

Atlantic Aquafarms (Pty) Ltd

Updated Final Environmental Management Plan
(EMP) Report for Proposed Aquaculture Project
on Portions G (10.1 Ha) and H (30.5 Ha),
Walvis Bay Townlands,
ERONGO REGION, NAMIBIA

September 2022

P.O. Box 96391
WINDHOEK
NAMIBIA

PROPONENT, LISTED ACTIVITIES AND RELATED INFORMATION SUMMARY

TYPE OF AUTHORISATIONS REQUIRING ECC

Aquaculture Project

NAME OF THE PROPONENT

Atlantic Aquafarms (Pty) Ltd

COMPETENT AUTHORITY

Ministry of Fisheries and Marine Resources (MFMR)

PROPONENT ADDRESS AND CONTACT PERSON

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PROPOSED PROJECT

Aquaculture Project on Portions G (10.1 Ha) and H (30.5 Ha),
Walvis Bay Townlands, Erongo Region, Namibia

PROJECT LOCATION

Walvis Bay Townlands, Erongo Region, Namibia
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EXECUTIVE SUMMARY

1. Introduction

Atlantic Aquafarms (Pty) Ltd (the Proponent) intend to develop an aquaculture project on the aquaculture zoned Portions G (10.1 Ha) and H (30.5 Ha) within the Walvis Bay Townlands along the B2 Road linking Swakopmund to Walvis Bay in the Erongo Region.

2. Regulatory Framework

Joe's Oyster Company (JOC) was granted three (3) aquaculture licences by the Ministry of Fisheries and Marine Resources (MFMR) for farming and production of Abalone (*Haliotis discus hannai*) and (*Haliotis middae*), Pacific Oysters (*Crassostrea gigas*), Red Seaweed (*Cracilarea gracillis*), Green Algae (*Ulva* species), Atlantic Salmon (*Salmon Salar*), and Jap Seacucumbers "*Stichus Japonicus*" (Annex 1). The proponent has also applied to the Ministry of Fisheries and Marine Resources for a license to produce Catfish (*Clarias gariepinus*). in Walvis Bay. An Environmental Clearance Certificate (ECC) dated 18th January 2016 was granted by the Environmental Commissioner with respect to the proposed aquaculture project.

As part of the investment requirements, the aquaculture licences were later transferred to Atlantic Aquafarms (Pty) Ltd (**Current Proponent**). However, these licenses have now expired and renewal applications have been submitted to the MFMR.

The ECC that was granted on the 17th May 2019 and valid for three (3) years has also expired and need to be renewed. This updated Environmental Management Plan (EMP) has been prepared in order to support the applications for the renewal of the ECC.

3. EMP Objectives

This updated EMP provides a detailed plan of action required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts respectively. The EMP also provides the management actions with roles and responsibilities requirements for implementation by the Atlantic Aquafarms (Pty) Ltd (the proponent) through the contractor who will be undertaking the activities from preconstruction to decommissioning of the proposed aquaculture project.

The EMP gives commitments including financial and human resources provisions for effective implementation of the EMP and management of the likely environmental liabilities during and after the proposed aquaculture project.

Regular assessments and evaluation of the environmental liabilities during the operational stage will need to be undertaken and will ensure adequate provision of the necessary resources towards good environmental management at various stages of the project development.

4. Summary of the EMP

Based on the assessment of both negative and positive impacts undertaken for the proposed aquaculture project, a number of high positive and localised negative impacts have been identified. Overall, positive impacts of the proposed project development outweigh the localised high negative ones at local, regional, national and global levels.

Mitigation measures for the negative impacts have been proposed and management strategies are provided in this Environmental Management Plan (EMP Vol. 3 of 3) covering the preconstruction, construction, operational, decommissioning and closure.

5. Roles and Responsibilities of the Proponent

The implementation of this EMP by Atlantic Aquafarms (Pty) Ltd as a part of the management of the impacts covers the entire lifecycle (planning and permitting, preconstruction, construction, operational, decommissioning and closure stages) of the proposed project activities.

All the responsibilities to ensure that the recommendations of this EMP Report are executed accordingly, rest with the proponent (**Atlantic Aquafarms (Pty) Ltd**).

The company must provide all appropriate resource requirements for the implementation of this EMP. It is the responsibility of **Atlantic Aquafarms (Pty) Ltd** to make sure that all members of the workforce including contractor and subcontractors are aware of the provisions of this EMP Report and its objectives.

1. PROJECT BACKGROUND

1.1 Introduction

The Ministry of Fisheries and Marine Resources (MFMR) has granted Joe's Oyster Company (JOC), (Previous Proponent) aquaculture licenses for farming and production of the following species:

1. Abalone (*Haliotis discus hannai*) and (*Haliotis middae*);
2. Pacific Oysters (*Crassostrea gigas*);
3. Red Seaweed (*Cracilarea gracillis*) and Green Algae (*Ulva* species).
4. Atlantic Salmon (*Salmon Salar*), and.
5. Jap Seacucumbers "Stichus Japonicus".

As part of the investment requirements, the aquaculture licences were later transferred to **Atlantic Aquafarms (Pty) Ltd (Current Proponent)**. However, these licenses have now expired and renewal applications have been submitted to the MFMR.

Copies of the granted aquaculture licenses are attached in Annex 1. The proponent has also applied for a licence for farming and production of Catfish / Barbel (*Clarias garipinus*), freshwater and indigenous Namibian species with quick growth and high demand in different part of Namibia and southern Africa.

The overall business strategy is to start with a species that will generate high returns and then use these funds to expand operations as more land becomes available, and thus also branch out into farming other species.

As part of the investment requirements the aquaculture licences that were initially granted to Joe's Oyster Company (JOC) later transferred to Atlantic Aquafarms (Pty) Ltd (Current Proponent). These licenses have now expired and renewal applications have been submitted to the MFMR.

The Proponent is currently at a stage of mobilising resources (financial, human and equipment) in order to start with the construction process of the aquaculture farm.

This updated Environmental Management Plan (EMP) report Vol. 3 of 3 form the final steps of the Environmental Assessment (EA) process that was undertaken by Risk-Based Solution (RBS) in 2015 and started with the preparation of the Environmental Scoping report Vol. 1 of 3 followed by the Environmental Impact Assessment (EIA) Vol. 2 of 3.

The EA Process was undertaken in line with the provisions of the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 gazetted under the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007).

Following the completion of the EA process, an Environmental Clearance Certificate (ECC) dated 18th January 2016 and valid for three (3) years was granted by the Environmental Commissioner in the Ministry of Environment, Forestry and Tourism (MEFT) with respect to

the proposed aquaculture project. This ECC was renewed in 2019 as shown in Fig. 1.1. The renewed ECC as shown in Fig. 1.1 has expired and need to be renewed.

This updated Environmental Management Plan (EMP) has been prepared in order to support the application for the renewal of the ECC as shown in Fig. 1.1.

1.2 Location, Infrastructure and Services

Portions G (10.1 Ha) and H (30.5 Ha) is located in the Walvis Bay Municipal land in the Walvis Bay District of the Erongo Region (Fig. 1.2). In accordance with the Walvis Bay Municipality Town Planning Scheme as well as the new Port of Walvis Bay expansion Plan as shown in Figs. 1.4 and 1.5, the proposed project falls within an area that has been identified and zoned for aquaculture development next to the proposed new North Port Terminal.

