WILDCOAST SPECIAL ECONOMIC ZONE UPPER NCISE AQUAPONICS DEVELOPMENT

OR TAMBO DISTRICT MUNICIPALITY, EASTERN CAPE

DRAFT SCOPING REPORT

DEA REFERENCE:

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DRAFT

TABLE OF CONTENTS

1. INTRODUCTION 1

1.1 Background Information 1
1.2 Scoping Report Requirement Checklist 1
1.3 Structure of this Report 1
1.4 Assumptions and Limitations 2

2. THE ENVIRONMENTAL ASSESSMENT PRACTITIONER 1

2.1 CES Company Profile 1
2.2 Project Team 1

3. PROPERTY DESCRIPTION 3

3.1 Project Location 3
3.2 Land Ownership 4

4. PROJECT DESCRIPTION 6

4.1 What is aquaponics? 6
4.2 Description of the proposed development 7
4.2.1 Proposed layout and design of facility 7
TECHNOLOGY AND DESIGN 7
SIZE AND CAPACITY 9
PLANTS 9
FISH 10
WATER DEMAND 10
WATER STORAGE 11
WATER QUALITY REQUIREMENTS 11
POTABLE WATER 11
4.2.2 Service Infrastructure 12
WATER SUPPLY 13
DAM ABSTRACTION 13
WASTEWATER 13
ROADS 14
STORMWATER 14
SOLID WASTE 14
ELECTRICITY 15

5. NEED AND DESIRABILITY 16

6. ALTERNATIVES 18

6.1 Fundamental Alternatives 18
6.2 Incremental Alternatives 21
6.3 No-Go Alternative 24
6.4 Alternatives for further assessment 24

7. LEGAL AND POLICY FRAMEWORK 25

7.1 The Constitution (Act No. 108 of 1996) 25
7.2 National Environmental Management Act (Act No. 107 of 1998, as amended) 25
7.3 National Environmental Management: Waste Act (Act No. 59 of 2008) 29
7.4 National Environmental Management: Protected Areas Act (Act No. 57 of 2003, as amended). 31
7.5 National Environment Management: Biodiversity Act (Act No. 10 of 2004) 32
7.6 National Water Act (Act No. 36 of 1998) 33
7.7 National Heritage Resources Act (Act No. 25 of 1999) 34

DRAFT

7.8 Conservation of Agricultural Resources Act (Act No. 43 of 1983) ... 35
7.9 The Genetically Modified Organisms (Act 15 of 1997) and Agricultural Pests (Act 36 of 1983) ... 35
7.10 Animal Health Act 7 of 2002 ... 36
7.11 Animal Diseases Act, 1984 (Act no 35 of 1984) ... 36
7.12 Aquaculture Development Bill (2018) ... 36
7.13 Occupational Health and Safety Act (Act No. 85 of 1993) ... 37
7.14 Other Relevant Legislation ... 38

8. APPROACH AND METHODOLOGY ... 39

8.1 Scoping and EIA Process ... 39
8.1.1 Scoping Phase ... 40
8.1.2 Environmental Impact Assessment Phase ... 41
8.1.3 Environmental Authorisation and Appeals ... 42
8.1.4 Public Participation Process ... 42

9. DESCRIPTION OF THE ENVIRONMENT ... 45

9.1 Current land use ... 45
9.2 Climate ... 47
9.3 Topography ... 47
9.4 Geology and Soils ... 49
9.5 Hydrology ... 50
9.5.1 Mthatha River Catchment Area ... 50
9.5.2 Mthatha Dam ... 51
9.5.3 Rivers, Watercourses and Drainage Lines ... 51
9.6 Vegetation and Floristics ... 53
9.6.1 SANBI Vegetation Map (Mucina and Rutherford, 2012) ... 54
MTHATHA MOIST GRASSLAND ... 55
EASTERN VALLEY BUSHVELD ... 55
9.6.2 Forest Classification ... 55
9.7 Threatened Ecosystems ... 56
9.8 Biodiversity Conservation ... 57
9.8.1 Eastern Cape Biodiversity Conservation Plan ... 57
9.8.2 Protected Areas (NEMPAA & NPAES) ... 59
9.8.3 Species of Conservation Concern ... 60
9.8.4 Alien invasive species ... 61
FLORA ... 61
FAUNA ... 61
9.9 Heritage and Culture ... 61
9.10 Socio-Economic Profile ... 62

10. IDENTIFICATION OF IMPACTS AND RISKS ... 65

10.1 Issues Identification Matrix ... 65
ISSUES LEVEL ASSESSMENT ... 67
10.2 Potential Impacts Identified ... 68

11. PLAN OF STUDY: ENVIRONMENTAL IMPACT ASSESSMENT PHASE ... 80

11.1 EIA phase ... 80
11.2 Alternatives ... 81
11.3 Specialist Studies ... 81
11.4 Assessment Methodology ... 82
11.5 Public Participation Process ... 83
11.5.1 Identification of and Consultation with Key Stakeholders ... 83
11.5.2 Interested and Affected Parties Database ... 84
11.5.3 Advertisements ... 84

DRAFT

11.5.4 Public Review of the Draft Environmental Impact Assessment Report 84
11.5.5 Public Meetings 84
11.5.6 Issues and Responses Trail 84
11.5.7 Notification of the Decision of the Authorities 84
11.6 Structure of the Proposed EIR 84

12. RECOMMNEDATIONS AND CONCLUSIONS 86

12.1 Activity and Possible Impacts 86
12.2 Fatal flaws 86
12.3 Recommendations 87

APPENDIX A: CURRICULUM VITAE OF THE EAP 88

APPENDIX B: SACNASP & EAPSA REGISTRATION 92

APPENDIX C: PUBLIC PARTICIPATION MATERIAL 94

APPENDIX D: ADDITIONAL INFORMATION 117

DRAFT

LIST OF FIGURES

Figure 3.1 Location of the proposed development 3
Figure 3.2: Centre and corner coordinates of the application area 4
Figure 4.1 Example of an Ebb and Flow Aquaponics system 8
Figure 4.2: Example of a multi-span greenhouse 8
Figure 4.3: Examples of seedling trays Figure 4.4: Examples of seedling trays 9
Figure 4.5: Example of growbeds within a greenhouse 10
Figure 4.6: Mozambique Tilapia (*Oreochromis mossambicus*) 10
Figure 4.7: A conceptual layout of the service infrastructure required for the aquaponics facility 12
Figure 8.1: Scoping and Environmental Impact Assessment Process. 40
Figure 9.1: Land Use Map of the proposed Aquaponics development. 46
Figure 9.2: Cultivated land located within the proposed site boundary 46
Figure 9.3: Livestock grazing within the proposed site boundary 46
Figure 9.4: Low urban density settlements surrounding the proposed site boundary 47
Figure 9.5: Low urban density settlements surrounding the proposed site boundary 47
Figure 9.6: Climatic data for Mthatha 47
Figure 9.7: North-South gradient profile of the study area 48
Figure 9.8: West-East gradient profile of the study area 48
Figure 9.9: Topographical map of the study area 48
Figure 9.10: Geological map of the study area 49
Figure 9.12: Hydrology of the proposed study area. 52
Figure 9.13: Location and direction of photos taken as described below 52
Figure 9.14: A - View of the pan depression wetland at the centre of the study site 53
Figure 9.15: A - Pan depression wetland at the centre of the study site. 53
Figure 9.16: B - View of gully erosion and drainage channel at the western boundary of the study site 53
Figure 9.17: C - View of the banks of the Mthatha Dam at the southern boundary of the study site. 53
Figure 9.18: C - View of the banks of the Mthatha Dam at the southern boundary of the study site. 53
Figure 9.19: D - View from the eastern boundary of the stidy site (looking south west) 53
Figure 9.20: SANBI Vegetation map of the study area 54
Figure 9.21: Forested areas within the study area. 56
Figure 9.22: Threatened Ecosystems surrounding the proposed Aquaponics development site. 57
Figure 9.23. ECBCP map of the study area showing terrestrial CBAs. 58
Figure 9.24: ECBCP map of the study area showing aquatic CBAs. 59
Figure 9.25: Protected areas within and in close proximity to the study area 60
Figure 9.26: Grave sites located within the study area 62
Figure 9.27: Population structure for the KSD Local Municipality 63

DRAFT

LIST OF TABLES

Table 1.1: Requirements for the content of the Scoping Report as per Appendix 2 of the EIA Regulations 2014 (as amended). 2
Table 2.1: CES Project Team. 1
Table 3.1: Coordinate points of the application area 4
Table 3.2: The farm numbers and portions, the coordinates and 21 surveyor general codes 5
Table 4.1: Summary of sizing and capacity of Aquaponics facility 9
Table 4.2: Estimated water requirements for the proposed Aquaponics facility 11
Table 6.1: Fundamental Alternatives to be considered for the proposed Aquaponics development. 19
Table 6.2: Incremental Alternative to be considered for the proposed Aquaponics development. 22
Table 6.3: No-Go Alternative to the Proposed Aquaponics Development. 24
Table 7.1: NEMA Environmental Management Principles. 26
Table 7.2: NEMA Listed Activities triggered by the proposed Aquaponics Development 27
Table 7.3: List of Waste Management Activities that have, or are likely to have a Detrimental Effect on the Environment 30
Table 7.4: Management and conservation of biodiversity within the framework of NEMA. 32
Table 7.5: Health and safety of persons at work according to the Occupational Health and Safety Act. 37
Table 9.1: Potential Floral SCC that may occur within the study area 60
Table 9.2: List of Alien invasive floral species likely to occur within the study area. 61
Table 10.1: Evaluation Criteria for Rating Impacts. 66
Table 10.2: Description of Issues Level Significance Ratings. 67
Table 10.3: Technical Scope of Issues identified during all phases of the proposed Aquaponics development. 68
Table 10.4 Potential impacts identified for the Planning and Design Phase of the proposed development. 71
Table 10.5: Potential impacts identified for the Construction Phase of the proposed development 73
Table 10.6: Potential impacts identified for the Operational Phase of the proposed development. 75
Table 10.7: Potential impacts identified for the Decommissioning Phase of the proposed development. 77
Table 11.1: Environmental Significance Scale. 83
Table 11.2: Report volumes generated during the EIA Process for the proposed Aquaponics development. 85

DRAFT

LIST OF ACRONYMS

BID:	Background Information Document
CBA:	Critical Biodiversity Areas
CDC:	Coega Development Corporation
DEA:	Department of Environmental Affairs
DTI:	Department of Trade and Industry
DWS:	Department of Water and Sanitation
EAP:	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA:	Environmental Impact Assessment
EIR:	Environmental Impact Report
EMPr:	Environmental Management Programme
GNR:	Government Notice Regulation
Ha:	Hectare
I&APs:	Interested and Affected Parties
IDP:	Integrated Development Plan
KSDLM	King Sabata Dalindyebo Local Municipality
NEMA:	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Area
ORTDM	Oliver Reginald Tambo District Municipality
PoS:	Plan of Study
PAES	Protected Areas Expansion Strategy
PPP:	Public Participation Process
RDB:	Red Data Book
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SSC:	Species of Special Concern
ToR:	Terms of Reference

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1. INTRODUCTION

This report is the first in a number of reports produced during the Scoping and Environmental Impact Assessment (S&EIA) process for the proposed Wildcoast Special Economic Zone (WCSEZ) Upper Ncise Aquaponics Development.

1.1 Background Information

The Department of Trade and Industry (DTI) has developed the Special Economic Zone (SEZ) policy to support and accelerate industrial development in the targeted regions where socio-economic growth has been problematic. The Coega Development Corporation (CDC) was requested to assist in the final development of a Feasibility and Business Plan for the proposed WCSEZ within the Upper Ncise area, which includes the Mthatha airport and surrounds, within the Eastern Cape Province.

Phase 1 of the WCSEZ Feasibility and Business Plan assessment included 14 priority sector-development projects which target the inherent agricultural potential of the Region and have labour intensive benefits. One of the fourteen projects identified included an Aquaculture Zone. The Upper Ncise area has been identified as a preferred site where the CDC is proposing to develop an Aquaponics facility and associated service infrastructure.

The proposed Aquaponics facility is to be located along the banks of the Mthatha Dam within the O.R Tambo District Municipality (ORTDM). The CDC have appointed CES as the project Environmental Assessment Practitioner (EAP).

The proposed study site consists of approximately 430 ha of unimproved land. The proposed large-scale aquaponics development will be based on the establishment of multiple 0.5 ha multi-span greenhouse type tunnel systems in which Mozambique Tilapia (*Oreochromis mossambicus*) will be farmed in combination with various vegetable and related crops, as well as field agriculture. The aquaponics development is also expected to include facilities for brood stock, hatchery, grow out (greenhouse type tunnels), slaughtering or processing, and support facilities such as laboratories, offices, storerooms, workshops, and feed stores.

Associated bulk infrastructure and services (water supply, electrical supply, access roads, wastewater treatment or removal and solid waste management) will also need to be established.

CES will facilitate the Environmental Impact Assessment (EIA) process to secure the required integrated Environmental Authorisation (EA) and Waste Management License (WML) for the proposed WCSEZ Upper Ncise Aquaponics Development.

1.2 Scoping Report Requirement Checklist

This report is based on the content requirements for a Scoping Report as listed in Appendix 2, Section 2 (1), of the EIA Regulations 2014 (as amended) (Table 1.1).

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Table 1.1: Requirements for the content of the Scoping Report as per Appendix 2 of the EIA Regulations 2014 (as amended).

Relevant Section in GN R 326	Requirement Description	Relevant Section in This Report
(a) Details of-	(i) The EAP who prepared the report; and	Please refer to Chapter 2
	(ii) The expertise of the EAP, including a curriculum vitae;	Please refer to Chapter 2, and Appendix A.
(b) The location of the activity, including-	(i) The 21 digit Surveyor General code of each cadastral land parcel;	Please refer to Chapter 3
	(ii) Where available, the physical address and farm name;	
	(iii) Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	
(c) A plan which locates the proposed activity or activities applied for at an appropriate scale	(i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	Please refer to Chapter 3
	(ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken;	
(d) A description of the scope of the proposed activity, including	(i) All listed and specified activities triggered;	Please refer to Chapter 7, Section 7.2
	(ii) A description of the activities to be undertaken, including associated structures and infrastructure;	Please refer to Chapter 4
(e)	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process	Please refer to Chapter 7
(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location	Please refer to Chapter 5
(g) A full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including -	(i) Details of all the alternatives considered;	Please refer to Chapter 6
	(ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Please refer to Chapter 8, Section 8.1.4, and Appendix C.
	(iii) A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	
	(iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Please refer to Chapter 9
	(v) The impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts-	Please refer to Chapter 10, Section 10.2

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Relevant Section in GN R 326	Requirement Description	Relevant Section in This Report
	(aa) Can be reversed; (bb) May cause irreplaceable loss of resources; and (cc) Can be avoided, managed or mitigated;	
	(vi) The methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Please refer to Chapter 10, Section 10.1.
	(vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Please refer to Chapter 10, Section 10.2
	(viii) The possible mitigation measures that could be applied and level of residual risk;	Please refer to Chapter 10, Section 10.2
	(ix) The outcome of the site selection matrix;	Please refer to Chapter 6 and Chapter 9
	(x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	Please refer to Chapter 6
	(xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity;	Please refer to Chapter 6, Section 6.4
(h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including	(i) A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	Please refer to Chapter 11, Section 11.2
	(ii) A description of the aspects to be assessed as part of the environmental impact assessment process;	Please refer to Chapter 10, Section 10.2, and Chapter 11
	(iii) Aspects to be assessed by specialists;	
	(iv) A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;	Please refer to Chapter 11, Section 11.4.
	(v) A description of the proposed method of assessing duration and significance;	
	(vi) An indication of the stages at which the competent authority will be consulted	Please refer to Chapter 8 and Chapter 11, Section 11.5.
	(vii) Particulars of the public participation process that will be conducted during the environmental impact assessment process; and	
	(viii) A description of the tasks that will be undertaken as part of the environmental impact assessment process;	Please refer to Chapter 11
	(ix) Identify suitable measures to avoid, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	Please refer to Chapter 11, Section 11.4.
(i) an undertaking under oath or affirmation by the EAP in relation to -	(i) The correctness of the information provided in the report;	Please refer to Appendix A.
	(ii) The inclusion of comments and inputs from	

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Relevant Section in GN R 326	Requirement Description	Relevant Section in This Report
	stakeholders and interested and affected parties;	
	(iii) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	
(j)	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	
(k)	Where applicable, any specific information required by the competent authority; and	No specific information has been requested by the authority to date.
(l)	Any other matter required in terms of section 24(4) (a) and (b) of the Act.	Not Applicable.

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1.3 Structure of this Report

The structure of this report is as follows:

Chapter 1 – Introduction
This chapter provides an overview of the proposed project including the background to the project, as well as the purpose and structure of the Scoping Report

Chapter 2 – The Environmental Assessment Practitioner
The details of the environmental assessment practitioner (EAP) and project team are provided within this chapter.

Chapter 3 – Property Description
This chapter provides a description of the properties on which the development is to be undertaken, the associated land ownership of these properties, and the location of the development on the property.

Chapter 4 – Project Description
This chapter provides a description of the technical details of the proposed aquaponics development. The associated bulk infrastructure requirements are also explained.

Chapter 5 – Need and Desirability
The motivation for the proposed aquaponics development is provided within this chapter.

Chapter 6 - Alternatives
This chapter provides a description of the fundamental and incremental alternatives to be assessed further during the EIA process.

Chapter 7 – Legal and Policy Framework
This chapter identifies all the legislation and guidelines that have been considered in the preparation of this Scoping Report and outlines the Listed Activities triggered by the proposed development.

Chapter 8 – Approach and Methodology
This chapter provides an outline of the S&EIR process that will be followed with details regarding the Environmental Impact Assessment report (EIR), which will be completed as per Section 23 of the EIA Regulations 2014 (as amended 2017), including the Public Participation Process (PPP) conducted in terms of Section 41. This chapter will include the objectives of the EIA process as outlined in Appendix 3 of the EIA Regulations 2014 (as amended 2017).

Chapter 9 – Description of the Environment
This chapter provides a brief overview of the biophysical and socio-economic characteristics of the site and its environs that may be affected by the proposed development, compiled largely from published information, but supplemented by information from the initial site visit.

Chapter 10 – Identification of Impacts and Risks
This chapter provides a description of the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks, as well as a description of the key issues that have been identified, which will be assessed further in the EIA phase.

Chapter 11 – Plan of Study: Environmental Impact Assessment Phase

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This chapter sets out the proposed approach to the EIA including:

- A description of the scope of work that will be undertaken as part of the EIA phase, including any specialist reports or specialised processes, and the manner in which the described scope of work will be undertaken;
- An indication of the stages at which the competent authority will be consulted;
- A description of the proposed methodology for assessing the environmental issues and alternatives, including the option of not proceeding with the proposed development;
- Particulars of the public participation process that will be conducted during the EIA phase; and
- Any specific information required by the authority.

Chapter 12 – Recommendations and Conclusions

This chapter provides a brief summary of the proposed development and outlines recommendations for the proposed way forward.

Appendices

The appendices contain all supporting and supplementary information.

1.4 Assumptions and Limitations

This report is based on the information available at the time of compiling the report and, as a result, is subject to the following assumptions and limitations:

- The report is based on the project description and the conceptual site layout provided to EOH CES by the applicant. This conceptual layout of the proposed Aquaponics development is likely to undergo a number of changes before being considered to be final. A project description based on the final design of the Aquaponics facility and routing of the associated bulk infrastructure (dependent on the outcome of which water supply and waste discharge alternative is put forward) will be provided in the EIA Phase;
- As concluded by the DWS (refer to DWS meeting minutes in Appendix D), applications for water abstraction from the Mthatha Dam will be rejected should the CDC fail to reach an agreement with the existing water users of the Mthatha Dam to amend their existing water use licenses in order to create a surplus supply for the application for water abstraction from the Mthatha Dam (as per Section 21 of the NWA (no.36 of 1998). This will render the proposed development fatally flawed;
- In addition, the DWS concluded that all waste discharge applications into the Mthatha Dam will be rejected, therefore should alternatives for waste discharge/disposal not be feasible, this will render the proposed development fatally flawed;
- Descriptions of the natural and social environments are based on limited fieldwork and available literature. More information will be provided in the EIA phase;
- The report is pre-dominantly based on a combination of desktop and on-site analysis;
- It should be emphasised that information, as presented in this document, only has reference to the study area as indicated on the project maps. Therefore, this information cannot be applied to any other area without a detailed investigation being undertaken.

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2. THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

According to Appendix 2, Section 2 (1), of the EIA Regulations (2014) (as amended), a *"scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include—*

(a) details of –

(i) the EAP who prepared the report; and

(ii) the expertise of the EAP, including a curriculum vitae"

CES has been appointed by the CDC, as the independent Environmental Assessment Practitioner (EAP) to apply for an Environmental Authorisation (EA) for the proposed aquaponics development within the ORTDM of the Eastern Cape Province.

EAP: Dr Alan Carter *Pr.Sci.Nat and registered with EAPSA*
Company: CES
Address: 25 Tecoma Street, Berea, East London, 5214
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Fax: +27 (43) 726 8352
Email: a.carter@cesnet.co.za
Website: www.cesnet.co.za

2.1 CES Company Profile

CES was established in 1990 as a specialist environmental consulting company and has considerable experience in terrestrial, marine and freshwater ecology, the Social Impact Assessment (SIA) process, State of Environment Reporting (SOER), Integrated Waste Management Plans (IWMP), Environmental Management Plans (EMPs), Spatial Development Frameworks (SDF), public participation, as well as the management and co-ordination of all aspects of the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) processes. CES has been active in all of the above fields, and in so doing have made a positive contribution towards environmental management and sustainable development in the Eastern Cape, South Africa and many other African countries. We believe that a balance between development and environmental protection can be achieved by skilful, considerate and careful planning.

2.2 Project Team

The proposed project team consists of a number of highly qualified and experienced environmental consultants from CES (Table 2.1). Full curricula vitae for the project team are provided in Appendix A.

Table 2.1: CES Project Team.

Dr Alan Carter Project Leader and Quality Control	Dr Alan Carter has extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He is a member of the American Institute of Certified Public Accountants and holds a PhD in Plant Sciences. He is also a certified ISO14001 EMS auditor with the American National Standards Institute. Alan will be responsible for all the review and quality control of the EIA process.
Ms Amy Lindsay Project Manager, Report Review	Ms Amy Lindsay is a Senior Environmental Consultant at CES. Amy holds a B.Sc. in Biochemistry and Zoology as well as a B.Sc. Honours in Zoology, both from the University of Johannesburg. Her honours

	project investigated the role of a tenebrionid beetle in the ecology of Bakwena Cave, Pretoria. Her M.Sc project, through Stellenbosch University, was a study on the effects of probiotics on the physiological and biochemical development of hatchery raised dusky kob (*Argyrosomus japonicus*) larvae. Her professional interests and passion lies within coastal and marine ecology as well as the development of sustainable aquaculture in South Africa. Amy has experience in a wide variety of areas with particular focus on aquaculture EIAs, coastal development EIAs and EMPs as well as coastal and estuarine management programmes. Amy is a registered Candidate Scientist with the South African Council of Natural Scientific Professions (SACNSP)
Ms Caryn Clarke Report Writer	Ms Caryn Clarke holds a M.Sc. Environmental Science (2012), B.Sc. Hon. Environmental Science (2010), and a B.Sc. Environmental Science and Economics (2009) from Rhodes University. Her M.Sc. thesis was titled "Responses to the linked stressors of Climate Change and HIV/AIDS amongst vulnerable rural households in the Eastern Cape, South Africa". Her B.Sc. Hon. thesis investigated climate change perceptions, drought responses and views on carbon farming amongst commercial livestock and game farmers within the Great Fish River Valley, Eastern Cape, from which a paper was published in the African Journal of Range and Forage Science 2012, 29(1):13-23. Caryn has further completed a Carbon Footprint Analysis Course (2013). Caryn's expertise includes project management, environmental impact assessments including public participation, MPRDA applications, environmental compliance monitoring, various licensing and permit applications, feasibility assessments and GIS mapping. Caryn is a registered Candidate Natural Scientist under SACNASP.

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3. PROPERTY DESCRIPTION

According to Appendix 2, Section 2 (1), EIA Regulations 2014 (as amended), a "*scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include—*

(b) the location of the activity, including –

(i) the 21 digit Surveyor General code of each cadastral land parcel;

(ii) where available, the physical address and farm name;

(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;

(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is—

(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or

(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;

The following section provides information on the general location of the proposed development as well as more detailed information regarding the land ownership within and surrounding the application area.

3.1 Project Location

The proposed aquaponics development is to be located along the banks of the Mthatha Dam, within the King Sabata Dalindyebo Local Municipality (KSDLM) within the ORTDM of the Eastern Cape Province (Figure 3.1).

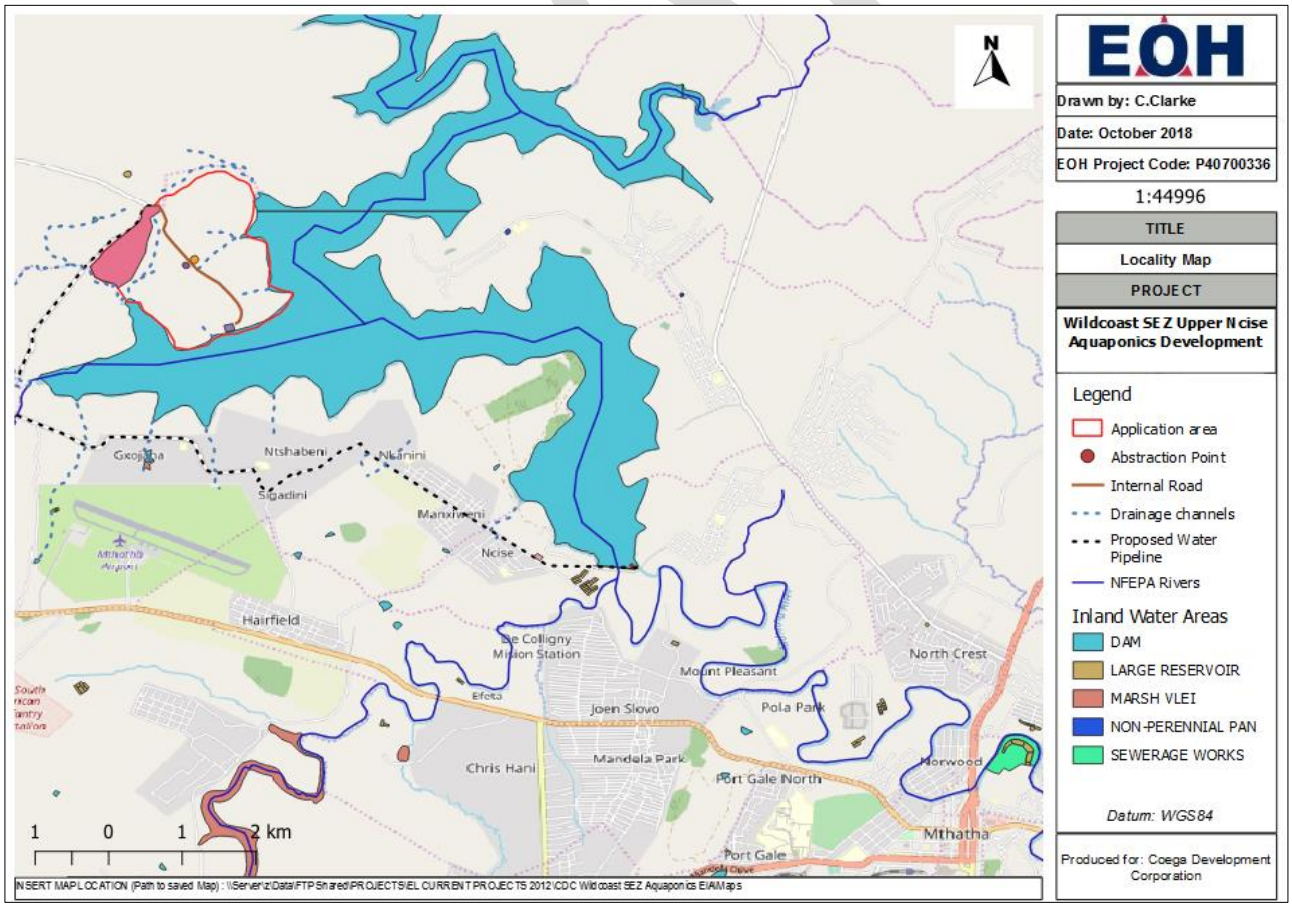

Figure 3.1 Location of the proposed development

The centre and corner coordinates of the application area are detailed in Table 3.1 and Figure 3.2 below.

Table 3.1: Coordinate points of the application area

Point	Coordinates
Centre Coordinate	31°30'32.11"S; 28°40'49.15"E
Corner 1 Coordinates	31°31'11.49"S; 28°40'39.03"E
Corner 2 Coordinates	31°30'29.27"S; 28°39'54.41"E
Corner 3 Coordinates	31°29'37.93"S; 28°41'7.68"E
Corner 4 Coordinates	31°30'42.79"S; 28°41'37.99"E

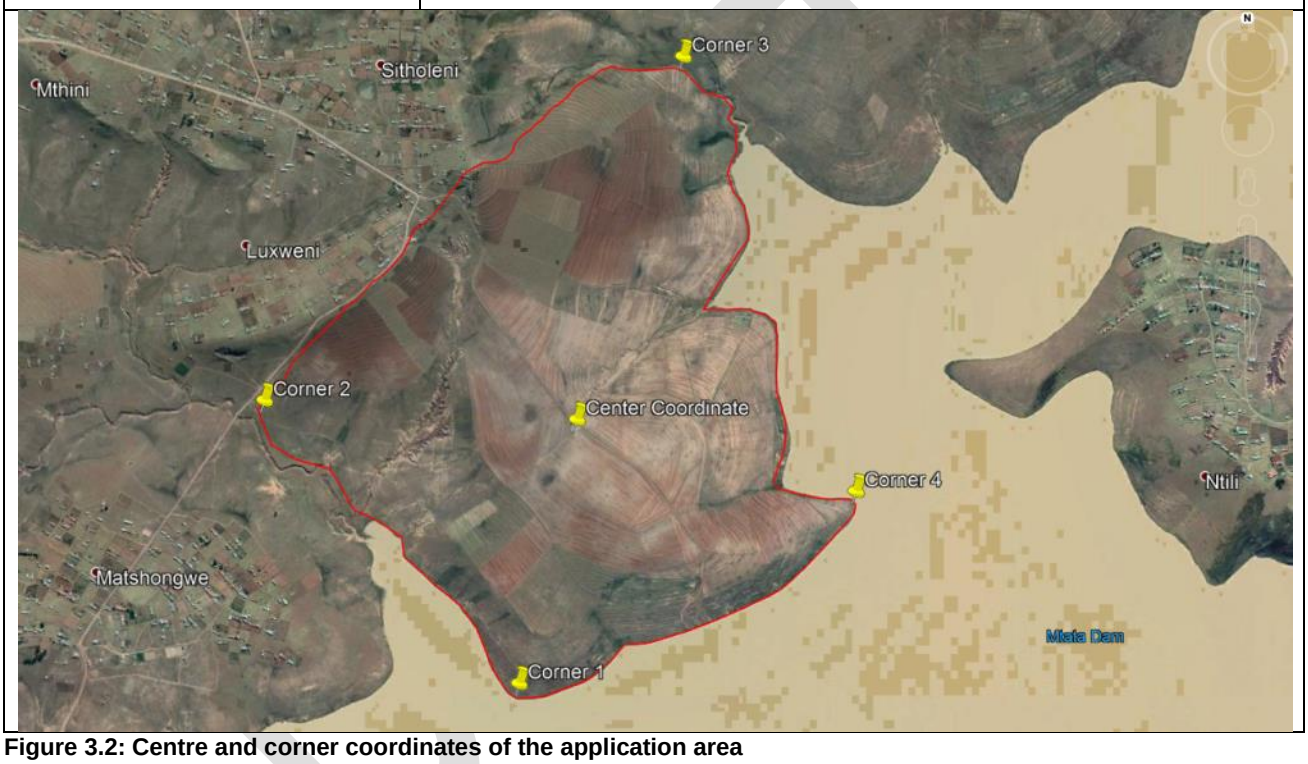

Figure 3.2: Centre and corner coordinates of the application area

3.2 Land Ownership

The application area comprises various portions, namely Remaining Extent (RE) of Farm75, portion 3 of Farm 75 as well as various unregistered surveyed portions.

There is no information regarding the owner of portion 3 of Farm 75 (as seen in the table below). There are also various portions of land within the study area which have been subdivided. It can be assumed that these portions are surveyed, unregistered state owned land, however after conferring with the Surveyor General, it has become evident that these portions have not been captured on their system and thus no surveyor general diagrams are available for these portions.

Refer to the signed land rights resolution attached in Appendix C: Public Participation between the Department of Rural Development and Land Reform (DRDLR) and the land right holders within the application area.

The table below details the affected farms which fall within the application area, as well as neighbouring farm portions.

Table 3.2: The farm numbers and portions, the coordinates and 21 surveyor general codes

APPLICABLE FARM PORTIONS	
Farm Portion: 21 digit SG Code: Property owner: Size:	RE/75 C11000000000007500000 Department of Rural Development and Land Reform 1129 Ha
Farm Portion: 21 digit SG Code: Property owner: Size:	3/75 C11000000000007500003 Unknown 0.029 Ha
NEIGHBOURING FARM PORTIONS	
Farm Portion: 21 digit SG Code: Property owner:	RE/76 C11000000000007600000 Department of Rural Development and Land Reform
Farm Portion: 21 digit SG Code: Property owner:	80 C11000000000008000000 Department of Rural Development and Land Reform
Farm Portion: 21 digit SG Code: Property owner:	RE/77 C11000000000007700000 Department of Rural Development and Land Reform

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4. PROJECT DESCRIPTION

According to Appendix 2, Section 2 (1), EIA Regulations 2014 (as amended 2017), a "*scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include—*

(d) a description of the scope of the proposed activity, including—

(ii) a description of the activities to be undertaken, including associated structures and infrastructure;

The following section provides background information regarding aquaponics as well as a more detailed description of the proposed development and the associated activities and infrastructure involved.

4.1 What is aquaponics?

Aquaponics is the combination of fish farming (aquaculture) and growing plants in water (hydroponics/soil-less growing of plants) within a single recirculating system. Fish feed is converted into growth and waste. The water containing waste is then pumped to the plants beds where bacteria converts the waste into plant fertilisers. The plants therefore aid in removing the nutrients from the water, essentially purifying it to use once again. Provided the ratios of fish, feed, and waste are well balanced, this system can be continuous, stable and productive.

This natural process can have many advantages, including reduced production inputs (using one feed source), exclusion of expensive aquaculture filters, low water losses, and potential high quality crop production. In addition, the following benefits associated with aquaponics over aquaculture and hydroponics includes:

- Reduced waste as fish waste is utilised as plant feed;
- Potential for high crop quality;
- Potential for organic crop production;
- Higher proven yields than conventional farming;
- Low water usage and losses;
- Low energy requirements;
- No biological filters required;
- No expensive hydroponic chemicals required;
- Fewer plant diseases noted;
- No crop rotation required;
- Easier harvesting and management of crops;
- Fewer risk of alien invasive weeds in crop production; and
- Constant annual and out-of-season production.

The different methods of aquaponics include:

- **Ebb and Flow** – Water is pumped continuously from the fish tanks to a series of gravel filled growbeds in which plants are grown. The water level in the beds fluctuates over a 15 – 30 min cycle period whereby it cycles between full and empty. Water drains from the growbeds back to the fish tanks in a continuous loop. Due to the changing water level, the plants roots and bacteria living in the bed are supplied with plenty of oxygen, which speeds up their biological processes. This method allows for a wide range of crops to be grown.

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- **Deep water culture** (raft based) – Plants are grown from foam rafts which float over channels filled with filtered fish effluent (waste solids removed). The plant roots are suspended in the water. This method is highly efficient for growing salad greens and other fast growing, relatively low-nutrient plants.
- **Media-based** – Plants are grown in inert planting media such as clay pellets or shale. The media provides the biological and mechanical filtration in the same system. Large fruiting plants, leafy greens, and herbs grow well using this system, however it is typically used in smaller scale productions.
- **Nutrient Film** – Nutrient-rich water flows through a narrow trough (PVC pipe) from which plants grow. Plants which require little support tend to do well with this method (strawberries and herbs), This system can also make use of unused space (hung from walls and/or ceilings).
- **Vertical** - Plants are stacked on top of each other in a tower system. Water flows through the top of the tower, through a wicking material from which the plants roots absorb nutrients and water. The water then falls into a trough or directly into the fish tank. This method is also a good utilisation of unutilised space, and works well for strawberries, leafy greens and other crops which don't require much support to grow.

