites;
- locality map showing and identifying (if possible) public and **access roads**; and
- the current land use as well as the land use zoning of each of the properties adjoining the site or sites.

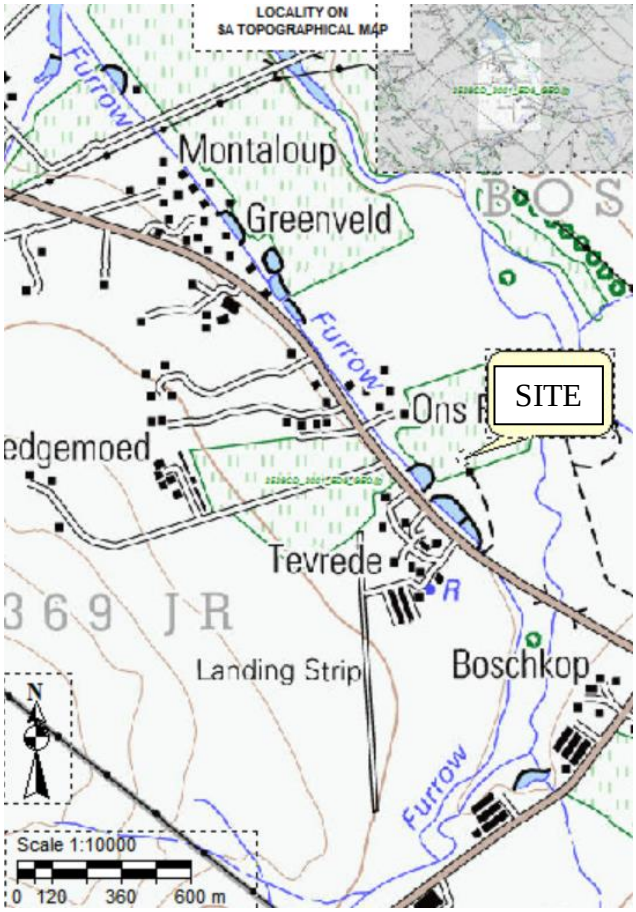


Figure 5: Farm 369 on topographical map

Ecosense Note:
A topographical locality Map on a scale of 1:50 000 has been included in **Appendix A.** It is not possible to see the boundaries etc. on this map, so a google earth image with these features have also been included

7. Site Photographs

Colour photographs from the center 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 the appropriate Appendix**.** It should be supplemented with additional photographs of relevant features on the site, where applicable.

Site Photographs have been included in **Appendix B**

8. Facility Illustration

A detailed illustration of the activity must be provided at a scale of 1:200 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 to be attached in the appropriate Appendix.

A basic layout of the preferred and 1st alternative has been included in **Appendix C**. Also included is a basic layout plan of the processing area.

Section B: Description of Receiving Environment

Note: Complete Section B for the proposal and alternative(s) (if necessary)

Instructions for completion of Section B for linear activities

1) For linear activities (pipelines etc) it may be necessary to complete Section B for each section of the site that has a significantly different environment.
2) Indicate on a plan(s) the different environments identified
3) Complete Section B for each of the above areas identified
4) Attach to this form in a chronological order
5) Each copy of Section B must clearly indicate the corresponding sections of the route at the top of the next page.

Section B has been duplicated for sections of the route	nil	times

Instructions for completion of Section B for location/route alternatives

1) For each location/route alternative identified the entire Section B needs to be completed
2) Each alterative location/route needs to be clearly indicated at the top of the next page
3) Attach the above documents in a chronological order

Section B has been duplicated for location/route alternatives	nil	times	(Complete only when appropriate)

Instructions for completion of Section B when both location/route alternatives and linear activities are applicable for the application - *Not applicable*

Section B is to be completed and attachments order in the following way

- All significantly different environments identified for Alternative 1 is to be completed and attached in a chronological order; then
- All significantly different environments identified for Alternative 2 is to be completed and attached chronological order, etc.

Section B - Section of Route		(complete only when appropriate for above)
Section B – Location/route Alternative No.		(complete only when appropriate for above)

1. Property Description

Property description: (Including Physical Address and Farm name, portion etc.)	Portion 691 of Portion 23 of Farm Boschkop 369 JR. The site is off Lynwood drive 9.5km on the left at 369 Boschkop Road, Tshwane

2. Activity Position

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 decimal degrees. The degrees should have at least six decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Alternative: Proposal	**Latitude (S):**	**Longitude (E):**
	25°51'15.37"S	28°27'10.19"E

In the case of linear activities: ***Not applicable***

Alternative:

- Starting point of the activity
- Middle point of the activity
- End point of the activity

Latitude (S):	**Longitude (E):**
°	°
°	°
°	°

For route alternatives that are longer than 500m, please provide co-ordinates taken every 250 meters along the route and attached in the appropriate Appendix

Addendum of route alternatives attached	

The 21 digit Surveyor General code of each cadastral land parcel

PROPOSAL	T	0	J	R	0	0	0	0	0	0	0	0	0	3	6	9	0	0	6	9	1
ALT. 1	T	0	J	R	0	0	0	0	0	0	0	0	0	3	6	9	0	0	6	9	1
ALT. 2	Not Applicable																				

3. Gradient of the Site

Indicate the general gradient of the site.

Flat X	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

4. Location in Landscape

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

Ridgeline	Plateau	Side slope of hill/ridge	Valley X	Plain	Undulating plain/low hills	River front X