Access to the proposed project area will be through a new road from the Trunk Road 201 and form part of the new local road network linked to the expansion of the Town of Walvis Bay as well as Part (Figs. 1.3 -1.6).

Water supply for industrial aquaculture farming will be seawater abstracted through boreholes drilled in sand within the site boundary. Freshwater supply will be supplied by the Walvis Bay Municipality. The project area has mobile and fixed telecommunication infrastructure as well as all the related and necessary business support services such as banking, security and retail available in Walvis Bay.



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14 May 2019

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

The Managing Director
Atlantic Aquafarms (Pty) Ltd
P.O. Box 96391
Windhoek
Namibia

Dear Sir/Madam

SUBJECT: ENVIRONMENTAL CLEARANCE CERTIFICATE FOR THE AQUACULTURE PROJECT ON PORTION G (10.1 Ha) AND H (30.5 Ha) SITUATED IN WALVIS BAY TOWNLANDS, ERONGO REGION

The Environmental Management Plan submitted is sufficient as it made provisions of the environmental management concerning the proposed activities. From this perspective, regular environmental monitoring and evaluations on environmental performance should be conducted. Targets for improvements should be established and monitored throughout this process.

This Ministry reserves the right to attach further legislative and regulatory conditions during the operational phase of the project.

On the basis of the above, this letter serves as an environmental clearance certificate for the project to continue. However, this clearance letter does not in any way hold the Ministry of Environment and Tourism accountable for any misleading information, nor any adverse effects that may arise from this project's activities. Instead, full accountability rests with Atlantic Aquafarms (Pty) Ltd.

This environmental clearance is valid for a period of 3 (three) years, from the date of issue unless withdrawn by this office.

Yours sincerely,

Fredrick Mupoti Sikabongo
DEPUTY ENVIRONMENTAL COMMISSIONER



"Stop the poaching of our rhinos"

All official correspondence must be addressed to the Permanent Secretary

Figure 1.1: Copy of the expired ECC dated 17th May 2019 granted to the Proponent, Atlantic Aquafarms (Pty) Ltd and need to be renewed.



Figure 1.2: Regional location of the proposed aquaculture project.

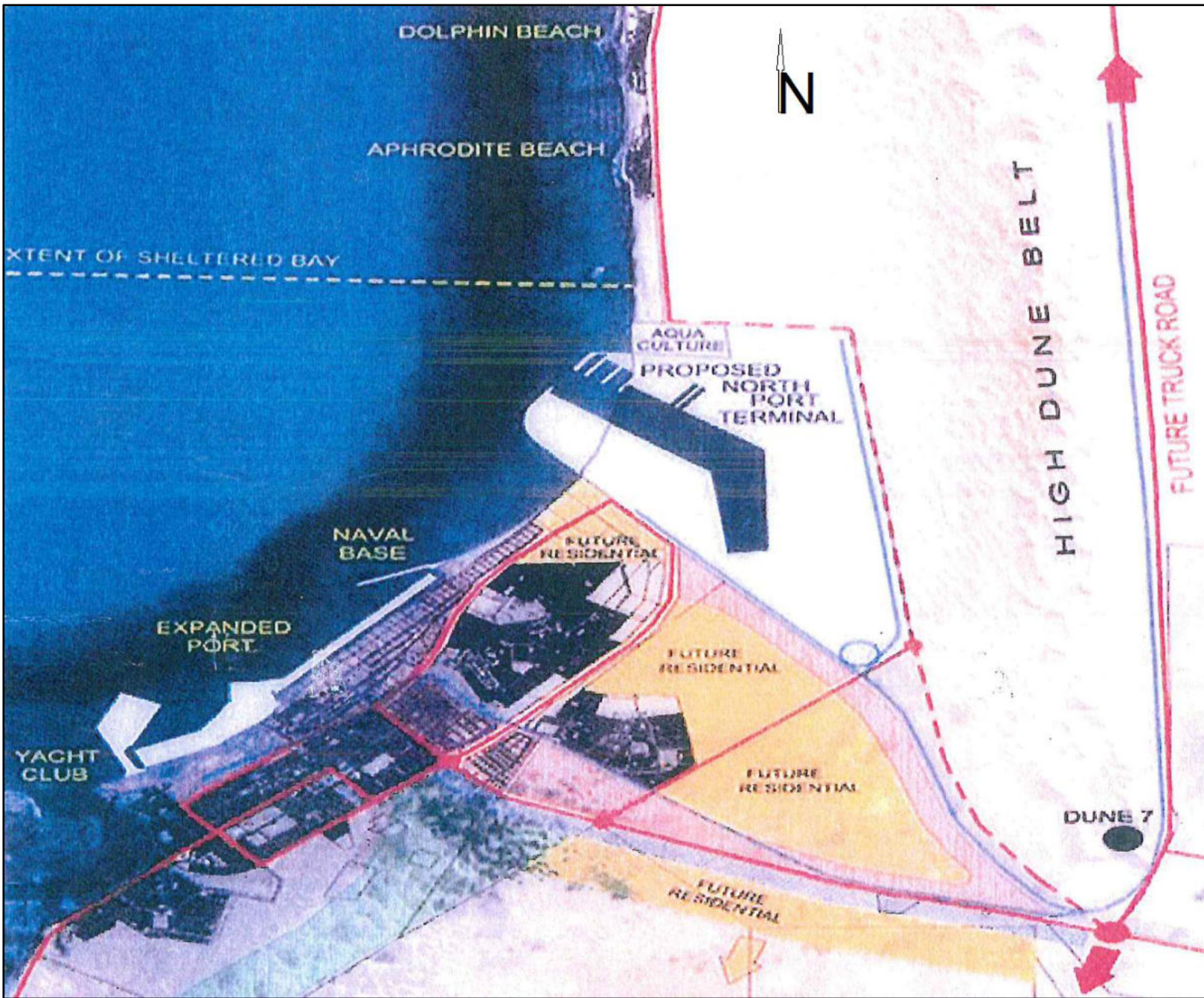


Figure 1.3: Regional location of the proposed aquaculture project in line with the new Walvis Bay town planning scheme and port expansion (Source: Atlantic Aquafarms (Pty) Ltd, 2015).