4.2 Description of the proposed development

The proposed large-scale aquaponics development will be based on the establishment of multiple 0.5 ha multi-span greenhouse type tunnel systems in which Mozambique Tilapia (*Oreochromis mossambicus)* will be farmed in combination with various vegetable and related crops, as well as field agriculture. The aquaponics development is also expected to include facilities for brood stock, hatchery, grow out (greenhouse type tunnels), slaughtering or processing, and support facilities such as laboratories, offices, storerooms, workshops, and feed stores.

Associated bulk infrastructure and services (water supply, electrical supply, access roads, wastewater treatment or removal and solid waste management) will also need to be established. This is further explained in the sections below.

4.2.1 Proposed layout and design of facility

This section is based on the Wildcoast Aquaponics Design Report (refer to Appendix D) compiled during the initial feasibility assessment for the Wildcoast SEZ Upper Ncise area. Of the 430 Ha SEZ study area, 30 Ha was determined to be economically feasible for an Aquaponics Zone.

Technology and design

The proposed Aquaponics facility will be based on the Ebb and Flow gravel bed design technology (refer to Figure 4.1 below for a schematic example of this system), which was deemed the most appropriate for this development as it allows for a wide variety of crops to be grown simultaneously.

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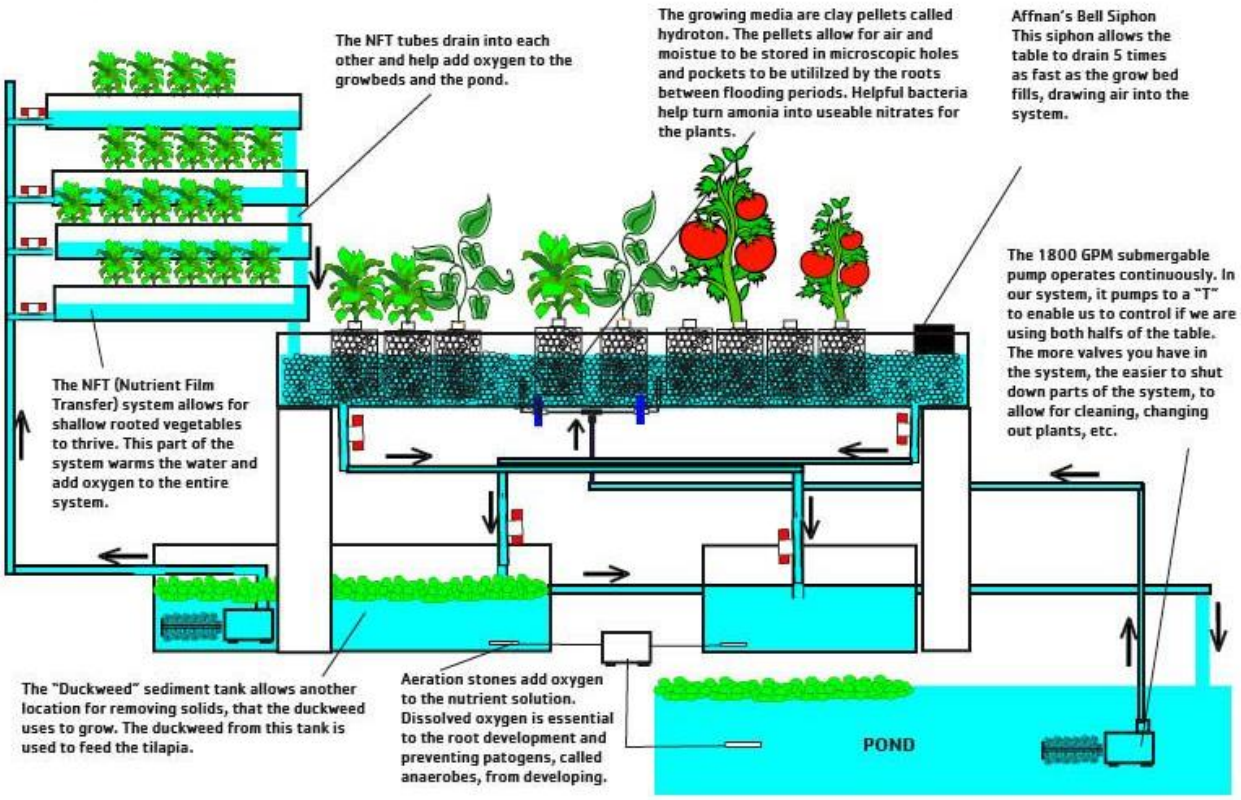

Figure 4.1 Example of an Ebb and Flow Aquaponics system

The submersible pumps will sit in a sump and continuously pump water to the growbeds. A siphon mechanism will repeatedly drain the growbeds once filled, allowing air into the system. The water draining out of the growbeds will flow into the fish tanks (via gravity), which will cause the fish tanks to overflow into clarifiers, and then finally back into the sump. The clarifiers collect any solid waste and will be drained periodically. The entire system will be placed inside a multi-span greenhouse, as depicted in Figure 4.2 below.

Figure 4.2: Example of a multi-span greenhouse

Size and capacity

The aquaponics design allows for a total growing area of 210 m^2 per node and a total fish tank volume of 69 m^3. This allows for 7 nodes to occupy a multi-span greenhouse of 0.5 Ha. The initial allocated area of 30 Ha will thus contain 60 greenhouses offering a total of 88 200 m^2 of growing area and 28 896 m^3 of fish water. Table 4.1 below provides a summary of the sizing and capacity of the proposed Aquaponics facility.

Table 4.1: Summary of sizing and capacity of Aquaponics facility

Summary of inputs (based on Tilapia)	
Market mass Growth period to market mass Age at stocking	0.3 kg 8 months 2 months
Grow bed area per node Fish tank volume per node	201 m^2 69 m^3
Area per multi-span tunnel Nodes per 0.5 Ha Initial design area Nodes per design area	0.5 Ha 7 30 Ha 420
Total growbed area Total fish tank area	88 200m^2 28 866 m^3

Plants

The primary crops proposed to be grown are tomato, cucumber and bell pepper. These crops thrive at temperatures of 23°C – 25°C. Tomatoes and bell pepper seeds will be planting in seedling trays first prior to being transferred to the growbeds (at two-leaf stage), as this has yielded greater success in previous cases. Cucumber seeds (which are larger) can be planted directly into the growbeds.

The pepper and tomato seeds for each node will require 4 seedling trays per meter using 200 seeds per tray. Therefore a 16 tray nursery area has been allocated to each node for the propagation of these seeds to be planted in that node.

Figure 4.3: Examples of seedling trays

Figure 4.4: Examples of seedling trays

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Figure 4.5: Example of growbeds within a greenhouse

Fish

The figures detailed below are based on the use of the indigenous Mozambique Tilapia (*Oreochromis mossambicus*).

Figure 4.6: Mozambique Tilapia (*Oreochromis mossambicus*)

Two hatcheries are estimated to be required for the 30 Ha Aquaponics facility. Fish breeders will be held in 4.2 m diameter tanks and females will be harvested of their eggs on a weekly basis. The eggs will be transferred to incubators. The hatchlings will be kept in 2 m diameter tanks for 4 weeks, and then transferred to 4.2 m diameter tanks for an additional week until they attain the required average mass (5 grams) to be stocked in the Aquaponics Ebb and Flow system.

Fish production can be increased by 30 – 50 % for this facility through the use of the faster growing exotic Nile Tilapia (*Oreochromis niloticus*). The Nile Tilapia is a Category 2 listed alien invasive freshwater species, and any use of this species will require that an application for a permit in terms of Chapter 7 of the Alien and Invasive Species List (2014) of the National Environmental Management Biodiversity Act (NEMBA) (No. 10 of 2004) be submitted to DEA. Therefore, the possible inclusion of Nile Tilapia is subject to approval in terms of NEMBA.

Water Demand

The water demand for the proposed Aquaponics facility has been calculated based on the full use of the 430 Ha study area and is based on the findings of the Upper Ncise Bulk Infrastructure Scoping Report compiled by Hatch Africa (Pty) Ltd in 2016 as part of the initial feasibility assessment undertaken for the Wildcoast SEZ Upper Ncise area (refer to Appendix D).

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The water demand for the proposed Aquaponics facility will be 110 m³ per tunnel. On the 430 ha of land, approximately 3600 nodes are possible allowing for some areas to be used as offices/workshops, etc.

In total, 410 000 m³ will be required to fill the aquaponics systems. Approximately 15% of the water will require replenishing per month due to evaporation. Therefore approximately 6100 m³ of water will be required per week. This equates to approximately 0.5 million m³ per annum. Allowance has been made to refill the aquaponics systems once every six months, which equates to approximately 0.8 million m³ per annum. Therefore a total water demand of 1.3 million m³ per annum is anticipated for the aquaponics system (based on the use of 3600 nodes).

Table 4.2: Estimated water requirements for the proposed Aquaponics facility

Water requirements	m^3
Per tunnel	110
Per week	6100
Per month	24400
Per annum	0.5 million
Per annum (including refill every 6 months)	**1.3 million**

Water Storage

In order to ensure a constant supply of water to the Aquaponics facility, it is recommended that 2 days storage is allowed for, which will require a 7.1Ml reservoir on site.

In addition, the Aquaponics facility has been classified as a moderate risk for fire and as such requires 1500 litre/min flow of water for a minimum duration of 4 hours. An inline pressure pump system will be required to boost the pressure in the system should firefighting be necessary.

Water Quality Requirements

Should water be abstracted from the Mthatha Dam (refer to section 4.2.2 below for a detailed description regarding water supply) for the Aquaponics facility, this will require treatment, namely for sedimentation and filtration.

The water supplied to the Aquaponics facility will require regular testing. The most critical water quality parameters to monitor are dissolved oxygen concentrations, temperature, pH and nitrogen from ammonia, nitrate and nitrite. Therefore a water quality monitoring programme will need to be established.

Potable Water

The amount of water required for human consumption has been calculated based of Department of Human Settlements Guidelines for Human Settlement Planning and Design (Red Book).

Assumptions have been made regarding the number of employees required. The Aquaponics facility is expected to make use of 15 labourers per Ha, resulting in a total of 6500 labourers employed. The required potable water demand (based on 90 litres/person/day) will be 870 m³ per day or 36 000 litres/hr. For the full 430 ha development, a water treatment works of 4.2Ml/day will be required.

Water to be used for human consumption will require further treatment (disinfection) to attain a potable standard as per SANS 241-1 once it arrives on site.

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4.2.2 Service Infrastructure

The following section provides an overview of the proposed service infrastructure required for the development, and is based on the findings of the Upper Ncise Bulk Infrastructure Scoping Report compiled by Hatch Africa (Pty) Ltd in 2016 as part of the initial feasibility assessment undertaken for the WSEZ Upper Ncise area.

It should be noted that the design stage of the bulk service infrastructure required has not been reached yet, as the designs and layout of bulk service infrastructure required for the proposed development will be dependent on the outcome of which alternatives are deemed reasonable and feasible moving forward (refer to Chapter 6 below). Therefore, details designs and layout of such infrastructure will be provided and further investigated during the EIA phase of this assessment.

Figure 4.7 below provides a conceptual overview of the layout of the proposed bulk service infrastructure required for the proposed Aquaponics facility. The following infrastructure will be required for the Aquaponics facility:

- Water supply pipelines
- Water treatment works
- Reservoirs (potable and aquaponics water storage)
- Waste water treatment works
- Access roads
- Offices and workshops

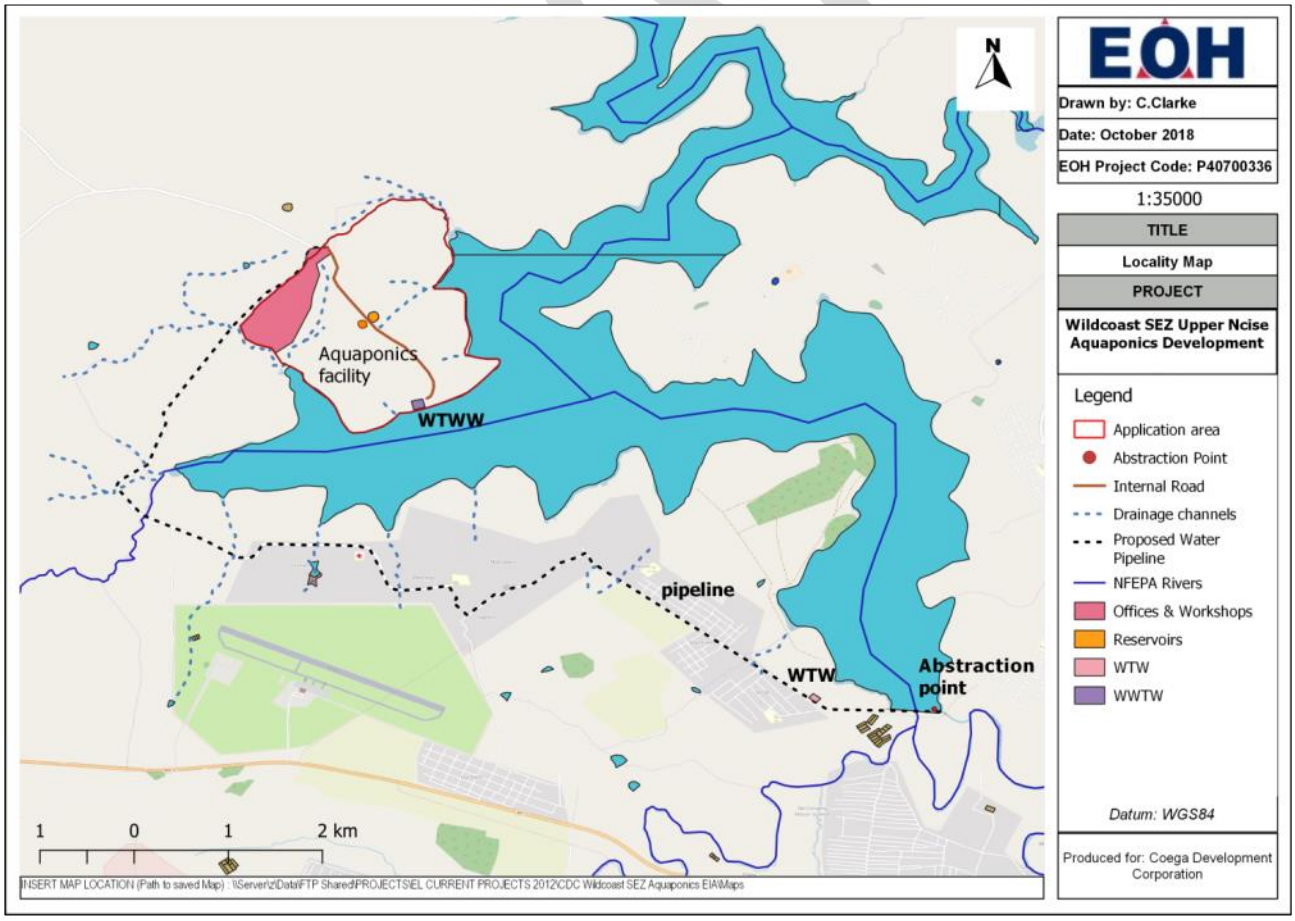

Figure 4.7: A conceptual layout of the service infrastructure required for the aquaponics facility

Water Supply

The 430 Ha study area falls within the T20B catchment of the Mthatha River Basin. The Mthatha Dam has a volume of 249 million m³. The Department of Water and Sanitation (DWS), in 2011, issued a Water Use Licence (WUL) (12/T20E/A/931) to ORTDM to abstract 55.1 million m³ per annum.

An additional 1.16 million m³ per annum is utilised by the Mthatha Rosedale Waste Water Treatment Works (WWTW). The Mthatha Dam also supplies Eskom for hydropower generation purposes at the First Falls and Second Falls Hydro Power Generation Stations, located along the Mthatha River.

The nearest bulk water main (300 mm diameter) runs along the R61 towards the Mthatha airport (8.5 km from the proposed site). Due to the anticipated volume of water required for this development, it is not feasible to connect to the existing municipal infrastructure due to its location and proximity, as well as for the need for this bulk main to be upgraded. In addition, the existing Mthatha Thornhill Water Treatment Works (WTW) would need to be upgraded in order to supply the proposed Aquaponics facility.

Standpipes are available in villages adjacent to the site, however this supply is limited to reticulation only and would be insufficient to supply the proposed Aquaponics facility.

The DWS has been consulted regarding the possibility of extracting water for the proposed Aquaponics facility from the Mthatha Dam (refer to Appendix D for the DWS pre-application meeting minutes). It was concluded that no additional capacity for the proposed Aquaponics facility is available and can the required water allocation can only be possible if negotiations between the CDC, DWS and existing water users (namely Eskom and KSDLM) reach an agreement in order to create surplus water capacity for the proposed Aquaponics facility. This would require the existing water users to amend (reduce) their authorised water use licenses with regards to abstraction. Should an agreement not be reached, this will potentially render the proposed development fatally flawed.

Therefore, the proposed water abstraction alternatives proposed within this report (refer to Chapter 6 below) will be dependent on the outcomes of such negotiations, and will be further investigated during the EIA phase.

Dam Abstraction

Should surplus capacity be made available from the Mthatha Dam, water would be extracted at the dam wall 15 km away from the proposed Aquaponics facility. The water would then be treated (placed in settling tanks and filtered) at the proposed WTW before being pumped to facility 15 km away. The raw water extraction point, water supply pipeline, and WTW are depicted in Figure 4.7 above.

It should be noted that Figure 4.5 above provides a conceptual layout of the proposed Aquaponics development and associated bulk services. Therefore, the exact routing of the proposed water pipeline and position of the WTW proposed are still to be confirmed, and will be further investigated during the EIA phase.

Wastewater

The proposed Aquaponics development will generate human waste and fish waste from fish tanks themselves. Chapter 7, Table 7.3 below details the anticipated listed waste management activities applicable to the proposed development that will require a Waste Management License (WML) as per GN R 921 of the National Environmental Management: Waste Act (NEM:WA) (Act No. 59 of 2008). All applicable

listed waste management activities will be further assessed during the EIA phase as part of this Integrated Waste and EIA process as part of the integrated application for an Environmental Authorisation (EA) and WML.

There is no existing sewer reticulation network on site, as existing WWTW is located on the eastern side of Mthatha. The KSDLM has planned to provide further bulk sewage system to the Mtahtha Airport and surrounding areas, however this is yet to be implemented. The Northern Outfall Sewer is proposed to be extended to the airport which currently is not connected to the municipal sewer network. However this extension has not taken into account the flows generated from the site.

As an interim measure, the Mthatha airport and surrounds make use of septic tank systems, however this system will not be favoured by DEA or DWS going forward (as concluded in the WCSEZ Feasibility Study and Business Plan).

As concluded during the DWS pre-application meeting (Appendix D), water use license applications regarding the discharge of waste into the Mthatha Dam will be rejected by DWS on the basis that any waste discharge into the dam will further compromise the ability of the existing Thornhill WTW to maintain drinking water standards.

Possible alternatives (refer to Chapter 5) to discharging into the Mthatha Dam could be to pipe the treated waste water outside of the Mthatha Dam catchment area where the waste water can be used for irrigation.

The feasibility of this alternative will need to be considered and further assessed during the EIA phase. Alternatively, a municipal sewer reticulation connection will be required. Should these alternatives be deemed unfeasible, this would present a fatal flaw to the proposed development.

Roads

The proposed Aquaponics facility is accessed from the R61 via a gravel road (DR08217), which is approximately 10.2 km in length. It is proposed that the access road from the R61 to the site be upgraded to a surfaced road. The internal roads within the proposed facility will be a combination of surfaced and gravel roads.

Stormwater

Stormwater on site is to be accommodated in a piped stormwater system as well as side channel drains, which will drain towards the Mthatha Dam.

Solid Waste

The KSDLM refuse collection area does not extend to the study site. Any refuse generated on site would need to be temporarily stored and transported to the Municipal Solid Waste Site.

Alternatively it may be possible to establish a private landfill on site, however this activity will trigger the need for a Waste Management License as detailed in Chapter 7, section 7.3 below, and will be further assessed during the EIA phase as part of the integrated EA and WML application.

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Electricity

Electricity is currently supplied to the broader study region via Eskom's 132 000/22 000/400/230 volt overhead reticulation network.

Eskom has proposed to reconfigure the 22 000 volt networks within the area, thus creating additional capacity, however it is anticipated that this will only come into effect in the year 2020. It should also be mentioned that an average of 3 to 5 years can be expected for Eskom to deliver electricity supplies of this nature from the date of payment and initial application by consumers.

The anticipated demand for the proposed Aquaponics facility is estimated at a minimum of a 25 MVA firm capacity, which would necessitate the building of a new 132/11KV Eskom substation and extending Eskom's 132 000 volt overhead reticulation network within close proximity to the site.

The internal proposed electrical design for the Aquaponics development would comprise of the following:

- Main intake 11 000 volt Switch House;
- 11 000 volt underground reticulation circuits to supply miniature substations;
- 400/230 volt underground reticulation to supply local distribution; and
- Area Lighting, Perimeter Protection and Security.

It is estimated that the installation of 3670 modular plants at 300m²/plant would provide an effective 25 % development coverage and would be comprised of the following key diversified load elements:

- 3670 Modular Plant: 20 000 KVA
- 2 Pumping: 450 KVA
- 1 Offices: 100 KVA
- 3 Workshop: 150 KVA
- 1 Area Lighting: 100 KVA
- 3 External Heating: 1500 KVA

This equates to a total demand of 22 300 KVA.

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5. NEED AND DESIRABILITY

According to Appendix 2, Section 2 (1), EIA Regulations 2014 (as amended), a "*scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include—*

f) A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;

A significant portion of the population within the (80 %) of the Wild Coast Region live in rural areas that comprise the three District Municipalities of Alfred Nzo District Municipality (ANDM), ORTDM and Amathole District Municipality (ADM). The Wild Coast Region covers an area of approximately 26 % of the Eastern Cape Province land area and is home to 3.1 million people.

The Region has under-developed infrastructure, suppressed industrial and agricultural development, high levels of poverty and elevated unemployment. Within the Eastern Cape, 61 % of people live below the poverty line, with most of these people residing in the Wild Coast Region. In 2006, the unemployment rate for KSDLM was 28.6 % and increased overtime to 30.2 % in 2016. The gap between the labour force participation rate and the unemployment rate decreased which indicates a negative outlook for the employment within KSDLM. Therefore, the DTI SEZ policy has four objectives:

- Support the development of targeted industrial capabilities and attract foreign and domestic direct investments in support of the Industrial Policy action Plan (IPAP) and Provincial Industrial Development Strategies (PIDS's), under the over-arching National Development Plan (NDP);
- Develop world-class industrial infrastructure in the line with the requirements of the targeted industries and investments;
- Promote beneficiation and further value addition of the country's mineral and agricultural resources; and
- Contribute to the creation of sustainable jobs and increase exports of beneficiated commodities in the targeted regions.

The 2030 National Development Plan (NDP, 2013) places emphasis on transforming the South African economy and creating sustainable expansion for job creation by "*increasing exports focusing on those areas where South Africa already has endowments and comparative advantage, such as agriculture and agro-processing*." The NDP places emphasis on creating jobs through agricultural development and the growth of irrigated agriculture and land production. One of the objectives of government is to create an additional 643 000 direct jobs and 326 000 indirect jobs in the agriculture, agro-processing and related sectors by the year 2030 with special emphasis on transforming the rural economy of the country by expanding the irrigated agriculture sector. In addition, there must be "*continued progressive development in agriculture and agro-processing*" in order to improve food security in South Africa, (NDP, 2013).

An objective of the Eastern Cape Provincial Development Plan (ECPDP, 2014) is accelerated economic development of rural areas and all regions and improved economic infrastructure that promotes new economic activity across all regions of the Eastern Cape.

The ECPDP (2014) has also set various targets for employment in the agricultural industry, with the aim to double the number of people employed in agriculture and allied industries between 2020 and 2030. It also states that "*the agriculture sector does have space for new entrants. In the short to medium term, government should support these entrants*."

According to the KSDLM's Integrated Development Plan (IDP) 2018/19, the municipality remains committed and continues to pursue the relevant High Impact Programmes, which includes the development of SEZ's including the Mthatha Airport.

The proposed development is therefore in line with NDP, the ECPDP as well as the KSDLM's IDP. The proposed Aquaponics facility will be beneficial to the society and local communities as it is likely to create temporary employment opportunities during the construction phase and a possible additional 6500 permanent jobs during operation (based on the full 420 Ha development). It will also provide opportunities for unskilled workers to develop new skills and have an additional contribution towards the local and national economy.

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6. ALTERNATIVES

According to Appendix 2, Section 2 (1), EIA Regulations 2014 (as amended), a "*scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include—*

(g) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including—

(i) details of all the alternatives considered;

One of the objectives of the S&EIR process is to investigate various alternatives of the proposed development. Alternatives must include the consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. There are two types of alternatives namely fundamental alternatives and incremental (or development) alternatives. The no-go alternative must also be included in the assessment phase as this provides the baseline against which the impacts of all the other alternatives are assessed.

Alternatives should include consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The no-go alternative must also 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 the proposed site and/or activity is appropriate needs to be informed by the specific circumstances of the activity and its environment.

The following alternatives to be considered include:

- Fundamental Alternatives:
  - Property/location alternatives
  - Activity alternatives
- Incremental Alternatives:
  - Design/layout alternatives
  - Technological alternatives
- No-go Alternatives

6.1 Fundamental Alternatives

Fundamental alternatives are developments that are completely different from the proposed project and usually involve a different type of development (different activity other than the no-go option) on the proposed site, or a different location for the proposed development to take place. Such alternatives include:

- Alternative property or location where it is proposed to undertake the activity; and
- Alternative type of activity to be undertaken.

The fundamental (activity) alternatives considered in this report are summarised below (Table 6.1).

Table 6.1: Fundamental Alternatives to be considered for the proposed Aquaponics development.

Alternative Type	Alternative	Advantages	Disadvantages	Reasonable and Feasible	Further Assessment Required
Location	**No Alternatives Assessed:** As discussed in section 1.1 above, the Upper Ncise area was earmarked as a preferred site for an Aquaculture Zone as part of Phase 1 of the WCSEZ Feasibility and Business Plan assessment. The Applicant, the CDC, have since acquired landowner consent for the property in question (refer to the signed land rights resolution attached in Appendix C: Public Participation). No alternative property/location alternatives were provided by the Applicant for the proposed Aquaponics Development and as such the proposed property/location illustrated in Figure 2.1 above will be the only property/location alternative assessed further.	• Land has already been cleared for agricultural purposes. • Suitable topography to gravity feed water on to site – lower pumping costs to circulate water on site. • In close proximity to Mthatha airport. • Relatively easy to access.	• Located within the Mthatha river catchment – DWS have indicated that they want to limit activities within the catchment. • Potential loss of viable agricultural land. • Potential impacts on surface and groundwater within the Mthatha Dam catchment area. • Possible water supply constraints. • Located far from proposed abstraction point.	YES – dependent on the outcome of the incremental alternatives (water supply and waste discharge alternatives) put forward.	**YES**
Activity	**Alternative 1 (Proposed)**: Aquaponics	• Job creation. • Economic development. • Emerging sector within the economy.	• High water requirements. • Relatively large volumes of waste generated. • High energy demands for pumping of water. • Staff need to be skilled at some level to operate.	YES - dependent on the outcome of the incremental alternatives (water supply and waste discharge alternatives) put forward.	**YES**
	Alternative 2: Agriculture	• Less expensive and less specialised set up and design than aquaponics. • Easier for community to	• Will require irrigation – limited water availability.	YES - dependent on the outcome of the incremental alternatives (water supply alternatives) put forward.	**YES**

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		engage with agricultural practices. • Land currently being used for agricultural purposes. • Low energy demands. • Low levels of waste generated.			
	Alternative 3: Aquaponics & Agriculture combined	• Continuation of existing land use within the study area in addition to aquaponics. • Job creation. • Economic development.	• High water requirements. • Relatively large volumes of waste generated. • High energy demands for pumping of water. • Staff need to be skilled at some level to operate. • Will require irrigation – limited water availability.	YES - dependent on the outcome of the incremental alternatives (water supply and waste discharge alternatives) put forward.	**YES**

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6.2 Incremental Alternatives

Incremental alternatives are changes or variations to the technical design of a project that provides different options to reduce or minimise any environmental impacts. There are several incremental alternatives that will be refined and assessed further during the EIR Phase of the project, including:

- Alternative design or layout of the activity; and
- Alternative technology to be used in the activity.

The incremental (design/layout and technological) alternatives considered in this report combine design, layout and technological elements and are summarised below (Table 6.2).

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Table 6.2: Incremental Alternative to be considered for the proposed Aquaponics development.

Alternative Type	Alternative	Advantages	Disadvantages	Reasonable and Feasible	Further Assessment Required
Water supply	**Alternative 1 (Proposed):** Water Abstraction from the Mthatha Dam	• Located in close proximity to the Mthatha Dam. • Water quality in Mthatha Dam is relatively good.	• DWS has indicated that there is no available water allocation for this project – 100% of water available has been allocated.	YES – dependent on negotiations between the CDC, DWS and existing water users (namely Eskom and KSDLM) regarding creating a surplus water capacity for the proposed Aquaponics facility. This would require the existing water users to amend (reduce) their authorised water use licenses with regards to abstraction.	**YES**
	Alternative 2: Municipal water reticulation connection	• Expansion of municipal network within un-serviced communities. • Potable water will require minimal pre-treatment.	• Municipality currently using full allocation – Potentially cannot provide water to the facility. • Reliant on the roll-out of municipal network expansion.	YES – dependent on confirmation from KSDLM that water can be allocated.	**YES**
	Alternative 3: Rainwater harvesting	• Low input costs. • Lowest energy demands. • No additional pressure placed on existing Mthatha Dam water supply.	• Unreliable water supply. • Unlikely to meet the large water demands for the proposed Aquaponics development.	NO – Water demand of the Aquaponics facility will unlikely be met by this alternative. Therefore, this alternative is deemed unfeasible and will not be assessed further.	**NO**
Waste discharge	**Alternative 1 (Proposed):** Waste discharge into the Mthatha Dam	• Site located in close proximity to the Mthatha Dam so minimal pumping costs.	• Potential cumulative surface and groundwater pollution. • Deterioration of water quality standards within the Mthatha Dam effecting existing water users. • Requires that effluent be treated to potable water	NO – The DWS stated that any application for waste discharge into the Mthatha Dam would be rejected. Therefore, this alternative is deemed unfeasible and will not be assessed further.	**NO**

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			standards.		
	Alternative 2: Irrigation of wastewater outside of the Mthatha Dam catchment	• Least impactful on surface and groundwater within the Mthatha Dam catchment.	• High construction costs of pipeline. • High energy demand for pumping waste. • Potential surface and groundwater pollution.	YES	**YES**
	Alternative 3: Municipal sewer reticulation connection	• No impact on Mthatha Dam. • Improved sanitation within the community.	• Additional pressure placed on the existing WWTW. • High construction costs. • Reliant on the roll-out of municipal network expansion.	YES	**YES**
Bulk service infrastructure	**Routing Alternatives:** The routing and design of bulk service infrastructure (water pipeline/s, sewer, and electrical reticulation) will be dependent on the Water and Waste Alternatives (described above) put forward during the EIA phase of this assessment.				YES – The routing of bulk service infrastructure required will be further investigated during the EIA phase of this assessment.

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6.3 No-Go Alternative

It is mandatory for the applicant and the EAP to consider the 'No-Go' option in the S&EIR process. The 'No-Go' alternative refers to the current status quo of the proposed study area and the associated existing risks and impacts. Existing activities may carry risks and may be undesirable (e.g. an existing contaminated site earmarked for a development). The No-Go is the continuation of the existing land use (i.e. maintaining the status quo) of undeveloped land classified as thicket, bushland, degraded thicket and cultivated land, according to the South African National Biodiversity Institute Land Use database (SANBI, 2009).

The study area is currently managed by the KSDLM and used for maize and soybean cultivation as well as communal grazing land. The existing land use does provide limited employment opportunities to local residents in this regard. Should the proposed Aquaponics development not proceed, the land will remain underutilized with no additional job creation and no contribution to economic development within the region (Table 6.3). The No-Go alternative will be used as a baseline throughout the EIA process against which potential impacts will be compared in an objective manner.

Table 6.3: No-Go Alternative to the Proposed Aquaponics Development.

Alternative Type	Advantages	Disadvantages	Reasonable and Feasible	Further Assessment Required
No-Go Option	• No further loss of natural vegetation • No potential loss of archaeological and/or paleontological resources • No additional surface and groundwater impacts within the Mthatha Dam catchment.	• Underutilized agricultural land • No additional job creation • No additional contribution to economic development and social upliftment.	YES	**YES**

6.4 Alternatives for further assessment

The removal of the non-feasible alternatives listed in Table 6.1 and 6.2 above leave the following alternatives to be assessed further during the EIA phase of this assessment:

- **Location Alternative** – the proposed location alternative will be the only alternative assessed;
- **Activity Alternative 1** – Aquaponics;
- **Activity Alternative 2** – Agriculture;
- **Activity Alternative 3** – Aquaponics and Agriculture combined;
- **Water Supply Alternative 1** – Water abstraction from the Mthatha Dam;
- **Water Supply Alternative 2** – Municipal water reticulation connection;
- **Water Supply Alternative 3** – Rainwater harvesting;
- **Waste Discharge Alternative 2** - Irrigation outside of the Mthatha Dam catchment;
- **Waste Discharge Alternative 3** – Municipal sewer reticulation connection;
- **Bulk service infrastructure** - routing alternatives will be assessed further during the EIA phase of this assessment based on the outcome of which water supply and waste discharge alternatives are put forward; and
- **No-Go Option** - (status quo - land to remain undeveloped).

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7. LEGAL AND POLICY FRAMEWORK

According to Appendix 2, Section 2 (1), of the EIA Regulations 2014 (as amended), a "*scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include—*

(d) a description of the scope of the proposed activity, including—

(i) all listed and specified activities triggered;

(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.

This section describes the South African (National), Eastern Cape (Provincial) and ORTDM and KSDLM (Local) legislation considered during the Scoping Phase of the proposed development.

7.1 The Constitution (Act No. 108 of 1996)

This is the supreme law of the land. As a result, all laws, including those pertaining to the proposed development, must conform to the Constitution. The Bill of Rights - Chapter 2 of the Constitution, includes an environmental right (Section 24) according to which, "*everyone has the right –*

(a) To an environment that is not harmful to their health or well-being; and

(b) To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that–

(i) prevent pollution and ecological degradation.

(ii) promote conservation; and

(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

Relevance to the proposed Upper Ncise Aquaponics Development

The proponent has an obligation to ensure that the proposed development will:

- Not result in pollution and ecological degradation; and
- Be ecologically sustainable, while demonstrating economic and social development.

7.2 National Environmental Management Act (Act No. 107 of 1998, as amended)

The objective of the National Environmental Management Act (NEMA) is "*provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for co-ordinating environmental functions exercised by organs of state; to provide for certain aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith*."

NEMA provides the basis for environmental governance in South Africa by establishing principles and institutions for decision-making on matters affecting the environment. A key aspect of NEMA is that it provides a set of environmental management principles that apply throughout South Africa to the actions of all organs of state that may significantly affect the environment. Section 2 of NEMA contains principles

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relevant to the proposed project, and likely to be utilised in the process of decision making by DEA (Table 7.1).

Table 7.1: NEMA Environmental Management Principles.

(2)	*Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.*
(3)	*Development must be socially, environmentally and economically sustainable.*
(4)(a)	*Sustainable development requires the consideration of all relevant factors including the following:* *i. That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;* *ii. That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;* *iii. That waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner.*
(4)(e)	*Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.*
(4)(i)	*The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.*
(4)(j)	*The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.*
(4)(p)	*The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.*
(4)(r)	*Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.*

As these principles are utilised as a guideline by the competent authority in ensuring the protection of the environment, the proposed development should, where possible, be in accordance with these principles. Where this is not possible, deviation from these principles would have to be very strongly motivated.