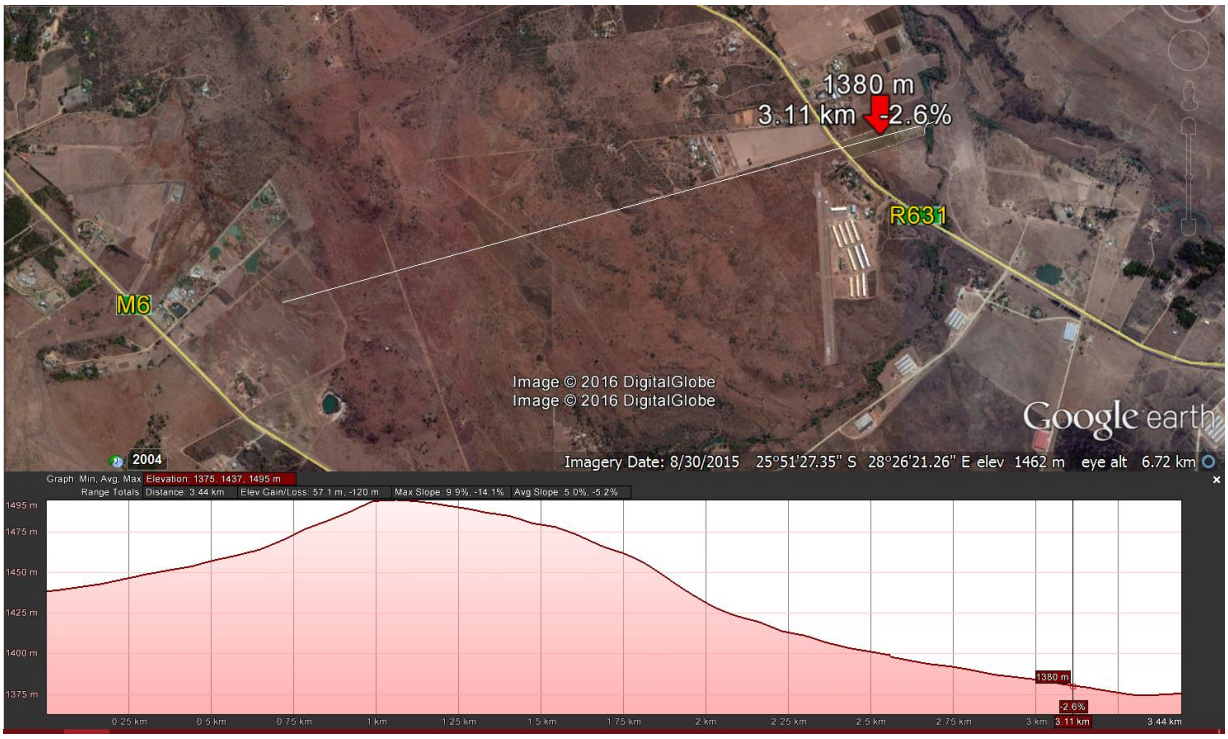


Figure 6: Location of the site in the landscape. the red arrow is the mid point of the site. the Google Earth elevation profile shows its location on the side of a hill

5. Groundwater, Soil and Geological Stability of the Site

a) Is the site located on any of the following?

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

(Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

b) are any caves located on the site(s)	YES	NO X

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
º	º

c) are any caves located within a 300m radius of the site(s)	YES	NO X

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
º	º

d) are any sinkholes located within a 300m radius of the site(s)	YES	NO X

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	**Longitude (E):**
º	º

If any of the answers to the above are "YES" or "unsure", specialist input may be requested by the Department

6. Agriculture

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)?	YES	NO X

Please note: The Department may request specialist input/studies in respect of the above.

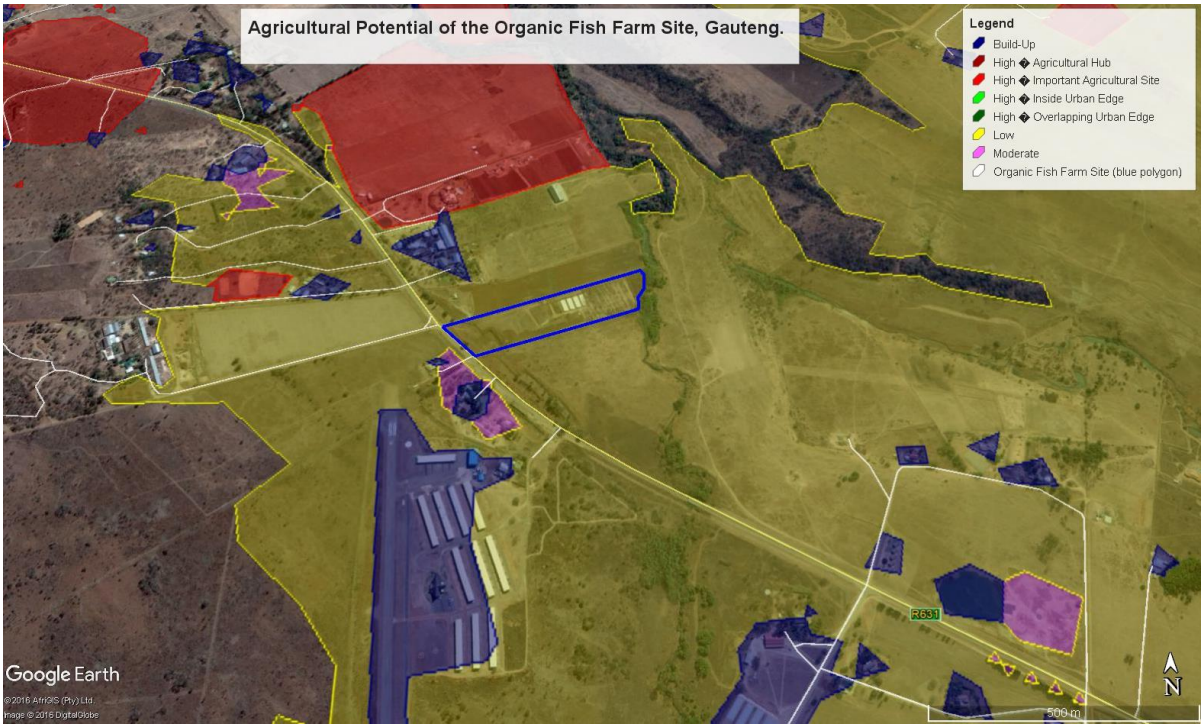


Figure 7: Agricultural potential of the site (blue polygon) (Source: AGIS)

7. Groundcover

To be noted that the location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s). **Not applicable**

Indicate the types of groundcover present on the site and include the estimated percentage found on site

Natural veld - good condition % = 0	Natural veld with scattered aliens % = 5	Natural veld with heavy alien infestation % = 0	Veld dominated by alien species % = 0	Landscaped (vegetation) % = 0
Sport field % = 0	Cultivated land % = 75% (previously cultivated, grazing)	Paved surface (hard landscaping) % = 5	Building or other structure % = 5%	Bare soil % = 10%

Figure 8: Google Earth image dated August 2016 showing buildings (orange circle), natural veld (green circle), bare soil (yellow circle). The remainder shows evidence of previous cultivation (cultivation rows), which is visible on earlier aerial images

Please note: The Department may request specialist input/studies depending on the nature of the groundcover and potential impact(s) of the proposed activity/ies.