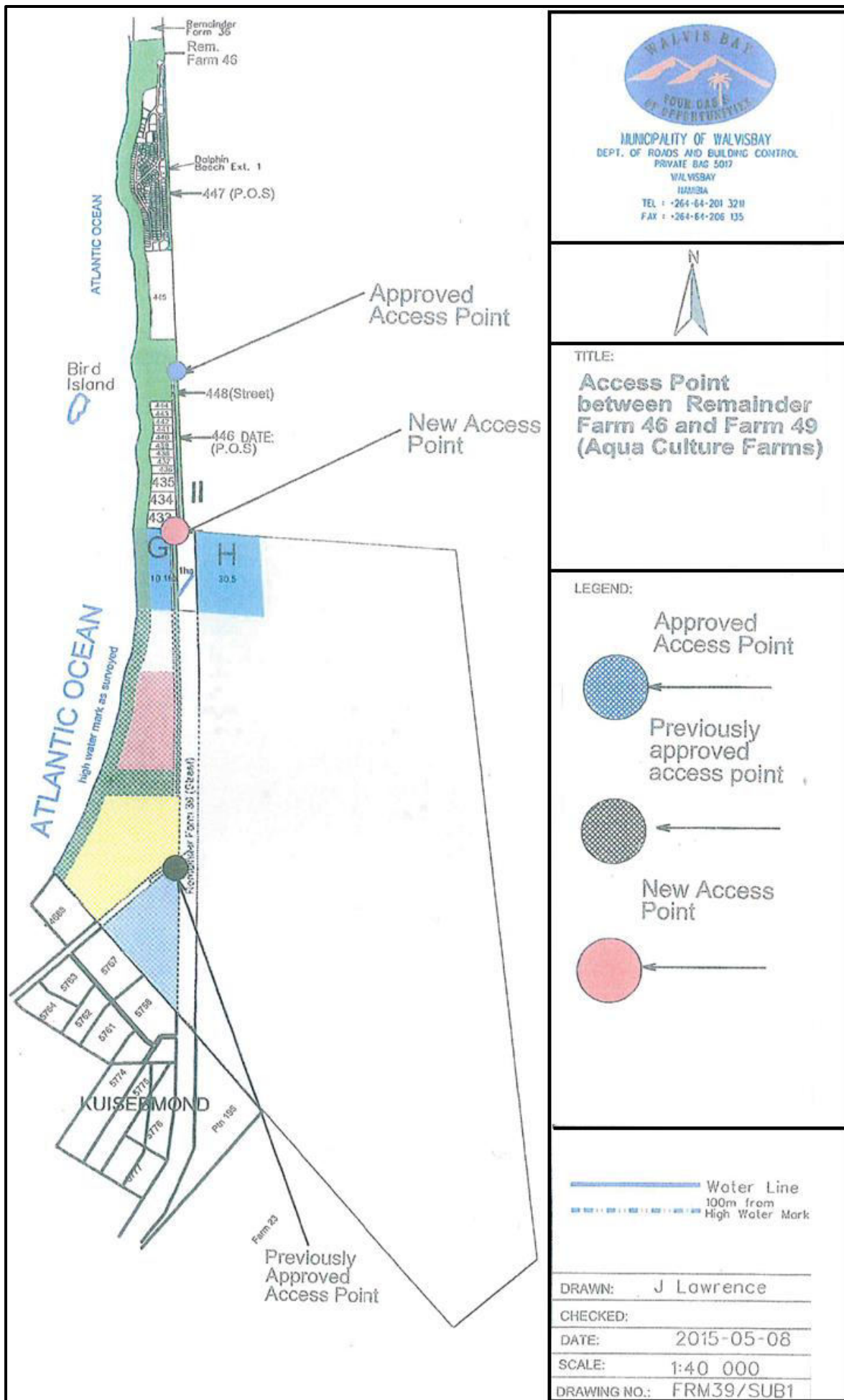


Figure 1.4: Location of the proposed project showing Portions G (10.1 Ha) and H (30.1 Ha) in line with the current Walvis Bay town planning scheme (Source: Atlantic Aquafarms (Pty) Ltd, 2015).

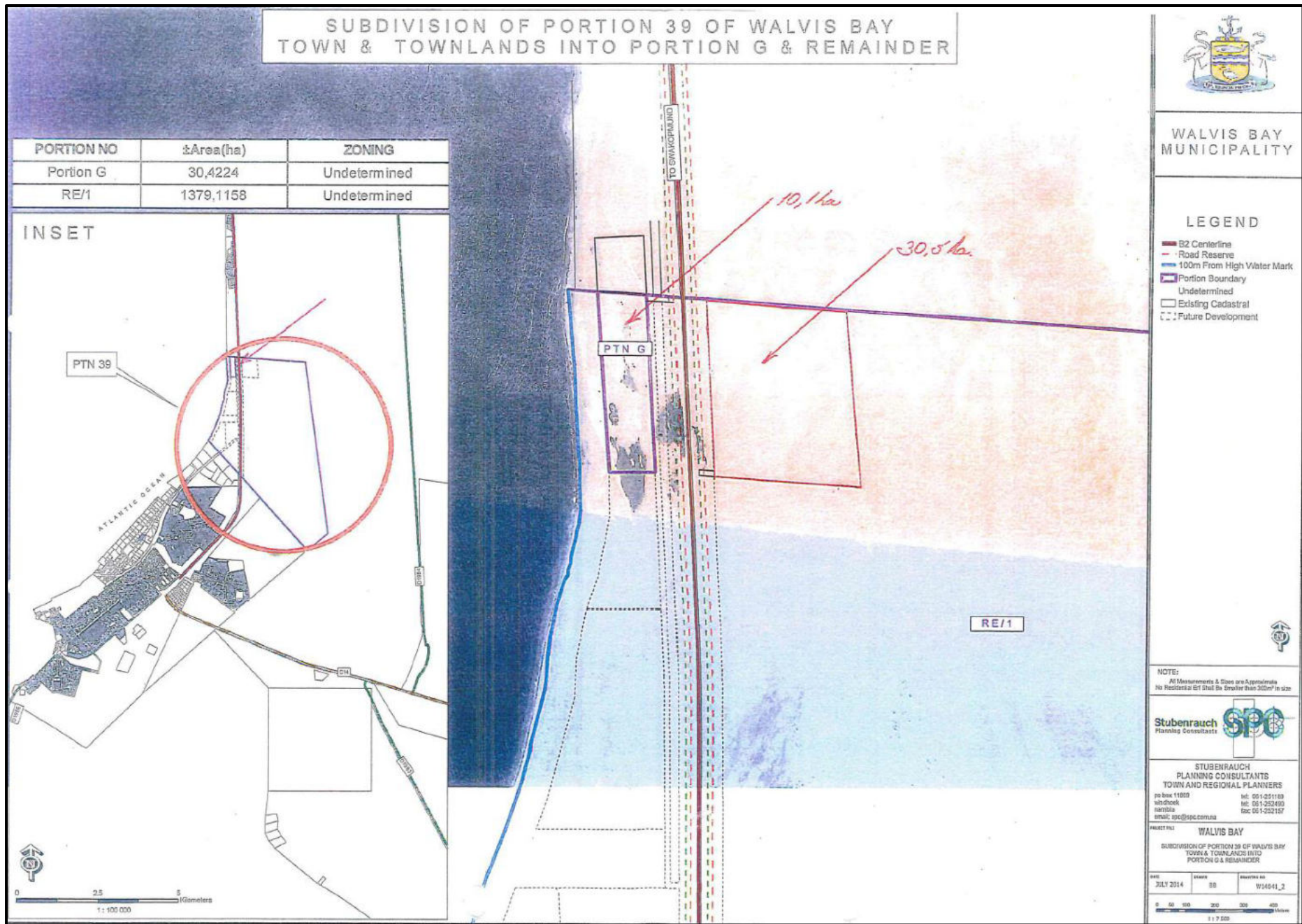


Figure 1.5: Detailed location of the proposed project in line with the current Walvis Bay town planning scheme (Source: Atlantic Aquafarms (Pty) Ltd, 2015).