NEMA introduces the duty of care concept, which is based on the policy of strict liability. This duty of care extends to the prevention, control and rehabilitation of significant pollution and environmental degradation. It also dictates a duty of care to address emergency incidents of pollution. A failure to perform this duty of care may lead to criminal prosecution, and may lead to the prosecution of managers or directors of companies for the conduct of the legal persons.

In addition NEMA introduced a framework for environmental impact assessments, which aims to avoid detrimental environmental impacts through the regulation of specific activities that cannot commence without prior environmental authorisation. Authorisation in terms of the EIA Regulations GN R 326, 2014 (as amended), either requires a Basic Assessment or a Full Scoping and Environmental Impact Assessment report (S&EIR), depending on the type of activity. These assessments specify mitigation and management guidelines to minimise negative environmental impacts and optimise positive impacts.

Relevance to the proposed Upper Ncise Aquaponics Development

An application for Environmental Authorisation (as triggered by the EIA Regulations 2014 (as amended 2017) will be required. In terms of Section 28, every person who causes, has caused, or may cause significant pollution or degradation of the environment, must take reasonable measures to prevent pollution or rectify the damage caused. The undertaking of various specialist studies, in order to identify potential impacts on the environment and to recommend mitigation measures to minimise these impacts, complies with Section 28 of NEMA. The developer must apply the NEMA principles, the fair decision-making

and conflict management procedures that are provided for in NEMA. The developer must apply the principles of Integrated Environmental Management and consider, investigate and assess the potential impact of existing and planned activities on the environment, socio-economic conditions and the cultural heritage.

Three lists of activities, initially published on 21 April 2006 were amended in 2010, 2014 and again on 7 April 2017, as per Listing Notices 1, 2 and 3 (GN R 324, 325, and 327 respectively), which define the activities that require, respectively, a Basic Assessment (applies to activities with limited environmental impacts), or a Scoping and Environmental Impact Assessment (applies to activities which are significant in extent and duration). There are a number of activities triggered by the proposed Aquaponics development (Table 7.2).

Table 7.2: NEMA Listed Activities triggered by the proposed Aquaponics Development

Listing Notice	Activity	Description	Comments and observations
Listing Notice 1 Basic Assessment	3(iii)	*The development and related operation of facilities or infrastructure for the slaughter of animals with a product throughput of fish, crustaceans and amphibians with a wet weight product throughput of 20 000 kg per annum.*	The proposed Aquaponics development will involve the development and operational facilities for fish with a possible wet weight product throughput of 20 000 kg per annum.
	6(ii)	*The development and related operation of facilities, infrastructure or structures for aquaculture of 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 proposed Aquaponics development will involve the development and operational facilities for fish with a possible production output exceeding 20 000 kg per annum.
	9(i)(ii)	*The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water with an internal diameter of 0,36 metres or more; or with a peak throughput of 120 litres per second or more.*	The proposed Aquaponics development will involve the development of infrastructure for the bulk transport of water.
	13	*The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of Activity 16 in Listing Notice 2 of 2014.*	The proposed Aquaponics development will involve the of-stream storage of water in a reservoir.
	19(i)	*The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.*	The proposed Aquaponics development is proposed to be located adjacent to the Mthatha Dam and the construction of service infrastructure required will fall within 10 m from a watercourse.
	24(ii)	*The development of a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres.*	The gravel access road leading to the site from the R61 is proposed to be upgraded to a surfaced road, which may be wider than 8 m.
	26	*The development and related operation of*	The proposed aquaponics

Listing Notice	Activity	Description	Comments and observations
		facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2000 cubic metres but less than 15000 cubic metres.	development will involve the development and operation of facilities, and infrastructure for the bulk transport of sewage/wastewater greater than 2000 m^3 per day.
	28(ii)	*Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.*	The proposed industrial development will be located on land used for agriculture outside of an urban area, and it will be greater than 1 Ha in size.
Listing Notice 2 Full Scoping and EIR	15	*The clearance of an area of 20 hectares or more of indigenous vegetation.*	The proposed development will involve the clearance of 20 Ha or more of indigenous vegetation.
Listing Notice 3 Basic Assessment	2(b)ii;iii(bb)(dd)	*The development of reservoirs for bulk water supply with a capacity of more than 250 cubic metres in Eastern Cape in a protected area identified in terms of NEMPAA, excluding conservancies; outside urban areas, in sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.*	The proposed development will involve the development of reservoirs for bulk water supply within a critical biodiversity area within the Eastern Cape Province.
	4(b)ii(aa)(cc)(ee)	*The development of a road wider than 4 metres with a reserve less than 13,5 metres in Eastern Cape outside urban areas, in protected area identified in terms of NEMPAA, excluding disturbed areas; sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.*	The activities associated with the proposed development may result in the development of a road wider than 4 metres with a reserve less than 13.5 metres, which occurs within National Protected Area Expansion Strategy Focus areas.
	12(a)iv	*The clearance of an area of 300 square metres or more of indigenous vegetation.* *(a) In Eastern Cape, Free State, Gauteng, Limpopo, North West and Western Cape provinces on land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.*	The proposed development may be located on land which is zoned as public open space.

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Listing Notice	Activity	Description	Comments and observations
	13(b)ii;iii	*The development and related operation of facilities of any size for any form of aquaculture in Eastern Cape in a Protected Area identified in the NEMPAA; or areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined.*	The proposed development is located within 100 m from the Mthatha Dam.

Relevance to the proposed Upper Ncise Aquaponics Development

Based on the listed activities identified in Listing Notice 2 of the EIA Regulations 2014 (as amended), the proposed project will be subject to an S&EIR process. In order to comply with NEMA, the impacts associated with the activities listed above will need to be identified and assessed during this process and will include the necessary specialist reports required. The Competent Authority (CA) for this project is identified as the National Department of Environmental Affairs (DEA).

7.3 National Environmental Management: Waste Act (Act No. 59 of 2008)

The NEMWA gives legal effect to the Government's policies and principles relating to waste management in South Africa, as reflected in the National Waste Management Strategy (NWMS).

The objects of the Act are "*to protect health, well-being and the environment by providing reasonable measures for:*

- *minimising the consumption of natural resources;*
- *avoiding and minimising the generation of waste;*
- *reducing, re-using, recycling and recovering waste;*
- *treating and safely disposing of waste as a last resort;*
- *preventing pollution and ecological degradation;*
- *securing ecologically sustainable development while promoting justifiable economic and social development;*
- *promoting and ensuring the effective delivery of waste services;*
- *remediating land where contamination presents, or may present, a significant risk of harm to health or the environment; and*
- *achieving integrated waste management reporting and planning.*"

Chapter 4 of this Act deals with the general duty in respect to waste management and emphasises that, "*a holder of waste must, within the holder's power, take all reasonable measures to:- avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated; reduce, re-use, recycle and recover waste; where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner; manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts; prevent any employee or any person under his or her supervision from contravening this Act; and prevent the waste from being used for an unauthorised purpose*".

Chapter 4, Part 3 of this Act deals with reduction re-use and recovery of waste, Part 4 deals with waste management activities, Part 5 covers storage collection and transportation of waste, Part 6 deals with

treatment, processing and disposal of wastes, Part 7 covers industry waste management plans and Part 8 deals with contaminated land. Chapter 5 covers all issues regarding the licensing of waste management activities.

Table 7.3 below further lists the applicable Waste Management Activities, as per GN R 921, which details activities that have, or are likely to have a detrimental effect on the environment. As such, the triggered Waste Management Activities will form part of the assessment for the **integrated application for an environmental authorisation and waste management license**.

In determining which waste management activities could apply to the proposed WCSEZ Upper Ncise Aquaponics Development, no provision has been made for the handling, storage, treatment or disposal of hazardous waste, as it is not envisaged that this will be required.

Table 7.3: List of Waste Management Activities that have, or are likely to have a Detrimental Effect on the Environment

GN R 921 Activity No.	Description of activity	Applicability	Assessment Process
A1	*The storage of general waste in lagoons*	This may be triggered if some of the sludge and related waste from the Aquaponics facility are stored in lagoons.	Basic Assessment **(Integrated with EIA process)**
A6	*The treatment of general waste using any form of treatment at a facility that has the capacity to process in excess of 10 tons but less than 100 tons.*	Although unlikely, this may be triggered pending the proposed manner in which waste will be handled.	
A9	*The disposal of inert waste to land in excess of 25 tons but not exceeding 25 000 tons, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation.*	Although unlikely, this may be triggered pending the proposed manner in which waste will be handled.	
A10	*The disposal of general waste to land covering an area of more than 50 m^2 but less than 200 m^2 and with a total capacity not exceeding 25 000 tons.*	This may be applicable if the facilities are self-reliant in terms of waste disposal.	
A11	*The disposal of domestic waste generated on premises in area not serviced by the municipal service where waste disposed exceeds 500kg per month.*	This may be applicable if the facilities are self-reliant in terms of waste disposal.	
A12	*The construction of a facility for a waste management activity listed in Category A of this Schedule.*	This may be applicable if any waste management facilities are established.	
B6	*The treatment of general waste in excess of 100 tons per day calculated as a monthly average, using any form of treatment*	Although unlikely, this may be triggered pending the proposed manner in which waste will be handled.	Full Scoping & EIA **(Integrated with EIA process)**
B8	*The disposal of general waste to land covering an area of more than 200 m^2 and with a total capacity exceeding 25 000 tons.*	Although unlikely, this may be triggered pending the proposed manner in which waste will be handled.	

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C1	*The storage of general waste at a facility that has the capacity to store in excess of 100 m^3 of general waste at any one time, excluding the storage of waste in lagoons or temporary storage of such waste*	Although unlikely, this may be triggered pending the proposed manner in which waste will be handled.	Norms and Standards for Storage of Waste (2013)

Relevance to the proposed Upper Ncise Aquaponics Development

- All reasonable measures must be taken to avoid the generation of waste and, where such generation cannot be avoided, minimise the toxicity and amounts of waste that are generated; reduce, re-use, recycle and recover waste; where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
- Manage the waste in such a manner that it does not endanger human health or the environment or cause a nuisance through noise, odour or visual impacts;
- Prevent any employee or any person from contravening this Act and prevent the waste from being used for an unauthorised purpose;
- Spoil rock material which may be generated as a result of bulk sampling must be re-used where possible;
- The proponent must ensure that all activities associated with the project address waste related matters in compliance with the requirements of the Act; and
- The proponent must ensure all listed Waste Management Activities, as per GN R 921, are applied for.

7.4 National Environmental Management: Protected Areas Act (Act No. 57 of 2003, as amended).

The purpose of the National Environmental Management: Protected Areas Amendment Act (NEMPAA) is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes.

The objectives of NEMPAA are:

(a) To provide, within the framework of national legislation, including the National Environmental Management Act, for the declaration and management of protected areas;
(b) To provide for co-operative governance in the declaration and management of protected areas;
(c) To effect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity;
(d) To provide for a representative network of protected areas on state land, private land and communal land;
(e) To promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas;
(f) To promote participation of local communities in the management of protected areas, where appropriate; and
(g) To provide for the continued existence of South African National Parks.

Relevance to the proposed Upper Ncise Aquaponics Development

- The proposed development is located within Luchaba Nature Reserve and therefore provisions within the National Environmental Management: Protected Areas Act (Act No. 57 of 2003, as amended) must be adhered to.

- In addition, the location of the proposed development will result in the need for particular consideration of spatially relevant listed activities that trigger the need for Environmental Impact Assessment (as per Listing Notice 3 in GN R 985 of 2014, as amended).

7.5 National Environment Management: Biodiversity Act (Act No. 10 of 2004)

The National Environment Management: Biodiversity Act (NEMBA) provides for the management and conservation of South Africa's biodiversity and the protection of species and ecosystems that warrant national protection.

The objectives of NEMBA are:

(a) within the framework of the National Environmental Management Act, to provide for—
- *(i) the management and conservation of biological diversity within the Republic and of the components of such biological diversity;*
- *(ii) the use of indigenous biological resources in a sustainable manner; and*
- *(iii) the fair and equitable sharing among stakeholders of benefits arising from bioprospecting involving indigenous biological resources;*

(b) to give effect to' ratified international agreements relating to biodiversity which are binding on the Republic;
(c) to provide for co-operative governance in biodiversity management and conservation; and
(d) to provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

The Act provides for the management and conservation of South Africa's biodiversity within the framework of NEMA (Table 7.4). In terms of the Biodiversity Act, the developer has a responsibility for:

- The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (including The Endangered and Threatened Ecosystem Regulations, Government Notice R. 1002 dated 9 December 2011);
- Application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all developments within the area are in line with ecological sustainable development and protection of biodiversity;
- Limit further loss of biodiversity and conserve endangered ecosystems.

Table 7.4: Management and conservation of biodiversity within the framework of NEMA.

Chapter 4	• Provides for the protection of species that are threatened or in need of national protection to ensure their survival in the wild; • To give effect to the Republic's obligations under international agreements regulating international trade in specimens of endangered species; and • Ensure that the commercial utilization of biodiversity is managed in an ecologically sustainable way.
Chapter 5 (Part 2) Section 73	A person who is the owner of land on which a listed invasive species occurs must: a) Notify any relevant competent authority, in writing, of the listed invasive species occurring on that land; b) Take steps to control and eradicate the listed invasive species and to prevent it from spreading; and c) Take all required steps to prevent or minimise harm to biodiversity.
Chapter 5 (Part 2) Section 75	• Control and eradication of a listed invasive species must be carried out by means or methods that are appropriate for the species concerned and the environment in which it occurs.

	• Any action taken to control and eradicate a listed invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment. • The methods employed to control and eradicate a listed invasive species must also be directed at the offspring, propagating material and re-growth of such invasive species in order to prevent such species from producing offspring, forming seed, regenerating or re-establishing itself in any manner.

NEMBA's permit system is further regulated in the NEMBA Threatened or Protected Species Regulations Government Notice R. 152 of 2007. The NEMBA Alien and Invasive Species List (Government Notice R 599 of 2014) define Alien and Invasive species that are regulated by the NEMBA Alien and Invasive Species Regulations (Government Notice 98 of 2014).

Relevance to the proposed Upper Ncise Aquaponics Development

The proponent must:

- Not cause a threat to any endangered ecosystems and must protect and promote biodiversity;
- Not remove or damage any protected species without a permit;
- Ensure that the site is cleared of alien vegetation using appropriate means;
- Implement an invasive species monitoring, control and eradication plan for land/activities under their control should be developed, as part of their environmental plans in accordance with Section 11 of NEMA.

7.6 National Water Act (Act No. 36 of 1998)

The National Water Act (NWA) provides for fundamental reform of the law relating to water resources in South Africa.

The purpose of the Act is "*to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors*–

(a) meeting the basic human needs of present and future generations;
(b) promoting equitable access to water;
(c) redressing the results of past racial and gender discrimination;
(d) promoting the efficient, sustainable and beneficial use of water in the public interest;
(e) facilitating social and economic development;
(f) providing for growing demand for water use;
(g) protecting aquatic and associated ecosystems and their biological diversity;
(h) reducing and preventing pollution and degradation of water resources;
(i) meeting international obligations;
(j) promoting dam safety;
(k) managing floods and droughts."

Section 21 of the NWA describes activities defined as a water use under the Act. These activities may only be undertaken subject to the application for, and issue of, a Water Use License (WUL) or general authorisation (GA). Water use activities include:

(a) taking water from a water resource;
(b) storing water;
(c) impeding or diverting the flow of water in a watercourse;

(d) engaging in a stream flow reduction activity contemplated in section 36;
(e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
(f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
(g) disposing of waste in a manner which may detrimentally impact on a water resource;
(h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
(i) altering the bed, banks, course or characteristics of a watercourse;
(j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
(k) using water for recreational purposes."

Relevance to the proposed Upper Ncise Aquaponics Development

- Should any infrastructure be constructed within the 100 m regulatory area of a river or drainage line or within the 500 m regulatory area a wetland, a water use authorisation (WUA) will be required for those applicable activities. This will be discussed with the Department of Water and Sanitation (DWS) and reported on in the EIR;
- According to Section 19(1) of the NWA, "*an owner of land, a person in control of land or a person who occupies or uses the land on which—*

  (a) Any activity or process is or was performed or undertaken; or

  (b) Any other situation exists, which causes, has caused or is likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring."

  Appropriate measures must be taken to prevent the pollution of water courses and other water resources and riparian zones must be protected.

7.7 National Heritage Resources Act (Act No. 25 of 1999)

The protection of archaeological and paleontological resources is the responsibility of a provincial heritage resources authority and all archaeological objects, paleontological material and meteorites are the property of the State. "*Any person who discovers archaeological or paleontological objects or material or a meteorite in the course of development must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority*".

Relevance to the proposed Upper Ncise Aquaponics Development

- No person may alter or demolish any structure or part of a structure, which is older than 60 years or disturb any archaeological or paleontological site or grave older than 60 years without a permit issued by the relevant provincial heritage resources authority;
- No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter or deface archaeological or historically significant sites;
- The South African Heritage Resources Agency (SAHRA) and the Eastern Cape Provincial Heritage Authority (ECPHRA) must be informed of the project.

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7.8 Conservation of Agricultural Resources Act (Act No. 43 of 1983)

The Conservation of Agricultural Resources Act (CARA) aims to control over-utilisation of the natural agricultural resources to promote the conservation of soil, water sources and vegetation through the combat of weeds and invader plants. Regulations 15 and 16 under this Act, which relate problem plants, were amended in March 2001.

The Act provides a list of declared weeds and invader plants as well as indicators of bush encroachment. In terms of weeds and invader plants:

- A land user shall control any category 1 plants that occur on any land or inland water surface;
- No person shall, except for the purposes of a biological control reserve:
    - Establish, plant, maintain, multiply or propagate weeds and invader plants;
    - Import or sell propagating material of category weeds and invader plants; and
    - Acquire propagating material of weeds and invader plants.

These lists include:

- Combating of category 1 plants (Section 15A) according to CARA (Act No 43 of 1983); and
- Combating of category 2 plants (Section 15B) according to CARA (Act No 43 of 1983)

In addition section 6 of the Act makes provisions for control measures to be applied to achieve the objectives of the Act. These measures relate to *inter alia*:

- Cultivation of virgin soil;
- Protection of "vleis", marshes, water courses and water sources;
- The regulation of the flow pattern and run-off;
- The protection of natural vegetation in the area and;
- The restoration or reclamation of land which is eroded or disturbed.

Relevance to the proposed Upper Ncise Aquaponics Development

- The proponent must restrict the prospecting and bulk sampling activities to areas which avoid "vleis", marshes and watercourses.
- An invasive species monitoring, control and eradication plan for land/activities under the control of the proponent should be developed as part of the Construction EMPr in accordance with CARA.

7.9 The Genetically Modified Organisms (Act 15 of 1997) and Agricultural Pests (Act 36 of 1983)

The objectives of the GMO Act:

- To provide for measures to promote the responsible development, production, use and application of genetically modified organisms;
- Ensure that activities are carried out in such a way as to limit possible harmful consequences to the environment and human and animal health; and
- To give attention to the prevention of accidents, and effective management of waste.

Relevance to the proposed Upper Ncise Aquaponics Development

- These would be relevant if any exotics or genetically modified organisms were to be farmed.

7.10 Animal Health Act 7 of 2002

Section 8 regulates the exportation of animals or things through a certification process and seeks to control the spread of animal diseases. The act provides the legislative framework for the owners to implement activities for the prevention of infection and control of diseases (Section 17).

Relevance to the proposed Upper Ncise Aquaponics Development

- This would be relevant if any species listed were to be farmed.

7.11 Animal Diseases Act, 1984 (Act no 35 of 1984)

In terms of Section 6 of the Animal Diseases Act, 1984 (Act no 35 of 1984), no animal or animal product may be imported into or moved in transit through South Africa without the importer obtaining a veterinary import permit from the Department of Agriculture, Forestry and Fisheries (DAFF). Directorate: Food Import and Export Standards. The DAFF has a regulatory function over the protection of agricultural resources and animal health matters. Veterinary Services of the Provincial Department(s) of Agriculture must be engaged for the export certification of live freshwater aquatic organisms.

Relevance to the proposed Upper Ncise Aquaponics Development

- Were any fish to be imported from outside of South Africa, this will be subject to a veterinary import permit, issued by the DAFF in terms of the Animal Diseases Act 35 of 1984.
- Such a permit will also be subject to the criteria and standards of the Aquatic Animal Health Code (currently in its 19th edition, 2016) and the Manual for Diagnostic Tests for Aquatic Animals (currently in its 6th edition, 2009) of the World Organisation for Animal Health (commonly referred to as the OIE or Office International des Epizooties).
- Processing of meat products for human consumption is subject to health and food safety standards. The establishment of a slaughtering or processing facility will be subject to the requirements of the National Regulator for Compulsory Standards (NRCS). Furthermore, the administration of such standards is regulated by DAFF in association with provincial departments.

7.12 Aquaculture Development Bill (2018)

The Aquaculture Development Bill (2018) was introduced to Parliament on 22 June 2018, under the regulation of DAFF. The main objective of the Bill is to promote responsible aquaculture development in South Africa. One of its other objectives is to promote the development and management of an aquaculture sector that is ecologically, socially and economically sustainable.

In terms of Chapter 7, Section 26. (1): *"a person may not engage in an aquaculture activity unless that activity is:*
(a) authorised by both an aquaculture licence and an aquaculture permit; and
(b) undertaken in accordance with the conditions in that aquaculture licence and aquaculture permit, as the case may be."

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Relevance to the proposed Upper Ncise Aquaponics Development
• The proposed Aquaponics facility will require a license through DAFF.

7.13 Occupational Health and Safety Act (Act No. 85 of 1993)

The objective of the Occupational Health and Safety Act (OHSA) is to provide for the health and safety of persons at work. In addition, the Act requires that, "*as far as reasonably practicable, employers must ensure that their activities do not expose non-employees to health hazards*". The importance of the Act lies in its numerous regulations, many of which will be relevant to the proposed Aquaponics development. These cover, among other issues, noise and lighting.

Table 7.5: Health and safety of persons at work according to the Occupational Health and Safety Act.

8: GENERAL DUTIES OF THE EMPLOYERS TO THEIR EMPLOYEES	
(1)	Every employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees.
(2)	Without derogating from the generality of an employer's duties under subsection (1), the matters to which those duties refer include in particular- a) The provision and maintenance of systems of work, plant and machinery that, as far as is reasonably practicable, are safe and without risks to health; b) Taking such steps as may be reasonably practicable to eliminate or mitigate any hazard or potential hazard to the safety or health of employees, before resorting to personal protective equipment; c) Establishing, as far as is reasonably practicable, what hazards to the health or safety of persons are attached to any work which is performed, any article or substance which is produced, processed, used, handled, stored or transported and any plant or machinery which is used in his business, and he shall, as far as is reasonably practicable, further establish what precautionary measures should be taken with respect to such work, article, substance, plant or machinery in order to protect the health and safety of persons, and he shall provide the necessary means to apply such precautionary measures; d) Providing such information, instructions, training and supervision as may be necessary to ensure, as far as is reasonably practicable, the health and safety at work of his employees; e) As far as is reasonably practicable, not permitting any employee to do any work or to produce, process, use, handle, store or transport any article or substance or to operate any plant or machinery, unless the precautionary measures contemplated in paragraphs (b) and (d), or any other precautionary measures which may be prescribed, have been taken; f) Taking all necessary measures to ensure that tire requirements of this Act are complied with by every person in his employment or on premises under his control where plant or machinery is used; g) Enforcing such measures as may be necessary in the interest of health and safety; h) Ensuring that work is performed and that plant or machinery is used under the general supervision of a person trained to understand the hazards associated with it and who have the authority to ensure that precautionary measures taken by the employer are implemented; and authority as contemplated in Section 37 (1) (b).
14: GENERAL DUTIES OF EMPLOYEES AT WORK **Every employee shall at work:-**	
(a)	Take reasonable care for the health and safety of himself and of other persons who may be affected by his acts or omissions;
(b)	As regards any duty or requirement imposed on his employer or any other person by this Act, cooperate with such employer or person to enable that duty or requirement to be performed or complied with;
(c)	Carry out any lawful order given to him, and obey the health and safety rules and procedures laid down by his employer or by anyone authorized thereto by his employer, in the interest of health or safety;
(d)	If any situation which is unsafe or unhealthy comes to his attention, as soon as practicable report such situation to his employer or to the health and safety representative for his workplace or section thereof, as the case may be, who shall report it to the employer; and
(e)	If he is involved in any incident which may affect his health or which has caused an injury to himself, report such

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	incident to his employer or to anyone authorized thereto by the employer, or to his health and safety representative, as soon as practicable but not later than the end of the particular shift during which the incident occurred, unless the circumstances were such that the reporting of the incident was not possible, in which case he shall report the incident as soon as practicable thereafter.
15: DUTY NOT TO INTERFERE WITH, DAMAGE OR MISUSE THINGS [S. 15 substituted by S. 3 of Act No. 181 of 1993.]	
	No person shall intentionally or recklessly interfere with, damage or misuse anything which is provided in the interest of health or safety.

Relevance to the proposed Upper Ncise Aquaponics Development

- The proponent must be aware of the principles and broad liability and implications contained in the OHSA and mitigate any potential impacts.

7.14 Other Relevant Legislation

Other legislation that may be relevant to the proposed development includes:

- Provincial Nature and Environmental Conservation Ordinance (No. 19 of 1974), which lists species of special concern which require permits for removal. Schedules 1 to 4 list protected and endangered plant and animal species. A permit will be required for the transporting of live fish, to or from the project, in terms of the Nature and Environmental Conservation Ordinance 19 of 1974 (Eastern Cape). Were these fish are to be transported from another South African province/s, similar permits will be required for the transporting of life fish from those province/s;
- Transkei Environmental Conservation Decree (No. 9 of 1992);
- Spatial Planning and Land Use Management Act (SPLUMA) (Act 16 of 2013 – came into force on 1 July 2015) aims to provide inclusive, developmental, equitable and efficient spatial planning at the different spheres of the government. This act repeals national laws on the Removal of Restrictions Act, Physical Planning Act, Less Formal Township Planning Act and Development Facilitation Act;
- Draft Policy and Guidelines for Fin Fish Farming, Marine Aquaculture Experiments and Pilot Projects in South Africa. DEAT - MCM, 2007;
- Guidelines for Aquaculture in the Eastern Cape;
- Department of Agriculture, Forestry and Fisheries (2013). Legal Guide to Aquaculture in South Africa (First Edition), 94 pp;
- Department of Environmental Affairs (2013). EIA Guideline for Aquaculture in South Africa, 72 pp;
- OR Tambo District Municipality and KSD Local Municipality By-Laws and plans.

In addition to the above, the following spatial tools from the South African National Biodiversity Institute (SANBI) need to be taken into consideration:

- The South African Vegetation Map (Mucina and Rutherford);
- The Subtropical Thicket Ecosystem Programme (STEP);
- The Eastern Cape Biodiversity Conservation Plan (ECBCP); and
- The National Freshwater Ecosystem Priority Areas (NFEPA) project.

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8. APPROACH AND METHODOLOGY

According to Appendix 2, Section 2 (1), of the EIA Regulations 2014 (as amended), a "*scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include:*

(g) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including:

(ii) details of the public participation process undertaken in terms of regulation 41

(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;

In terms of the South African Environmental Legislative Framework, this project will be subject to the Environmental Authorisation. This process has been implemented by South African National Government to streamline the environmental process due to the number of authorisations required for these types of projects. It is intended to save time, rationalise the management of the number of competent authorities and prevent delays due to the lack of resources and time for the review process. Based on the scope of work, this project requires an Environmental Authorisation (EA) in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998, as amended) and the EIA Regulations 2014 (as amended). The process triggered is a Scoping and Environmental Impact Assessment (S&EIA).

The S&EIA must ensure that all parties involved are aware that the assessment is not solely focused on the biophysical environment, but is inclusive of social and economic considerations. EOH CES's approach to the S&EIA process is to adopt a holistic and integrated view of the environment, with equal emphasis on the ecological and social components. Based on previous experience, incorporating both aspects at an early stage leads to a more comprehensive end product. In order to produce comprehensive and complete documents, the S&EIR (S&EIR) must not only identify and evaluate the significance of environmental impacts, but also suggest ways to mitigate any negative impacts and optimise positive impacts.

8.1 Scoping and EIA Process

The process to be followed is dictated by the EIA Regulations 2014 (as amended) for projects requiring an S&EIA (Figure 8.1). The S&EIA process is initiated through a pre-assessment Public Participation Process (PPP). The pre-assessment process is not a mandatory requirement in terms of the EIA Regulations 2014 (as amended) but is a beneficial option for the client and EAP in order to identify key stakeholders and Interested and Affected Parties (I&APs), as well as to identify any fatal flaws, at the onset of a project.

This phase is followed by the Scoping Phase (inclusive of a notice of intent to the authorities, landowners and other I&APs and Stakeholders). During the Scoping Phase, the Terms of Reference (ToR) for the full EIA is formulated, and requirements from the authorities clarified. The Scoping process serves to bring stakeholders on board by means of consultation with relevant government departments, allowing for the identification of potential issues and concerns.

After completion of the Scoping Phase, a detailed assessment will be undertaken in order to address issues identified during the Scoping Phase. This assessment will not only provide baseline information for the study area, but also to take this study further and identify which project activities will result in significant impacts. The assessment will also suggest ways in which these negative impacts could be mitigated, to reduce their severity.

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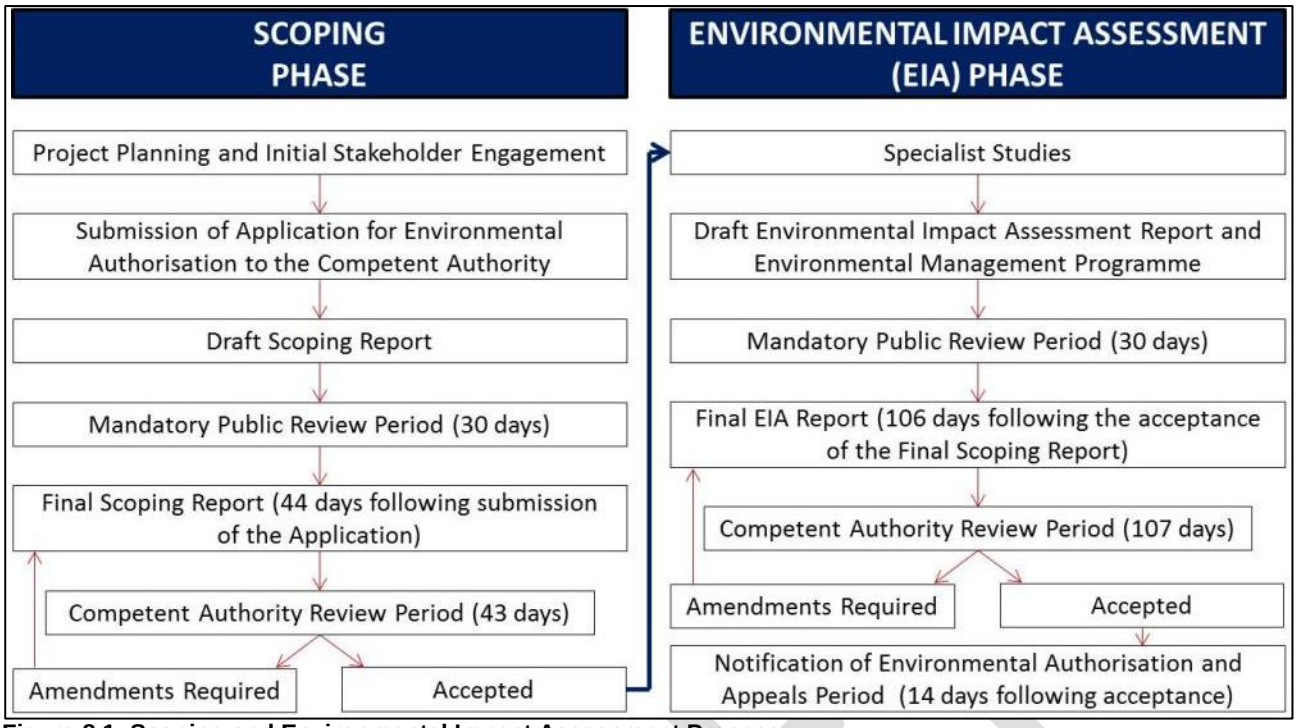

Figure 8.1: Scoping and Environmental Impact Assessment Process.

All draft reports are submitted for public review, which is a mandatory period of 30 calendar days, during which time EOH CES present the key findings to all I&APs at the provincial and local levels. All comments made by I&APs are captured in an Issues and Response Trail (IRT) and, in this report, responses to all issues and concerns raised during the public review period are provided.

All recommendations cited in the EIA report must be detailed in an Environmental Management Programme report (EMPr), which defines the actions to be implemented. The EMPr is recognised as a very important tool for the sound environmental management of projects.

8.1.1 Scoping Phase

The Scoping Phase is outlined in GN R 326, EIA Regulations 2014 (as amended) under Part 3, Regulation 21, as well as in Appendix 2. The process consists of a desktop review, site visit, public participation, submission of the NEMA Application form and the Scoping Report (draft and final versions).

Desktop Review

All aspects of the proposed project are first analysed using a high-level desktop study which looks at the basic description of the project and what the initial environmental and social concerns may be. This includes background information for the project area as well as the proposed activity, details of the activity applied for according to the Amended EIA Regulations of 2014 (as amended) (the listed activities) and the type of assessment which will be required. The desktop review involves the interpretation of maps covering the proposed project area, as well as available reports and planning instruments in order to familiarise the project team with the area and the various physical and biological properties of the area. The desktop review also identifies if the project requires any additional licences in terms of water use, waste, air quality, land use or any other environmental requirements.

Site Visit

CES consultants made an initial visit to the proposed prospecting sites on 18 October 2018 in order to assess the site and initiate the Scoping Phase. Baseline social and ecological data was collected at a screening level.

Public Participation

The general public, key stakeholders, landowners, adjacent landowners and government authorities at National, Provincial and Local level, where notified of the proposed development on the 11th of December 2018. In addition, a public meeting was held on the 18 October 2018 with the affected landowners and community. The means by which I&APs were notified are described in full in Appendix C.

Submission of Application Form

An integrated application for EA and EML will be submitted to the Competent Authority (CA), which has been identified as the National Department of Environmental Affairs (DEA).

Draft Scoping Report

The information gathered through the initial PPP phase, as well as the information from the site visit and from the client with regard to the design of the project was integrated into the DSR. The DSR will be made available to the public for a period of 30 calendar days for comment. Registered I&APs will be informed of the release of the DSR by email and via communication with the local Traditional Chief and ward councillors within the study area. The release of the report will also be advertised in one provincial and/or one local newspaper. A hard copy of the report will made available in a publicly accessible place, and it will also be available on CES website.

Final Scoping Report

Any comments, issues and concerns raised by I&APs and the authorities during the review period of the Scoping Phase will be included in the Final Scoping Report (FSR) in the form of an Issues and Response Trail (IRT). The FSR will be submitted to the National DEA, who will decide whether the Scoping Phase can progress to the EIA Phase of the assessment. DEA will also approve, with or without amendments, the Terms of Reference (ToR) for the Plan of Study (PoS) for the EIA phase of the assessment, which is presented in Chapter 7 of this report. The Final Scoping Report must be submitted to DEA within 44 days of receipt of the application by the competent authority.

8.1.2 Environmental Impact Assessment Phase

The EIA Phase is outlined in GN R 326, EIA Regulations 2014 (as amended) under Part 3, Regulation 23, as well as Appendix 3. This task involves the integrated writing of the EIR. A detailed assessment will be undertaken in order to address issues identified during the Scoping Phase and specialist input will be undertaken during preparation of the Draft EIR. The report will consist of an introductory section, followed by a detailed project description, sections in which the results of all detailed studies are summarised, and an environmental impact section, where impacts are assessed and rated according to a predefined rating scale. Measures to mitigate negative impacts will also be included.

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Draft Environmental Impact Assessment Report

The primary objective is to prepare a report that is scientifically credible but also understandable, with enough detail to deal with all the issues but not too much detail to confuse I&APs. The EIAR will include a detailed EMPr, which will be submitted as a separate report, for the proposed project. The EMPr will contain suggested measures to manage and mitigate impacts identified during the EIA Process, for both the construction and operational phase of the development. These measures will be informed by the findings of the EIAR, and particularly by the specialist assessments undertaken as part of this process.