Are there any rare or endangered flora or fauna species (including red list species) present on the site	YES	NO X

If YES, specify and explain:

Not applicable

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site.	YES	NO X

If YES, specify and explain:

Not applicable

Are there any special or sensitive habitats or other natural features present on the site?	YES	NO X

If YES, specify and explain:

Not applicable

Was a specialist consulted to assist with completing this section		YES	NO X
If yes complete specialist details			
Name of the specialist:			
Qualification(s) of the specialist:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	
Are any further specialist studies recommended by the specialist?		YES	NO
If YES, specify:			
If YES, is such a report(s) attached?		YES	NO
If YES list the specialist reports attached below			

Signature of specialist: _____ Date:

Please note; If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated.

The SANBI Biodiversity GIS site was consulted in determining if the site falls within any Critical Biodiversity Area. Even though a small section of the site bordering onto the stream falls within an ecological support area, the development footprint would be outside of this. See Figure 9 for BGIS Map.

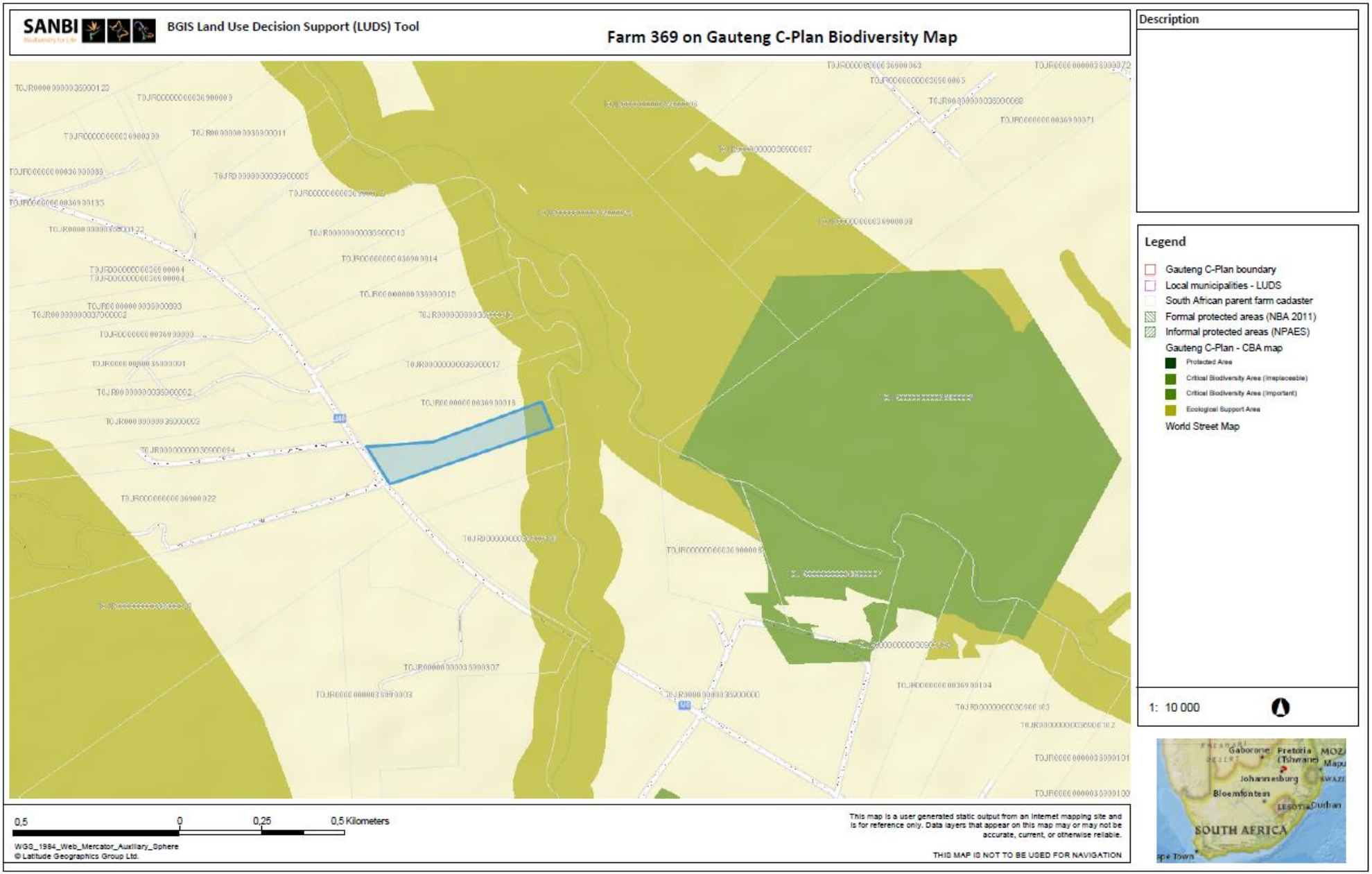


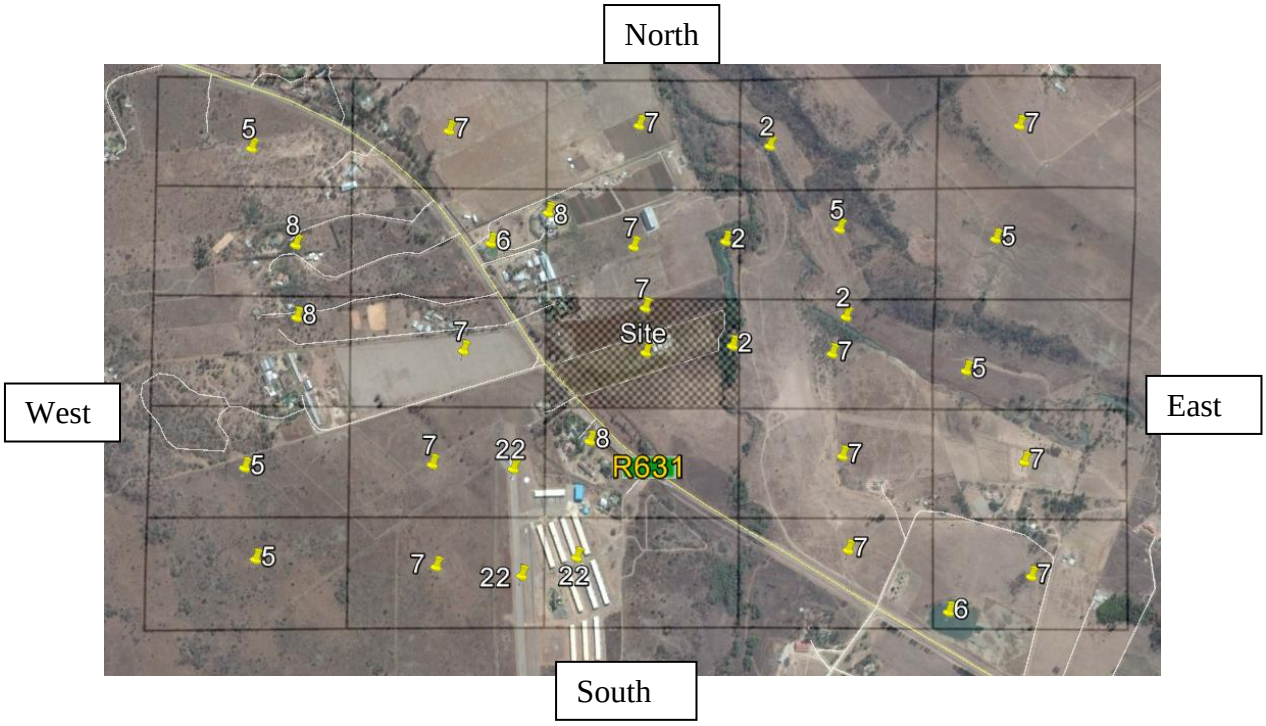
Figure 9: Site on Gauteng C-Plan (source: SANBI BGIS)