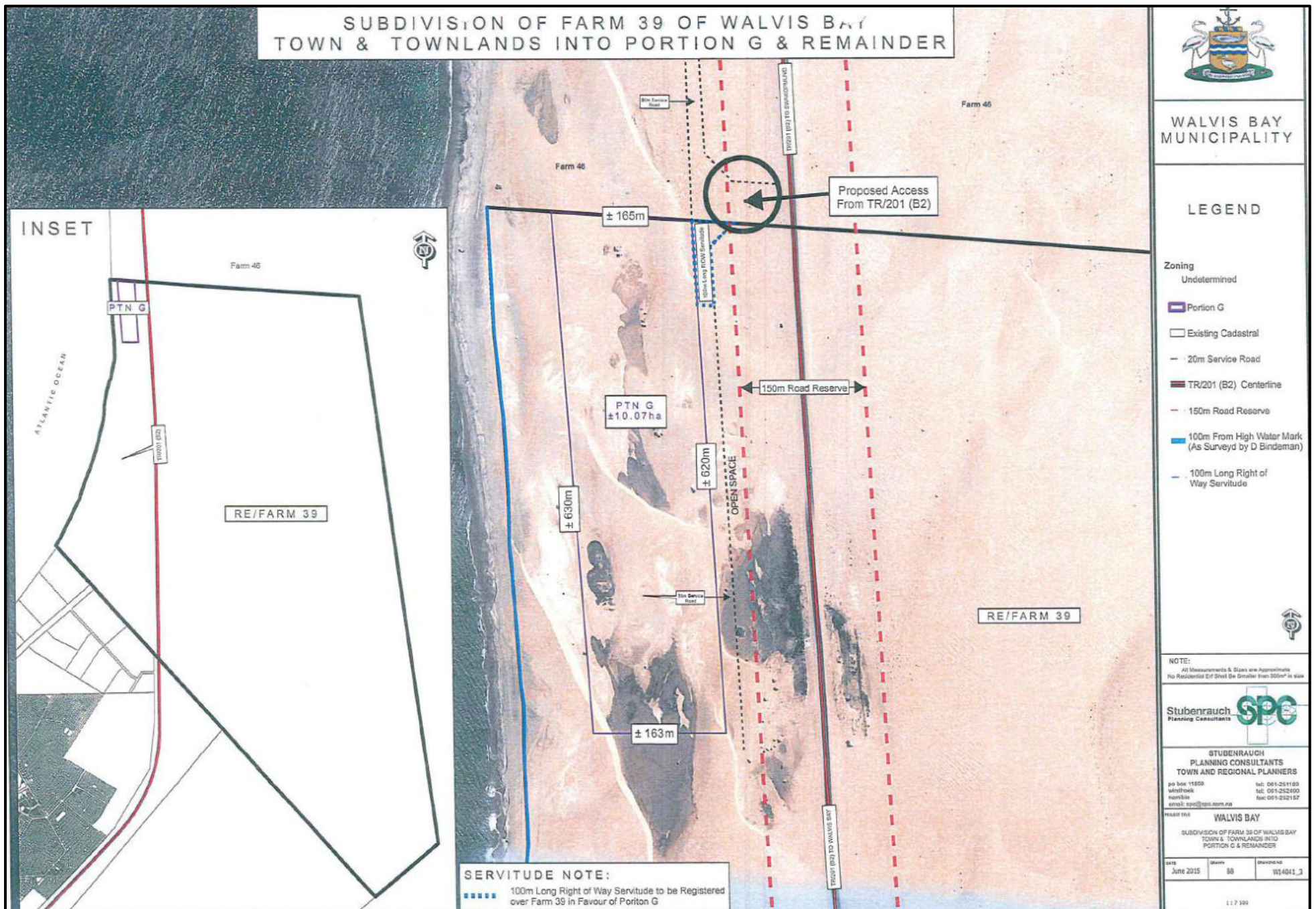


Figure 1.6: Detailed location of the Phase 1, 10.1 Ha project area (Source: Atlantic Aquafarms (Pty) Ltd, 2015).

1.3 Regulatory Requirements

1.3.1 Permits Requirements

The Aquaculture Act, (No. 18 of 2002) is the primary legal framework for the aquaculture industry in Namibia, and provides for the establishment, administration and conduct of aquaculture in water and on land. The proposed aquaculture project activities are listed in the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 gazetted under the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007) and cannot be undertaken without an Environmental Clearance Certificate (ECC). A list of key permits required for the proposed aquaculture project are shown in Table 1.1.

Table 1.1: Permit requirements for the proposed aquaculture project.

ACTIVITY	APPLICABLE LEGISLATION	PERMITTING AUTHORITY	CURRENT STATUS
1. Aquaculture Licenses	Aquaculture Act, (No. 18 of 2002) and associated regulations	Ministry of Fisheries and Marines Resources (MFMR)	Renewal Application Submitted
2. Sale of Land Planning and Registration	<ul style="list-style-type: none"> o Regional Councils Act and Local Authority Act o Town Planning Ordinance 18 of 1954 o Township and Division of Land Ordinance 11 of 1963 o Town and Regional Planners Act 9 of 1996 o Walvis Bay Municipality By-Laws and Regulations 	Ministry of Urban and Rural Development	Planning process has been implemented and submission to NAMPAB and Registration to Deed's Office will Follow
3. EIA Clearance	Environmental Policy and Environmental Management Act, (Act No. 7 of 2007)	Ministry of Environment, Forestry and Tourism (MEFT)	ECC Granted on 18 th January 2016 Renewal and Transfer Applications Submitted to MEFT
4. Building Permits	Walvis Bay Municipal by-laws and regulations	Walvis Bay Municipality	To be submitted
5. Construction, alteration of waterworks with capacity to hold in excess of 20000L.	Water Act 54 of 1956	Ministry of Agriculture, Water and Land Reform (MAWLR)	To Apply when Required
6. Abstraction Permit: Abstraction of water other than that provided by NamWater / Walvis Bay Municipality.	Water Resources Management Act, 2004 (No. 284 of 2004).		
7. Discharge Permit: Discharge of effluents or construction of effluent facility or disposal site.			
8. Removal, disturbances or destruction of bird eggs.	Nature Conservation Ordinance 4, 1975.	Ministry of Environment, Forestry and Tourism (MEFT)	No removals anticipated
9. Removal, disturbance of protected plants.			
10. Removal, destruction of indigenous trees, bushes or plants within 100 yards of stream or watercourse.	Forestry Act, 12 of 2001.	Ministry of Agriculture, Water and Land Reform (MAWLR)	
11. Scheduled processes in Controlled area.	Atmospheric Pollution Prevention Ordinance 11 of 1976	Ministry of Health and Social Services.	Meet HSE Provisions
12. Discarding or disposing of used oil.	Petroleum Products and Energy Act 13 of 1990	Ministry of Mines and Energy (MME).	To Apply when Required
13. Operating a petroleum consumer installation.			

1.3.2 Regulatory Agencies

Table 1.2 outlines the list of the key regulating authorities with respect to the relevant permits / licenses required for the proposed project. Industrial effluent likely to be generated by the proposed aquaculture project must comply with provisions of the Government Gazette No 217 dated 5 April 1962 under the Ministry of Agriculture, Water and Forestry (Table 1.3).

Table 1.2: Government agencies regulating environmental protection in Namibia.