Environmental Management Programme

The measures presented in the EMPr will be aimed at enhancing the potential benefits and minimizing the potential negative impacts of the project. The EMPr will specify responsibilities for the implementation and monitoring of the project as well as the periodicity of the audits to be carried out.

Public Participation

The Draft EIR and EMPr will be made available for public review for a period of thirty (30) calendar days (mandatory). The availability of the Draft EIR and EMPr to the public will be advertised in one provincial and/or one local newspaper. A hard copy of the report will be made available as done in the Scoping Phase.

A further public meeting (as required) will be held during the Draft EIR 30 day public review period, to inform stakeholders and I&APs of the detailed findings of the EIA Phase, and to enable them to raise any issues or concerns.

Final Environmental Impact Assessment Report

When the Draft EIR and EMPr have been updated to reflect public comments the deliverables from the entire EIA Process, the Final EIR will be prepared. This will include the additional comments, issues and concerns raised by I&APs and the authorities, provided in an updated Issues and Response Trail (IRT). The Final EIAR, together with any Specialist Reports and Final EMPr will then be submitted to DEA for decision making. The Final EIR must be submitted to DEA within 106 days of acceptance of the Scoping Report by the competent authority.

According to the EIA Regulations 2014 (as amended 2017) Regulation 24, DEA must, within 107 days of receipt of the Final EIR and EMPr, either grant or refuse the application by means of a positive or negative EA.

8.1.3 Environmental Authorisation and Appeals

Should the EA be granted, it usually carries Conditions of Approval. The project proponent is legally obliged to adhere to all conditions stipulated therein. In accordance with GN R 326, a copy of the EA must be sent to all registered I&APs within fourteen (14) days of the date of issuing the authorisation. The public can then appeal the decision, should they wish to do so. A notice of intent to appeal must be submitted to the relevant competent authority within twenty (20) days upon notice of a decision on the application.

8.1.4 Public Participation Process

Public consultation is a legal requirement throughout the EIA process. Developers are required to conduct public consultation throughout the Scoping and EIA phase. Formal EIA documents are required to be made

available for public review and comment by the proponent, these include the Project Brief, Scoping Report and Terms of Reference and Plan of Study (PoS) the EIA, the Draft and Final EIAR, and the decision of the DEA.

The method of public consultation to be used depends largely on the location of the development and the level of education of those being impacted on by the project. Required means of public consultation include:

- Site notice(s)
- Newspaper advertisements
- Letter of Notification and information to affected landowner(s), stakeholders and registered I&APs
- Background Information Document (BID) distribution
- Public Meeting (attendance register and meeting minutes)
- Authority and Stakeholder engagement (DWS and DEA).

Site Notice

According to Regulation 41(2) of the NEMA EIA Regulations 2014 (as amended) "*the person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by*:

> *(a) fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of:*
> *(i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and*
> *(ii) any alternative site.*

During the initial site visit, 2 site notices were placed adjacent to the proposed property boundary as well as at the entrance to the Mthatha Dam. Refer to Appendix C for proof of placement.

Newspaper advertisement

> *(b) placing an advertisement in:*
> *(i) one local newspaper; or*
> *(ii) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;*
> *(c) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii);*

A newspaper advertisement will be placed in the Daily Dispatch (provincial newspaper) on the 14th of December 2018, in order to notify the general public of the proposed development and availability of the DSR for public review. Proof of placement will be provided in the Final Scoping Report.

I&AP and Stakeholder Notifications

(d) giving written notice, in any of the manners provided for in section 47 D of the Act, to:
- *(i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner and to any alternative site where the activity is to be undertaken;*
- *(ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
- *(iii) the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;*
- *(iv) the municipality which has jurisdiction in the area;*
- *(v) any organ of state having jurisdiction in respect of any aspect of the activity; and*
- *(vi) any other party as required by the competent authority;*

Contact details of all stakeholders identified (I&AP list) are available in Appendix C. Letters of notification and Background Information Documents (BIDs) were distributed on site during the initial site visit and public meeting (simultaneously held on the 18 October 2018). Notifications were also sent out via email on the 11th of December 2018.

The local Traditional Chief (Chief Makawula) and ward councillors were contacted telephonically in order to obtain and confirm contact details and preferred methods of communication. No registered mail has been sent out to date, as all communication has been made telephonically and via the Traditional Chief and local ward councillors. Should the need arise in the future this will be conducted. All I&APs will be notified of the availability of The DSR by means of email, telephone and via an advertisement placed in the Daily Dispatch newspaper. Refer to Appendix C for all notification proofs.

A public meeting was previously held on the 18th October 2018 at the local Traditional Chief's residence (Chief Makawula) located within the Luxweni village adjacent to the proposed development.

Stakeholder Identification and Registered I&APs

A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of:
- *(a) all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;*
- *(b) all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and*
- *(c) all organs of state which have jurisdiction in respect of the activity to which the application relates.*

As such, a comprehensive I&AP database, including all identified and registered I&APs, has been included in Appendix C-6 of this report.

Issues Raised by I&APs

Comments and issues raised during the Public Meeting held on the 18 October 2018 are included in the meeting minutes which can be found in Appendix C-7.

9. DESCRIPTION OF THE ENVIRONMENT

According to Appendix 2, Section 2 (1), of the Amended EIA Regulations 2014 (as amended), a "*scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include:*

(g) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including—

(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

The following chapter outlines the biophysical features of the study area of the proposed Aquaponics development. In addition, the socio-economic baseline of the region is provided. The section draws on existing available information within the immediate area as well as municipal and local planning tools and any additional published and unpublished material. The biophysical baseline section will look at aspects relating to climate, topography, geology, soils, flora, and surface and groundwater resources, while the social baseline section will address the administrative and institutional structures, demographic profile and economy.

9.1 Current land use

The proposed Aquaponics development is largely comprised of cultivated land (classified as temporary: semi-commercial/subsistence dryland) which is surrounded by degraded unimproved grasslands (Figure 9.1 below). The proposed development is located adjacent to the Mthatha Dam and is surrounded by small tributaries of the dam.

The Ncise Township, which is characterised as a low density urban area, surrounds the proposed study area (see Figures 9.4 and 9.5 below). The local communities of Luxweni and Sitholeni (located to the north-west), Matshongwane (to the west), and Matshongwe (to the south-west) form part of the Ncise Township.

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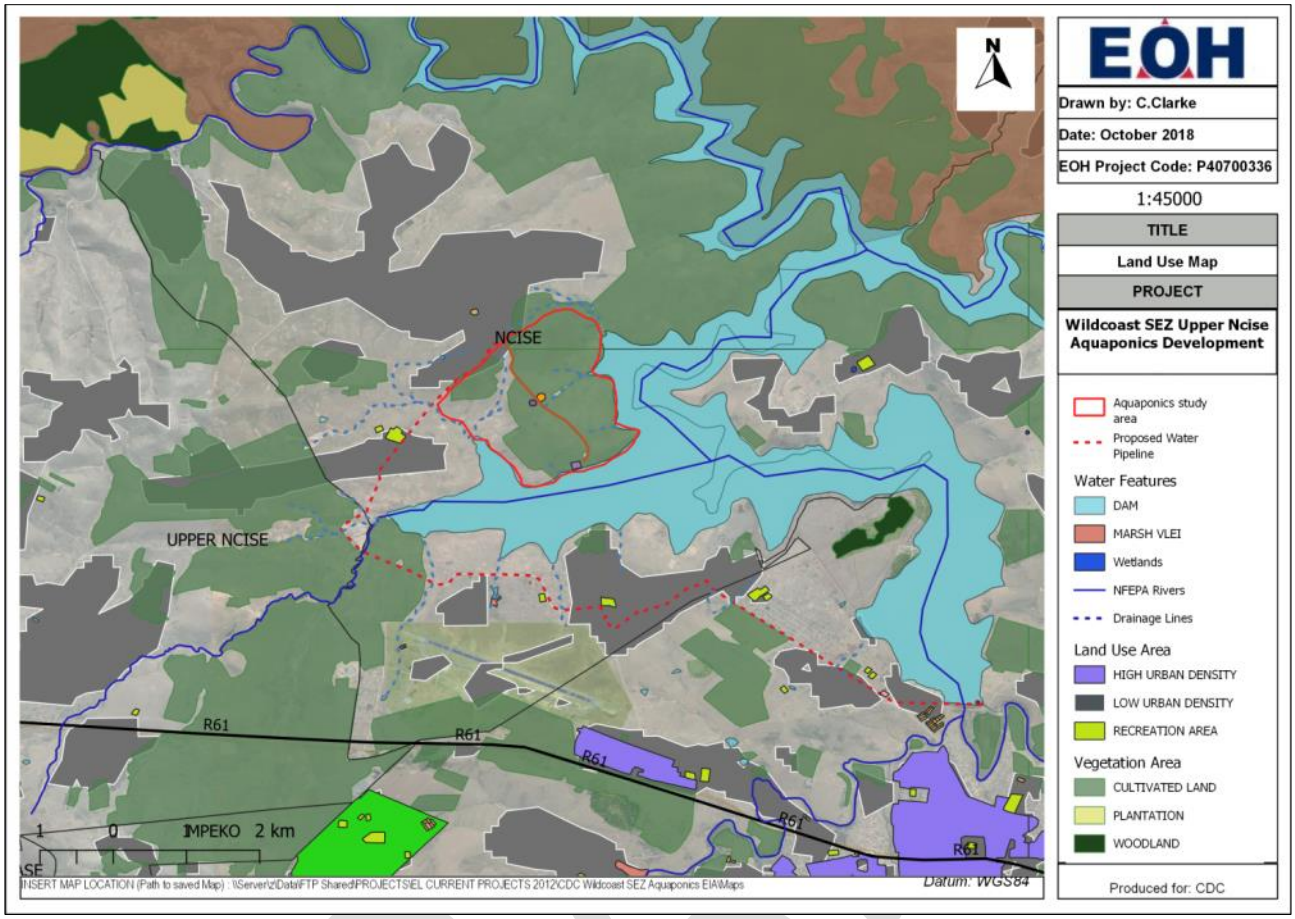

Figure 9.1: Land Use Map of the proposed Aquaponics development.

Correspondence with local residents on site during the site assessment confirmed that a portion of the proposed application area is currently used for cultivation of maize and soybeans (through support from Rural Advancement Foundation International (RAFI)) and as communal grazing land (see Figures 9.2 and 9.3 below).

Figure 9.2: Cultivated land located within the proposed site boundary

Figure 9.3: Livestock grazing within the proposed site boundary

Figure 9.4: Low urban density settlements surrounding the proposed site boundary

Figure 9.5: Low urban density settlements surrounding the proposed site boundary

9.2 Climate

Mthatha normally receives about 556 mm of rain per year, with most rainfall occurring mainly during summer. The chart below (below left) shows the average rainfall values for Umtata per month. It receives the lowest rainfall (6 mm) in June and the highest (87 mm) in March. The monthly distribution of average daily maximum temperatures (centre chart below) shows that the average midday temperatures for Umtata range from 19.4°C in July to 25.8°C in February. The region is the coldest during July when the temperature drops to 5.8°C on average during the night.

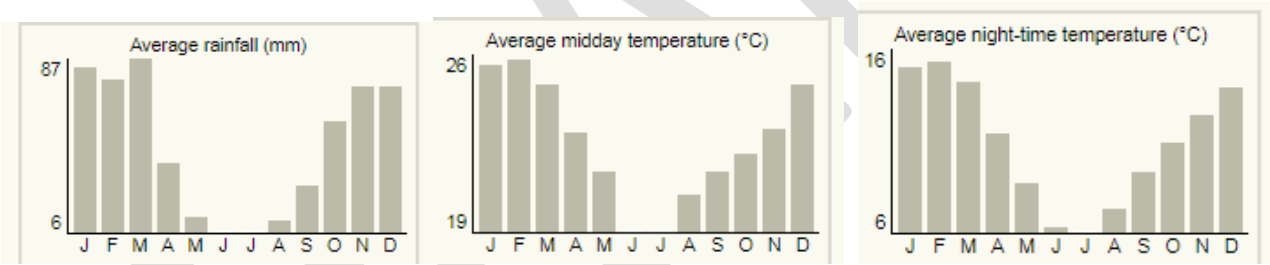

Figure 9.6: Climatic data for Mthatha

9.3 Topography

The topography of the proposed study area ranges from 770 m (northern boundary) to 695 m above sea level (southern boundary adjacent to the Mthatha Dam) (Figure 9.9 below). The cross-sectional views of the gradient of the study site are illustrated in Figures 9.7 and 9.8 below.

The gradient of the study site directs runoff in a south easterly and westerly direction. The centre topography of the study site creates a shallow depression, creating a favourable environment for wetland formations (refer to section 9.5 below).

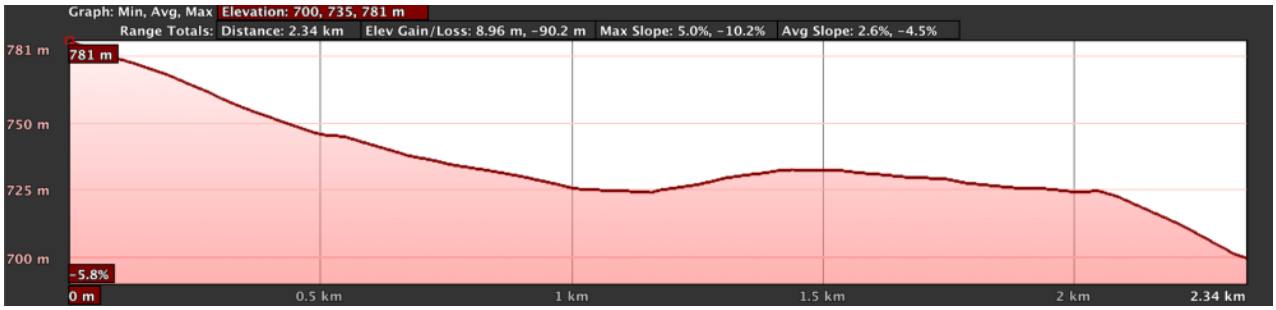

Figure 9.7: North-South gradient profile of the study area

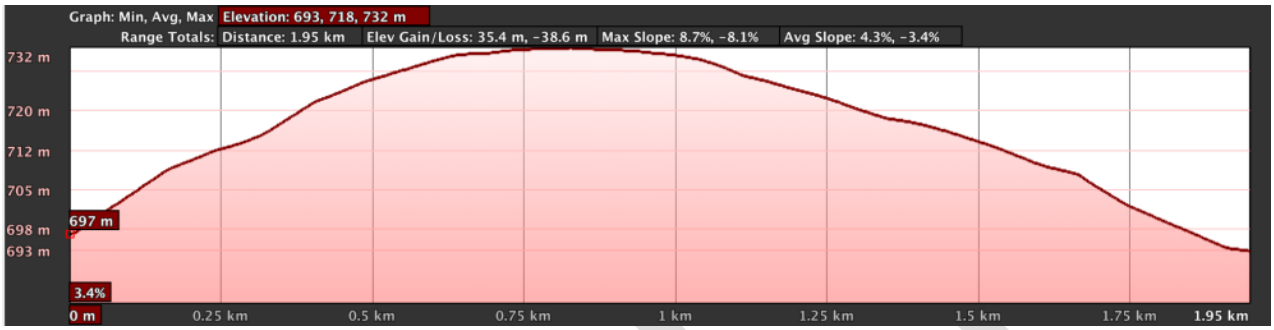

Figure 9.8: West-East gradient profile of the study area

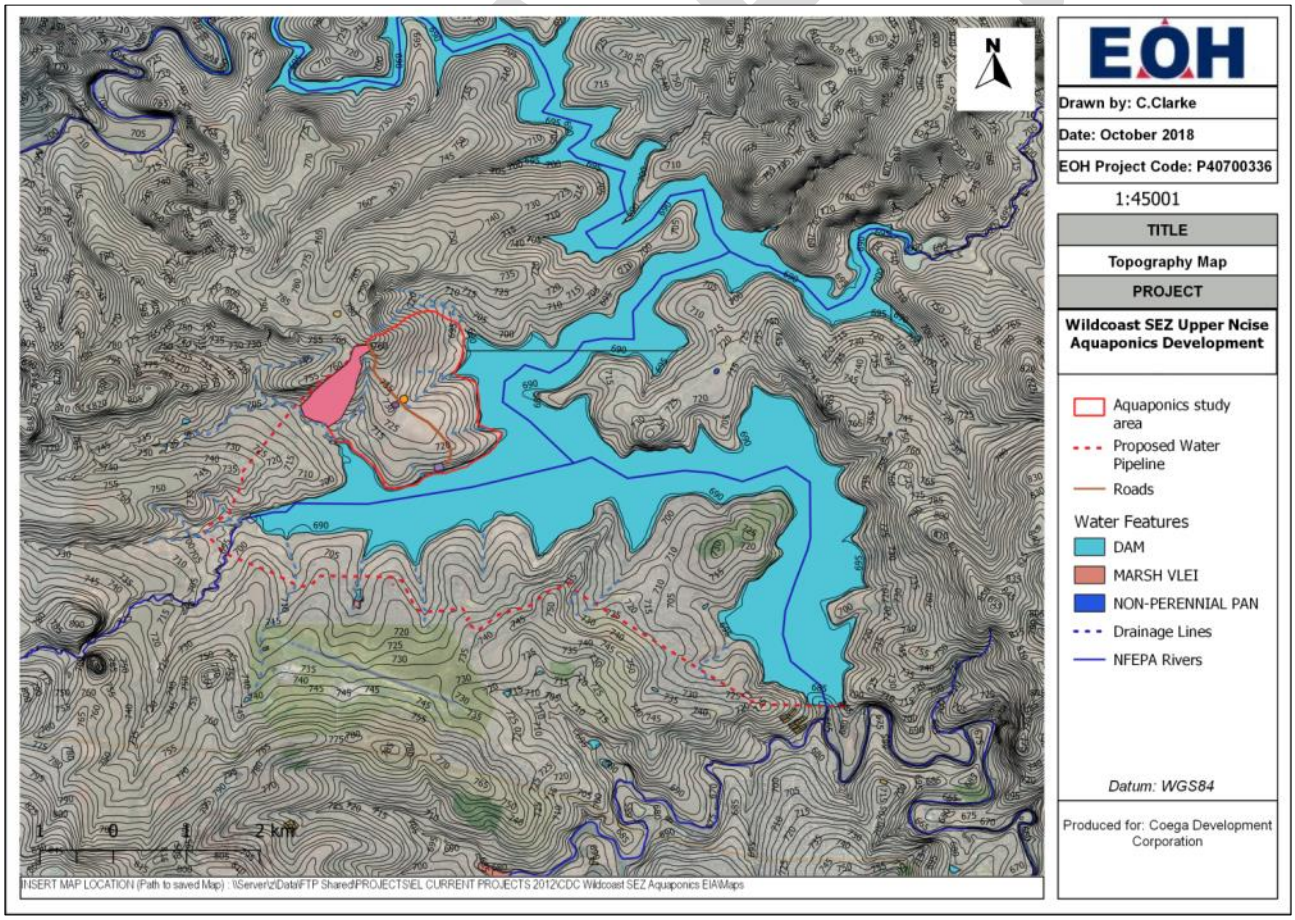

Figure 9.9: Topographical map of the study area

9.4 Geology and Soils

The study site and surrounds are largely underlain by Mudstones of the Tarkastad Subgroup (Beaufort Group, Karoo Supergroup) (Figure 9.10). The SOTER soil types (shown in Figure 9.11 below) present in the study area are characterised by:

- **E1** - Soils with minimal development, usually shallow on hard or weathering rock, with or without intermittent diverse soils. (association of Leptosols, Regosols, Calcisols and Durisols. In addition one or more of Cambisols, Luviso.
- **C1** - Soils with a marked clay accumulation (association of Luvisols, Planosols and Solonetz. In addition one or more of Plinthosols, Vertisols and Cambisols may be present)

Gully erosion, caused by concentrated surface flow and soil piping, was evident on site.

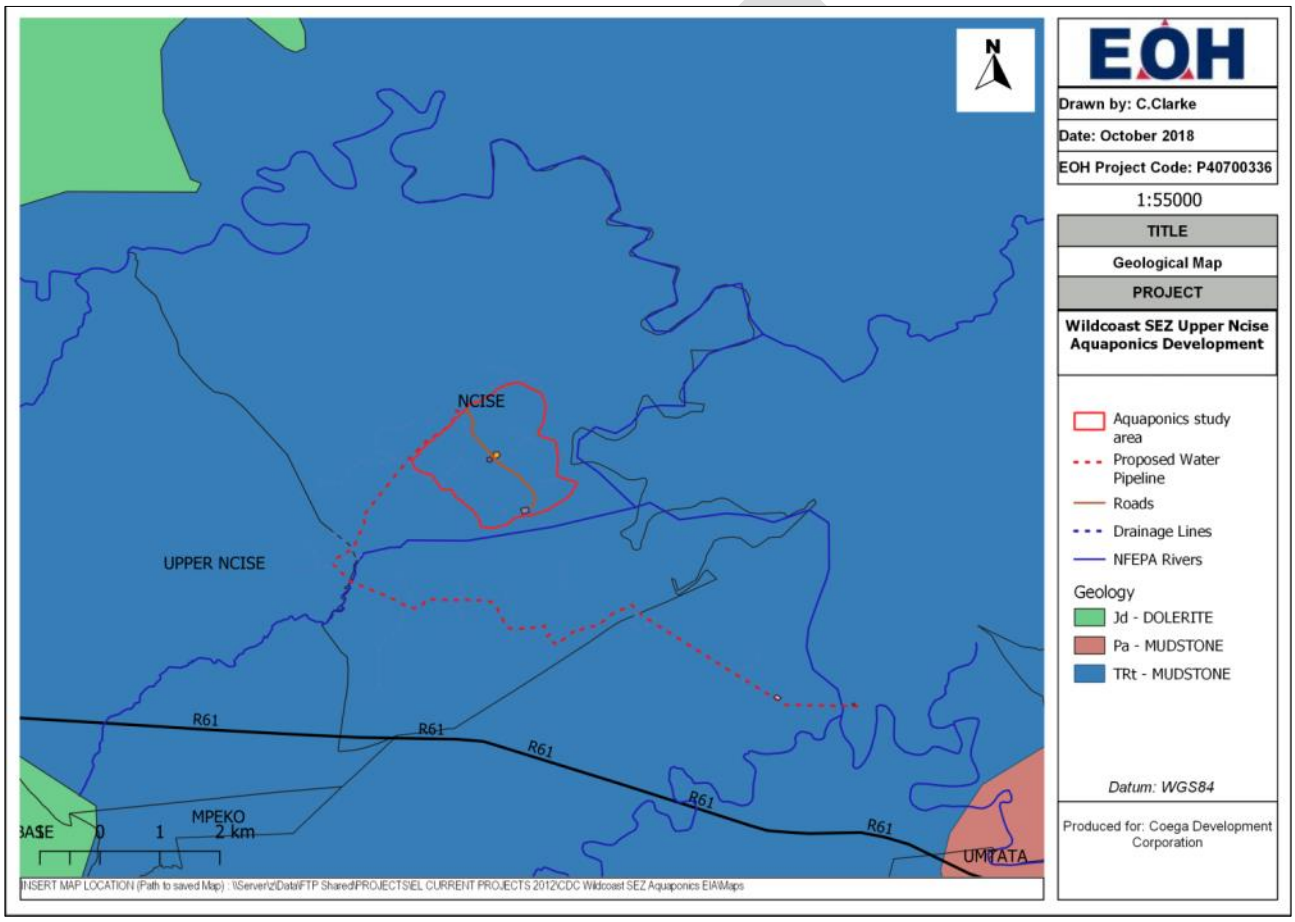

Figure 9.10: Geological map of the study area

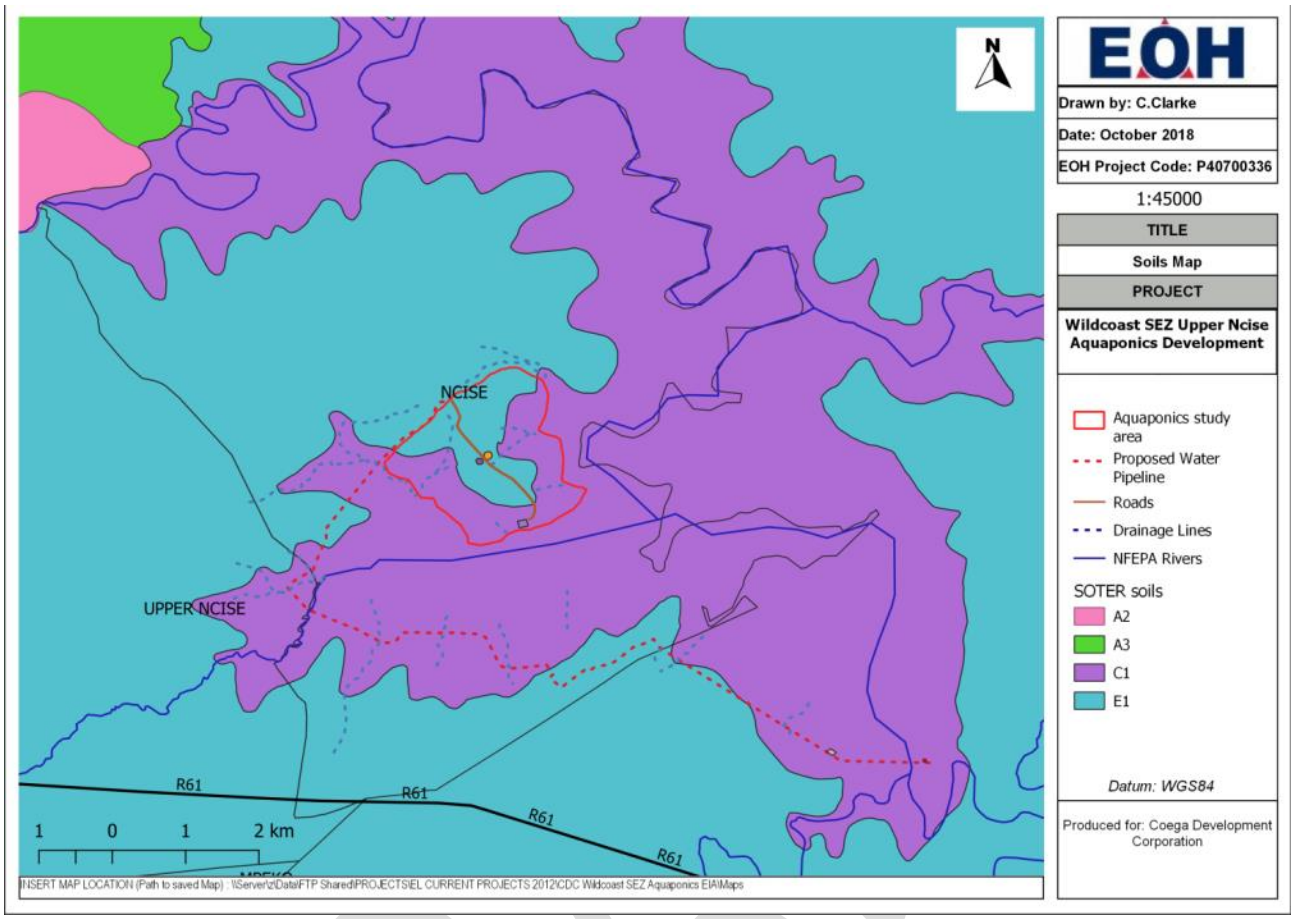

Figure 9.11. SOTER Soils of the study area

9.5 Hydrology

The following sections provide a summary of the status quo of the Mthatha River System (as per the DWS State-of-Rivers report no. 14 (Mthatha River System 2008)), as well as a description of the surface water features present on site.

9.5.1 Mthatha River Catchment Area

The Mthatha River catchment is roughly 100 km long and 50 km wide and covers an area of just over 5 520 km^2. The uppermost regions of the catchment remain largely natural with pockets of indigenous natural forest located on steeper slopes. Commercial forestry has had a large adverse effect on the upper catchment as well as alien tree and plant species encroachment, river bank destabilisation and natural vegetation clearance. Upstream of Mthatha and the Cicira tributary (which forms at the south eastern boundary of the Mthatha Dam), grazing, water abstraction, vegetation clearing and sand mining have altered the river channel. The Mthatha Dam has also changed the natural river flow.

The water quality upstream of the Mthatha Dam is relatively good but it becomes turbid within and downstream of the Dam. The ecological functioning of the Cicira River is severely impaired. The river is highly polluted and inundated with litter and solid waste such as scrap metal, tyres and human waste. Algal growth on the rocks is extensive. Water quality downstream of Mthatha town is poor due to the discharge of untreated or inadequately treated sewage.

According to the DWS State-of-Rivers report no. 14 (Mthatha River System 2008), studies conducted for the River Health Programme (RHP) summarise the EcoStatus of the Mthatha River as follows:

- **Upper River**: Fair to Poor
- **Mthatha Town area and downstream**: Poor to Seriously Modified
- **Lower River:** Fair

9.5.2 Mthatha Dam

The Mthatha Dam has a catchment area of 886 km^2 and a volume of up to 254 million m^3 of water, while yielding about 14.5 million m^3 of water a year. Mthatha Dam supplies the town of Mthatha and the surrounding areas with domestic water and acts as balancing water storage, supplying the small dams at First and Second Falls downstream of Mthatha.

According to the State-of-Rivers report no. 14 (2008), deteriorating water quality in the middle and lower reaches of the Mthatha River poses potential health and economic risks to the communities living there. Population growth has exceeded the development of infrastructure and therefore the supply of potable water to all households is a problem. The majority of rural households do not have access to clean potable water and many use untreated river water. Most households also do not have adequate sanitation facilities. Poor sanitation, overloaded systems and malfunctioning sewage treatment works result in untreated human waste discharging into the river.

9.5.3 Rivers, Watercourses and Drainage Lines

The proposed Aquaponics development falls within the T20B catchment of the Mthatha River Basin, and is located on the northern boundary of the Mthatha Dam. The Mthatha River and its tributaries (one of which being the Cicira tributary) is classified as a NFEPA river (see Figure 9.12). Additionally there are numerous non-perennial tributaries/drainage channels (dotted blue lines in Figure 9.12) and non-perennial pans (wetlands) within the study site.

Within the proposed study site, several drainage channels flow towards the Mthatha Dam. Several wetlands are located within the site, of which pan depression wetlands are centrally located (see Figures 9.14 and 9.15 below)

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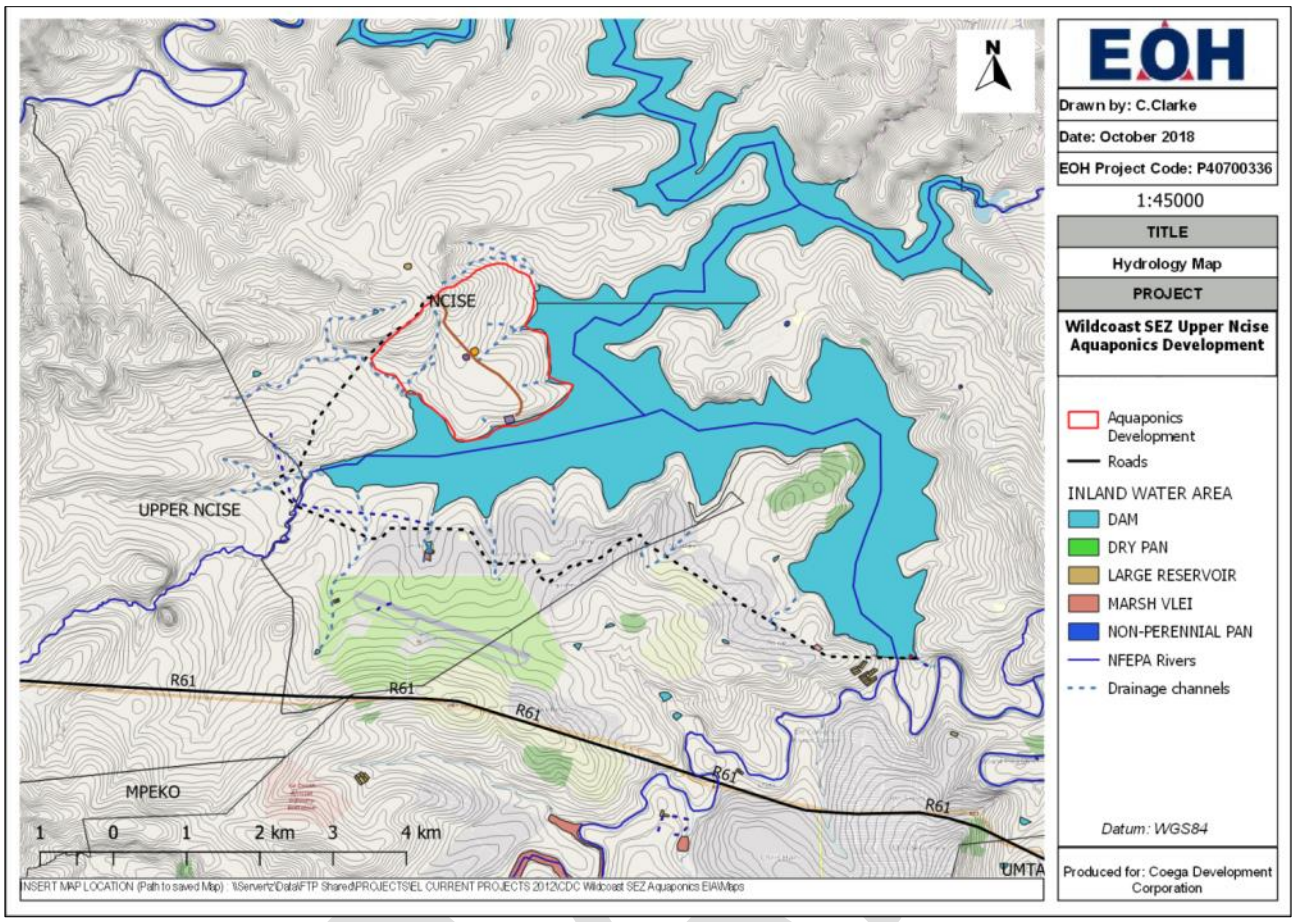

Figure 9.12: Hydrology of the proposed study area.

Figure 9.13: Location and direction of photos taken as described below

Figure 9.14: A - View of the pan depression wetland at the centre of the study site

Figure 9.15: A - Pan depression wetland at the centre of the study site.

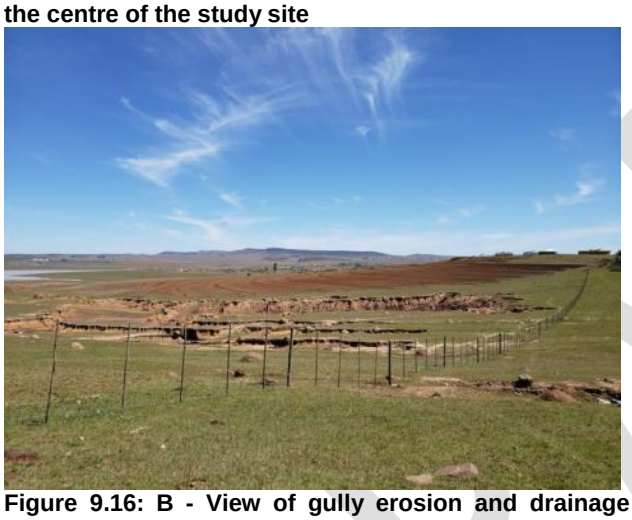

Figure 9.16: B - View of gully erosion and drainage channel at the western boundary of the study site

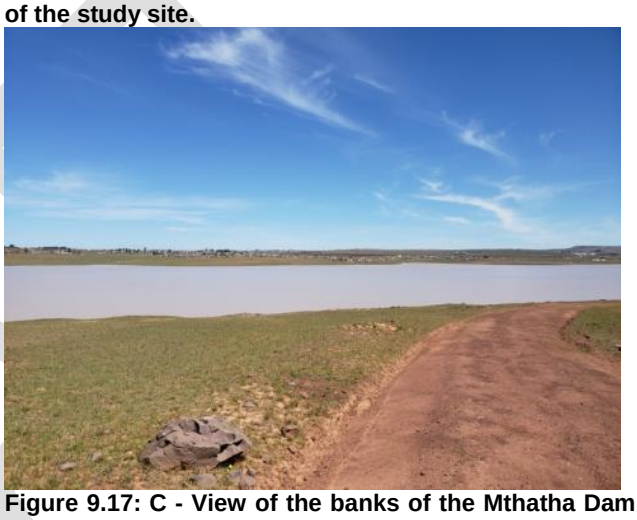

Figure 9.17: C - View of the banks of the Mthatha Dam at the southern boundary of the study site.