8. Land Use Character of Surrounding Area

Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site

1. Vacant land	2. River, stream, wetland	3. Nature conservation area	4. Public open space	5. Koppie or ridge
6. Dam or reservoir	7. Agriculture	8. Low density residential	9. Medium to high density residential	10. Informal residential
11. Old age home	12. Retail	13. Offices	14. Commercial & warehousing	15. Light industrial
16. Heavy industrial[AN]	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport[N]	23. Train station or shunting yard[N]	24. Railway line[N]	25. Major road (4 lanes or more)[N]
26. Sewage treatment plant[A]	27. Landfill or waste treatment site[A]	28. Historical building	29. Graveyard	30. Archeological site
31. Open cast mine	32. Underground mine	33.Spoil heap or slimes dam[A]	34. Small Holdings	
Other land uses (describe):				

NOTE: Each block represents an area of 250m X 250m, if your proposed development is larger than this please use the appropriate number and orientation of hashed blocks



Note: More than one (1) Land-use may be indicated in a block

Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an "[A]" and with an "[N]" respectively.

Have specialist reports been attached	YES	NO X

If yes indicate the type of reports below

Not applicable

9. Socio-economic Context

Describe the existing social and economic characteristics of the area and the community condition as baseline information to assess the potential social, economic and community impacts.

The site is in a rural area to the east of Pretoria. Surrounding land use is predominantly agriculture, with low population, mostly mid-high income group. Some agri-industry is also found in the area.

10. Cultural/Historical Features

Please be advised that if section 38 of the National Heritage Resources Act 25 of 1999 is applicable to your proposal or alternatives, then you are requested to furnish this Department with written comment from the South African Heritage Resource Agency (SAHRA) – Attach comment in appropriate annexure

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50m in length;

(c) any development or other activity which will change the character of a site-

(i) exceeding 5 000 m2 in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) the re-zoning of a site exceeding 10 000 m2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Are there any signs of culturally (aesthetic, social, spiritual, environmental) or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?	YES	NO X

If YES, explain:

If uncertain, the Department may request that specialist input be provided to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist if one was already appointed:

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

If yes, please attached the comments from SAHRA in the appropriate Appendix

Section C: Public Participation (Section 41)

The Environmental Assessment Practitioner must conduct public participation process in accordance with the requirement of the EIA Regulations, 2014.

1. Local Authority Participation

Local authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least thirty (30) calendar days before the submission of the application to the competent authority.

Was the draft report submitted to the local authority for comment?	YES	NO X
If yes, has any comments been received from the local authority?	YES	NO

If "YES", briefly describe the comment below (also attach any correspondence to and from the local authority to this application):

If "NO" briefly explain why no comments have been received or why the report was not submitted if that is the case.

This is the first draft report in the pre-application phase of the basic assessment process. Organs of state and municipality will be given the first opportunity to comment.

2. Consultation with Other Stakeholders

Any stakeholder that has a direct interest in the activity, site or property, such as servitude holders and service providers, should be informed of the application at least **thirty (30) calendar days** before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?	YES	NO X

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

If "NO" briefly explain why no comments have been received

This is the first draft report in the pre-application phase of the basic assessment process. Stakeholders will be given the first opportunity to comment.

3. General Public Participation requirements

The Environmental Assessment Practitioner must ensure that the public participation process is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees and ratepayers associations. Please note that public concerns that

emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was flawed.

The EAP must record all comments and respond to each comment of the public / interested and affected party before the application report is submitted. The comments and responses must be captured in a Comments and Responses Report as prescribed in the regulations and be attached to this application.

4. Appendices for Public Participation

All public participation information is to be attached in the appropriate Appendix. The information in this Appendix is to be ordered as detailed below

Appendix 1 – Proof of site notice

Appendix 2 – Written notices issued as required in terms of the regulations

Appendix 3 – Proof of newspaper advertisements

Appendix 4 –Communications to and from interested and affected parties

Appendix 5 – Minutes of any public and/or stakeholder meetings

Appendix 6 - Comments and Responses Report

Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report

Appendix 8 –Comments from I&APs on amendments to the BA Report

Appendix 9 – Copy of the register of I&Aps

Section D: Resource Use and Process Details

Note: Section D is to be completed for the proposal and alternative(s) (if necessary)

Instructions for completion of Section D for alternatives

1) For each alternative under investigation, where such alternatives will have different resource and process details (e.g. technology alternative), the entire Section D needs to be completed
4) Each alterative needs to be clearly indicated in the box below
5) Attach the above documents in a chronological order

Section D has been duplicated for alternatives	nil	times	(complete only when appropriate)

Section D Alternative No.	Proposal	(complete only when appropriate for above)

1. Waste, effluent, and emission management

Solid waste management

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

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

Waste will be collected either by a waste collection service provider or by truck and taken off site to a licensed landfill. Recycling of office waste would be undertaken as far as practically possible.