AGENCY	RESPONSIBILITY
Ministry of Environment, Forestry and Tourism (MEFT)	Issues Environmental Clearance Certificates (ECC) in line with the provisions of the Environmental Management Act (2007) and the Environmental Impact Assessment Regulations, 2012 for all listed activities.
Ministry of Fisheries and Marine Resources (MFMR)	Issues Licenses for Aquaculture development in Namibia. The MFMR is the Competent Authority and has jurisdiction over all living marine resources management and aquaculture development in Namibia.
Ministry of Works, and Transport (MWT)	The Directorate of Maritime Affairs (DMA) in the MWTC is the government's lead agency responsible for National Oil Spill Contingency Planning (NOSCP), organisation and response. It therefore plays a significant role with respect to prevention and management of pollution of the maritime environment arising from shipping activities.
Ministry of Agriculture, Water and Land Reform (MAWLR)	The Directorate of Resource Management within the Department of Water Affairs (DWA) at the Ministry of Agriculture, Water and Land Reform (MAWLR) is currently the lead agency responsible for management of surface and groundwater utilisation through the issuing of abstraction permits and waste water disposal permits. DWA is also the Government agency responsible for water quality monitoring and reporting.

Table 1.3: R553 Regional Standards for Industrial Effluent, in Government Gazette No 217 dated 5 April 1962.

Colour, odour and taste	The effluent shall contain no substance in concentrations capable of producing colour, odour or taste	
pH	Between 5.5 and 9.5	
Dissolved oxygen	At least 75% saturation	
Typical faecal coli	No typical faecal coli per 100 ml	
Temperature	Not to exceed 35 °C	
Chemical demand oxygen	Not to exceed 75 mg/l after applying a correction for chloride in the method	
Oxygen absorbed	Not to exceed 10 mg/l	
Total dissolved solids (TDS)	The TDS shall not have been increased by more than 500 mg/l above that of the intake water	
Suspended solids	Not to exceed 25 mg/l	
Sodium (Na)	The Na level shall not have been increased by more than 50 mg/l above that of the intake water	
Soap, oil and grease	Not to exceed 2.5 mg/l	
Other constituents	Residual chlorine	0,1 mg/l as Cl
	Free & saline ammonia	10 mg/l as N
	Arsenic	0,5 mg/l as As
	Boron	1,0 mg/l as B
	Hexavalent Cr	0,05 mg/l as Cr
	Total chromium	0,5 mg/l as Cr
	Copper	1,0 mg/l as Cu
	Phenolic compounds	0,1 mg/l as phenol
	Lead	1,0 mg/l as Pb
	Cyanide and related compounds	0,5 mg/l as CN
	Sulphides	1,0 mg/l as S
	Fluorine	1,0 mg/l as F
	Zinc	5,0 mg/l as Zn

1.4 Proposed Project Summary

1.4.1 Developmental Phases

Atlantic Aquafarms (Pty) Ltd intend to establish an aquaculture project in Walvis Bay comprising the hatcheries, grow-out facilities, feed processing factories, cold storage, a large truck-port and distribution facilities and a marketing system. According to the Aquaculture Act (No. 18 of 2002), aquaculture is defined as the cultivation of aquatic organisms, such as fish and shellfish or of plants, such as seaweed, in a controlled and sometimes enclosed body of water. On a technical level, aquaculture is defined in Namibia's Aquaculture Act (No. 18 of 2002) as the "farming and ranching of aquatic organisms". Both terms include the use of salty, fresh or brackish water. The following is the summary of the envisaged development timelines:

- ❖ Development and initial production (Phase 1): 1 – 24 months;
- ❖ Construction of processing, storage and truck port facilities: 18 – 42 months;
- ❖ Phase 1 in full production: 24 -36 months;
- ❖ Phase 2 development and production: 24 – 42 months, and;
- ❖ Establishment of northern fish farms, construction of support facilities: 36 -48 months.

1.4.2 Description of the Proposed Activities

1.4.2.1 Overview

A typical examples of an aquaculture abalone farm and the associated key components shown in Plate 1.1 and Plates 1.2-1.6 respectively. The layout of the proposed aquaculture project covering phases 1-3 is shown in Fig. 1.7. The proposed aquaculture project will be developed in phases and covering the following key components:

- ❖ Grow-Out;
- ❖ Primary Water Intake;
- ❖ Primary Water Purification;
- ❖ Blowers, and;
- ❖ Other critical components such as electricity supply and logistic support infrastructure.

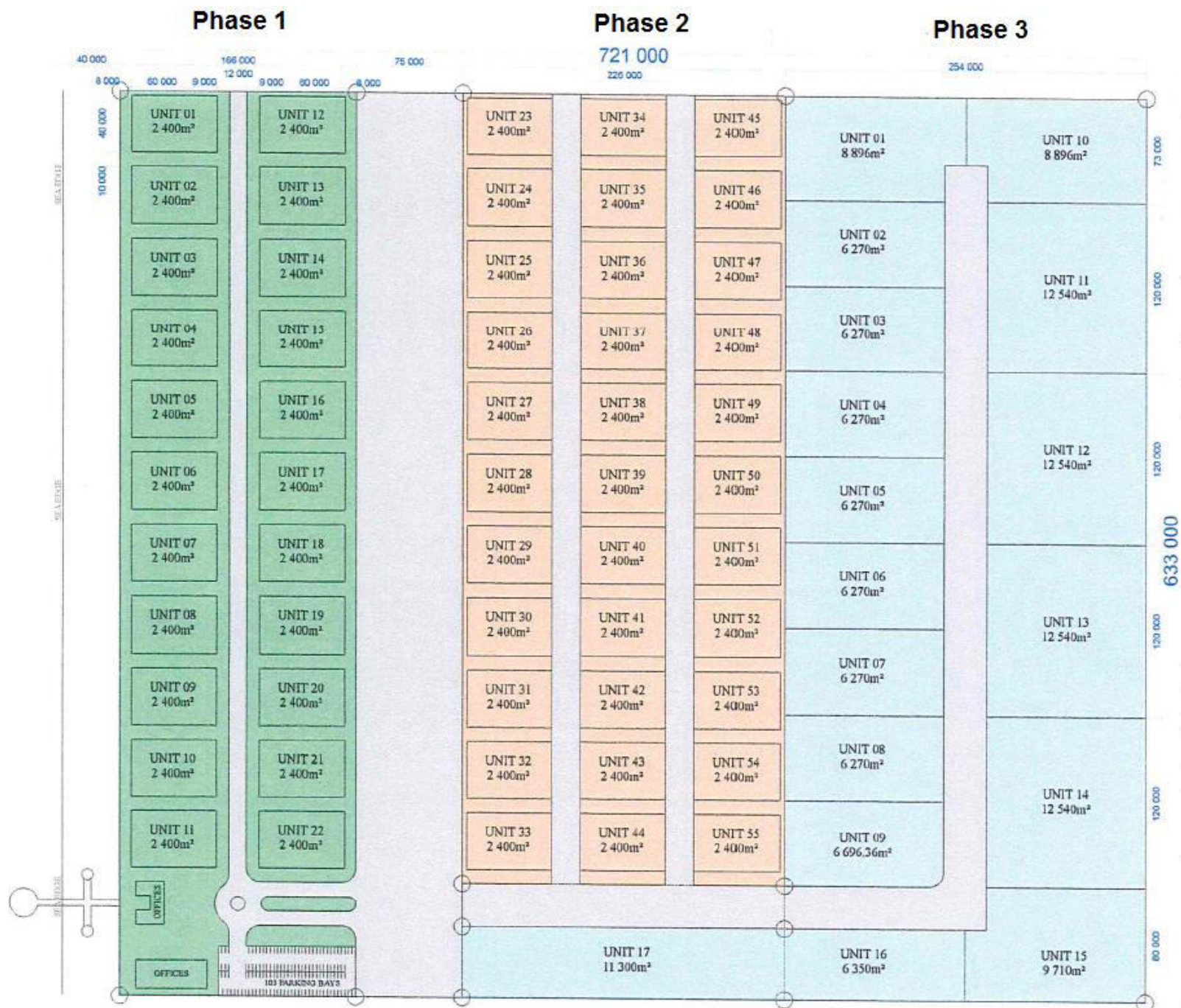


Figure 1.7: Outline of the proposed aquaculture project covering Phased 1 -3 (Source: Atlantic Aquafarms (Pty) Ltd, 2015).