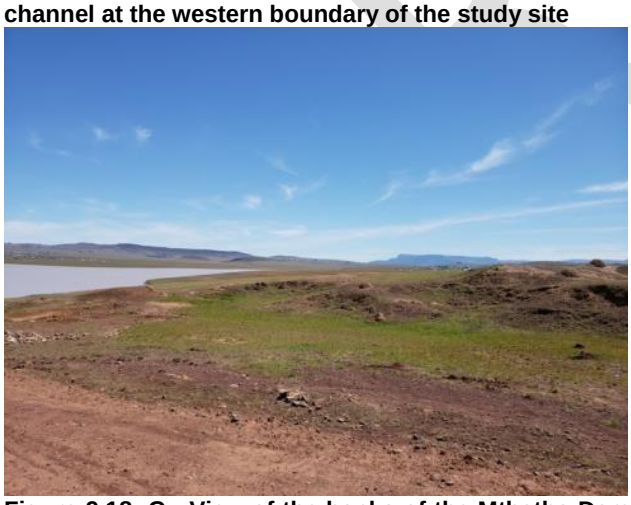

Figure 9.18: C - View of the banks of the Mthatha Dam at the southern boundary of the study site.

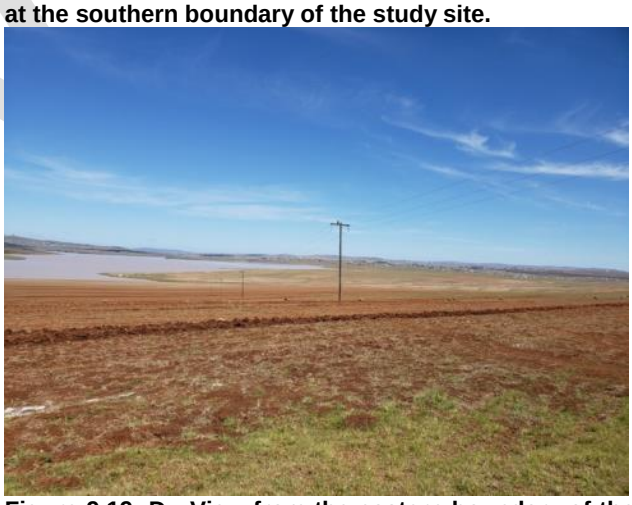

Figure 9.19: D - View from the eastern boundary of the stidy site (looking south west)

9.6 Vegetation and Floristics

The following National & Provincial Plans are used to describe vegetation floristics that may potentially occur within the proposed study site:

- SANBI classification (Mucina and Rutherford, 2012)
- DAFF Forestry classification

9.6.1 SANBI Vegetation Map (Mucina and Rutherford, 2012)

Mucina and Rutherford (2012) have developed the National Vegetation map as part of a South African National Biodiversity Institute (SANBI) funded project: "*to provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available before.*" The map was developed using a wealth of data from several contributors and has resulted in the best national vegetation map to date. This map forms the base of finer scale bioregional plans such as Sub-tropical Thicket Ecosystem Plan (STEP).

The map and accompanying book describe each vegetation type in detail, along with the most important species including endemic species and those that are biogeographically important and is the most comprehensive data for vegetation types in South Africa.

Mucina and Rutherford (2012) define the vegetation types that occur within the proposed sites as **Mthatha Moist Grassland and Eastern Valley Bushveld.**

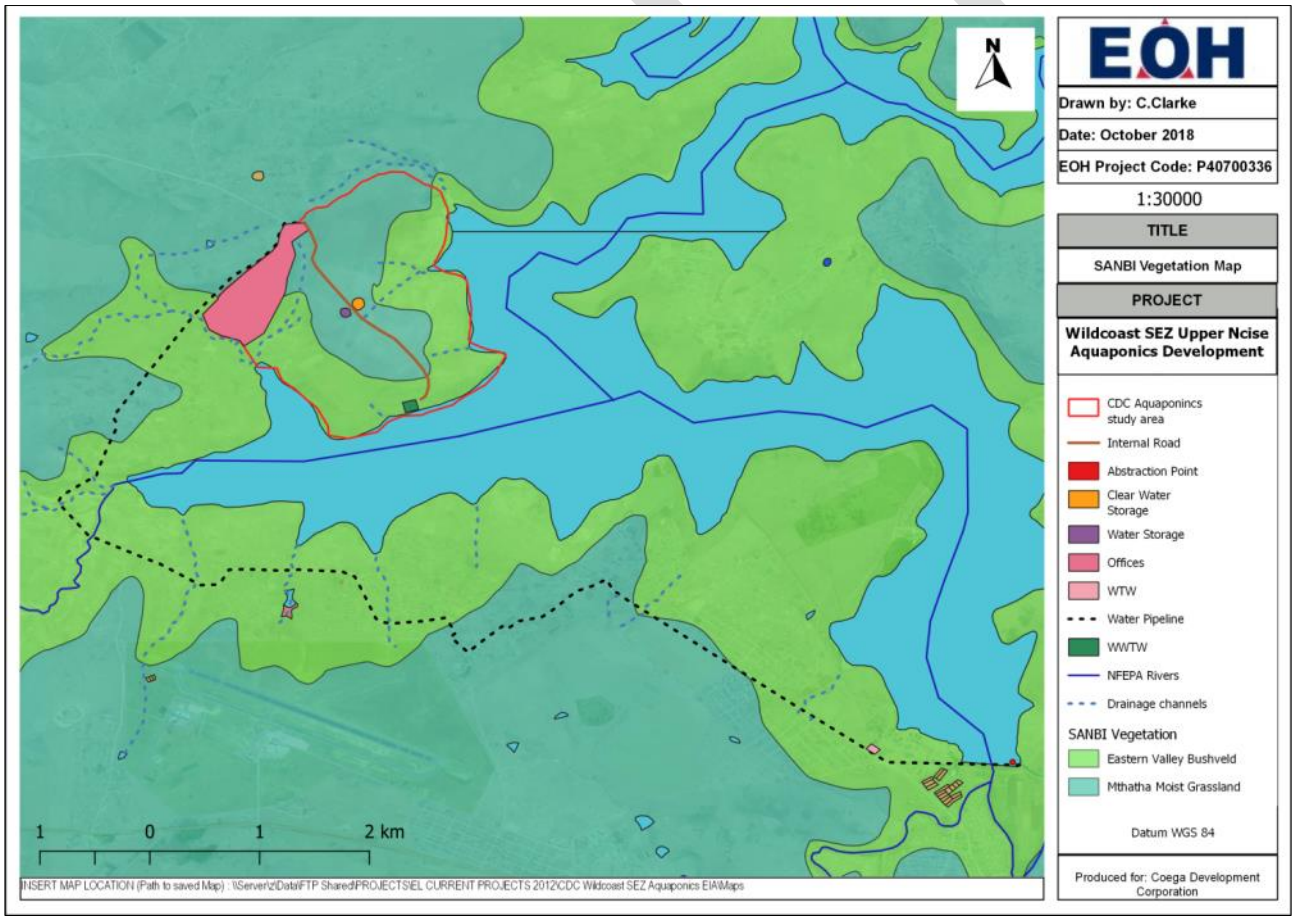

Figure 9.20: SANBI Vegetation map of the study area

Mthatha Moist Grassland

The Mthatha Moist Grassland is distributed in the Eastern Cape Province along the plains between Mthatha and Butterworth parallel to the coastline and excluding the river valleys that intrude landwards into this unit.

The undulating plains and hills support species poor, sour, wiry grassland with *Eragrostis plana* and *Sporobolus africanus*, dominated by *Themeda triandra.* In terms of the conservation status, Mucina and Rutherford (2012) classify Mthatha Moist Grassland as an **ENDANGERED** vegetation type. The NSBA Conservation Target for this vegetation type is 23%. Only a small percentage of this vegetation type is statutorily conserved in the Luchaba and Nduli Wildlife Reserves. More than 40% of Mthatha Moist Grassland has been transformed for cultivation, plantations or dense rural settlements.

The high level of utilisation of this unit, including cultivation, the effects of development as well as poor grazing management (establishment of unpalatable grasses and invasive species), has led to the degradation and transformation of this vegetation type.

Eastern Valley Bushveld

This Eastern Valley bushveld is distributed through Kwa-Zulu Natal and the Eastern Cape Province along deeply incised river valleys including the lower reaches of the Mthatha River and its tributaries.

The semi-deciduous savanna woodlands are comprised of a mosaic of thickets often succulent and dominated by species of *Euphorbia* and *Aloe*. The NSBA Conservation Target for this vegetation type is 25%. Only 0.8% is statutorily conserved, largely in the Luchaba Wildlife Reserve. Mucina and Rutherford (2012) classify Mthatha Moist Grassland as a **LEAST THREATENED** vegetation type.

Cultivation has transformed 15% of this vegetation type and alien plant invasions are as serious threat with *Chromolaena odorata, Lantana* camara and *Caesalaena decapetala* being most problematic.

9.6.2 Forest Classification

No natural forest will be impacted by the proposed development. The Khambi Forest plantation is located more than 5 km away in a north westerly direction (see Figure 9.21 below).

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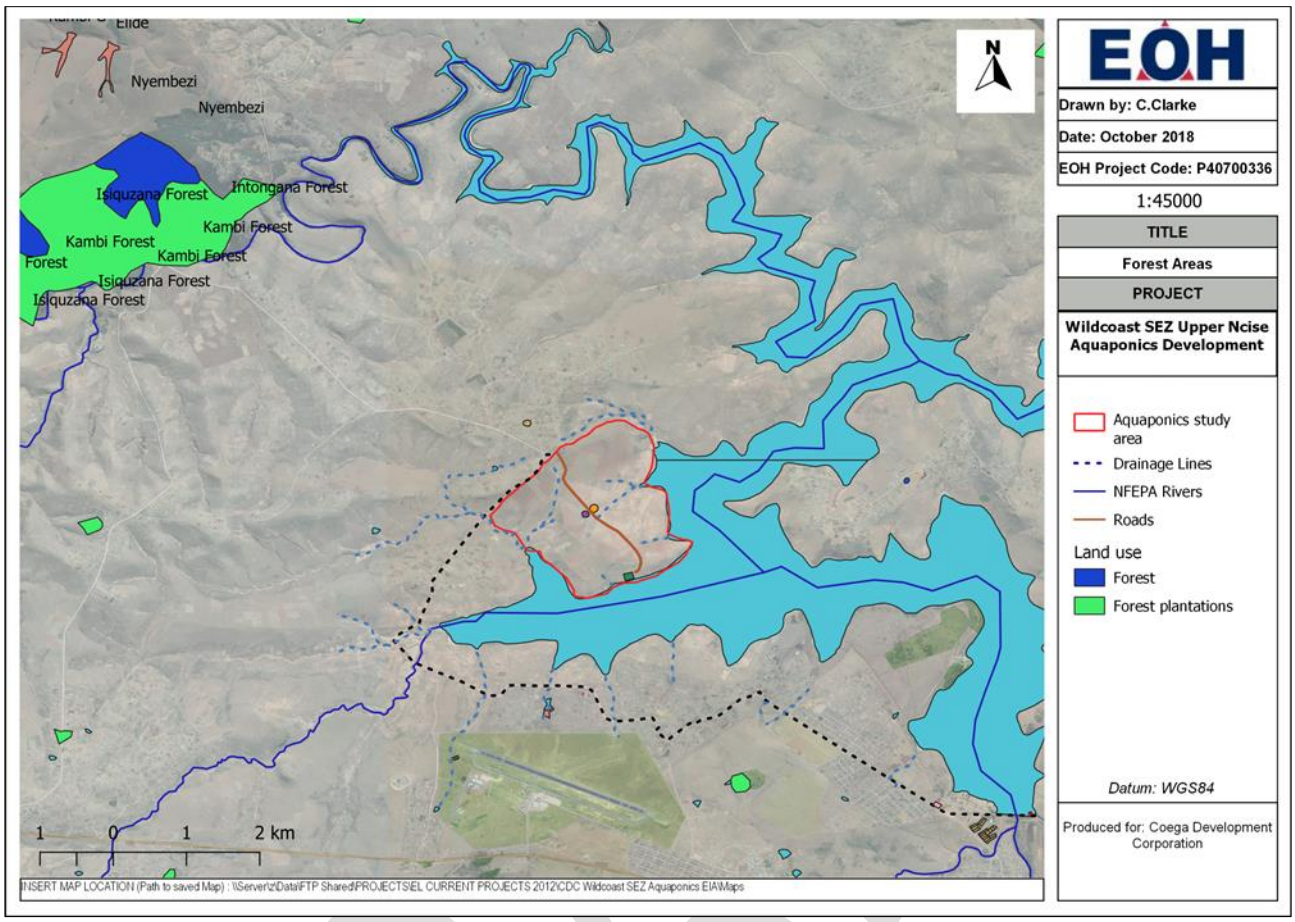

Figure 9.21: Forested areas within the study area.

9.7 Threatened Ecosystems

The NEMBA National List of Ecosystems that are Threatened and in Need of Protection was released in 2011 and contains the first national list of threatened terrestrial ecosystems. The following categories were listed:

- **critically endangered (CR) ecosystems**, being ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation;
- **endangered (EN) ecosystems**, being ecosystems that have undergone degradation of ecological structure, function .or composition as a result of human intervention, although they are not critically endangered ecosystems;
- **vulnerable (VU) ecosystems**, being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems;
- **protected ecosystems**, being ecosystems that are of high conservation value or of high national or provincial importance, although they are not listed as critically endangered, endangered or vulnerable

Sections of the proposed Aquaponics site fall within a listed vulnerable ecosystem, namely Mthatha Moist Grassland. Figure 9.22 indicates the extent of the affected area. However, a site visit confirmed that a large portion of the area falling within the Threatened Ecosystem has been transformed for agricultural purposes.

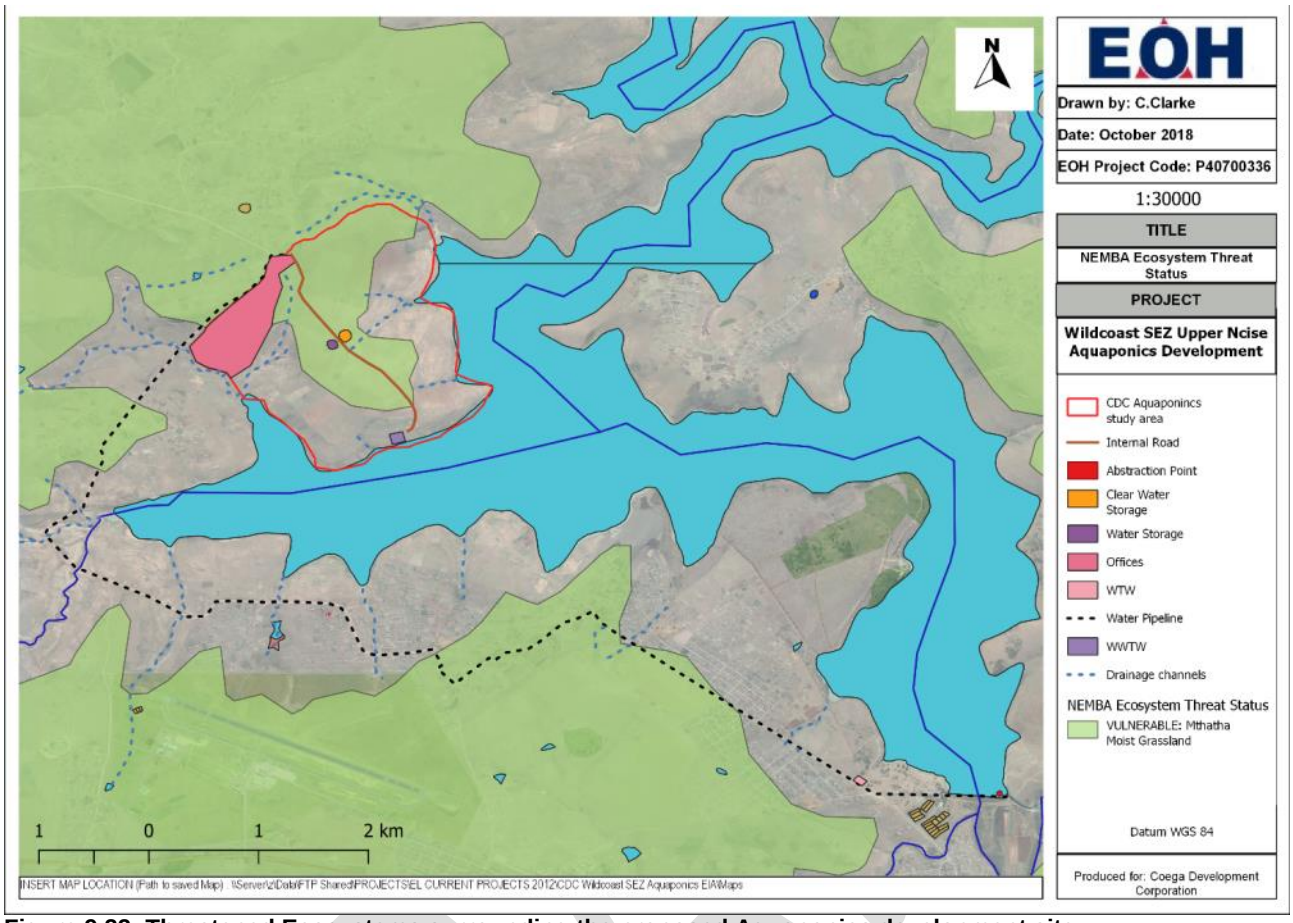

Figure 9.22: Threatened Ecosystems surrounding the proposed Aquaponics development site.

9.8 Biodiversity Conservation

South Africa's policy and legislative framework for biodiversity is well developed, providing a strong basis for the conservation and sustainable use of biodiversity. South Africa is one of the few countries in the world to have a Biodiversity Act and a National Biodiversity Institute.

Key components of the national policy and legislative framework for biodiversity include:

- The White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity (1997)
- The National Environmental Management: Biodiversity Act (Act 10 of 2004)
- The National Environmental Management: Protected Areas Act (Act 57 of 2003)
- The National Protected Area Expansion Strategy (NPAES) (2008)

9.8.1 Eastern Cape Biodiversity Conservation Plan

The Eastern Cape Biodiversity Conservation Plan (ECBCP) is a first attempt at detailed, low-level conservation mapping for land-use planning purposes. Specifically, the aims of the Plan were to map critical biodiversity areas through a systematic conservation planning process. The current biodiversity plan includes the mapping of priority aquatic features, land-use pressures, and critical biodiversity areas which develops guidelines for land and resource-use planning and decision-making.

The main outputs of the ECBCP are the identification of “critical biodiversity areas” or CBAs, which are allocated the following management categories:

- CBA 1 = Maintain in a natural state
- CBA 2 = Maintain in a near-natural state

Land use outputs not classified as CBAs are called Biodiversity Land Management Classes (BLMCs) and are allocated the following management categories.

- BLMC 3 (CBA3) = Functional Landscapes
- BLMC 4 (CBA 4) = Towns & Settlements, Woodlots & Plantations, Cultivated Land

Figure 9.23 and Figure 9.24 illustrates that the proposed Aquaponics facility falls largely within a CBA 2 Terrestrial area and a CBA 1 Aquatic area. A small portion of the study area is classified as CBA 1 Terrestrial area. CBA 1 regions must ensure that those extents are maintained in their natural state, whilst the CBA 2 regions must be maintained in a near natural state.

If one compares the current land uses on site to the CBA Terrestrial Map (Figure 9.23 below), the portion of the proposed development area which is classified as a CBA 1 Terrestrial area is largely used for maize and soybean cultivation. In addition, the remaining area classified as a CBA 1 Terrestrial area is also classified as low-urban density residential. The initial site visit confirmed the transformed nature of this area on site.

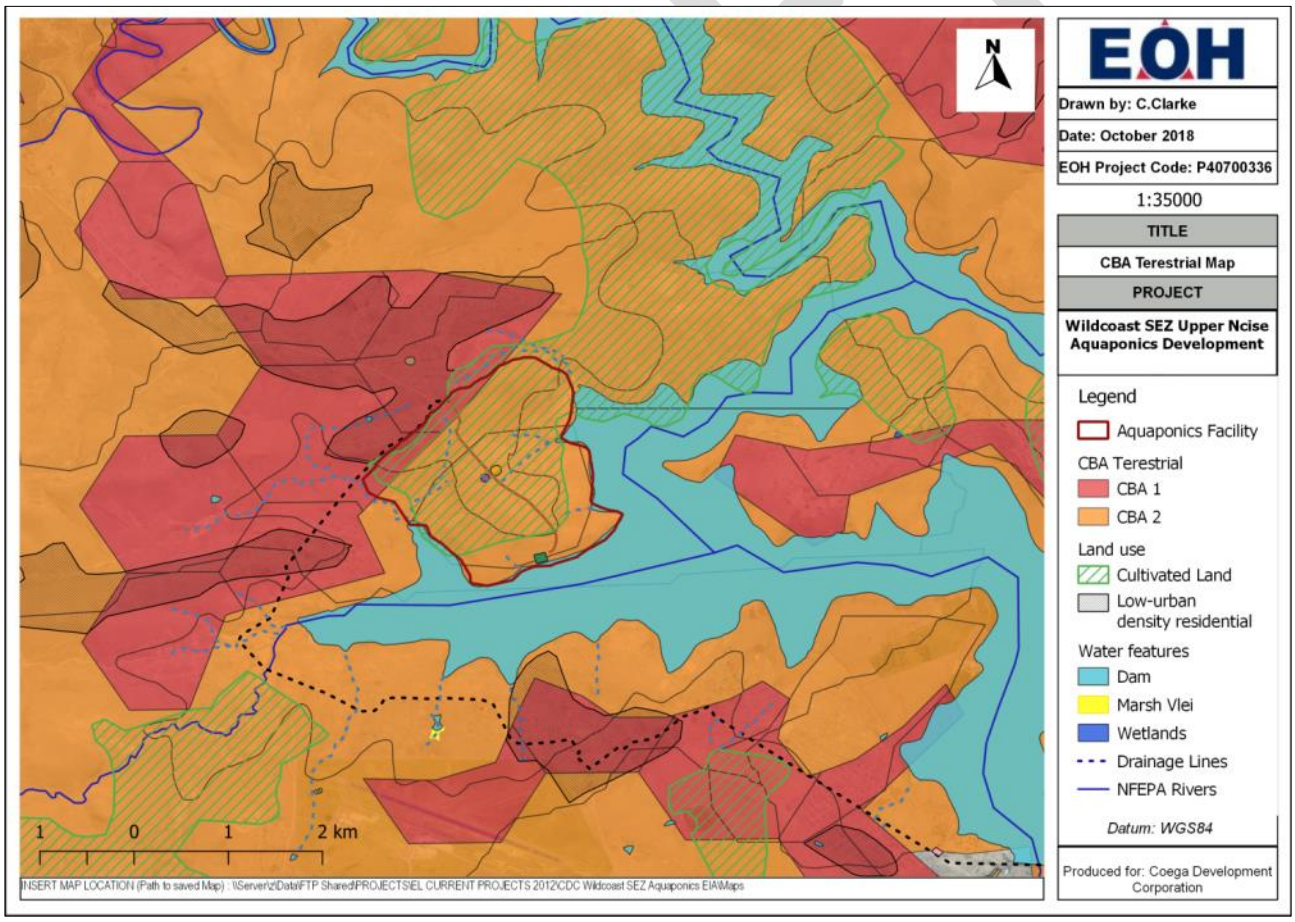

Figure 9.23. ECBCP map of the study area showing terrestrial CBAs.

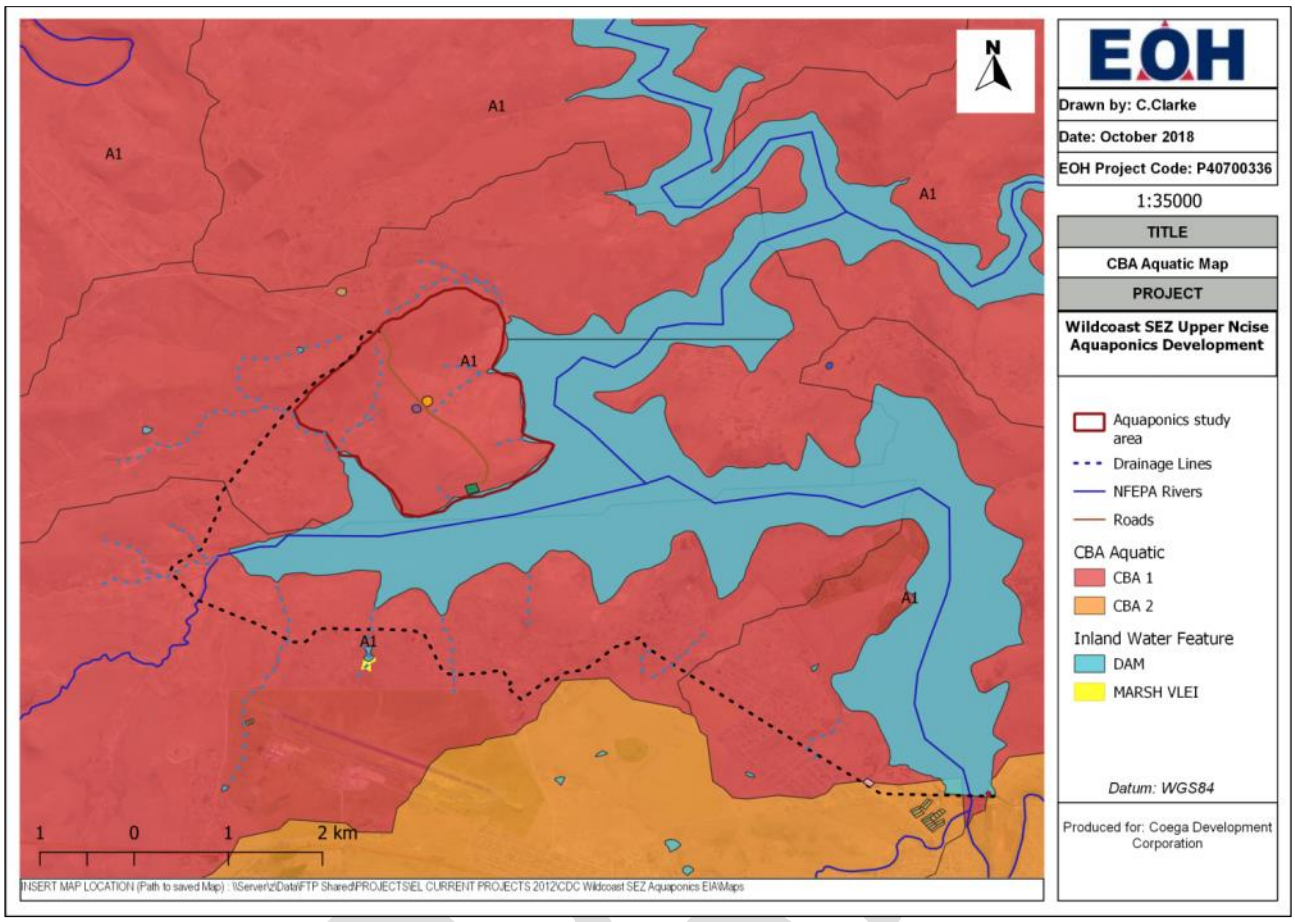

Figure 9.24: ECBCP map of the study area showing aquatic CBAs.

9.8.2 Protected Areas (NEMPAA & NPAES)

The proposed Aquaponics development falls within the Luchaba Wildlife Reserve. In addition, the Nduli Wildlife Reserve is located 10 km south west of the proposed development.

Luchaba Nature Reserve is a 480 Ha provincial nature reserve located on state owned land by the KSD Local Municipality. Nduli Nature Reserve was originally established in 1951 and re-proclaimed on 15th February 1972 in terms of the Cape Nature Conservation Ordinance of 1965. Therefore provisions within the NEMPAA (Act No. 57 of 2003, as amended) must be adhered to.

The proposed development does not fall within any National Protected Area Expansion Strategy Areas (NPAES).

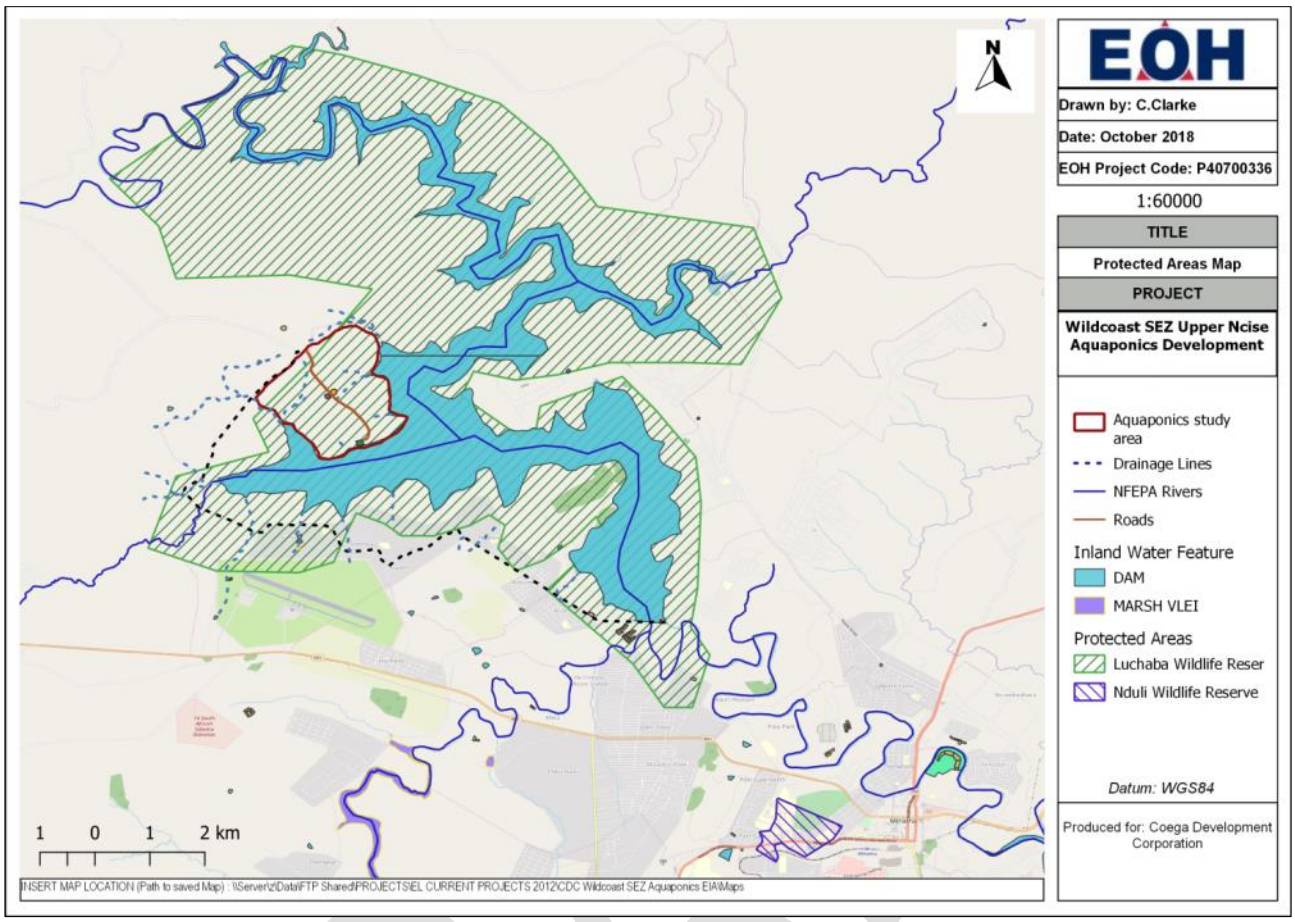

Figure 9.25: Protected areas within and in close proximity to the study area

9.8.3 Species of Conservation Concern

Table 9.1 below lists the potential Floral Species of Conservation Concern (SCC) within the quarter degree grid square 3128DA (study area) as per the SANBI online threatened species database.

Table 9.1: Potential Floral SCC that may occur within the study area

Scientific Name	Common Name	Status
Brachystelma caffrum	unknown	Vulnerable
Crinum macowanii	River Crinum, River Lily	Declining
Impatiens flanagariae	Mrs Flanagan's impatiens	Vulnerable
Dioscorea browni	unknown	Vulnerable

During the site visit, no plant SCCs were identified onsite. Current land use practices including cultivation and livestock grazing reduce the likelihood for any SCCs to occur onsite.

However, it must be noted that due to the vast area under application, it is possible that not all existing plant SCC were encountered. Therefore, it is recommended that a walkthrough of the areas to be cleared be undertaking by a suitably qualified individual prior to the commencement of construction in order to ensure that no plant SCC are damaged or destroyed, and to take into account possible seasonality changes. This walkthrough should ideally be undertaken with the appointed contractor during the demarcation of the site and take into consideration (but not limited to) the potential plant SCC listed in Table 7.1 above.

9.8.4 Alien invasive species

The following section details potential alien invasive species likely to occur within the study area. As per the NEMBA Alien and Invasive Species List (Government Notice R 599 of 2014), the applicant must ensure that the site is cleared of alien vegetation using appropriate means. An invasive species monitoring, control and eradication plan must be implemented as part of the EMPr.

Flora

As per the SANBI POSA database, the Table 9.2 below details a list of potential alien invasive floral species that are likely to occur within the study area.

Table 9.2: List of Alien invasive floral species likely to occur within the study area.

Scientific Name	Common Name	NEMBA Status
Ricinus communis	Castor-oil plant	Category 2
Acacia mearnsii	Black Wattle	Category 2
Solanum mauritianum	Bugweed	Category 1b
Verbena rigida	Veined verbena, Slender vervain	Category 1b
Cestrum laevigatum	Inkberry	Category 1b

Fauna

The Mthatha Dam is inhabited by the indigenous Chubbyhead Barb (*Barbus anoplus*), the indigenous but locally alien Banded Tilapia (*Tilapia sparrmanii*), Mozambique Tilapia (Oreochromis mossambicus), Sharptooth Catfish (*Clarias gariepinus*) and the exotic Smallmouth Bass (*Micropterus dolomieu*) and Rainbow Trout (*Oncorhynchus mykiss).* It is likely that the system is also inhabited by Largemouth Bass (*Microperus salmoides*) and Common Carp (*Cyprinus carpio*), while polyculture experiments in the region in the early 1980's, may have introduced other fish species.

9.9 Heritage and Culture

The results of a desktop Heritage Impact Assessment (HIA) undertaken by Frans Prins of Active Heritage for Phase 1 of the WildCoast SEZ (Agro-processing Sector) in the immediate north and immediate south of the Mthatha Airport have been considered with regards to the proposed Aquaponics development.

According to this desktop HIA, no archaeological, living heritage or cultural sites were found to occur within the study area. Several graves sites associated with abandoned homesteads were identified during the desktop study. The ground survey confirmed that these graves have been exhumed and reburied. It further confirmed that none of the abandoned homesteads were classified as heritage features as they were deemed to not be older than 60 years.

With regards to the proposed Aquaponics development study area, the initial site visit confirmed the occurrence of grave sites located at the northern boundary of the proposed development area (see Figure 9.26 below). No other graves sites were encountered on site, however it is recommended that a walkthrough of the areas to be cleared and excavated (including the routing of the bulk service infrastructure) be undertaking by a suitably qualified individual prior to the commencement of construction in order to ensure that no graves are impacted.

It is recommended that all identified graves sites within the development area be demarcated and declared as 'no-go 'areas.

Figure 9.26: Grave sites located within the study area

9.10 Socio-Economic Profile

The proposed Aquaponics development falls within the KSDLM (3 027 km^2) in the ORTDM (12 087 km^2), within the Eastern Cape Province. The KSDLM is located in the former Transkei Area which is comprised of 36 Wards dominated by rural settlements.

Population

According to the KSDLM IDP (2017/2018), the total population in the within the Local Municipality in 2016 was 494 000. There are significantly more females (53.38%) than males (46.62%), which is typical for an area with high male out migration.

Based on the present age-gender structure and the present fertility, mortality and migration rates, KSDLM population is projected to grow at an average annual rate of 1.2 % from 494 000 in 2016 to 525 000 in 2021.