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

To licensed landfill site

Will the activity produce solid waste during its operational phase?	YES X	NO
If yes, what estimated quantity will be produced per month?	4,7m3	

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

Waste will emanate from fish processing and will be used to produce bio-fertiliser. It will not require disposal. A minimal amount of office waste will be generated, which will be disposed of by normal municipal collection service.

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity?	YES	NO

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

Weekly collection to dispose off at licensed landfill site.

Note: 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, 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 relevant legislation?	YES	NO X

If yes, inform the competent authority and request a change to an application for scoping and EIA.

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

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.

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

Separation at source of plastic / paper glass from office / packaging and reuse of fish processing waste for bio-fertiliser.

Liquid effluent (other than domestic sewage)

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	YES	NO X
If yes, what estimated quantity will be produced per month?	m^3	
If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)?	YES	NO

Will the activity produce any effluent that will be treated and/or disposed of on site?	Yes X	NO
If yes, what estimated quantity will be produced per month?	395 m3	

If yes describe the nature of the effluent and how it will be disposed.

Nutrient enriched water from fish recirculation system will be used for irrigation of grazing areas, hydroponic additions and plant uptake / evaporation within an evaporation pond.

Note that if effluent is to be treated or disposed on site the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA

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

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:

Waste water would be recycled into an aquaponics system any excess would be irrigated to grazing pasture and or evaporated in a small pond.

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?	YES	NO X

If yes, what estimated quantity will be produced per month?	m^3	
If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?	YES	NO

Will the activity produce any effluent that will be treated and/or disposed of on site?	YES X	NO

If yes describe how it will be treated and disposed off.

Conservancy tank, to be pumped out as required by local municipality, as is the current practice on the farm.

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	YES X	NO
If yes, is it controlled by any legislation of any sphere of government?	YES	NO X

If no, describe the emissions in terms of type and concentration: Not applicable

A smoker would be utilised for on-site artisanal purposes. Fish would be dried or smoked for local sale.

Figure 10: SCB0600 smoker cabinet

Unit size: 1280 x 770 x 2020
Voltage: 380V / 50Hz 3 phase
Power: 5kW Drying and 0,75kW Sawdust ignition
Weight: 216kg
Volume: 2.66m³

The capacity of the smoker unit falls below any Air Emissions License thresholds and although it would result in emissions, these would be negligible in terms of the NEMAQA requirements.

2. Water Use

Indicate the source(s) of water that will be used for the activity

municipal	Directly from water board	Groundwater X	river, stream, dam or lake	other	the activity will not use water

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: liters

If Yes, please attach proof of assurance of water supply, e.g. yield of borehole, in the appropriate Appendix

Does the activity require a water use permit from the Department of Water Affairs?	YES	NO

If yes, list the permits required

If yes, have you applied for the water use permit(s)?	YES	NO
If yes, have you received approval(s)? (attached in appropriate appendix)	YES	NO

3. Power Supply

Please indicate the source of power supply eg. Municipality / Eskom / Renewable energy source

Eskom

If power supply is not available, where will power be sourced from?

Generator

4. Energy Efficiency

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

The fish farm is in an Insulated Shed, which controls the ambient temperature in the shed and therefore keep the water temperature constant. Borehole water is used, which is already cold enough to use. Both these are energy efficient ways to keep water cool, reducing the need for air conditioning or chillers, which consumes additional energy.

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

Currently none have been incorporated into the design, but solar or biogas would be considered, if viable.

Section E: 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 as well as the impacts of not implementing the activity (Section 24(4)(b)(i).

1. Issues Raised by Interested and Affected Parties

Summarise the issues raised by interested and affected parties.

To follow release of this pre-application basic assessment report.

Summary of response from the practitioner to the issues raised by the interested and affected parties (including the manner in which the public comments are incorporated or why they were not included)
(A full response must be provided in the Comments and Response Report that must be attached to this report):

To follow release of this pre-application basic assessment report.

2. Impacts that may result from the Construction and Operational Phase

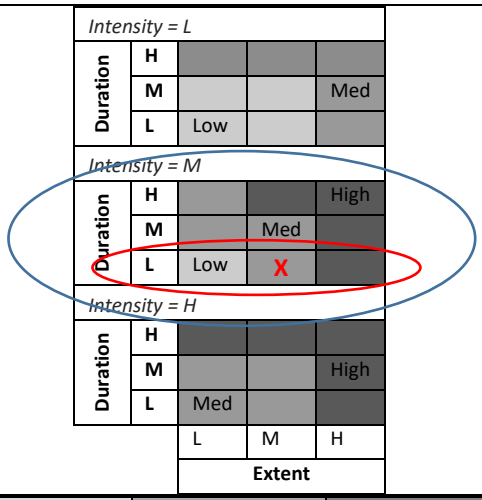
Briefly describe the methodology utilised in the rating of significance of impacts

The methodology applied is standard methodology and best general criteria to be applied across a range of different types of impacts, although it is difficult to quantify some impacts such as visual or social. In such cases the rating of confidence would be Med to low. The methodology makes provision for the assessment of impacts against the criteria required to include:

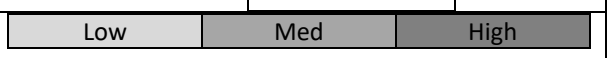
- Spatial scale
- Temporal scale and
- Probability
- Significance

Determination of significance is calculated by considering intensity, duration and extent. For example - Intensity is medium / Duration is low / Extent is medium:

1. Choose the intensity block first (blue circle), which is the middle one, because it is rated as medium.
2. Within this block, look at duration and choose a row (bottom one), because duration is rated as low (red circle)
3. Within this row, choose a column for extent. In this case extent is rater as medium, so choose the middle column (x)
4. Because this block is in the medium grey coloured area (there are 4 blocks with this rating), **the significance is <u>medium</u>.**



All blocks with the same shade of grey would have the same rating:



Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Context:

Impacts from recirculation aquaculture systems can generally be categorized into (Department of Primary Industries: 16):

1. Impacts on the aquatic environment in terms of water and sediment quality;
2. Impacts on indigenous flora and fauna;
3. Socio-economic impacts on humans in terms of nuisance or risks to health; and
4. Impacts within the wider global environment, in this case associated with the no-go option

Specific impacts associated with the above categories are presented in the sections that follow.

Note that although the mitigation indicated may not result in a change in significance rating as per the above calculation, it would still be able to reduce the impact to acceptable levels. The risk of the impact occurring or mitigation not being implemented is reduced through the requirement to implement and audit an Environmental Management Programme.