Plate 1.1: An Example of an Abalone Aquaculture project in South Africa (Source: Atlantic Aquafarms (Pty) Ltd, 2015).



Plate 1.2: Example of typical HTE Beat Bio-filter and CO² stripper (Source: Atlantic Aquafarms (Pty) Ltd, 2015).



Plate 1.3: Example of the Heater and Chillers to ensure optimum water conditions at all times especially in the hatchery (Source: Atlantic Aquafarms (Pty) Ltd, 2015).



Plate 1.4: Example of the types of fans and blowers used to drive water and air circulation (Source: Atlantic Aquafarms (Pty) Ltd, 2015).



Plate 1.5: Example of the drum (top photo) and sand (bottom photo) filters used in aquaculture farms (Source: Atlantic Aquafarms (Pty) Ltd, 2015).



Plate 1.6: Examples of foam fractionators aerated by venture and also used for protein skimming (top photo) and main suction pumps (bottom photo) (Source: Atlantic Aquafarms (Pty) Ltd, 2015).

1.4.2.2 Grow-Out

Grow-out production will be based in production units lined with Polyvinyl Chloride (PVC) liner. Dimensions for the units are 100 x 50 x 2 and will take up around 90000m² of the 101000m² site allocated to Atlantic Aquafarms (Pty) Ltd. Flow rates will be based on a 200% exchange per day. Outflow water (waste) will pass through 200-micron screen filters before being discharged back into the ocean. The screen filters will collect all solids bigger than 200 micron which will eliminate waste products and marine fouling. The filtered waste water will then pass over a dune sand bed where most of the water will seep through the sand back into the Atlantic Ocean, thereby filtering the water even further.

1.4.2.3 Primary Water Intake

The primary water intake of 6, 250, 000 liters of seawater per hour will be based on a combination of a well point system where sea water will be extracted via boreholes set at 5 - 10 meters under the seawater table and sea anchored High-density polyethylene or polyethylene high-density (HDPE) suction pipes. The natural beach sand will act as the primary filtration of the incoming borehole water, thereby filtering the water while the direct seawater suction path will pass through initial filtration. The well point and sea anchored suction will each have a pumping system under one pump house building above the high-water mark that will house all the pumps and switchgear. All the suction lines will be buried under the sand and will therefore not be an eyesore for the public and will not impact access to the beach.

1.4.2.4 Primary Water Purification

The water will be very clean when it passed through the well point but will still need further treatment before it can be used. Namibia has sulphur blooms which mainly occur between Dec - Mar. The sulphur depletes the oxygen in the water which is the most important requirement for ANY aquaculture project. Without oxygen in the water, it cannot sustain life. Any aquaculture operation along the Namibian coast must have systems in place to maintain high levels of oxygen in the water. All the water will pass through a degassing tower which will bring the oxygen back to saturation. Further filtration and purification of the water will take place in the main water reservoir where a foam filtration remover will remove all the fats, oils and grease. Once this is done the water can pass through the grow-out ponds.

1.4.2.5 Blowers

The hatchery will be using a standard high pressure air blower and one backup blower of roughly 12 KW.

1.4.2.6 Other Critical Components

Electricity is the heart of the operation and for this reason the farm will have 2 x 250 KVA generators on site to ensure uninterrupted power supply to all the pumps and blowers. Joe's Oyster Company will not operate its own transport fleet but will sub-contract all its transport requirements to contractors already operating in the transport sector. Specifically, the company will utilize the services of local companies.

1.5 Summary Results of the EIA

1.5.1 Proposed Project Activities

The following is the summary of the activities associated with the planning and permitting, preconstruction, construction, operational and closure stages of the proposed aquaculture project that have been considered in the impact assessment as potential sources of impacts:

- ❖ Access roads preparation;
- ❖ Site preparation and grading;
- ❖ Fencing and security;
- ❖ Installation of services and supporting Infrastructure (Access road, Electricity, Water);
- ❖ Soil / foundations preparation;
- ❖ Construction of the main structures;
- ❖ All equipment installation;
- ❖ Installation of communication monitoring systems;
- ❖ Commissioning;
- ❖ Seawater intake, purification process use, circulation for reuse and purification before discharge;
- ❖ Growth and harvesting periods;
- ❖ Discharge of purified used water;
- ❖ All other related supporting / operational activities including logistics, and;
- ❖ Decommissioning license renewal and upgrade of facility.

1.5.2 Summary and Assessment Results of the Key Issues

The following is the summary of the key issues that have been considered in the EIA processes with respect to the likely impacts (without mitigations) that the proposed project activities will have during the preconstruction, construction, operation and decommissioning stages of the proposed project:

- ❖ Land use impacts (Impact: *Very low*, Significant: *Negligible*);
- ❖ Surficial geology (Impact: *Localised low*, Significant: *Low*);
- ❖ Freshwater and seawater use and quality (Impact: *Very low*, Significant: *Negligible*);
- ❖ Faunal loss (Impact: *Localised low*, Significant: *Low*);
- ❖ Flora loss (Impact: *Localised low*, Significant: *Low*);

- ❖ Landscape and visual change (Impact: *Localised High*, Significant: *High*);
- ❖ Light reflection from roof with solar panels (Impact: Localised low, Significant: Negligible);
- ❖ Ground conditions contamination (Impact: *Localised low*, Significant: *Negligible*);
- ❖ Noise and vibration (Impact: *Localised low*, Significant: *Negligible*);
- ❖ Air quality influences (Impact: *Localised low*, Significant: *Negligible*);
- ❖ Cultural, archaeological and paleontological resources (Impact: Very low, Significant: Negligible);
- ❖ Socioeconomic (Potential employment, food security, knowledge creation and awareness raising) (Impact: High, Significant: High);
- ❖ Occupational Health and Safety (HSE) (Impact: Localised low, Significant: Negligible);
- ❖ Security and public access (Impact: Localised low, Significant: Negligible);
- ❖ Solid waste management (Impact: Localised low, Significant: Negligible), and;
- ❖ Liquid waste management (discharge of used purified seawater back into the sea) (Impact: Localised low, Significant: low).