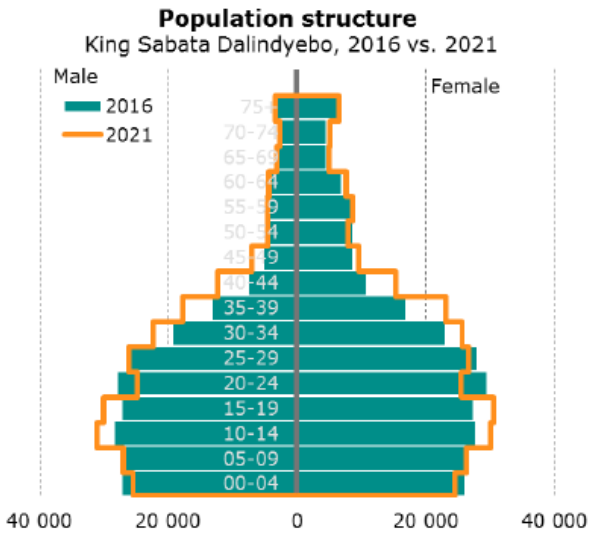

Figure 9.27: Population structure for the KSD Local Municipality

In 2016, the KSD Local Municipality's population consisted of 98.62 % African (487 000), 0.25 % White (1 220), 0.78 % Coloured (3 850) and 0.35 % Asian (1 750) people. The largest share of population is within the 0-14 years age category with a total number of 162 000 (32.8 %) of the total population. The age category with the second largest population is the young working age (25-44 years) age category with a total share of 29.2 %. The age category with the least number of people is the 65 years and older age category with only 23 600 people.

Employment

According to the 2017/2018 KSDLM IDP, the working age population in KSDLM was 308 000, of which 26 % were economically active. The working age population has been increasing at an average annual rate of 1.98 % since 2006.

The 2016 unemployment rate in KSD Local Municipality (based on the official definition of unemployment) was 30.22 %, which is slightly higher than the provincial unemployment rate of 29.71 %.

Local Economy

The KSDLM Gross Domestic Product (GDP) for 2016 was R 24.7 billion, which amounted to 7.3 % of the total for the Eastern Cape Province and 0.53 % for South Africa. In 2016, the community services sector was the largest performing sector within KSD Local Municipality accounting for R 8.1 billion (35.3 %) of the total Gross Value Added (GVA) in the local economy. This was followed by the finance sector at R 5.5 billion, the

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trade sector with R 5.1 billion of the total GVA. Agriculture was the second lowest performing sector with R 2 million contributed towards the local GVA.

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10. IDENTIFICATION OF IMPACTS AND RISKS

According to Appendix 2, Section 2 (1), of the EIA Regulations 2014 (as amended) a "*scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include:*

(g) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including—

(v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts—

(aa) can be reversed;

(bb) may cause irreplaceable loss of resources; and

(cc) can be avoided, managed or mitigated;

(vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;

(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

(viii) the possible mitigation measures that could be applied and level of residual risk;

(ix) the outcome of the site selection matrix;

During the Scoping Phase, impacts are assessed and rated on a broader issues level, and are regarded as preliminary. This is because, at the Scoping Phase of the EIA process, a limited amount of information on project-related detail is available, and baseline data on the project affected environment and social systems has not yet been gathered other than from the initial site visit. This information requires input from the specialist assessments, which are only undertaken at the completion of the Scoping Phase and therefore a definitive assessment of project specific impacts cannot be completed at this stage. The environmental and social consequences of the project and alternatives are discussed more broadly than what is required in the EIR.

10.1 Issues Identification Matrix

CES has developed a revised rating scale for the Scoping Phase of the EIA process in accordance with the requirement outlined in Appendix 2 of the EIA Regulations 2014 (as amended) (Table 10.1). This scale takes into consideration the following variables:

- Duration
- Extent
- Consequence
- Probability
- Significance
- Reversibility and Mitigation

Duration

The temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.

Extent

The spatial scale defines the physical extent of the impact.

Consequence

The consequence scale is used in order to objectively evaluate how severe a number of negative impacts might be on the issue under consideration, or how beneficial a number of positive impacts might be on the issue under consideration.

Probability

This is the likelihood of impacts taking place as a result of project actions arising from the various alternatives. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development and alternatives. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

Mitigation

The degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. Both the practical feasibility of the measure, the potential cost and effectiveness is taken into consideration when determining the appropriate degree of difficulty.

Table 10.1: Evaluation Criteria for Rating Impacts.

Effect	**Duration**	
	Short term	Less than 5 years
	Medium term	Between 5-20 years
	Long term	More than 20 years
	Extent	
	Localised	The proposed site
	Study Area	The site and its immediate environs
	Regional	District / Municipal and Provincial level
	National	National and International level
	Consequence	
	Slight	Slight impacts or benefits on the affected system(s) or party(ies)
	Moderate	Moderate impacts or benefits on the affected system(s) or party(ies)
	Severe/Beneficial	Severe impacts or benefits on the affected system(s) or party(ies)
	Probability	
	Unlikely	The likelihood of these impacts occurring is slight (low probability)
	May Occur	The likelihood of these impacts occurring is possible (high probability)
	Definite	The likelihood is that this impact will definitely occur
Mitigation	**Mitigation**	
	Easily Achievable	The impact can be easily, effectively and cost effectively mitigated
	Achievable	The impact can be effectively mitigated without much difficulty or cost
	Difficult	The impact could be mitigated but there will be some difficultly in ensuring effectiveness and/or implementation, and significant costs
	Very Difficult	The impact could be mitigated but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly

Significance

The above criteria are used to determine the overall significance of an activity. The impact effect (which includes duration; extent; consequence and probability) and the reversibility/mitigation of the impact are then read off the significance matrix in order to determine the overall significance of the issue. The overall significance is either negative or positive and will be classified as low, moderate or high (Table 10.2).

Table 10.2: Description of Issues Level Significance Ratings.

Significance Rate	Description
LOW	The impacts on this issue are acceptable and mitigation, whilst desirable, is not essential. The impacts on the issue by themselves are insufficient, even in combination with other low impacts, to prevent the development being approved. Impacts on this particular issue will result in either positive or negative medium to short term effects on the social and/or natural environment.
MODERATE	The impacts on this issue are important and require mitigation. The impacts on this issue are, by themselves, insufficient to prevent the implementation of the project, but could in conjunction with other issues with moderate impacts, prevent its implementation. Impacts on this particular issue will usually result in either a positive or negative medium to long-term effect on the social and/or natural environment.
HIGH	The impacts on this issue are serious, and if not mitigated, they may prevent the implementation of the project (if it is a negative impact). Impacts on this particular issue would be considered by society as constituting a major and usually a long-term change to the (natural and/or social) environment, and will result in severe effects or if positive, substantial beneficial effects.

The issues level environmental significance scale needs to take the context into account, and at the relevant level. For example, if the issue under consideration is 'changes to the terrestrial biological environment,' the impacts to be considered when assessing this issue might include (1) loss of a particular vegetation type, (2) disruption to, or loss of, faunal habitats, (3) fragmentation of habitats (4) loss of species of conservation concern (if known at the Scoping stage of the assessment, and so on). The evaluation of the significance of the issue therefore relies heavily on the information that is available at the Scoping stage of an EIA, and out of necessity must be broad and value laden. For this reason, impacts need to reflect the values of the affected society.

The evaluation of the issues, as described above, is used to prioritise which issues require mitigation measures, or which issues might lead to a conclusion that the particular alternative under assessment is not appropriate. Negative issues that are ranked as being of "**HIGH**" significance will need to be investigated further to determine how the impacts can be minimised, or what alternative activities or mitigation measures can be implemented. For issues identified as having a negative impact of "**MODERATE**" significance, it would be standard practice to investigate alternate activities and/or mitigation measures. The most effective and practical mitigation measures will then be proposed. For impacts ranked as "**LOW**" significance, no investigations or alternatives will be considered. Possible management measures will be investigated to ensure that the impacts remain of low significance.

Issues Level Assessment

The issues identified during the Scoping Phase for the proposed project lists the environmental issues and resulting impacts that have been identified for the following phases of the project development: planning and design, construction, operation, and decommissioning. These impacts have been identified for all the alternatives proposed (refer to section 10.2 below).

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10.2 Potential Impacts Identified

Table 10.3: Technical Scope of Issues identified during all phases of the proposed Aquaponics development.

THEME	POTENTIAL ISSUES	SOURCE OF ISSUE	POTENTIAL RECEPTORS	PHASE				ASSESSMENT ACTIONS
				PLANNING & DESIGN	CONSTRUCTION	OPERATIONAL	DECOMISSIONING	
Environmental Policy	Legal and Policy Compliance	• Licensing & Authorisations • Permitting	• CDC	X	X	X		*Obtaining Authorisation from relevant Competent Authorities*
Built Environment	Site Establishment	• Siting & placement • Footprint creep	• Aquatic & Terrestrial environment • Heritage & paleontological resources • Neighbouring community	X	X		X	*General EIA*
	Associated Bulk Infrastructure	• Siting and placement • Earthworks	• Aquatic & Terrestrial environment • Heritage & paleontological resources • Neighbouring community	X	X	X	X	*General EIA*
	Material Stockpiling	• Siting & placement • Runoff & sedimentation	• Aquatic & Terrestrial environment	X	X		X	*General EIA*
	Stormwater management	• Inappropriate planning & maintenance	• Aquatic & Terrestrial environment	X	X	X		*General EIA*
	Waste Management	• Construction rubble and litter • Sewage • Aquaponics Effluent	• Aquatic & Terrestrial environment • Neighbouring community	X	X	X	X	*General EIA*

DRAFT

THEME	POTENTIAL ISSUES	SOURCE OF ISSUE	POTENTIAL RECEPTORS	PHASE				ASSESSMENT ACTIONS
				PLANNING & DESIGN	CONSTRUCTION	OPERATIONAL	DECOMISSIONING	
	Water Supply	• Licensing & Authorisations • Water supply constraints	• Existing Water Users of the Mthatha Dam catchment area • Neighbouring community	X	X	X		*General EIA*
Terrestrial Environment	Loss of Natural Vegetation	• Vegetation clearance	• Flora in study area	X	X		X	*General EIA*
	Species of Conservation Concern (SCC)	• Vegetation clearance	• SCC in study area	X	X		X	*General EIA*
	Invasion of Alien Vegetation Species	• Habitat disturbance • Vegetation clearance	• Disturbed areas	X	X	X	X	*General EIA*
	Erosion Management	• Earthworks • Vegetation clearance	• Erosion prone areas in study area	X	X	X	X	*General EIA*
Aquatic Environment	Damage/destruction of aquatic features	• Siting and placement • Earthworks • Construction & operational activities	• Aquatic & Terrestrial environment • Neighbouring community	X	X	X	X	*General EIA*
	Control of aquatic alien species	• Habitat disturbance	• Aquatic environment			X	X	*General EIA*
	Biosecurity	• Aquatic diseases	• Aquatic environment	X		X	X	*General EIA*
Socio-economic	Job creation	• Construction activities	• Neighbouring community • Individuals	X	X	X	X	*General EIA*
	Visual impacts	• Sense of place	• Neighbouring community	X	X	X		*General EIA*
	Dust Pollution	• Earthworks • Road traffic	• Neighbouring community		X	X	X	*General EIA*

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THEME	POTENTIAL ISSUES	SOURCE OF ISSUE	POTENTIAL RECEPTORS	PHASE				ASSESSMENT ACTIONS
				PLANNING & DESIGN	CONSTRUCTION	OPERATIONAL	DECOMISSIONING	
	Noise Pollution	• Earthworks • Road traffic • Construction & operational activities	• Neighbouring community		X	X	X	*General EIA*
	Loss of cultivated land	• Siting and placement • Construction activities	• Land users • Neighbouring community	X	X	X		*General EIA*
Health & Safety	Hazardous substances	• Storage and use (cement, tar, fuel, bitumen & oil)	• Aquatic & Terrestrial environment • Neighbouring community	X	X	X	X	*General EIA*
	Onsite Sanitation & Ablutions	• Inadequate facilities on site	• Labourers • Terrestrial & Aquatic environments		X	X	X	*General EIA*
	Crime & Theft	• Site security • Damage to property	• Labourers • CDC		X	X		*General EIA*
	Traffic	• Construction & operational activities	• Neighbouring community		X	X	X	*General EIA*
Heritage and Palaeontological Environment	Loss of cultural, heritage and paleontological resources	• Siting and placement • Earthworks	• Heritage sites and Palaeontological findings	X	X	X	X	*General EIA*
Rehabilitation & Maintenance	Lack of rehabilitation & maintenance	• Inadequate planning and provisioning • Lack of maintenance of infrastructure	• Aquatic & Terrestrial environment • Neighbouring community	X	X	X	X	*General EIA*

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Table 10.4 Potential impacts identified for the Planning and Design Phase of the proposed development.

PLANNING AND DESIGN PHASE			
Issue	**Impact**	**Significance**	***Further Assessment***
Legal and Policy Compliance	During the Planning and Design Phase, failure to adhere to existing policies and legal obligations could lead to the project conflicting with local, provincial and national policies, legislation, etc. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.	**HIGH NEGATIVE**	*General EIA*
Siting/location of facility structures and associated bulk infrastructure	During the Planning and Design Phase, planning and placement of structures and associated infrastructure in sensitive areas (e.g. wetlands close to drainage systems) could lead to the damage and degradation of natural areas as well as to the structures themselves. Similarly, graves sites that may be present within the study area could be damaged should planning not take into consideration their location/s.	**HIGH NEGATIVE**	*General EIA*
Stormwater management	During the Planning and Design Phase, inadequate stormwater management designs for the access road and layout of the aquaponics facility itself could result in erosion due to loss of vegetation and unmanaged runoff.	**MODERATE NEGATIVE**	*General EIA*
Waste Management	During the Planning and Design Phase, inadequate planning and provisions for general waste removal during all phases of the development, as well as the treatment and disposal of effluent waste generated from the Aquaponics facility itself, may result in surface and groundwater pollution to the surrounding environment. In addition, failure by the CDC to provision for alternatives to discharging effluent waste into the Mthatha Dam will result in the development becoming fatally flawed.	**HIGH NEGATIVE**	*General EIA*
Water Supply	During the Planning and Design Phase, failure by the CDC to reach an agreement with the existing water users of the Mthatha Dam in order to create a surplus supply for the proposed development will result in the development becoming fatally flawed. Alternatively, failure of KSDLM to expand the municipal water reticulation network will result in the development becoming fatally flawed.	**HIGH NEGATIVE**	*General EIA / Water Use License Application*
Loss of Natural Vegetation	During the Planning and Design Phase, the inappropriate design of the Aquaponics development and associated bulk infrastructure will lead to the unnecessary loss of natural vegetation.	**MODERATE NEGATIVE**	*General EIA*

PLANNING AND DESIGN PHASE			
Issue	**Impact**	**Significance**	***Further Assessment***
Loss of Species of Conservation Concern (SCC)	During the Planning and Design Phase, the inappropriate provisions made for the identification of plant SCCs onsite prior to vegetation clearing will lead to the loss of identified and unidentified plant and animal SCC.	**MODERATE NEGATIVE**	*General EIA*
Invasion of Alien Vegetation Species	During the Planning and Design Phase, inadequate planning and provisioning for the removal and management of alien vegetation throughout all phases of the development could result in the invasion of alien vegetation in both terrestrial and riparian areas.	**MODERATE NEGATIVE**	*General EIA*
Aquatic diseases	During the Planning and Design Phase, inadequate planning and provisioning for biosecurity measures during the operational phase of the development could result in the uncontrolled spread of infectious diseases.	**MODERATE NEGATIVE**	*General EIA*
Erosion Management	During the Planning and Design Phase, inadequate planning for the management of erosion could lead to erosion within the study area and surrounding areas.	**MODERATE NEGATIVE**	*General EIA*
Damage/ destruction of aquatic features	During the Planning and Design Phase, failure to plan mitigation measures to prevent or minimise the degradation of the health and functioning of water courses during the all phases of the Aquaponics development have the potential risk of polluting the surrounding watercourses within the proposed prospecting sites.	**HIGH NEGATIVE**	*General EIA*
Job creation	During the Planning and Design Phase, jobs for the local community will be created.	**BENEFICIAL**	*General EIA*
Visual Impacts	During the Planning and Design Phase, inadequate consideration given towards the design and placement of the development may visually impact on the surrounding community, affecting ones 'sense of place' within the area.	**MODERATE NEGATIVE**	*General EIA*
Hazardous substances	During the Planning and Design Phase, inadequate planning and provisions for the appropriate storage and transport of hazardous substances could lead to contamination of the surrounding terrestrial and aquatic environment.	**HIGH NEGATIVE**	*General EIA*
Cultivated Land	During the Planning and Design Phase, inadequate consideration giving to the surrounding agricultural and cultivated land may result in the loss of potential for such resources.	**MODERATE NEGATIVE**	*General EIA*

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PLANNING AND DESIGN PHASE			
Issue	**Impact**	**Significance**	***Further Assessment***
Cultural, heritage and paleontological resources	During the Planning and Design Phase, failure to identify culturally important artefacts, graves and various other heritage/archaeological aspects could potentially result in the potential loss of sites of archaeological, cultural and paleontological significance due to poor planning.	**MODERATE NEGATIVE**	*General EIA*
Rehabilitation & maintenance	During the Planning and Design Phase, inadequate planning for rehabilitation could lead to degradation of the study area and surrounding areas.	**MODERATE NEGATIVE**	*General EIA*

Table 10.5: Potential impacts identified for the Construction Phase of the proposed development

CONSTRUCTION PHASE			
Issue	**Impact**	**Significance**	***Further Assessment***
Legal and Policy Compliance	During the Construction Phase, failure to adhere to existing policies, regulations, permits, authorisations and legal obligations could lead to the project conflicting with local, provincial and national policies, legislation, etc. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.	**HIGH NEGATIVE**	*General EIA*
Site Establishment, Bulk Infrastructure, and Material Stockpiling	During the Construction Phase, inappropriate siting of site camp and routing of bulk infrastructure could lead to damage and degradation of the terrestrial and aquatic environment. Inappropriate placement of material stockpiles within aquatic buffer areas may lead to runoff and siltation.	**HIGH NEGATIVE**	*General EIA*
Stormwater	During the Construction Phase, the implementation of inadequate stormwater management measures for the Aquaponics facility and bulk infrastructure may result in erosion due to loss of vegetation and uncontrolled runoff.	**MODERATE NEGATIVE**	*General EIA*
Waste Management	During the Construction Phase, litter on site may attract vermin, detract from the visual appeal of the area, and pollute the surrounding areas. Construction rubble left onsite could pollute the area and encourage the growth of opportunistic alien vegetation	**MODERATE NEGATIVE**	*General EIA*
Water Supply	During the Construction Phase, inadequate provisions made for construction related water requirements may result in the unlawful abstraction of water from a water source, impacting on existing water users and potentially jeopardising the proposed development.	**HIGH NEGATIVE**	*General EIA / Water Use License Application*

Loss of natural vegetation	During the Construction Phase, the construction of the Aquaponics facility and bulk infrastructure services may result in unnecessary damage to and removal of natural and vulnerable vegetation.	**MODERATE NEGATIVE**	*General EIA*
Loss of Species of Conservation Concern (SCC)	During the Construction Phase, SCC may be damaged or destroyed if not identified prior to vegetation clearing.	**MODERATE NEGATIVE**	*General EIA*
Invasion of Alien Vegetation Species	During the Construction Phase, the removal of existing natural vegetation creates 'open' habitats that will favour the establishment of undesirable species in areas that are typically very difficult to eradicate and may pose a threat to surrounding ecosystems.	**MODERATE NEGATIVE**	*General EIA*
Erosion Management	During the Construction Phase, inadequate provision for the management of erosion could lead to erosion of the study area and surrounding areas.	**MODERATE NEGATIVE**	*General EIA*
Damage/destruction of aquatic features	During the Construction Phase, lack of avoidance and adherence to the recommended buffer areas of watercourses may lead to the damage and degradation of the surrounding aquatic environment.	**HIGH NEGATIVE**	*General EIA*
Job creation	During the Construction Phase, the proposed development will create temporary employment opportunities	**BENEFICIAL**	*General EIA*
Visual impacts	During the Construction Phase, temporary construction related structures and activities may impact on the aesthetic appearance of the project area.	**MODERATE NEGATIVE**	*General EIA*
Dust pollution	During the Construction Phase, dust (air) pollution caused by grading and levelling exposed land can cause a nuisance to the neighbouring community and local residents	**LOW NEGATIVE**	*General EIA*
Noise Pollution	During the Construction Phase, noise pollution could potentially be a nuisance to neighbouring residential areas.	**LOW NEGATIVE**	*General EIA*
Loss of cultivated land	During the Construction Phase, inadequate consideration giving to the surrounding local community and the portions of the study area used for agriculture and cultivation may result in the loss of potential for such resources.	**MODERATE NEGATIVE**	*General EIA*
Handling, transport and use of hazardous substances	During the Construction Phase, inappropriate transportation and storage of fuel on site could result in pollution of surface and groundwater in the event of a fuel spillage.	**HIGH NEGATIVE**	*General EIA*
	During the Construction Phase, spillage of any hazardous substances such as fuel, chemicals, paint, etc. can lead to the contamination of surface and groundwater.	**HIGH NEGATIVE**	*General EIA*

DRAFT

Onsite Sanitation & Ablutions	During the Construction Phase, failure to provide adequate onsite sanitation for labourers may result in runoff transferring contaminants into the surrounding environment.	**MODERATE NEGATIVE**	*General EIA*
Crime & Theft	During the Construction phase, inadequate security measures, including access control to the site camp, etc. may result in the theft of and damage to property.	**LOW NEGATIVE**	*General EIA*
Traffic	During the Construction phase, increased flow of construction and vehicular traffic through neighbouring community areas may present a safety risk to the local community.	**LOW NEGATIVE**	*General EIA*
Loss of cultural, heritage and paleontological resources	During the Construction Phase, the sensitive heritage sites and palaeontological findings could be damaged or destroyed by construction activities during the construction phase.	**MODERATE NEGATIVE**	*General EIA*
Lack of rehabilitation & maintenance	During the Construction Phase, inadequate provision and implementation of rehabilitation measures and maintenance of infrastructure may lead to the degradation of the surrounding terrestrial environment.	**MODERATE NEGATIVE**	*General EIA*

Table 10.6: Potential impacts identified for the Operational Phase of the proposed development.

OPERATIONAL PHASE			
Issue	**Impact**	**Significance**	***Further Assessment***
Legal and Policy Compliance	During the Operational Phase, failure to adhere to existing policies, regulations, permits, authorisations and legal obligations could lead to the project conflicting with local, provincial and national policies, legislation, etc. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.	**HIGH NEGATIVE**	*General EIA*
Site & Bulk infrastructure	During the Operational Phase, lack of maintenance of infrastructure, particularly associated with waste, may result in the degradation of the surrounding environment.	**HIGH NEGATIVE**	*General EIA*
Stormwater management	During the Operation Phase, inappropriate routing of stormwater will lead to erosion and sedimentation.	**MODERATE NEGATIVE**	*General EIA*
Waste Management	During the Operation Phase, inadequate treatment and disposal of effluent waste generated from the Aquaponics facility itself, may result in surface and groundwater pollution to the surrounding environment.	**HIGH NEGATIVE**	*General EIA*
Water Supply	During the Operational Phase, lack of provisions made for the water requirements of the Aquaponics may result in water supply constraints which will negative impact on	**MODERATE NEGATIVE**	*General EIA / Water Use License Application*

	existing water users within the Mthatha area.		
Invasion of Alien Vegetation Species	During the Operational Phase, the lack of an effective Alien Vegetation Management Plan post-construction could lead to large scale alien plant invasion during the operational phase.	**MODERATE NEGATIVE**	*General EIA*
Erosion Management	During the Operational Phase, inadequate provision for the management of erosion could lead to erosion of the study area and surrounding areas.	**MODERATE NEGATIVE**	*General EIA*
Damage/destruction of aquatic features	During the Operational Phase, lack of avoidance and adherence to the recommended buffer areas of watercourses may lead to the damage and degradation of the surrounding aquatic environment.	**HIGH NEGATIVE**	*General EIA*
Control of aquatic alien species	During the Operational Phase, the potential application for and use of alien invasion fish species (such as the Nile tilapia (*Oreochromis niloticus*)) within the Aquaponics facility may result in the spread of such species within the Mthatha Dam through onsite activity.	**HIGH NEGATIVE**	*General EIA*
Aquatic diseases	During the Operational Phase, inadequate implementation and monitoring of biosecurity measures may result in the uncontrolled spread of infectious diseases.	**HIGH NEGATIVE**	*General EIA*
Job creation	During the Operational Phase, the proposed development will create permanent employment opportunities during the lifespan of the development.	**BENEFICIAL**	*General EIA*
Visual impacts	During the Operational Phase, the permanency/long-term placement of the facility structures and activities on site may impact on the aesthetic appearance of the project area.	**MODERATE NEGATIVE**	*General EIA*
Dust Pollution	During the Operational Phase, dust generated by on site activities may generate nuisance dust to the neighbouring community.	**LOW NEGATIVE**	*General EIA*
Noise Pollution	During the Operational Phase, noise generated by on site activities may be of a nuisance to the neighbouring community.	**LOW NEGATIVE**	*General EIA*
Loss of cultivated land	During the Operational Phase, inadequate consideration giving to the surrounding local community and the portions of the study area used for agriculture and cultivation may result in the loss of potential for such resources.	**MODERATE NEGATIVE**	*General EIA*
Hazardous substances	During the Operational Phase, inappropriate storage and handling of hazardous substances required for the operation and day to day site activities could lead to the contamination of surface and groundwater.	**HIGH NEGATIVE**	*General EIA*
Onsite Sanitation & Ablutions	During the Operational Phase, inadequate provision and management of ablutions for labourers may result in runoff transferring	**MODERATE NEGATIVE**	*General EIA*

DRAFT

	contaminants into the surrounding environment.		
Traffic	During the Operational Phase, increased flow of vehicular traffic through neighbouring community areas may present a safety risk to the local community.	**LOW NEGATIVE**	*General EIA*
Loss of cultural, heritage and paleontological resources	During the Operational Phase, inadequate consideration for the location of identified sensitive heritage sites and palaeontological findings could result in the damage or destruction by operational activities.	**MODERATE NEGATIVE**	*General EIA*
Lack of rehabilitation & maintenance	During the Operational Phase, inadequate provision and implementation of rehabilitation measures and maintenance of infrastructure may lead to the degradation of the surrounding terrestrial environment.	**MODERATE NEGATIVE**	*General EIA*

Table 10.7: Potential impacts identified for the Decommissioning Phase of the proposed development.

DECOMMISSIONING PHASE			
Issue	**Impact**	**Significance**	***Further Assessment***
Legal and Policy Compliance	During the Decommissioning Phase, failure to adhere to existing policies, regulations, permits, authorisations and legal obligations could lead to the project conflicting with local, provincial and national policies, legislation, etc. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.	**HIGH NEGATIVE**	*General EIA*
Facility, Materials & Bulk infrastructure	During the Decommissioning Phase, the closure, removal and disposal of all facility and bulk infrastructure may result in the disturbance to the surrounding terrestrial and aquatic environments.	**HIGH NEGATIVE**	*General EIA*
Waste Management	During the Decommissioning Phase, general facility rubble & litter left on site may attract vermin, detract from the visual appeal of the area, and pollute the surrounding areas. Construction rubble left onsite could pollute the area and encourage the growth of opportunistic alien vegetation.	**MODERATE NEGATIVE**	*General EIA*
Loss of Natural Vegetation	During the Decommissioning Phase, the closure and removal of all facility and bulk infrastructure may result in unnecessary damage to and removal of natural and vulnerable vegetation.	**MODERATE NEGATIVE**	*General EIA*
Species of Conservation Concern (SCC)	During the Decommissioning Phase, the closure and removal of all facility and bulk infrastructure may result in the loss of potential plant SCCs on site.	**MODERATE NEGATIVE**	*General EIA*
Invasion of Alien Vegetation Species	During the Decommissioning Phase, the lack of an effective Alien Vegetation Management Plan during the closure and removal of all facility and bulk infrastructure could lead to	**MODERATE NEGATIVE**	*General EIA*

	large scale alien plant invasion.		
Erosion Management	During the Decommissioning Phase, inadequate provision for the management of erosion could lead to erosion of the study area and surrounding areas.	**MODERATE NEGATIVE**	*General EIA*
Damage/destruction of aquatic features	During the Decommissioning Phase, lack of avoidance and adherence to the recommended buffer areas of wetlands and watercourses may lead to the damage and degradation of the surrounding aquatic environment.	**HIGH NEGATIVE**	*General EIA*
Control of aquatic alien species	During the Decommissioning Phase, the potential release of alien invasion fish species (such as the Nile tilapia (*Oreochromis niloticus*)) into the Mthatha Dam (should they be used during the Operational Phase) could threaten existing indigenous aquatic fish species.	**HIGH NEGATIVE**	*General EIA*
Aquatic diseases	During the Decommissioning Phase, the irresponsible removal/redistribution/disposal of all fish could result in the uncontrolled spread of infectious diseases.	**MODERATE NEGATIVE**	*General EIA*
Job creation	During the Decommissioning Phase, the proposed development will create temporary employment opportunities.	**BENEFICIAL**	*General EIA*
Dust Pollution	During the Decommissioning Phase, dust generated by on site activities may generate nuisance dust to the neighbouring community.	**LOW NEGATIVE**	*General EIA*
Noise Pollution	During the Decommissioning Phase, noise generated by on site activities may be of a nuisance to the neighbouring community.	**LOW NEGATIVE**	*General EIA*
Hazardous substances	During the Decommissioning Phase, inappropriate storage and handling of hazardous substances use during decommissioning and removed from site could lead to the contamination of surface and groundwater.	**MODERATE NEGATIVE**	*General EIA*
Onsite Sanitation & Ablutions	During the Decommissioning Phase, inadequate provision and management of ablutions for labourers may result in runoff transferring contaminants into the surrounding environment.	**MODERATE NEGATIVE**	*General EIA*
Traffic	During the Decommissioning Phase, increased flow of vehicular traffic through neighbouring community areas may present a safety risk to the local community.	**LOW NEGATIVE**	*General EIA*
Loss of cultural, heritage and paleontological resources	During the Decommissioning Phase, inadequate consideration for the location of identified sensitive heritage sites and palaeontological findings could result in the damage or destruction by operational activities.	**MODERATE NEGATIVE**	*General EIA*

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Lack of rehabilitation & maintenance	During the Decommissioning Phase, inadequate provision and implementation of rehabilitation measures may lead to the degradation of the surrounding terrestrial environment.	**MODERATE NEGATIVE**	*General EIA*

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11. PLAN OF STUDY: ENVIRONMENTAL IMPACT ASSESSMENT PHASE

According to Appendix 2, Section 2 (1), of the EIA Regulations 2014 (as amended) a "*scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include—*

(h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including—

(i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;

(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;

(iii) aspects to be assessed by specialists;

(iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;

(v) a description of the proposed method of assessing duration and significance;

(vi) an indication of the stages at which the competent authority will be consulted;

(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and

(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;

(ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

In line with the above-mentioned legislative requirements, this Chapter sets out the Plan of Study for the EIA phase of the assessment. Consultation with DEA will be on-going throughout this EIA. However, it is anticipated that DEA will provide relevant comment with respect to the adequacy of this Plan of Study for the EIA, as it informs the content of the EIR and sufficiency thereof.

11.1 EIA phase

The EIA phase has four key elements, namely:-

- **Specialist Studies:** After the authority review of the Final Scoping Report, additional specialist studies may be requested by the authorities, and these will be undertaken during the initial phase of the EIA. Appropriately qualified and experienced specialists will be appointed to undertake the various assessments. Specialists will gather baseline information relevant to the study being undertaken and will assess impacts associated with the development. Specialists will also make recommendations to mitigate negative impacts and enhance benefits. The resulting information will be synthesised into the Environmental Impact Report (EIR), whilst the full specialist reports will be attached to the EIR as a Specialist Volume.

- **Environmental Impact Report (EIR):** The main purpose of this report is to gather and synthesise environmental information and evaluate the overall environmental impacts associated with the development, to consider mitigation measures and alternative options, and make recommendations in choosing the best development alternative. The EIR also identifies mitigation measures and management recommendations to minimise negative impacts and enhance benefits. The EIR and associated specialist reports are made available for public and authority review and comment. The availability of the report will be advertised in one provincial and one local newspaper and the report will also be made available for public review in easily accessible locations.

- **Comments Report**: The comments report (or an Issues & Response Trail (IRT)) provides a detailed record of comments, issues and concerns raised by I&APs and the authorities during the review period, and also provides relevant responses to these comments.

- **Environmental Management Programme (EMPr):** The EMPr provides guidelines to the project proponent and the technical team on how best to implement the mitigation measures and management recommendations outlined in the EIR during the construction and operational phase.

In addition to the above, the Public Participation Process (PPP) commenced during the Scoping Phase will be continued, during which I&APs are afforded further opportunities to raise their issues, concerns and comments regarding the proposed project. It is possible that some of the project details may have changed in response to the preliminary findings of the Scoping Report, and as a result of design changes made by the project proponent. I&APs and key stakeholders are given the opportunity to review the Draft EIR before it is submitted to the authorities for consideration. Comments on the Draft EIR received from I&APs are included and addressed in the submitted EIR.

11.2 Alternatives

The alternatives (fundamental and incremental) outlined in Chapter 4 of this report will be expanded upon in the EIR. In summary, the following alternatives will be further assessed:

- **Location Alternative** – the proposed location alternative will be the only alternative assessed;
- **Activity Alternative 1** – Aquaponics;
- **Activity Alternative 2** – Agriculture;
- **Activity Alternative 3** – Aquaponics and Agriculture combined;
- **Water Supply Alternative 1** – Water abstraction from the Mthatha Dam;
- **Water Supply Alternative 2** – Municipal water reticulation connection;
- **Water Supply Alternative 3** – Rainwater harvesting;
- **Waste Discharge Alternative 2** - Irrigation outside of the Mthatha Dam catchment;
- **Waste Discharge Alternative 3** – Municipal sewer reticulation connection;
- **Bulk service infrastructure** - routing alternatives will be assessed further during the EIA phase of this assessment based on the outcome of which water supply and waste discharge alternatives are put forward; and
- **No-Go Option** - (status quo - land to remain undeveloped).

11.3 Specialist Studies

Several environmental issues, as identified in Chapter 8, will be further assessed during the EIA phase. Additional impacts might be raised by I&APs and/or the EAP, and these will also be assessed.

As part of the application for a WUL (as per the requirements of Section 21 of the NWA (No. 36 of 1998)), the DWS will require specific specialist assessments to be conducted. This will supplement the EIA process.

A Heritage & Paleontological Impact Assessment has not been proposed to be included during the EIA phase, as a walkthrough by a suitably qualified individual will be required prior to construction to demarcate any existing sensitive heritage, cultural or paleontological findings on site. This will be made a condition in the EMPr and these areas (if identified) will be deemed 'no-go' areas.

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11.4 Assessment Methodology

Although specialists, should they be required, will be given relatively free rein on how they conduct their research and obtain information, they will be required to provide their reports to the EAP in a specific layout and structure, so that a uniform specialist report volume can be produced. To ensure a direct comparison between various specialist studies, a standard rating scale has been defined and will be used to assess and quantify the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed.

Four factors need to be considered when assessing the significance of impacts, namely:

1) Relationship of the impact to **temporal** scales - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.

2) Relationship of the impact to **spatial** scales - the spatial scale defines the physical extent of the impact.

3) The severity of the impact - the **severity/beneficial** scale is used in order to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on a particular affected system (for ecological impacts) or a particular affected party. The severity of impacts can be evaluated with and without mitigation in order to demonstrate how serious the impact is when nothing is done about it. The word 'mitigation' means not just 'compensation', but also the ideas of containment and remedy. For beneficial impacts, optimization means anything that can enhance the benefits. However, mitigation or optimization must be practical, technically feasible and economically viable.

4) The **likelihood** of the impact occurring - the likelihood of impacts taking place as a result of project actions differs between potential impacts. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

Each criterion is ranked to determine the overall effect of an activity (Table 11.1). The criterion is then considered in two categories namely the effect of the activity and the likelihood of the impact in order to determine its overall significance. The overall significance is either negative or positive.

The ***environmental significance*** scale is an attempt to evaluate the importance of a particular impact (Table 11.1). This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this reason, impacts of especially a social nature need to reflect the values of the affected society.