Proposal

Potential impacts:	Criteria	Rating	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Aquatic impacts (construction phase):						
Pollution of water course through dust, • waste, • cement or • waste from construction activities	**Extent**	Low	**Low negative**	Implementation of an EMPr which includes: • Site camp establishment at least 100m away from the local water course • Management of waste and stockpile areas	**Low negative**	**Low**
	Duration	Low				
	Intensity	Medium				
	Reversibility	High				
	Irreplaceability	Low				
	Probability	Low				
Aquatic impacts (operational phase):						
Effluent discharge could lead to • Nutrient enrichment resulting from nitrogen and phosphorous in effluents • Increased water turbidity and sedimentation • Reduced dissolved oxygen concentrations • Direct toxicity to aquatic life	**Extent**	Low	**Low negative**	Implementation of an EMPr which includes: • Operational management and maintenance of infrastructure • Feed management • Waste treatment system maintenance Use of Bio-remediation as a natural process to reduce, sequester, or eliminate: • Suspended organic matter • Soluble inorganic compounds like nitrates • Settled organic solids and organic sludge Effluent disposal system to include artificial wetland for polishing	**Low negative**	**Low**
	Duration	Low				
	Intensity	Medium				
	Reversibility	High				
	Irreplaceability	Low				
	Probability	Low				
• Impact of chemicals and therapeutants on receiving waters	**Extent**	Low	**Med negative**	Implementation of an EMPr which includes: • Health check programme • Operational management and maintenance of infrastructure	**Low negative**	**Low**
	Duration	Low				
	Intensity	High				
	Reversibility	High				
	Irreplaceability	Low				
	Probability	Low				
Indigenous fauna and flora impacts (Construction phase)						
None identified, as the proposed project footprint has already been disturbed with no indigenous fauna or flora occurring on it. No habitat would be affected by expansion of the existing development footprint. The buildings would be set back further than 32m from a water course.						

Potential impacts:	Criteria	Rating	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Indigenous fauna and flora impacts (Operational phase)						
Impacts from escaped fish • interaction of escapees with indigenous fish populations - predation and competition for habitat. • Disease transmission from escapees	**Extent** **Duration** **Intensity** **Reversibility** **Irreplaceability** **Probability**	Medium Med-high Medium Medium Medium Low	**Med negative**	Implementation of an EMPr which includes: • Health check programme • Biosecurity programme • Operational management and maintenance of infrastructure	**Negligible**	**Very low**
Impacts on humans and social aspects (Construction phase)						
Job creation • Unskilled labour would be required for construction work, but also plant operators and foremen. • Procuring of goods and services during construction.	**Extent** **Duration** **Intensity** **Reversibility** **Irreplaceability** **Probability**	Low Low Low Med N.a. High	**Low positive**	• Source local labour as far as possible • Procure goods and services from local, provincial or South African suppliers as far as possible • Provide environmental awareness training to labourers (improve life skills)	**Low positive**	**High - positive**
Dust and noise • Construction vehicles may cause dust and noise • Disturbance of top soil may cause dust nuisance to neighbouring properties	**Extent** **Duration** **Intensity** **Reversibility** **Irreplaceability** **Probability**	Low Low Low Medium N.a. High	**Low negative**	Implementation of an EMPr which includes: • Construction during normal work hours and not on weekends of public holidays • Covering of stockpiles • Use of Dustex or other means of reducing dust	**Low negative**	**Low**
Waste generation • Wind blown litter • Unnecessary Construction waste to landfill	**Extent** **Duration** **Intensity** **Reversibility** **Irreplaceability** **Probability**	Low Low Low-Med Med N.a. Medium	**Low negative**	Implementation of an EMPr which includes: • Good housekeeping on site • Provision of sufficient bins for construction workers Ensure that clean building rubble is recycled as far as possible to minimise waste to landfill Building waste that cannot be recycled must be taken to licensed landfill site.	**Low negative to negligible**	**Low (litter)** **Med-high (waste to landfill)**

Potential impacts:	Criteria	Rating	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Impacts on humans and social aspects (operational phase)						
Visual Farm facilities and general rubbish may provide visual intrusion.	**Extent** **Duration** **Intensity** **Reversibility** **Irreplaceability** **Probability**	Low High Low Medium N.a. High	**High negative**	Implementation of an EMPr which includes: • Waste management • housekeeping on site Setting back building away from the road Screening from the road by planting a row of trees	**Low negative**	**Medium**
Noise Mechanical equipment from operations, transport vehicles can cause noise.	**Extent** **Duration** **Intensity** **Reversibility** **Irreplaceability** **Probability**	Low High Med Med n.a. Medium	**Med Negative**	• Noise created by the proposed development is not expected to be problematic as the facilities would be some distance from neighbours. • If required, noise reduction measures must be implemented in compliance with the Gauteng Noise Regulations. • No sound amplification equipment to be used on site, except in emergency situations. • Limit vehicles travelling to and from the site to minimise traffic noise to the surrounding environment. • A complaints register should be kept on site, with records of complaints received and the way the complaint was addressed.	**Low negative**	**Low**
Odour Improper disposal of wastes may result in odours.	**Extent** **Duration** **Intensity** **Reversibility** **Irreplaceability** **Probability**	Low Low Medium High N.a. Low	**Low negative**	Implementation of an EMPr which includes: • No open storage or disposal of wastes are allowed on site. • No burning of waste on site • Maintenance of equipment to ensure effective production of bio-fertiliser without unnecessary odours • Prompt removal of bio-fertiliser from site	**Negligible**	

Potential impacts:	**Criteria**	**Rating**	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
Job creation • Various levels of skilled and unskilled labour • Procuring of goods and services during operation.	**Extent**	Low	**Low positive**	• Source local employees as far as possible • Procure goods and services from local, provincial or South African suppliers as far as possible • Provide environmental awareness training to staff	**Low positive**	**High - positive**
	Duration	Low				
	Intensity	Low				
	Reversibility	Med				
	Irreplaceability	N.a.				
	Probability	High				
Food security (indirect impact) • Additional source of protein with low feed in food out ratio	**Extent**	High	**High positive**	As this is a positive impact, mitigation is not proposed	**N.a.**	**N.a.**
	Duration	Med-high				
	Intensity	Medium				
	Reversibility	Medium				
	Irreplaceability	N.a.				
	Probability	Medium				

Alternative 1 *(REPEAT THIS TABLE FOR EACH ALTERNATIVE)*

Potential impacts:	**Criteria**	**Rating**	**Significance rating of impacts (positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
The impacts associated with Alternative 1 would be the same as for the preferred proposal. The impacts associated with an alternative site layout would not result in a difference in rating of the impacts as set out above.						