1.5.3 Overall the Results of the Significant Impact

Overall the results of the significant impact assessment impacts for the proposed aquaculture project on Portions G and H in Walvis Bay Erongo Region is low impact on the terrestrial and marine biological environmental (fauna, flora and habitat) with respect to the activities of the preconstruction and part of the constructions stage. The rest of the activities of the construction, operational and decommissioning stages will have negligible impact on the terrestrial and marine biological environment (EIA Vol. 2 of 3 Tables 5.12 and 5.13). In accordance with significant impact assessment undertaken in the EIA Report Vol. 2 of 3, Section 5.6, the following is the summary of the results of the significant impact assessment undertaken for the aquaculture project physical environment:

- ❖ Onshore and Coastal and Marine Natural Environment – Air, noise, water and green space with assessment of low impacts [C2] for preconstruction and part of the constructions stage, negligible impact [B1] for 1st parts of the construction stage and negligible impact [B0] for the rest of the project lifecycle;
- ❖ Built Environment – Houses, roads, transport systems, buildings and infrastructure with assessment of negligible impact [B1] for preconstruction and the 1st parts of the construction stage and negligible impact [B0] for the rest of the construction, operational and decommissioning stages, and;
- ❖ Socioeconomic and Cultural–Characteristics of the local societies and communities with assessment of negligible impact [B1] for preconstruction and the 1st parts of the construction stage and negligible impact [B0] for the rest of the construction and operational.

2. THE EMP FRAMEWORK

2.1 Summary of the EMP Objectives

The Environmental Management Plan (EMP) provides a detailed plan of action required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts respectively. The EMP gives commitments including financial and human resources provisions for effective management of the likely environmental liabilities during and after the exploration. Regular assessments and evaluation of the environmental liabilities during the exploration will need to be undertaken and will ensure adequate provision of the necessary resources towards good environmental management at various stages of the project development.

2.2 Specific Mitigation Measures

Based on the findings of the EIA study contained in the Vol. 2 of 3 Report, the following are the key specific mitigations measures covering the preconstruction, construction, operational, decommissioning and closure for the proposed aquaculture by Atlantic Aquafarms (Pty) Ltd:

- (i) **Regulatory mitigation measures with respect to the proposed project:**
 - ❖ All preconstruction permits must be obtained before the implementation of the proposed project and the permits includes:
 - Environmental Clearance Certificate;
 - Land ownership / Lease Agreement;
 - Approved Building plans with the relevant building permits, and;
 - All other permits as may be required by the Walvis Municipal By-Laws and Regulations.
 - ❖ Adhere to the regulatory requirements by the Walvis Bay Municipality, Ministry of Fisheries and Marine Resources, Ministry of Environment, Forestry and Tourism, Ministry of Works and Transport, NamPort and all other applicable Competent Authorities / Organs of State with jurisdiction over the proposed aquaculture project;
 - ❖ Adhere to all regulatory limits, standards and guideline, and;
 - ❖ Adhere to all regulatory environmental performance monitoring requirements.
- (ii) **Mitigation measures for preventing flora destruction are:**
 - ❖ Capture and relocate as many of the important reptiles and small mammals – e.g., dune hairy-footed gerbils – from the vegetated dune hummocks, as possible;

- ❖ Relocation should be to similar undisturbed habitats not expected to be developed along the coast – e.g., vegetated Kuiseb River mouth area south of Walvis Bay;
- ❖ Implement and maintain track discipline limited to pre-determined tracks with maximum speed limits (e.g. 30km/h) as this would result in fewer faunal road mortalities and overall destruction of vegetated areas which serve as habitat to a variety of fauna;
- ❖ Avoid off-road and nocturnal driving as this result in the destruction of slow-moving fauna – e.g. various reptiles and other nocturnal species;
- ❖ Prevent and discourage any form of poaching, illegal collecting of veld foods (e.g. bird eggs, etc.), indiscriminate killing of perceived dangerous species (e.g. snakes, etc.) as this would diminish and negatively affect the local fauna – especially during the construction phase(s);
- ❖ Initiate a suitable and appropriate refuse removal policy during the construction phase(s) as littering could result in certain animals becoming accustomed to humans and associated activity and result in typical problem animal scenarios – e.g. black-backed jackal, crows, gulls, etc.;
- ❖ Include patches of what limited vegetated there is into the overall landscaping during developments (including the development of access routes) as these serve as habitat for a myriad of fauna in an otherwise marginal area;
- ❖ Rehabilitation of the disturbed areas – i.e. initial development access route “scars” and associated tracks. Such rehabilitation would not only confirm the companies’ environmental integrity, but also show true local commitment to the environment, and;
- ❖ Educate/inform contractors and staff on dangerous and protected species to avoid and the consequences of illegal collection of such species. Liaise with MEFT to provide this service as the area is adjacent the Dorob National Park.

(iii) **Mitigation measures for preventing faunal destruction are:**

- ❖ Prevent the planting of potentially alien invasive plant species (e.g. *Pennisetum setaceum*, etc.) for ornamental purposes as part of the landscaping. Alien species often “escape” and become invasive causing further ecological damage;
- ❖ Incorporate the natural vegetation – especially vegetated dune hummocks – into the overall landscaping. This would require less maintenance (e.g. water) than alternative vegetation as well as support the natural ambiance of the area;
- ❖ Rehabilitation of the disturbed areas – i.e. initial development access route “scars” and associated tracks. Such rehabilitation would not only confirm the companies’ environmental integrity, but also show true local commitment to the environment, and;
- ❖ Educate/inform contractors and staff on protecting what little vegetation occurs on site.

- (iv) **Mitigation measures for abstraction of seawater, use and discharge of used industrial water back into the marine environment:**
- ❖ Abstraction of seawater must be undertaken using boreholes drilled into the sand below the sea level in order to improve the natural filtration while at the same time avoid sucking tiny marine life in the seawater abstraction system;
 - ❖ Used seawater must be cooled, purified and kept in a holding pond until all clear test results have been obtained. Regular verification test may be carried out by the Ministry of Fisheries and Marine Resources;
 - ❖ Used seawater shall be filtered through a natural sand bed before discharging it back into the sea;
 - ❖ Used freshwater from the Catfish / Barbel (*Clarias garipinus*) production area will be reused, recycled and applied in the hydroponics operation. No used freshwater shall be discharged directly into the marine environment, and;
 - ❖ Used seawater discharge point shall be monitored regularly as part of the environmental performance monitoring programme.
- (v) **Mitigation measures for water resources (fresh and sea water) protection and general water usage are:**
- ❖ Always use as little water as possible. Reduce, reuse and re-cycle water where possible;
 - ❖ All leaking pipes / taps must be repaired immediately they are noticed;
 - ❖ Measure, monitor, and account for water usage throughout the operations;
 - ❖ Always maintain all water related infrastructure;
 - ❖ Never leave taps running. Close taps after you have finished using them.
 - ❖ Never allow any hazardous substance to soak into the soil, and;
 - ❖ No washing of vehicles, equipment and machinery, containers and other surfaces.
- (vi) **Mitigation measures to be implemented with respect to the siting and management of temporary construction site are:**
- ❖ Select temporary construction site and other temporary layover sites with care and must be within the boundaries of Portion G and H and must avoid any important habitats;
 - ❖ In the absence of municipal sewer line at the beginning of the construction, use portable toilets to avoid faecal pollution around the construction site;
 - ❖ Initiate a suitable and appropriate refuse removal policy to avoid;
 - ❖ Prevent the killing of species that may be viewed as dangerous – e.g. various snakes – when on site;

- ❖ Prevent the collection of unique plants or any form of illegal activities;
- ❖ Avoid introducing dogs and cats as pets to the site as these can cause significant mortalities to local fauna;
- ❖ Remove and relocate slow moving vertebrate fauna to suitable habitat elsewhere on property;
- ❖ Avoid the removal and/or damaging of protected flora potentially occurring in the general area;
- ❖ Avoid introducing ornamental plants, especially potential invasive alien species, as part of the landscaping of the camp site, etc., but rather use localised indigenous species, should landscaping be attempted, which would also require less maintenance (e.g. water), and;
- ❖ Employ an independent environmental officer to ensure environmental compliance during the preconstruction, construction and operational stages.