Negative impacts that are ranked as being of "**VERY HIGH**" and "**HIGH**" significance will be investigated further to determine how the impact can be minimised or what alternative activities or mitigation measures can be implemented. These impacts may also assist decision makers (i.e. several **HIGH** negative impacts may bring about a negative decision).

For impacts identified as having a negative impact of "**MODERATE**" significance, it is standard practice to investigate alternate activities and/or mitigation measures. The most effective and practical mitigations measures will then be proposed.

For impacts ranked as "**LOW**" significance, no investigations or alternatives will be considered. Possible management measures will be investigated to ensure that the impacts remain of low significance.

Table 11.1: Environmental Significance Scale.

Significance Rate		Description
LOW –	**LOW +**	An acceptable impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in either positive or negative medium to short term effects on the social and/or natural environment.
MODERATE –	**MODERATE +**	An important impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in either a positive or negative medium to long-term effect on the social and/or natural environment.
HIGH –	**HIGH +**	A serious impact, if not mitigated, may prevent the implementation of the project (if it is a negative impact). These impacts would be considered by society as constituting a major and usually a long-term change to the (natural &/or social) environment and result in severe effects or beneficial effects.
VERY HIGH –	**VERY HIGH +**	A very serious impact which, if negative, may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are unmitigable and usually result in very severe effects, or very beneficial effects.

All feasible alternatives and the "no-go option" will be assessed in order to evaluate the significance of the impacts (prior to mitigation) and the residual impacts after mitigation measures are taken into account. The reason(s) for the judgement will be provided where necessary. All impacts must have a "cause and comment", a significance rating before mitigation, after mitigation and for the no-go option. Impacts should also indicate applicable mitigation measures/recommendations to reduce the impact significance.

11.5 Public Participation Process

I&APs and key stakeholders are given the opportunity to review the Draft Scoping Report and the Draft EIR before it is submitted to the authorities for consideration. Comments on the Draft Scoping Report and Draft EIR received from I&APs will be included and addressed in the Final Scoping and EIR Report.

11.5.1 Identification of and Consultation with Key Stakeholders

I&APs and Key Stakeholders will be identified during the Scoping Phase of the project. The identification and engagement if necessary, of I&APs and Key Stakeholders will continue through into the EIA phase of the project as the public participation process is a continuous process that runs throughout the duration of an environmental investigation.

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11.5.2 Interested and Affected Parties Database

All I&AP information (including contact details), together with dates and details of consultations and a record of all issues raised, is recorded within a comprehensive database of I&APs. This database will be updated on an on-going basis throughout the project, and will act as a record of the communication and involvement process.

11.5.3 Advertisements

In terms of the EIA Regulations 2014 (as amended), the availability of the Draft Scoping Report and the Draft EIR will be advertised in the Daily Dispatch newspaper. The primary aim of this advertisement will be to ensure that the widest group of I&APs possible are informed of the project. Other advertisements to be placed during the course of the EIA phase of the project will relate to the availability of reports for public review, the dates of public meetings, as well as the advertising of the environmental authorisation/decision.

11.5.4 Public Review of the Draft Environmental Impact Assessment Report

The Draft EIR will be made available for a thirty (30) day public review period. The availability of the Draft EIR will be advertised and all registered I&APs will be notified of the availability of the Draft EIR for public comment. In addition (and if required), a public meeting will be held during this public review period.

11.5.5 Public Meetings

The purpose of public meetings is to provide an appropriate format to enable I&APs to raise concerns related to the proposed project. The intention is that I&APs are afforded the opportunity of interacting on a one-on-one basis with the technical and planning representatives of the developer as well as the environmental team. I&APs will be encouraged to complete an attendance register and a comment and registration form to assist I&APs in raising concerns and general views on the project.

11.5.6 Issues and Responses Trail

All issues, comments and concerns raised during the public participation process of the EIA Process will be compiled into an IRT and incorporated and submitted as part of the Final EIR.

11.5.7 Notification of the Decision of the Authorities

An advertisement will be placed in the newspaper to notify the public of the Competent Authority's (CA) decision on the Final EIR. In addition, the advertisement will inform the public of how to access a copy of the Environmental Authorisation (EA) and it will draw their attention to their right to appeal the decision and set out the appeal procedures to be followed.

11.6 Structure of the Proposed EIR

To avoid the EIA being excessively long and cumbersome, whilst meeting the content requirements specified in the EIA Regulations 2014 (as amended), the final reports will be divided into a number of volumes indicated in Table 11.2.

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Table 11.2: Report volumes generated during the EIA Process for the proposed Aquaponics development.

Volume Number	Report	Contents
1	**Scoping Report**	As per the Final Scoping Report.
2	**Environmental Impact Assessment Report (EIA Report)**	**Introduction:** Detail of the environmental assessment practitioner who compiled the report and expertise of the EAP to carry out an environmental impact assessment **Description of the Project:** A description of the property on which the activity is to be undertaken, the location of the activity on the property and a description of the types of activities that are proposed for the development. **Description of the Affected Environment:** The natural environment, socio-economic environment and the legal, policy and planning setting. **The Public Participation Process:** Steps undertaken in order to notify and involve I&APs, advertisements, meetings held, issues and comments. **Summary of Issues and Response Trail:** Summary of comments and issues raised by I&APs and responses to the issues. **Summary of Specialist Reports:** Summary of the findings and recommendations of all specialist studies. **Alternatives Considered:** Description of all alternatives considered in the EIA, initial screening of alternatives, description and comparative assessment of all alternatives identified during the EIA. **The Significance of Potential Environmental Impacts:** The methodology used to determine the significance of environmental impacts, the impacts on the natural environment and the impacts on the socio-economic environment. **Environmental Impact Statement:** A summary of the key findings of the EIA and a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives. **Conclusions:** An opinion as to whether the activity should or should not be authorised and any conditions that should be made in respect to any form of authorisation.
3	**Specialist Studies**	This volume will be a compilation of all the specialist studies undertaken in the EIA, and will include an Aquatic Assessment.
4	**Environmental Management Programme Report (EMPr)**	**Introduction:** The details of the EAP who prepared the EMPr, the expertise of the EAP who prepared the EMPr and a detailed description of the aspects of the activity covered by the EMPr. **Mitigation Measures and Actions:** Planning and design, pre-construction and construction activities and operational phase actions to be undertaken. **Responsibilities:** Persons responsible and time periods for implementation. **Monitoring Programme**

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12. RECOMMNEDATIONS AND CONCLUSIONS

12.1 Activity and Possible Impacts

The study site for the proposed aquaponics development consists of approximately 430 Ha of unimproved land. The proposed large-scale aquaponics development will be based on the establishment of multiple 0.5 Ha multi-span greenhouse type tunnel systems in which Mozambique Tilapia (*Oreochromis* mossambicus) will be farmed in combination with various vegetable and related crops, as well as field agriculture.

The aquaponics development is also expected to include facilities for brood stock, hatchery, grow out (greenhouse type tunnels), slaughtering or processing, and support facilities such as laboratories, offices, storerooms, workshops, and feed stores. Associated bulk infrastructure and services (water supply, electrical supply, access roads, wastewater treatment or removal and solid waste management) will also need to be established.

The establishment of the proposed development raises various issues pertaining to:

- Environmental policy;
- Built environment;
- Terrestrial environment;
- Aquatic environment;
- Socio-Economic environment;
- Health and safety;
- Heritage and palaeontological environment; and
- Rehabilitation and maintenance.

These key issues are to be comprehensively addressed and assessed during the general EIA assessment as well as according to the ToR developed for the specialist assessment during the EIA phase.

12.2 Fatal flaws

The proposed development may have the following potential fatal flaws, unless the CDC can resolve these issues before the final EIR is submitted:

- **Water supply** – should the water supply alternatives proposed in Chapter 4 of this report not be feasible, the proposed development may be fatally flawed as water supply is a critical component of any aquaponics development. The two water supply alternatives include:
    - CDC to reach an agreement with the existing water users of the Mthatha Dam in order to amend their existing water use licenses to create a surplus supply for the application for water abstraction from the Mthatha Dam (as per Section 21 of the NWA (no.36 of 1998)); and
    - KSDLM to expand the municipal water reticulation network.
- **Waste water discharge -** should the waste water discharge alternatives proposed in Chapter 4 of this report not be feasible, the proposed development may be fatally flawed as waste management is an important component of any aquaponics development. The two waste water discharge alternatives include:
    - Irrigation of wastewater outside of the Mthatha Dam catchment; and
    - Municipal sewer reticulation connection.

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The CDC are currently in negotiations with the relevant stakeholders to resolve the above mentioned issues and these alternatives (and their feasibility) will need to be further assessed during the EIA phase.

12.3 Recommendations

It is recommended that the following activities form part of the EIA phase:

- Public Participation: public meetings, focus group meetings, public review of documentation;
- Consultation with I&APs regarding possible significance of impacts and suitable mitigation measures;
- Evaluation of impacts prior to mitigation;
- Compilation of practicable and effective mitigation measures;
- Evaluation of impacts after mitigation;
- Provision of an opinion as to whether or not the activity should be authorised;
- Compilation of an environmental impact statement; and
- Compilation of a Draft EMPr.

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APPENDIX A: CURRICULUM VITAE OF THE EAP

Profile – Personal Details	
Name	**Alan Robert Carter**
Location	**East London, Eastern Cape Province**

Comparable Projects
Environmental Impact Assessment, Feasibility and Pre-feasibility Assessments • Managed numerous projects and prepared environmental impact assessment (EIA) reports in terms of relevant EIA legislation and regulations for development proposals including: Infrastructure projects: bulk water and waste water, roads, electrical, mining, ports, aquaculture, renewable energy (solar and wind), industrial processes, housing developments, golf estates and resorts, etc. (2002 – present). • Projects have also included preparation of applications in terms of other statutory requirements, such as water-use and mining licence /permit applications. • Managed projects to develop pre-feasibility and feasibility assessments for various projects, including various tourism developments, infrastructure projects, etc. • Managed project for the East London Industrial Development Zone (ELIDZ) to develop a Conceptual Framework for a Mariculture Zone within the ELIDZ (2009). • Managed pre-feasibility study to establish a Mariculture Zone within the Coega Industrial Development Zone (2014). • Assisted City of Johannesburg in the process to proclaim four nature reserves in terms of relevant legislation (2015-2016). • Acted as Environmental Control Officer (ECO) for numerous projects including solar and wind farms, roads, industrial processes, etc. **Strategic Environmental Assessment** • Managed Strategic Environmental Assessment (SEA) project toward the development of a Biofuel Industry in the Eastern Cape Province of South Africa (2014-2016) • Managed Strategic Environmental Assessment (SEA) projects for two South African ports (2006 – 2007). • Managed Strategic Environmental Assessment (SEA) projects for five (5) local municipalities in the Eastern Cape as part of the municipal Spatial Development Framework plans (2004 – 2005). • Involved in the financial assessment of various land-use options and carbon credit potential as part of a larger Strategic Environmental Assessment (SEA) for assessing forestry potential in Water Catchment Area 12 in the Eastern Cape of South Africa (2006). **Climate change, emissions trading and renewable energy** • Participated in the development of a web-based Monitoring & Evaluation (M&E) system for climate change Mitigation and Adaptation in South Africa for National Department of Environmental Affairs (DEA) (2015-2016. • Managed project to develop a Climate Change Strategy for Buffalo City Metro Municipality (2013). • Managed projects to develop climate change strategies for two district municipalities in the Eastern Cape Province (2011).

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- Conducted specialist carbon stock and greenhouse gas emissions impact and life cycle assessment as part of the Environmental, Social and Health Impact Assessment for a proposed sugarcane to ethanol project in Sierra Leone (2009 - 2010) and a proposed Jatropha bio-diesel project in Mozambique (2009 - 2010).
- Managed project to develop the Eastern Cape Province Climate Change Strategy (2010).
- Managed project to develop a Transnet National Ports Authority Climate Change Risk Strategy (2009)
- Participated in a project to develop a Renewable Energy roadmap for the East London Industrial Development Zone (ELIDZ) (2013).
- Participated in a project for the East London Industrial Development Zone (ELIDZ) and Eastern Cape Government to prepare a Renewable Energy Strategy (2009).
- Contributed to the development of Arthur Andersen LLP's International Climate Change and Emissions Trading Services (2001).
- Conducted carbon credit (Clean Development Mechanism - CDM) feasibility assessment for a variety of renewable energy projects ranging from biogas to solar PV.
- Participated in the preparation of CDM applications for two solar PV projects in the Eastern Cape.

Waste Management

- Managed project to develop Integrated Waste Management Plans for six local municipalities on behalf of the Sarah Baartman District Municipality in the Eastern Cape Province (2016).
- Managed project to develop Integrated Waste Management Plans for four local municipalities on behalf of Alfred Nzo District Municipality in the Eastern Cape Province (2015).
- Managed project to develop Integrated Waste Management Plans for eight local municipalities on behalf of Chris Hani District Municipality in the Eastern Cape Province (2011).
- Managed a project to develop a zero-waste strategy for a community development in the Eastern Cape Province (2010).
- Managed waste management status quo analysis for a District Municipality in the Eastern Cape Province (2003).
- For three consecutive years, managed elements of the evaluation of the environmental financial reserves of the three largest solid waste companies (Waste Management, Inc., Republic Services, Inc., Allied Waste, Inc.) and number of smaller waste companies in the USA as part of the annual financial audit process for SEC reporting purposes. Ensured compliance with RCRA and CERCLA environmental regulations.
- Managed elements of the evaluation of the environmental financial reserves of the largest hazardous waste company in the USA (Safety-Kleen, Inc.), as part of the audit process for SEC reporting purposes. Ensured compliance with RCRA and CERCLA environmental regulations.

Environmental Due Diligence and Business Risk

- Conducted environmental due diligence projects on behalf of the German Development Bank for a forestry pulp and paper operation in Swaziland (2010) and for a large diversified South African agricultural/agro-processing company (2011)
- Managed project for the Transnet National Ports Authority to identify the environmental risks and liabilities associated with the operations of the Port of Durban as part of a broader National initiative to assess business and financial risks relating to environmental management (2006).
- Managed project to determine the financial feasibility of various proposed tourism developments for the Kouga Development Agency in the Eastern Cape Province (2006)
- Contributed significantly to a study to determine the financial and environmental feasibility of three proposed tourism development projects at Coffee Bay on the Wild Coast (2004).
- Conducted sustainability and cost/benefit analysis of various waste water treatment options

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(including a marine pipeline at Hood Point) for the West Bank of East London (2004).

- Conducted analysis of permit fees and application processing costs for off-road vehicle use on the South African coastline for the Department of Environmental Affairs and Tourism, Marine & Coastal Management (2003).
- Involved in the determination of the historical cost element of environmental remediation insurance claims for a number of multinational companies, including Dow Chemicals, Inc. and International Paper, Inc.
- Evaluated the environmental budgeting process of the US Army and provided best practice guidance for improving the process.

Policy and Guidelines

- Managed project to develop a Coastal Management Programme for Amathole District Municipality, Eastern Cape (2015 – 2016).
- Managed project to develop a sustainability diagnostic report as part of the development of the Eastern Cape Development Plan and Vision 2030 (2013)
- Managed project for the Department of Environmental Affairs and Tourism, Marine & Coastal Management to determine the cost implications associated with the implementation of the Integrated Coastal Management Act (2007).
- Managed project to develop a Conservation Plan and Municipal Open Space System (MOSS) for Buffalo City Municipality (2007)
- Managed project to develop a Sanitation Policy and Strategy for Buffalo City Municipality, Eastern Cape (2004 – 2006).
- Managed project to develop an Integrated Environmental Management Plan and Integrated Coastal Zone Management Plan for Buffalo City Municipality, Eastern Cape (2004 – 2005).
- Managed projects to develop and implement an Environmental Management System (EMS) for the Chris Hani and Joe Gqabi (formerly Ukhahlamba) District Municipalities in the Eastern Cape generally in line with ISO14001 EMS standards (2004 – 2005).
- Managed project to develop a State of the Environment Report and Environmental Implementation Plans for Amathole, Chris Hani, OR Tambo and Joe Gqabi District Municipalities in the Eastern Cape Province (2005 – 20010).
- Conducted analysis of permit fees and application processing costs for off-road vehicle use on the South African coastline for the Department of Environmental Affairs and Tourism, Marine & Coastal Management (2003).

Environmental auditing and compliance

- Managed project to develop an Environmental & Social Management System (ESMS) in line with IFC Performance Standards for a wind farm in South Africa (2015)
- Managed project to develop an Environmental & Social Management System (ESMS) in line with IFC Performance Standards for a telecoms company in Zimbabwe on behalf of the German Development Bank (2013)
- Participated in numerous ISO14001 Environmental Management System (EMS) audits for large South African corporations including SAPPI, BHP Billiton, SAB Miller, Western Platinum Refinery, Dorbyl Group and others (2002 – present).
- Reviewed the SHE data reporting system of International Paper, Inc. (IP) for three successive years as part of the verification of the IP SHE Annual Report, which included environmental assessments of 12 IP pulp and paper mills located throughout the USA.
- Conducted Environmental Management System (EMS) reviews for a number of large US corporations, including Gulfstream Aerospace Corporation

Public financial accounting

- While with Ernst & Young LLP, (USA), functioned as lead financial auditor for various public and

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private companies, mostly in the technology business segment of up to $200 million in annual sales. Client experience included assistance in a $100 million debt offering, a $100 million IPO and SEC annual and quarterly reporting requirements.

- Completed three years of articles (training contract) in fulfilment of the certification requirements of the South African Institute of Chartered Accountants which included auditing, accounting and preparation of tax returns for many small to medium sized commercial entities.

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APPENDIX B: SACNASP & EAPSA REGISTRATION

The Interim Certification Board

for

Environmental Assessment Practitioners
of
South Africa

Alan Robert Carter

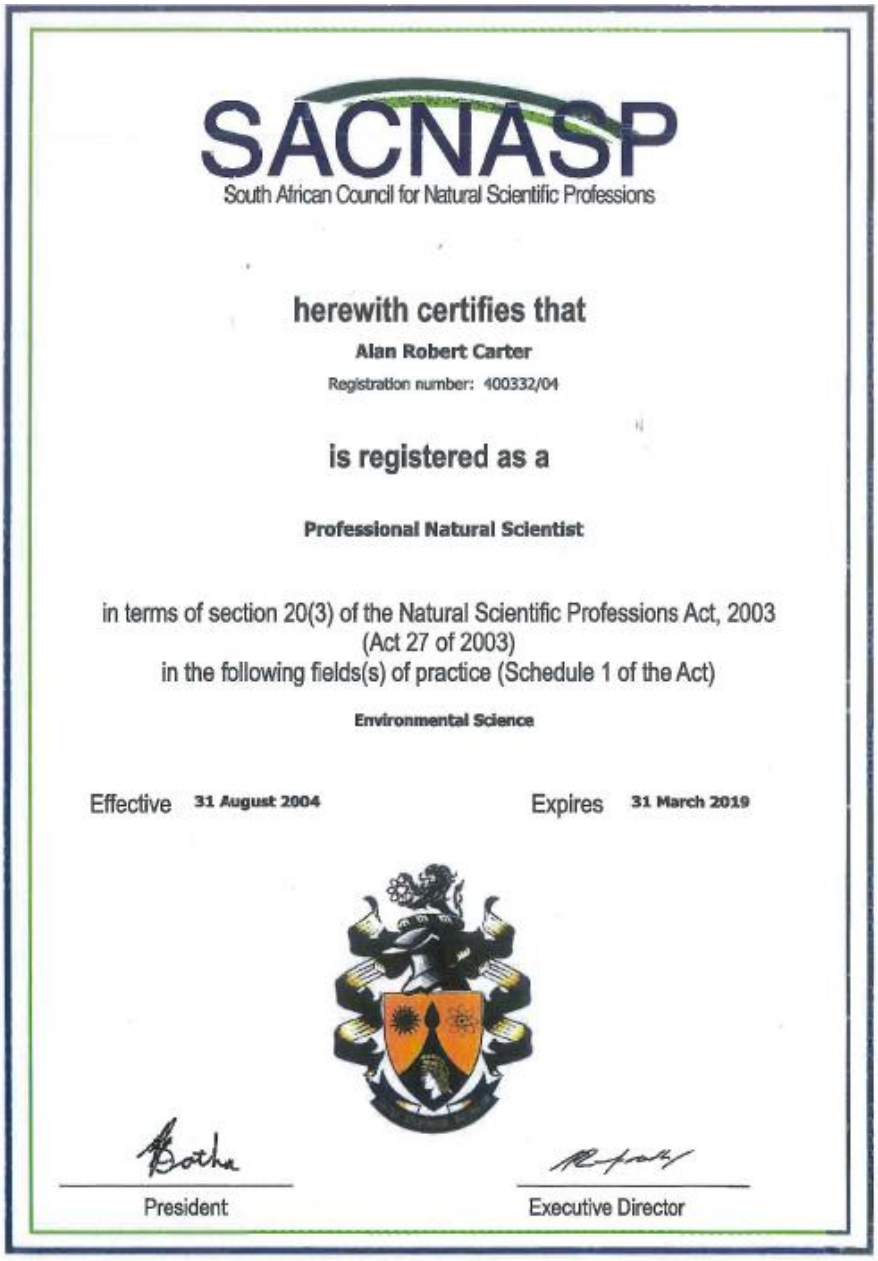
was certified as an

ENVIRONMENTAL ASSESSMENT PRACTITIONER

on this 1st day of March 2012

Chairperson

Secretary



SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Alan Robert Carter

Registration number: 400332/04

is registered as a

Professional Natural Scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following fields(s) of practice (Schedule 1 of the Act)

Environmental Science

Effective **31 August 2004** Expires **31 March 2019**

President

Executive Director

APPENDIX C: PUBLIC PARTICIPATION MATERIAL

C-1: Newspaper Advert
C-2: Onsite Notice
C-3: I&AP Notification Letter
C-4: Background Information Document
C-5: Proof of Notification
C-6: I&AP database
C-7: Public Meeting Minutes

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C-1: Newspaper Advert

A newspaper advert for the proposed Aquaponics development will be placed in the local Daily Despatch Newspaper at the start of the public review period. Proof of placement will be provided in the Final Scoping Report.

CES

ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT (EIA)
PROPOSED WILDCOAST SEZ UPPER NCISE AQUAPONICS DEVELOPMENT, MTHATHA DAM, WITHIN THE OR TAMBO DISTRICT MUNICIPALITY.

Notice is hereby given in terms of Regulation 41(2) published in Government Notice No. R 982 under Chapter 5 of the National Environmental Management Act (No. 107 of 1998; NEMA) of the intent to submit an application for environmental authorisation and waste license to the National Department of Environmental Affairs (DEA).

Proponent, Activities and Location:

The Coega Development Corporation (CDC) is proposing to develop the Wild Coast Special Economic Zone (SEZ) in the Upper Ncise area within the OR Tambo District Municipality. CDC is proposing to develop an aquaponics zone along with associated infrastructure. including multiple 0.5 ha multi-span greenhouse type tunnel systems. Mozambique Tilapia (*Oreochromis mossambicus*) will be farmed in combination with vegetable and crops, as well as field agriculture.

NEMA Listed Activities: A full Scoping and EIA process is triggered by the following listed activities:

- **LISTING NOTICE 1: 3(iii); 6(ii); 9(i)(ii); 13; 19 (i); 24 (ii); 26; 28 (ii)**
- **LISTING NOTICE 2: 15**
- **LISTING NOTICE 3: 2(b)(ii)(iii)(bb)(dd); 4(b)(ii)(aa)(cc)(ee); 12(a)(iv); 13(b)(ii)(iii)**

The process will also include a Water Use License Application as regulated by the National Water Act (Act No. 36 of 1998; NWA), and a Waste Management License (WML) as regulated by GN R 921 of the National Environmental Management: Waste Act (Act No. 59 of 2008; NEMWA). Applicable waste management activities will be applied for and assessed through an integrated (single) full Scoping and EIA process.

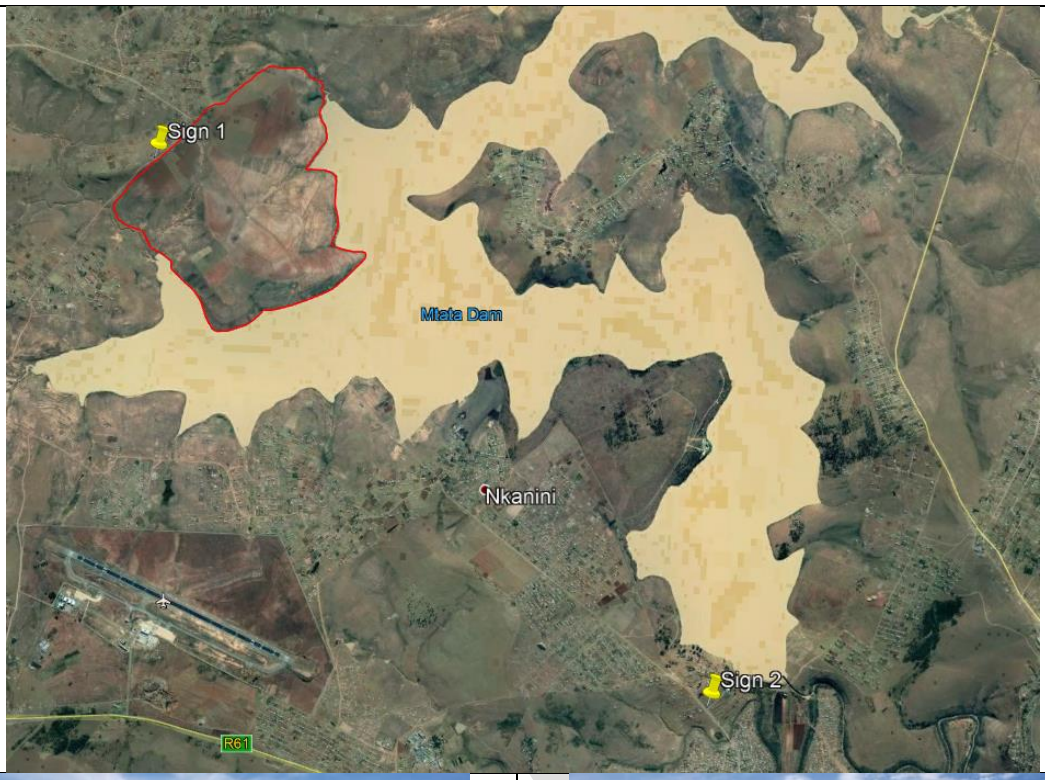
CES has been appointed as the Environmental Assessment Practitioner (EAP) to undertake the EIA for the proposed Wildcoast SEZ Upper Ncise aquaponics zone.

For more information, registration as an I&AP or submission of written comments contact by post, phone, fax or e-mail:

Contact details: Ms Caryn Clarke; PO Box 8145, East London, 5241;
Tel: 043 726 7809/8313; Fax: 043 726 8352;
E-mail: c.clarke@cesnet.co.za

C-2: Onsite Notices

Three onsite sign board notices both in English and Xhosa were placed at two (2) different locations surrounding the proposed site. Sign 1 was placed adjacent to the proposed development, and Sign 2 was placed at the entrance to the Luchaba Nature Reserve and Mthatha Dam.



Sign 1 Coordinates: 31°30'11.59"S; 28°40'9.68"E

Sign 2 Coordinates: 31°33'13.10"S; 28°44'5.03"E

C-3: I&AP Notification Letter

November 2018

Dear Stakeholder

NOTICE: PROPOSED WILDCOAST SEZ UPPER NCISE AQUAPONICS DEVELOPMENT, MTHATHA DAM, WITHIN THE OR TAMBO DISTRICT MUNICIPALITY.

Proponent: The Coega Development Corporation (CDC) is proposing to develop the Wildcoast Special Economic Zone (SEZ). The Upper Ncise area has been identified as a preferred site and the CDC are proposing to develop an aquaponics zone and associated service infrastructure, to be located along the banks of the Mthatha Dam within the OR Tambo District Municipality. The CDC have appointed CES as the Environmental Assessment Practitioner (EAP).

Activity: The proposed large-scale aquaponics development will be based on the establishment of multiple 0.5 ha multi-span greenhouse type tunnel systems in which Mozambique Tilapia (*Oreochromis mossambicus*) will be farmed in combination with various vegetable and related crops, as well as field agriculture. The aquaponics development is also expected to include facilities for brood stock, hatchery, grow out (greenhouse type tunnels), slaughtering or processing, and support facilities such as laboratories, offices, storerooms, workshops, and feed stores.

This letter of notification serves to inform you, in terms of Regulation 54 of the Regulations published in Government Notice No. R 982 under Chapter 6 of the National Environmental Management Act (Act 107 of 1998; NEMA), as amended, of the intention to carry out a full Scoping and EIA Report for the proposed Wildcoast SEZ Upper Ncise aquaponics development for approval by the authorities of the Department of Environmental Affairs (DEA).

The process will also include a Water Use License Application as regulated by the National Water Act (Act No. 36 of 1998; NWA), and a Waste Management License (WML) as regulated by GN R 921 of the National Environmental Management: Waste Act (Act No. 59 of 2008; NEMWA) Applicable waste management activities will be applied for and assessed through an integrated (single) full Scoping and EIA process.

As a stakeholder, your involvement in the public participation process is vital and it is very important for us, as the EAP, to maintain an open and inclusive channel of communication with you.

Public Participation: A critical element of the Environmental Impact Assessment (EIA) is the Public Participation Process (PPP). The objective is to contact, notify and inform as many stakeholders and members of the community, who may be interested and/or affected by the proposed interchange construction, so that any such party may fully participate in, interact with and inform the EIA process.

It would be greatly appreciated if you would provide us with the contact details of any other person(s) you are aware of, that would be interested in or affected by this development.

For more information, registration as an Interested and Affected Party (I&AP), or submission of written comments, please contact us within 30 days of this notice using the phone, fax, post or email details provided below:

CES
Attn: Caryn Clarke
PO Box 8145, Nahoon
East London, 5241

Tel: 043 726 7809
Fax: 043 726 8352
E-mail**: c.clarke@cesnet.co.za**

I look forward to hearing from you.

Kind regards,

Caryn Clarke

C-4: Background Information Document

ENVIRONMENTAL IMPACT ASSESSMENT: PROPOSED WILDCOAST SEZ UPPER NCISE AQUAPONICS DEVELOPMENT, THE OR TAMBO DISTRICT MUNICIPALITY.

BACKGROUND INFORMATION DOCUMENT (BID) & INVITATION TO COMMENT

Return address for comments:

Caryn Clarke

CES

25 Tecoma Street,
Berea, East London, 5214
P.O Box 8145,
Nahoon, East London, 5241
Tel: (043) 726 7809
Fax: (043) 726 8352
Email: c.clarke@cesnet.co.za

AIM OF THIS DOCUMENT

The purpose of this document is to ensure that **people that are interested in** or **affected by the proposed project** are **provided with information about the proposal, the process being followed** and **provided with an opportunity to be involved** in the Environmental Impact Assessment (EIA) process for proposed Wildcoast SEZ Upper Ncise aquaponics development, to be located along the banks of the Mthatha Dam, within the O.R Tambo District Municipality.

Registering as an **Interested and/or Affected Party** (I&AP) allows individuals or groups the opportunity to **contribute ideas, issues, and concerns relating to the project**. I&APs also have an opportunity to **review all of the reports and submit their comments** on those reports. All of the comments that are received will be included in the reports that are submitted to the Competent Authority (CA).

THE PROPONENT

The Coega Development Corporation (CDC) is proposing the development of the Wildcoast Special Economic Zone (SEZ). The Upper Ncise area has been identified as a preferred site where the CDC are proposing to develop an aquaponics zone and associated service infrastructure, to be located along the banks of the Mthatha Dam within the O.R Tambo District Municipality. The CDC have appointed CES as the project Environmental Assessment Practitioner (EAP).

THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

CES was established in 1990 as a specialist environmental consulting company and has considerable experience in terrestrial, marine and freshwater ecology, the Social Impact Assessment (SIA) process, State of Environment Reporting (SOER), Integrated Waste Management Plans (IWMP), Environmental Management Programme (EMPr), Spatial Development Frameworks (SDF), public participation, as well as the management and co-ordination of all aspects of the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) processes. EOH CES has been active in all of the above fields, and in so doing have made a positive contribution towards environmental management and sustainable development in the Eastern Cape, South Africa and many other African countries. We believe that a balance between development and environmental protection can be achieved by skilful, considerate and careful planning.

THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

According to the EIA regulations (2014 as amended) promulgated under the National Environmental Management Act (NEMA) (Act No.107 of 1998; NEMA) the potential impacts on the environment will have to be assessed in terms of the listed activities. The proposed Wildcoast SEZ Upper Ncise aquaponics development triggers listed activities (Table 1 below) in terms of the NEMA EIA Regulations (2014, as amended) as per Listing Notices 1, 2, and 3, and as such requires the completion of a **Full Scoping and EIA Report** to be undertaken in accordance with Regulation 6 of the EIA Regulations (2014, as amended). The competent authority for this application will be the National Department of Environmental Affairs (DEA).

Table 1: Listed Activities which require Environmental Authorisation for the proposed development

LISTING NOTICE 1: ***Activities require a Basic Assessment***	
3(iii)	The development and related operation of facilities or infrastructure for the slaughter of animals with a product throughput of fish, crustaceans and amphibians with a wet weight product throughput of 20 000 kg per annum.
6(ii)	The development and related operation of facilities, infrastructure or structures for aquaculture of finfish, crustaceans, reptiles or amphibians, where such facility, infrastructure or structures will have a production output exceeding 20 000 kg per

	annum (wet weight).
9(i)(ii)	The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water with an internal diameter of 0,36 metres or more; or with a peak throughput of 120 litres per second or more.
13	The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of Activity 16 in Listing Notice 2 of 2014.
19(i)	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.
24(ii)	The development of a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres.
26	The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2000 cubic metres but less than 15000 cubic metres.
28(ii)	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.
LISTING NOTICE 2: Activities require a Full Scoping and EIA	
15	The clearance of an area of 20 hectares or more of indigenous vegetation.
LISTING NOTICE 3: *Activities require a Basic Assessment*	
2(b)ii;iii(bb)(dd)	The development of reservoirs for bulk water supply with a capacity of more than 250 cubic metres in Eastern Cape in a protected area identified in terms of NEMPAA, excluding conservancies; outside urban areas, in sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.
4(b)ii(aa)(cc)(ee)	The development of a road wider than 4 metres with a reserve less than 13,5 metres in Eastern Cape outside urban areas, in protected area identified in terms of NEMPAA, excluding disturbed areas; sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.
12(a)iv	The clearance of an area of 300 square metres or more of indigenous vegetation. (a) In Eastern Cape, Free State, Gauteng, Limpopo, North West and Western Cape provinces on land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.
13(b)ii;iii	The development and related operation of facilities of any size for any form of aquaculture in Eastern Cape in a Protected Area identified in the NEMPAA; or areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined.
GN R 921 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT (ACT NO. 59 OF 2008; NEMWA)	

GN R 921 of the National Environmental Management: Waste Act (Act No. 59 of 2008; NEMWA) details waste management activities that have, or are likely to have a detrimental effect on the environment. Should a Waste Management License (WML) be required, this will be applied for and assessed through an integrated (single) full Scoping and EIA process. The potential waste management activities that may be applicable are detailed below:

A1: The storage of general waste in lagoons;
A2: The sorting, shredding, grinding, crushing, screening or bailing of with general waste at a facility that has an operational area in excess of 1000 m^2;
A3: The recycling of general waste at a facility that has an operational area in excess of 500 m^2, excluding recycling that takes place as an integral part of an manufacturing process within the same premises;
A6: The treatment of general waste using any form of treatment at a facility that has the capacity to process in excess of 10 tons but less than 100 tons;
A7: The disposal of inert waste to land in excess of 25 tons but not exceeding 25 000 tons, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation;
A10: The disposal of general waste to land covering an area of more than 50m^2 but less than 200 m^2 and with a total capacity not exceeding 25 000 tons;
A11: The disposal of domestic waste generated on premises in area not serviced by the municipal service where waste disposed exceeds 500 kg per month;
A12: The construction of a facility for a waste management activity listed in Category A of this Schedule;
B8: The disposal of general waste to land covering an area of more than 200 m^2 and with a total capacity exceeding 25 000 tons; and
C1: The storage of general waste at a facility that has the capacity to store in excess of 100m^3 of general waste at any one time, excluding the storage of waste in lagoons or temporary storage of such waste.