No Go

Potential impacts:	Criteria	Rating	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Import of fish which increase countries trade deficit.	**Extent**	Medium	**Medium negative**	Implement the project	**Medium Positive**	**N.a.**
	Duration	Medium				
	Intensity	High				
	Reversibility	High				
	Irreplaceability	N.a.				
	Probability	Low				
Food security decrease	**Extent**	High	**High Negative**	Implement the project	**High Positive**	**N.a.**
	Duration	Med-high				
	Intensity	Medium				
	Reversibility	Medium				
	Irreplaceability	N.a.				
	Probability	Medium				
Should the project not be implemented, the associated positive impacts as set out above would not realize.						

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

Not applicable.

Describe any gaps in knowledge or assumptions made in the assessment of the environment and the impacts associated with the proposed development.

Gaps in knowledge include issues which may arise from the public participation process which have not been identified by the EAP. Uncertainties form part of any proposed development with regards to the actual degree of impact that the development will have on the immediate environment. Any actual and/or site specific results will only be determined once development has commenced and throughout the life cycle of the proposed project. Future changes in circumstances and legislation can also not be accounted for at this stage. It is assumed that all information provided to the EAP was correct and valid at the time on which it was provided. Every effort will be made to inform all potential stakeholders of the proposed development (notification through letters, advertisements, site notices), but it is impossible to determine who exactly all interested and affected parties are.

3. Impacts that may result from the decommissioning and closure phase

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Proposal

Potential impacts:	**Significance rating of impacts(positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
Decommissioning and/or closure phase is not expected to occur for the proposed aquaculture farm. As it is not currently known what decommissioning and/or closure would entail, a closure plan must be submitted to the competent authority for approval to comply with the relevant legislation at the time of closure. Note - most equipment and infrastructure is movable and reasonably easily dismantled.				

Alternative 1

Potential impacts:	**Significance rating of impacts(positive or negative):**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**	**Risk of the impact** and **mitigation not being implemented**
Not applicable				

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

None applicable as there are no sensitive features on the site. Impacts normally associated with such installations have been identified and assessed in the context of the local environment.

Where applicable indicate the detailed financial provisions for rehabilitation, closure and ongoing post decommissioning management for the negative environmental impacts.

Not applicable

4. Cumulative impacts

Describe potential impacts that, on their own may not be significant, but is significant when added to the impact of other activities or existing impacts in the environment. Substantiate response:

The most positive cumulative impact is the contribution of this project to food security and supply of farmed protein in a relatively environmentally friendly manner (DAFF 2013:1). The feed in-food out ratio (Feed conversion ratio / FCR) is much lower than for beef or poultry, which has less negative impact on the environment in terms of habitat destruction and greenhouse gasses.

5. Environmental impact statement

Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposal 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.

Proposal

Construction impacts would be of temporary nature, i.e. only during construction period and can be minimised through implementation of a construction environmental management plan.
The risk of the occurrence of operational impacts is low. Operations can be monitored through effective implementation of the operational phase management plan to reduce the risk and mitigate impacts, should they occur. The major positive social impacts are skills development, job creation, and a contribution to food security, which would in turn also contribute to the local, regional and national economy.

Alternative 1

The impact associated with alternative 1 would be the same as for the proposal.

No-go (compulsory)

The no go option result : The existing trial production is not economically sustainable and should the expansion not happen there is the likelihood that the project be terminated into the future.

6. Impact Summary of the Proposal or Preferred

For proposal:

<u>Construction impacts:</u>

Pollution of water course through
- dust,
- waste,
- cement or
- waste from construction activities

Dust and noise
- Construction vehicles may cause dust and noise
- Disturbance of top soil may cause dust nuisance to neighbouring properties

Waste generation
- Wind blown litter
- Unnecessary Construction waste to landfill

Job creation
- Unskilled labour would be required for construction work, but also plant operators and foremen.
- Procuring of goods and services during construction.

<u>Operational Impacts:</u>

Effluent discharge could lead to
- Nutrient enrichment resulting from nitrogen and phosphorous in effluents
- Increased water turbidity and sedimentation
- Reduced dissolved oxygen concentrations
- Direct toxicity to aquatic life

- Impact of chemicals and therapeutants on receiving waters

Impacts from escaped fish
- interaction of escapees with indigenous fish populations - predation and competition for habitat.
- Disease transmission from escapees

Visual
- Farm facilities and general rubbish may provide visual intrusion.

Noise
- Mechanical equipment from operations, transport vehicles can cause noise.

Odour
- Improper disposal of wastes may result in odours.

Job creation
- Various levels of skilled and unskilled labour
- Procuring of goods and services during operation.

Food security (indirect impact)
- Additional source of protein with low feed in food out ratio

For alternative:

The impacts associated with the Alternative would be similar to the proposal, except for internal circulation on the site, which would be slightly more difficult.

Having assessed the significance of impacts of the proposal and alternative(s), please provide an overall summary and reasons for selecting the proposal or preferred alternative.

There is not a significant difference between the proposal and alternative.
Construction impacts are generally of low significance and can be mitigated further through the implementation of an EMPr.
Operational impacts have the potential to be higher, but since the system would be enclosed, the risk is generally low and impacts can be mitigated to a lower significance.
The no-go alternative would not result in any positive impacts associated with the proposed project.

7. Spatial Development Tools

Indicate the application of any spatial development tool protocols on the proposed development and the outcome thereof.

ANY CONSENT USE / REZONING REQUIRED?	The property is zoned agricultural. According to the 2008 Town planning Scheme, Agriculture includes aquaculture
BUILDING PLAN APPROVAL	The requirement for building plan approval should be confirmed by the municipality

8. Recommendation of the 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 as bound by professional ethical standards and the code of conduct of EAPASA[1]).

YES	NO X

[1] Note that the EAP is SACNASP registered

If “NO”, indicate the aspects that require further assessment before a decision can be made (list the aspects that require further assessment):

Since this report is the first draft for comment, other issues may still be identified that have not been assessed.