SECTION 21 OF THE NATIONAL WATER ACT (ACT NO. 36 OF 1998)

A Water Use Licence Application (WULA) will need be submitted to the Department of Water and Sanitation (DWS), in terms of Section 21 of the National Water Act (Act no. 36 of 1998), for the following potential activities:

(a) Taking water from a water resources;
(b) Storing water;
(c) Impeding or diverting the flow of water in a water course;
(f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
(g) Disposing of waste in a manner which may detrimentally impact on a water resource; and
(i) Altering the bed, banks, course or characteristics of a watercourse.

APPROACH TO THE EIA PROCESSES

The EIA process required for the proposed Wildcoast SEZ Upper Ncise aquaponics development, is a **Full Scoping and EIA Report**. The illustration below indicates where we are currently in the EIA process:

FULL SCOPING AND EIA PROCESS

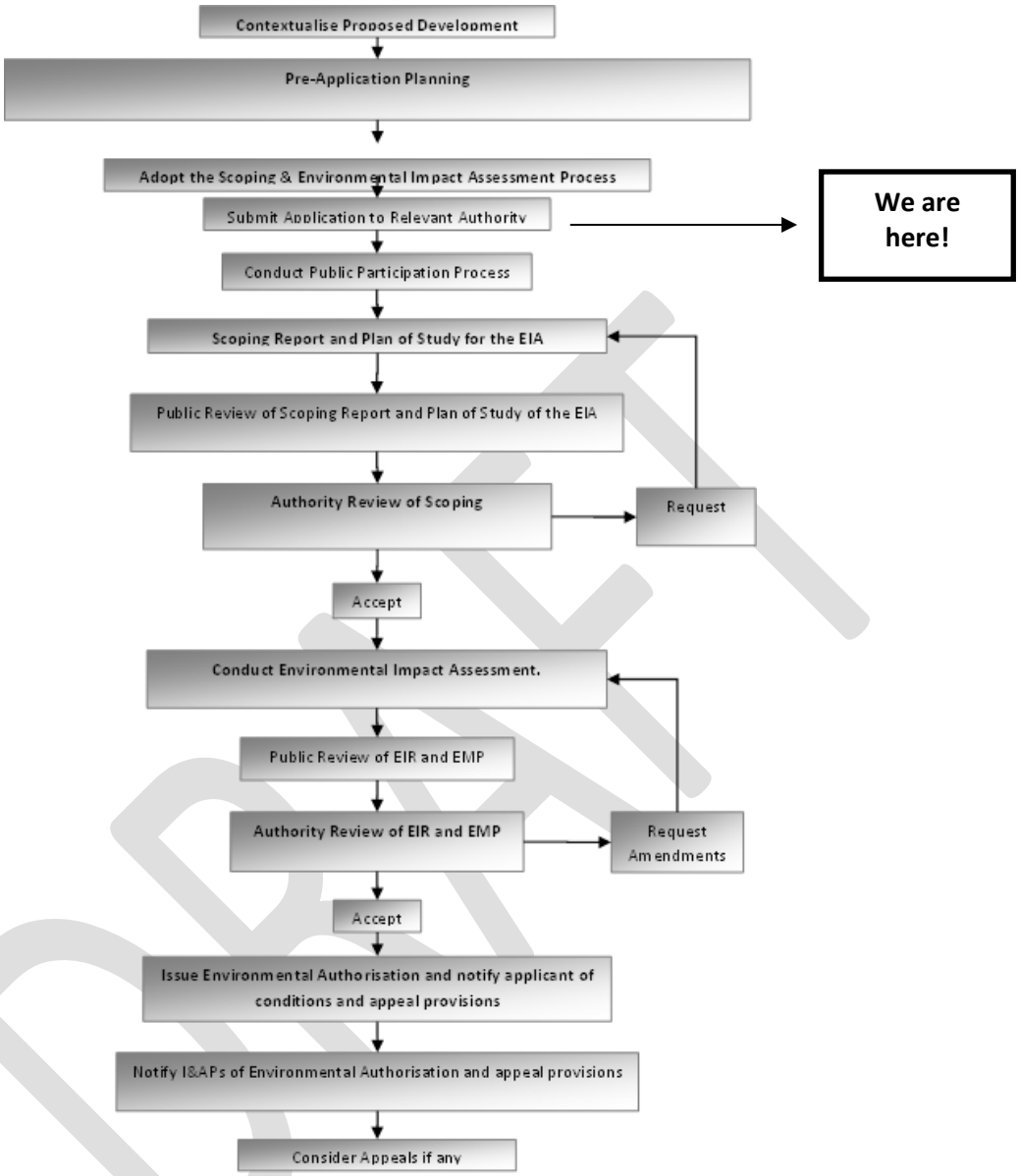


Figure 1. Process of the Environmental Impact Assessment (EIA)

DRAFT

PROJECT DESCRIPTION

The proposed large-scale aquaponics development will be based on the establishment of multiple 0.5 ha multi-span greenhouse type tunnel systems in which Mozambique Tilapia (*Oreochromis mossambicus*) will be farmed in combination with various vegetable and related crops, as well as field agriculture. The aquaponics development is also expected to include facilities for brood stock, hatchery, grow out (greenhouse type tunnels), slaughtering or processing, and support facilities such as laboratories, offices, storerooms, workshops, and feed stores.

Associated bulk infrastructure and services (water supply, electrical supply, access roads, wastewater treatment or removal and solid waste management) will also need to be established.

POTENTIAL IMPACTS AND BENEFITS

CES will assess the impacts of the proposed activity on the environment. Impacts will be assessed for various alternatives; including the preferred alternative and the "No-Go" alternative. Impacts will be assessed for the planning and design phase, construction phase and operational phase.

HOW CAN YOU BE INVOLVED?

A Public Participation Process (PPP) is being conducted as part of the EIA process for the proposed Wildcoast SEZ Upper Ncise aquaponics development. The aim of the PPP is to allow everyone who is interested in, or likely to be affected by the proposed development to provide input into the process.

The Public Participation Process includes:

- Advertisement in the Daily Dispatch;
- On-site signage;
- Circulation of the BID *(this document)* to all identified I&APs and stakeholders;
- Commenting period;
- Review of the reports by all registered I&APs and stakeholders; and
- A public meeting.

If you consider yourself an interested and/or affected person/party, it is important that you become and remain involved in the PPP. In order to do so, please follow the steps below in order to ensure that you are continually informed of the project developments and will ensure your opportunity to raise issues and concerns pertaining to the project.

STEP 1: Please register by responding to our notification and invitation, with your name and contact details (details provided on cover page and below). As a registered I&AP, you will be informed of all meetings, report reviews and project developments throughout the EIA process.

STEP 2: Register by returning the slip at the back of this document to EOH CES.

STEP 3: Attend any meetings that may be held during the EIA process. As a registered I&AP, you will receive an invitation to attend such meetings.

CES is required to engage with all private and public parties that may be interested and/or affected by the proposed interchange construction, in order to distribute information for review and comment in a transparent manner.

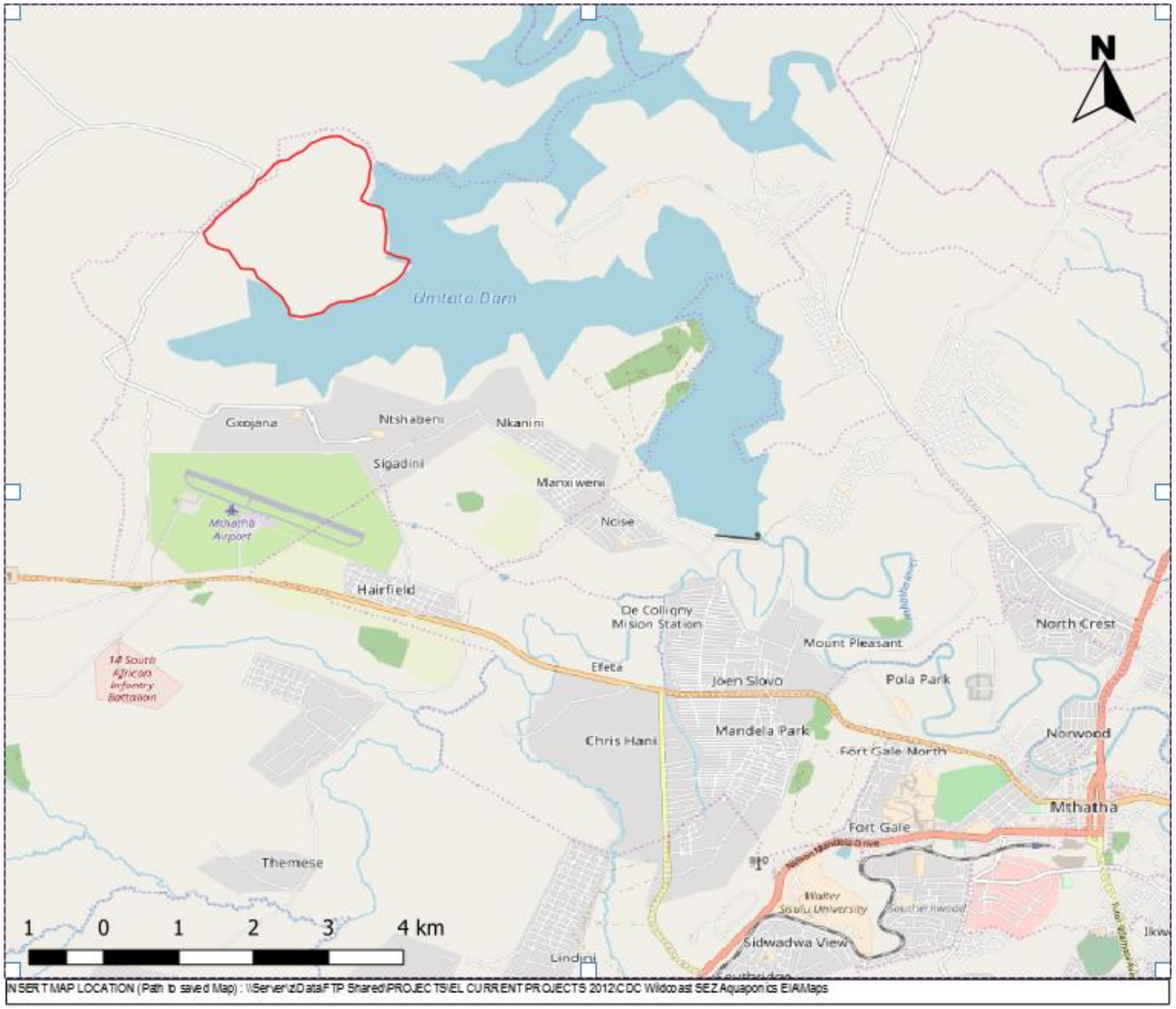
In the same light, it is important for I&APs to note the following:

1. In order for CES to continue engaging with you, please **ENSURE** that you register on our database by contacting the person below.
2. As the EIA process is regulated by specific review and comment timeframes, it is your responsibility to submit your comments within these timeframes.

Please send your enquiries and/or comments to:

Ms. Caryn Clarke
25 Tecoma Street, Berea, East London, 5214
P.O Box 8145, Nahoon, East London, 5241
Tel: (043) 726 7809/8313
Fax: (043) 726 8352
Email: c.clarke@cesnet.co.za

DRAFT



INSERT MAP LOCATION (Path to saved Map) : \\Server\z\Data\FTP Shared\PROJECTS\EL CURRENT PROJECTS 2012\CDC Wildcoast SEZ Aquaponics EIA\Maps

EOH

Drawn by: C.Clarke

Date: October 2018

EOH Project Code: P40700336

1:50003

TITLE

Locality Map

PROJECT

Wildcoast SEZ Upper Ncise Aquaponics Development

Legend

Aquaponics study area

Datum: WGS84

Produced for: Coega Development Corporation

I hereby wish to register as an Interested and Affected Party (I&AP) for the proposed Wildcoast SEZ Upper Ncise aquaponics development within the O.R Tambo District Municipality of the Eastern Cape Province.

Name & Surname:

Organisation:

Postal Address:

Email:

Phone #:

Fax #:

My initial comments, issues or concerns are:

Other individuals, stakeholders, organisations or entities that should be registered are:

Name & Surname:

Organisation:

Postal address:

Contact details:

Please return details to: **Caryn Clarke**: P.O. Box 8145, Nahoon, East London, 5241

Telephone: (043) 726 7809 | Fax: (043) 726 8352 | Email: c.clarke@cesnet.co.za

C-5: Proof of Notification

EIA Notification: Proposed Upper Ncise Aquaponics Development

Caryn Clarke <c.clarke@cesnet.co.za>

COEGA CDC Aquaculture EIA

Sent: Tue 2018/12/11 04:14 PM

To: 'sizakele.gabula@deaet.ecape.gov.za'; 'Namhla.Libalele@drdlr.gov.za'; 'Nomkhitha.Zokufa@drdlr.gov.za'; 'BNcube@environment.gov.za'; 'sizakele.gabula@deaet.ecape.gov.za'; 'qondile.paliso@dedea.gov.za'; 'StanleyT@environment.gov.za'; 'pmakitla@environment.gov.za'; 'tzungu@environment.gov.za'; 'MgcaN@dws.gov.za'; 'NdunaM@dws.gov.za'; 'BlesiH@dws.gov.za'; 'Xotyeni@dws.gov.za'; 'FourieL4@dws.gov.za'; 'MabuleR@daff.gov.za'; 'HettieB@daff.gov.za'; 'smokhanya@ecphra.org.za'; 'shane.gertze@ecpta.co.za'; 'Nobusika.Makeleni@ecpta.co.za'; 'Vuyani.Mapiya@ecpta.co.za'; 'Eleanor.VanDenBerg-McGregor@ecpta.co.za'; 'Dean.Peinke@ecpta.co.za'; 'sibulele.msindo@dot.ecprov.gov.za'; 'Andre.Devries@dot.ecprov.gov.za'; 'phumza.edi@drdlr.gov.za'; 'zukile.pityi@drdlr.gov.za';

Cc: 'David.Lefutso@coega.co.za'; 'Simphiwe.Silwana@coega.co.za'; 'Akhona.Ganuganu@coega.co.za'; a.hunter@cesnet.co.za

Message | BID_CDC Aquaponincs.pdf (703 KB) | Letter of Notification.pdf (564 KB)

Dear Stakeholders,

Please find attached a letter of notification as well as a Background Information Document (BID) for an Environmental Impact Assessment (EIA) that is being conducted for the Wildcoast Special Economic Zone (SEZ) Upper Ncise Aquaponics Development which is proposed to be located along the banks of the Mthatha Dam, within the King Sabata Dalindyebo Local Municipality (KSDLM) within the ORTDM of the Eastern Cape Province.

Please do not hesitate to contact me should you have any queries or concerns regarding the proposed project and EIA process.

Kind regards

CES
ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

Caryn Clarke - M.Sc., *Cand.Sci.Nat.*
Senior Environmental Consultant
CES - Environmental and social advisory services
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Tel: +27 (43) 726 7809 | Cell: +27 (72) 118 6684
c.clarke@cesnet.co.za | www.cesnet.co.za

C-6: I&AP Database

Name	Affiliation	Email address	CONTACT DETAILS	
			Phone number	Cell
Applicant				
David Lefutso	CDC	David.Lefutso@coega.co.za		
Simphiwe Silwana	CDC	Simphiwe.Silwana@coega.co.za		
Akhona Ganuganu	CDC	Akhona.Ganuganu@coega.co.za		
Viwe Biyana	CDC	Viwe.Biyana@coega.co.za		
Pepi Silinga	CDC	Pepi.Silinga@coega.co.za		
Graham Taylor	CDC	Graham.Taylor@coega.co.za		
Land Owners	**Property Description**			
S. Gabula	O.R. Tambo District Municipality	sizakele.gabula@deaet.ecape.gov.za	047 531 1191	0824614128
Ms Namhla Libalele	Department of Rural Development and Land Reform (DRDLR)- Deputy Director: ORTDM	Namhla.Libalele@drdlr.gov.za	0475325959	
Ms Nomkhitha Zokufa	DRDLR- Deputy Director: ORTDM	Nomkhitha.Zokufa@drdlr.gov.za	043 700 7020	
S.T. Makaula	Local Traditional Chief - Luxeni Ncise	_		0737117372
Siyakumisa Makaula	Luxeni Ncise	_		
H.S. Halam	Sectretary of Local Traditional Chief - Luxeni Ncise	_		0714370470
Government	**Organisation**	**Email**	**Landline**	**Cell**
Bathandwa Ncube	Department of Environmental Affairs (DEA)	BNcube@environment.gov.za	012 399 9368	
S. Gabula	Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) Regional Director ORTDM	sizakele.gabula@deaet.ecape.gov.za	047 531 1191	0824614128
Paliso Qondile	DEDEAT Regional EIM Unit Head	qondile.paliso@dedea.gov.za		071 874 8728
Tshitwamulomoni Stanley	DEA Biodiversity Conservation Unit (BCU)	StanleyT@environment.gov.za		
Portia Makitla	DEA BCU	pmakitla@environment.gov.za	012 399 9411	
Thobekile Zungu	DEA BCU	tzungu@environment.gov.za	012 399 9477	
Nombuyiselo Mgca	Department of Water and Sanitation (DWS)	MgcaN@dws.gov.za		

Mandisi Nduna	Department of Water and Sanitation (DWS)	NdunaM@dws.gov.za		
Hilton Blesi	Department of Water and Sanitation (DWS)	BlesiH@dws.gov.za		
N. Xotyeni	Department of Water and Sanitation (DWS)	Xotyeni@dws.gov.za		
Lisna fourie	Department of Water and Sanitation (DWS)	FourieL4@dws.gov.za		
R. Mabule	Department of Agriculture, Forestry and Fisheries (DAFF)	MabuleR@daff.gov.za		
B. Hettie	Department of Agriculture, Forestry and Fisheries (DAFF)	HettieB@daff.gov.za		
Sello Mokhanya	Eastern Cape Provincial Heritage Resource Agency (ECPHRA)	smokhanya@ecphra.org.za		
	South African Heritage Resource Agency (SAHRA)			
Shane Gertze	Eastern Cape Parks and Tourism Agency (ECPTA)	shane.gertze@ecpta.co.za		
Nobusika Makeleni	Eastern Cape Parks and Tourism Agency (ECPTA)	Nobusika.Makeleni@ecpta.co.za		
Vuyani Mapiya	Eastern Cape Parks and Tourism Agency (ECPTA)	Vuyani.Mapiya@ecpta.co.za		
Eleanor Van Der Berg	Eastern Cape Parks and Tourism Agency (ECPTA)	Eleanor.VanDenBerg-McGregor@ecpta.co.za		
Dean Peinke	Eastern Cape Parks and Tourism Agency (ECPTA)	Dean.Peinke@ecpta.co.za		
AS Msindo	Department of Roads and Transport (DRT) ORTDM	sibulele.msindo@dot.ecprov.gov.za	0475326534	
Andre Devries	Department of Transport (Eastern Cape)	Andre.Devries@dot.ecprov.gov.za		
E.Phumza	Department of Rural Development and Land Reform (DRDLR)	phumza.edi@drdlr.gov.za		
Zukile Pityi	Department of Rural Development and Land Reform (DRDLR)	zukile.pityi@drdlr.gov.za		
Mr. S. Nogwanya	O.R. Tambo District Municipality (ORTDM) - Mayor	sibusisos@ortambo.gov.za	047 501 6400	
Lugetye Nangamso	ORTDM	nangamsol@ortambodm.gov.za		
M. Maxwell	ORTDM	maxwellm@ortambodm.org.za		
B. Siyakubonga	ORTDM	siyakubongab@gmail.com		
N. Mnyanda	ORTDM - Human Settlements	nyamekam@ortambodm.gov.za	047 501 6400	
Pax Dunywa	ORTDM - Rural Economic Development & Planning	andiswad@ortambodm.gov.za		
A. Valem	ORTDM - Water and Sanitation	info@ortambodm.gov.za	0475016400	
Mr. Mbulelo Sigaba	KSDLM Municipal Manager	ksdsec@ksd.gov.za		
A. Jordaan	KSD Local Municipality	jordaan@ksd.gov.za	047 501 4058	
Mike Merry	KSD Local Municipality	mikem@ksd.gov.za	047 501 4142	

Pamela Bongoza	KSD Local Municipality	pamelab@ksd.gov.za	047 501 4276	
S. Makaza	KSD Local Municipality	smkaza40@gmail.com	047 501 4269	
N. Nikelo	KSD Local Municipality	nikelon@ksd.gov.za	047 501 4212	
S. Mamposa	KSD Local Municipality	sonwabom@ksd.gov.za	047 501 4212	
V.N. Roji	KSDLM Ward 10 Councillor			0839511954
Z.M. Gusana	KSDLM Ward 16 Councillor			0835350126
Organs of State	**Organisation**	**Email**	**Landline**	**Cell**
M Mfaxa S	ESKOM - Distribution (Mthatha)	southern@eskom.co.za	+27 47 502 6452	
Ms Unathi Nozulu	ESKOM - Distribution (Mthatha)	southern@eskom.co.za	+27 43 703 2634	
A. Nandi	ECDC	anandi@ecdc.co.za		
Key Stakeholders	**Organisation**	**Email**	**Landline**	**Cell**
Paullin Naidoo	Mthatha Airport	paullin.naidoo@airports.co.za		
Mcebisi, Langa	Embo Farms (Pty) Ltd	nyatila15@gmail.com		
Nksosi Minenkulu	Royal House of Joyi (House of Traditional Leaders Member)	nkosijoyi1@gmail.com		735 114 839
Registered	**Address/Community**	**Email**	**Landline**	**Cell**
Pindiwe Mngini	Johannesburg			0737117372
Mandi Dwlane	Ncise Community Memebr			0832842568
Towana Mbogini	Zigadini 1			0737532356
Benneti Sbongile	Ncise A/A Lalini			0721061212
Thothi Sipho	Ncise A/A Lalini			0632846768
Tinzi Sonwabo	Siqithini Community			0785721268
Tase Zukiswa	Siqithini Community			0736342689
Tyhili Nozanga	Siqithini Community			
Tshaka Thobela	Rosedale Ward 10			0792752888
Mlanjeni Bongani	Ncambele			0718069562
K Lowigo	Ncise Community Memebr			0737969465
A Makwanda	Ncise A/A Lalini			0787172139
D Mcunga	Ncise A/A Lalini			0604191866
Andile	Ncise A/A Lalini			0762206761
Sani Manyifolo	Ncise A/A Lalini			0724369362

Tukuse Ruxwana	Ncise A/A Lalini			0834948928
N. Makaula	Luxeni Ncise			0783589576
S Landudume	Malshongwe			0787666391
N.E. Mzimane	Malshongwe			0710818355
N. Lawana	Malshongwe			0655646695
Zukile Soso	Ncise Community Memebr	zukilesodo@yahoo.com		0631056637

C-7: Public Meeting Minutes

CES
ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

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25 Tecoma Street, Berea
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Website: www.cesnet.co.za

PUBLIC MEETING MINUTES	
TITLE	CDC Wildcoast SEZ Upper Ncise Aquaponics Development
DATE	18 October 2018
VENUE	Upper Ncise Great Place
TIME OF MEETING	10H00
MINUTES BY	Lungisa Bosman
CIRCULATION DATE	Included in DSR

BACKGROUND

An EIA public meeting was held at Upper Ncise Great Place. The purpose of the meeting was to introduce the EIA process currently being conducted by EOH CES.

ATTENDEES:

See attendance register

MEETING MINUTES

A presentation was made by Mr Lefutso on the progress of the two projects for the Wildcoast SEZ. He mentioned that there are two phases to the project which are Phase 1A and Phase 1B. The EIA for the first phase (Phase 1A) which include sections of the airport is almost complete. He said the delay in the EIA process was because of two wetlands identified in the airport area but this has now been resolved. The Environmental Authorisation for the EIA will be received soon. Mr Lefutso said that a masterplan for the area is currently being developed and the area will change from being demarcated as rural to industrial. Due to the problem of wetlands in the area the project area will be reduced from 167 hectares to 107 hectares. For Phase 1B the EIA is currently being conducted by EOH CES and the process normally takes 18 months to complete. Hatch Engineers have been contracted to do the infrastructure requirements assessment.

Mr Bosman from EOH CES presented the EIA process and stated that this is the initial stage of the process. He mentioned that EOH CES is still doing different studies that will be included in the EIA. He mentioned that the proposed Aquaponics will involve a number of activities such as crop production, storage facilities and a number of tunnels for the fish. Mr Bosman stated that there will be both positive and negative impacts as a result of the proposed development. He mentioned that some of the positive impacts of the project will be:

- The proposed activity will bring much needed employment opportunities in the area.
- The activity will result is skills development in the area as people will be trained in handling fish and vegetable farming.
- The activity will result in business opportunities for people of Mthatha and surrounds.
- There will be improvement of road infrastructure as a result of the project.

Some of the negatives will be:

- Noise, Dust, Waste generation, Loss of vegetation, Ground and surface water pollution, spread of alien invasive vegetation (weeds).
- Social impacts - impact of the activity on surrounding land-uses and inhabitants.

• Visual impact. • Operational impacts may include: • Ground and surface water pollution should lack of maintenance occur	
ISSUES RAISED	
Chief Makawula: How big is the land and where are the boundaries?	The boundaries of the site start from close to the airport and affects the area which is meant for agricultural project.
The area targeted for Phase 1B is currently being used for OR Tambo DM agricultural project. Is this project not going to disturb and clash with the current project?	This will not be a problem as the EIA process itself is starting and normally take 18 months. Even after the EIA is approved there will be a process of engaging with communities before any construction can start. The community will be given an opportunity to harvest all the crops prior to any construction work.
What benefits will go to the community from this project?	There will be a beneficiation process for the community but the model is not yet developed. The community will have to setup a company that will run the project. There will also a community trust that will be formed to act as the board of the company. SO except for the employment opportunities the community will own the project.
How long is this EIA going to take?	The EIA normally takes 18 months and EOH CES is just starting the process. The aim is to fast-track the process as EOH CES is already bringing specialist on site to do different specialists studies.
If the EIA is approved when will construction start?	There are still a lot of processes that need to be followed and done prior to the start of construction. For example Hatch Engineers are developing a master plan that will look at infrastructure needed for the project.
Mr Lefutso explained the boundaries of the project area and mentioned that the area Phase 1B is much bigger than that of Phase 1A.	
CLOSING	
After the discussions the meeting was closed by chief Makawula.	
APPENIDCES	
Appendix A – Attendance Register	

EOH Coastal & Environmental Services

ATTENDANCE REGISTER

WILDCOAST SEZ UPPER NCISE AQUAPONICS DEVELOPMENT

17 October 18

NAME	ADDRESS	TELEPHONE	SIGNATURE
H.S. HALAM	NCISE NDI A/A	047 0714370470	
S. LABULA	~~AEDAT~~ MTHATHA	0824614128	
K. Longo	NCISE	0737969465	K. Longo
A. Malhanda	NCISE A/A	0787172139	
D. Mlungu	NCISE A/A	0604191866	
Andile	NCISE A/A	0768706761	
Sani Mayifolo	NCISE A/A	0724369362	
~~Tukase Kuxwana~~	~~NCISE A/A~~	~~0834948925~~	
N. Makhula	Luxem Ncise	0783589576	
S. Laduduma	Malekongwe	0787666391	S. Laduduma
N.C. Mzimane	Matshongwe	0710883355	
N. Lavana	Matshongwe	0655646095	

EOH Coastal & Environmental Services

ATTENDANCE REGISTER

WILDCOAST SEZ UPPER NCISE AQUAPONICS DEVELOPMENT

17 October 18

NAME	ADDRESS	TELEPHONE	SIGNATURE
STHOKOZANI MAKAULA	LUSCENI	073 711 7372	
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David Hefuko	Coega (Wild Coast SEZ)	0718621095	
BENNEGI SBONGILE	Ncise A/A LALINI	072 106 1212	
MOTHI SIPHO	"	063 284 6768	
Tinzi Sonwabo	Siqithini	0785721268	
TASE ZUKISWA	SIQITHINI	0736342689	
TYHILI NOZANGA	SIQITHINI		
TSHAKA THOBELA	Rosebank (Wards 10)	0792752888	
MLAWENI BONGANI	Ncambele	0718069562	

Name & Surname	Organisation	Email	Telephone Number	Signature
86. Zukile Soko	Ncise Community	zukilesoko@yahoo.com	0631056637	
87				

APPENDIX D: ADDITIONAL INFORMATION

D-1: DWS Meeting Minutes
D-2: DWS Response Letter
D-3: WCSEZ Upper Ncise Bulk Infrastructure Scoping Report
D-4: Fish Farm Design Report

D-1: DWS Meeting Minutes

EOH
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MEETING WITH THE DEPARTMENT OF WATER AND SANITATION- MEETING MINUTES

TITLE	CDC Wildcoast SEZ Upper Ncise Aquaponics Development
DATE	18 October 2018
VENUE	Mthatha Dam
TIME OF MEETING	11H00
MINUTES BY	Caryn Clarke
CIRCULATION DATE	19 October 2018

BACKGROUND

A pre-application meeting was held on Thursday, 18 October 2018 with the Department of Water and Sanitation (DWS) (Mthatha) at the Mthatha Dam to discuss the potential water use licensing requirements for the proposed Wildcoast SEZ Upper Ncise Aquaponics Development.

ATTENDEES:

Blesi Hilton	Department of Water and Sanitation (DWS)
Mgca Nombuyiselo	Department of Water and Sanitation (DWS)
Nduna Mandisa	Department of Water and Sanitation (DWS)
Nqaba Xotyeni	Department of Water and Sanitation (DWS)
Ms Caryn Clarke	EOH CES – Environmental Consultant
Ms Amy Lindsay	EOH CES – Environmental Consultant

MEETING MINUTES

Ms Clarke and Ms Lindsay form EOH CES welcomed the Department of Water Affairs and Sanitation (DWS) to the meeting and site visit.

Ms Clarke provided DWS representatives with an overview of the proposed Aquaponics development and provided them with a conceptual layout map (attached as Appendix 1). The following project details were discussed:

- **Abstraction:** proposed abstraction point at the Mthatha Dam wall
- **Water Pipeline and WTW:** water will be piped from the abstraction point via a Water Treatment Works (WTW) to the Aquaponics facility located 15 km on the opposite side of the Mthatha Dam.
- **Aquaponics Facility:** the facility is proposed to include, in addition to the growhouses, offices & workshops, water storage reservoirs, and a Waste Water Treatment Works (WWTW).

Once the project overview was completed, DWS provide comment based on each of their designated roles regarding Section 21 water uses. This can be summarised as follows:

Section 21 (a): Abstraction

DWS stated that the Mthatha Dam does not have spare capacity as it has all been allocated to existing users. Therefore, DWS stated that any new applications will be rejected.

Ms Clarke then discussed the possibility of creating surplus capacity through agreements reached between the Coega Development Corporation (CDC) and the existing water users, particularly the KSD Municipality and Eskom.

The DWS mentioned that this could be possible if agreements are reached. However this will be dependent on whether the exiting water users will be willing to amend their existing authorised water use license. DWS also stated that should the existing water users wish to increase their abstraction volume again in the future, they would be required to reapply for this and there would be no guarantee of approval as it will be dependent on the surplus capacity of the Mthatha Dam at the time of application.

Section 21 (b): Storage

DWS stated that this will be dependent on whether 21 (a) (discussed above) is approved.

Section 21 (c) and (i): Impeding and diverting flow

DWS stated that this will be dependent on whether 21 (a) (discussed above) is approved. However, DWS stated that all activities within watercourses (including drainage lines) and 500 m of wetlands will require a water use license application. A wetland delineation will be required if there are wetlands found on site.

Section 21 (e) (f) (g): Waste related water uses

DWS stated that Mthatha Dam supplies a large area for their water requirements and as there are no industries within the upper reaches of the Mthatha rive. As such,, the water quality remains to be relatively good. DWS stated that once you move downstream of the Mthatha Dam, water quality becomes worse. The Thornhill WTW can be inconsistent in meeting the required water drinking standards. Any additional waste discharge to the Mthatha Dam may further compromise the ability of the Thornhill WTW in meeting the drinking standards.

The DWS also expressed concern over how consistent the WWTW of the proposed Aquaponics facility will be with regards to meeting its treated effluent discharge parameters (water quality standards). They further mentioned that the DWS have no monitoring capacity to monitor water quality within the Mthatha Dam, only at the inlet and below the dam wall.

Therefore based on the above, DWS stated that applications relating to Section 21 (e) (f) (g) waste related water uses within the Mthatha Dam will likely be rejected.

Ms Lindsay enquired whether the alternative of irrigation outside of the catchment area using the waste water from the Aquaponics facility would be acceptable. DWS stated that it could be considered, however applications for Section 21 (f) within the Mthatha Dam will be rejected.

Ms Clarke and Ms Lindsay stated that DWS concerns and comments will be communicated to the CDC, as the lack of a feasible water supply will be a fatal flaw to the proposed Aquaponics development.

CLOSING

Ms Clarke and Ms Lindsay concluded the meeting and thanked DWS for their attendance.

APPENIDCES

Appenidx1: Layout Map
Appendix 2: Attendance Register

D-2: DWS Response Letter

water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

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SITE INSPECTION REPORT: APPLICATION FOR A WATER USE AUTHORISATION FOR UPPER NCISE AQUAPONICS DEVELOPMENT, UPPER NCISE VILLAGE UNDER KSD LOCAL MUCIPALITY.

INTRODUCTION

Please be informed that a site inspection for a water use authorisation application for Upper Ncise Aquaponics Development was conducted.

The client, Ms. Caryn Clarke on behalf of Coega Development Corporation proposes to apply for an integrated water use authorization in terms Section 21(a), (c), (e), (f), (g) & (i) of the National Water Act for the development of the Upper Ncise Aquaponics Project.

SURFACE WATER ABSTRACTION

- The client proposes to abstract a total volume of 1.3Mm^3/a from Mthatha Dam and pump it to the proposed aquaponics site which ±15 km away. Mthatha Dam situated at the upper reaches of Mthatha River catchment in T20B drainage region.

- It should be noted that Mthatha Dam was only meant for potable water supply for Mthatha town and surroundings as well as power generation by Eskom and that there is no surplus water that can be allocated out of Mthatha Dam. As shown below.

Summary of Mthatha Dam abstractions

Water the User	*Sector*	*Source*	*Mthatha Dam Yield (million m^3/a)*	*Water Requirements (million m^3/a)*	*Balance (million m^3/a)*
ESKOM	*Hydropower*	*Mthatha Dam*	*145*	*90*	*0*
ORTDM	*Municipal*	*Mthatha Dam*		*55*	
TOTAL			***145***	***145.0***	***0***

WATER QUALITY MANAGEMENT

The client proposes to have a wwtw that will discharge to Mtata Dam, the Water Quality Management office will not support such a proposal as the Mtata Dam is on the upper reaches of the catchment and as such has good quality water which is used for drinking purposes by Mtata town and surrounding areas, and therefore allowing a waste discharge to the dam would be not be a brilliant idea as the waste water treatment facilities have proved to only function to the required DWS standards when the contractor is onsite, once the contractor leaves, the treatment facility collapses and untreated waste water will be discharged to the resource.
As it is currently, the Mtata river where the Mtata dam flows to is very polluted due to failing wwtw's and associated sewer infrastructure and as the Departmemt we have a responsibility to protect and conserve our water resources and Mtata dam is one of those water resources that we will protect for the benefit of our people.

SECTION 21 C AND I

The proposed Ncise aquaponics development will trigger section 21 c and I and therefore all activities within regulated areas (i.e across drainage lines, streams and within 500m radius from the boundary of a wetlands) will require authorization with the Department of Water and Sanitation. However, the issuance of license for section 21 c and i will be subject to the approval of section 21 a, e, f and g water uses.

Recommendations

- The proposed water use for taking of 1.3Mm^3/a out of Mthatha Dam cannot be allowed as all water is fully allocated.
- The client was advised to look for an alternative site outside of Mthatha River catchment. They were also advised that, if they can reach some sort of agreement with the current users from Mthatha Dam so that they surrender some of their water allocation to facilitate this application depending on whether the other uses will be approved.
- For Water quality management water uses, the applicant must consider section 21 (e)

Recommended/not Recommended
Comments: **Engineering Technician: Planning unit** **H Blesi** HBlesi **Date: 23-10-2018**

D-3: WCSEZ Upper Ncise Bulk Infrastructure Scoping Report

D-4: Fish Farm Design Report