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:

Not applicable

9. The Needs and Desirability of the Proposed Development (as per notice 792 of 2012, or the updated version of this guideline)

PART I: NEED		
1.	Is the land use associated with the activity being applied for considered within the timeframe intended by the existing approved SDF agreed to be the relevant environmental authority?	Yes. The proposed land use is in line with the City of Tshwane's Regional Spatial Development Framework 2011 - 2016 and Municipal Spatial Development Framework's Strategic Objective 2 of Economic growth and development. As part of this objective, emphasis is also placed on Rural development programmes to improve livelihoods and stimulate employment.
2.	Should the development, or if applicable, expansion of the town/area concerned in terms of this land use occurs here at this point in time?	Yes. The proposed activity will result in optimal use of rural land. Per the Region 1: Regional Integrated Development Plan, 2014-15, the proposed project falls within an area which is demarcated as "rural", and the intention of development in this area is to create vibrant, equitable and sustainable rural development which provides food and work opportunities.
3.	Does the community/area need the activity and the associated land use concerned? This refers to the strategic as well as local level.	Yes. The current operations of the business supply vegetables to local stores and supermarkets, and with the proposed expansion, the company aims to supply major supermarkets in the region.
4.	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?	Yes. The proposed development can be adequately serviced by the existing infrastructure and planned infrastructure which is not of municipal service. The proposed project will make use of borehole water, for which a water use license will be applied for if required.
5.	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 the services and opportunity cost)?	No. The proposed development is not provided for in the infrastructure planning of the municipality as it is a small development of local importance. It is a small operation and will therefore not impact greatly to municipal services. Therefore, the proposed project will not have major implications for the infrastructure planning.
6.	Is the project part of a national programme to address an issue of national concern or importance?	Although this project draws from no specific objectives of the National Development Plan of South Africa, the proposed fish and vegetable production would however contribute to the country's collective objective of promoting sustainable food security. With this contribution to small and medium sized agricultural initiatives in the area, it is hoped to result in growing of the aquaculture industry in the area, resulting in the growth of jobs and the growth of the area's economic base resulting in poverty alleviation.

PART II: DESIRABILITY		
1.	Is the development the best practicable environmental option for this land/site?	Yes. The proposed development is for an expansion of an existing land use in the form of fish and vegetable farming. The historical use of the site included grazing, and according to the Gauteng Agricultural Potential Atlas (GAPA 4) the site does not have high crop agricultural potential. Due to its' small size, as well as previous and current land use practices, the site is ideal for thee proposed development, and the environmental impacts associated with this use are minimal as the area is not of high environmental sensitivity.
2.	Would the approval of this application compromise the integrity of the existing approved and credible IDP and SDF as agreed to by the relevant authorities?	No. The proposed project intends to align its' objectives with that of the Regions SDF, which are directly linked to Tshwane's 2016 -20121 IDP and 2055 vision. It aims to aligned to the following objectives: Promote shared economic growth and job creation Improve financial sustainability Continue institutional development, transformation and innovation
3.	Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	No. The agricultural sector is one of the identified targeted for sectors in the Gauteng Growth and Development Strategy. The proposed development falls within areas demarcated for agriculture, as identified in the 2014 Gauteng Provincial EMF, and therefore the integrity of the existing environmental management priorities for the area will not be compromised by this development. It is also evident in view of the provincial SDF that there is also an emphasis on preserving a strong agricultural base.
4.	Do location factors favour this land use at this place? (this relates to the contextualization of the proposed land use on this site within its broader context).	Yes. The site falls within an area demarcated for agricultural development in the greater framework of the province. This is also attributed to agriculture having a strong social element in that it provides employment and housing to a significant proportion of the population, creating a unique social environment associated within rural areas.
5.	How will the activity of the land use associated with the activity being applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	The development of the proposed development associated infrastructure will exert an impact on the environment; but based on the conditions and existing transformed state and locality of the site, the impacts associated with this proposed development can be mitigated and in implementing those measures effectively can have a significantly low impact.
6.	How will the development impact on people's health and well-being? (E.g. In terms of noise, odours, visual character and sense of place, etc.)?	This is an existing farm and the area has very few households, with the neighbours also engaged in farming activities therefore the visual character and sense of place aesthetics in the area is associated to agricultural activities and the proposed activity will not have a high significant impact in this regard.

7.	Will the proposed activity or the land use associated with the activity being applied for, result in unacceptable opportunity costs?	No. The South African aquaculture industry is growing. This industry also presents opportunities in that there is a huge potential in the rural markets and exports to the SADC region.
8.	Will the proposed land use result in unacceptable cumulative impacts?	No. The proposed project and associated activities has identified 3 cumulative impacts, with two of these having a low significant impact upon mitigation. The socio-economic impact will not be mitigated as mitigation will not result in job creation and improvement of the local socio-economic status. The measures outlined in the attached EMPr serve as mitigation methods to prevent the current and proposed project from having any serious long term cumulative impacts on the receiving environment.

10. The period for which the environmental authorisation is required (consider when the activity is expected to be concluded)

Minimum 3 years for the development to commence. An EA under NEMA does not have an end date.

11. Environmental Management Programme (EMPr) (must include post construction monitoring requirements and when these will be concluded.)

If the EAP answers "Yes" to Point 7 above then an EMP is to be attached to this report as an Appendix

EMPr attached	Yes

Section F: Appendixes

The following appendixes must be attached as appropriate (this list is inclusive, but not exhaustive):

It is required that if more than one item is enclosed that a table of contents is included in the appendix

Appendix A: Site plan(s) – *(must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)*
Locality Map

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Route position information

Appendix E: Public participation information

Appendix F: Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information

Appendix G: Specialist reports

Appendix H: EMPr

Appendix I: Impact Assessment Criteria

CHECKLIST

To ensure that all information that the Department needs to be able to process this application, please check that:

- ✓Where requested, supporting documentation has been attached;
- ✓All relevant sections of the form have been completed.

REFERENCES

Blue Planet 2016. N End Lake Remediation Report 22 May 2016

http://www.blueridgeaquaculture.com/recirculatingaquaculture.cfm accessed on 15-5-17

Department of Agriculture Forestry and Fisheries 2013. National Aquaculture Policy Framework for South Africa

Department of Primary Industries (2008). Best Practice Environmental Guidelines for Recirculating Aquaculture Systems. Fisheries Victoria Management Report Series No. 37.

City of Tshwane Metropolitan Municipality IDP and SDF 2011-2016