(vii) **Mitigation measures for vehicles movements and access tracks management are:**

- ❖ Avoid unnecessary affecting areas viewed as important habitat – i.e. Dune areas outside Portion G and H boundaries;
- ❖ Make use of existing tracks/roads as much as possible throughout the area;
- ❖ Do not drive randomly throughout the area (could cause mortalities to vertebrate fauna and unique flora);
- ❖ Avoid off-road driving at night as these increases mortalities of nocturnal species;
- ❖ Implement and maintain off-road track discipline with maximum speed limits (e.g.30km/h) as this would result in fewer faunal mortalities and limit dust pollution;
- ❖ Where tracks have to be made to potential source of construction materials, from the main routes, the new minor routes should be selected causing minimal damage to the environment – e.g. use the same tracks; cross drainage lines at right angles; avoid placing tracks within drainage lines; avoid collateral damage, and;
- ❖ Rehabilitate all new tracks created.

(viii) **Mitigation measures to enhance positive socioeconomic impacts include the following actions to be implemented by the exploration company:**

- ❖ Stipulate a preference for local contractors in the tender policy. Preference to local coastal contractors should still be based on competitive business principles and salaries and payment to local service providers should still be competitive;

- ❖ Develop a database of local businesses that qualify as potential service providers and invite them to the tender process;
- ❖ Scrutinise tender proposals to ensure that minimum wages were included in the costing;
- ❖ Tender documents must stipulate that local resident should be employed for temporary unskilled/skilled and where possible in permanent unskilled/skilled positions as they would reinvest in the local economy;
- ❖ Must ensure that potential employees are from Walvis Bay and to some extent Swakopmund, if required, proof of having lived in the area for a minimum of 5 years must be produced;
- ❖ Must ensure that contractors adhere to Namibian Affirmative Action, Labour and Social Security, Health and Safety laws. This could be accomplished with a contractual requirement stipulating that monthly proof should be submitted indicating payment of minimum wages to workers, against their ID numbers, payment of social security and submission of affirmative action data, and;
- ❖ Encouraged to cater for the needs of employees to increase the spending of wages locally.

(ix) **Mitigation measures to minimise negative socioeconomic impacts are:**

- ❖ The employment of local residents and local companies should be a priority. To ensure that potential employees are from the area, they need submit proof of having lived in the area for a minimum of 5 years;
- ❖ Addressing unrealistic expectations about large numbers of jobs being created from day 1 because the proposed project will be developed in phases;
- ❖ Temporary construction camp if required should be established in close consultation with the Walvis Bay Municipality;
- ❖ Tender documents could stipulate that contractor have HIV/Aids workplace policies and programmes in place and proof of implementation should be submitted with invoicing;
- ❖ Contract companies could submit a code of conduct, stipulating disciplinary actions where employees are guilty of criminal activities in and around the vicinity of the project area. Disciplinary actions should be in accordance with Namibian legislation;
- ❖ Contract companies could implement a no-tolerance policy regarding the use of alcohol at workplace;
- ❖ Request that the Roads Authority erect warning signs of heavy-duty vehicles on affected public roads;
- ❖ Ensure that drivers adhere to speed limits and that speed limits are strictly enforced particularly around the site;
- ❖ Ensure that vehicles are road worthy and drivers are qualified;

(x) **Mitigation measures to minimise health and safety impacts are:**

- ❖ Physical hazards: Follow national and international regulatory and guidelines provisions, use of correct Personal Protective Equipment (PPE) at all times, training programme, as well as the implementation of a fall protection program in accordance with the Labour Act;
- ❖ Some of the public access management measures that may be considered in an event of vandalism occurring are:
 - All the equipment must be in good working condition and services accordingly;
 - Control access to the site through using gates on the access road(s);
 - The entire site, must be secured by fence or boundary wall, and;
 - Notice or information boards relating to public safety hazards and emergency contact details to be put up at the gate(s) to the site.

(xi) **Mitigation measures to minimise visual impacts are:**

- ❖ Consider the landscape character and the visual impacts of the site from all relevant viewing angles, particularly from public roads;
- ❖ Use vegetation screening where applicable for site screening;
- ❖ Avoid the use of very high boundary walls or fencing;
- ❖ Minimise access roads and no off-road that could result in land scarring is allowed;
- ❖ Minimise the presence of secondary structures: remove inoperative and redundant support structures, and;
- ❖ Remove all infrastructure and reclaim, or rehabilitate the project site in an event of closure.

(xii) **Mitigation measures to minimise noise impacts are:**

- ❖ Limit vehicle movements and adhere to the speed of 30 km/h around the site and the official speed limits on all public roads;
- ❖ Vehicles and all equipment must be properly serviced to minimise noise pollution;
- ❖ Use the appropriate Personal Protective Equipment (PPE) as may be required in order to minimise Occupational Health Safety impacts due to noise pollution around the site, and;
- ❖ National or international acoustic design standards must be followed.

(xiii) **Mitigation measures for waste (solid and liquid) management are:**

- ❖ Burial of waste on anywhere within the site prohibited and all generated solid waste must be disposed at the Walvis Bay municipal solid disposal site;
- ❖ Toilet and ablution facilities must be provided on site and should not be located close to sea or pans;
- ❖ Provide site information on the difference between the two main types of waste, namely:
 - Building rubbles;
 - General Waste; and
 - Hazardous Waste.
- ❖ Sealed containers, bins, drums or bags for the different types of wastes must be provided around site and in all critical working areas;
- ❖ Never dispose of hazardous waste in the bins or skips intended for general waste or construction rubble;
- ❖ All solid and liquid wastes generated from the proposed project activities shall be reduced, reused, or recycled to the maximum extent practicable;
- ❖ Trash may not be burned around the site, except at an approved municipal site and under controlled conditions in accordance with the Walvis Bay Municipality municipal regulations and by-laws;
- ❖ Never overfill any waste container, drum, bin or bag because it can be a source of litter around the site;
- ❖ Never litter or throwaway any waste on the site, along any road. No illegal dumping;
- ❖ Littering is prohibited.

3. ROLES AND RESPONSIBILITIES

3.1 Introduction

This section contains the roles and responsibilities with respect to the Environmental Management Plan (EMP) for the planning and permitting, preconstruction, construction, and operational stages of the proposed aquaculture project by Atlantic Aquafarms (Pty) Ltd. A generic organisation structure for Atlantic Aquafarms (Pty) Ltd with respect to the roles and responsibilities for implementation of this EMP is shown in Fig. 3.1.

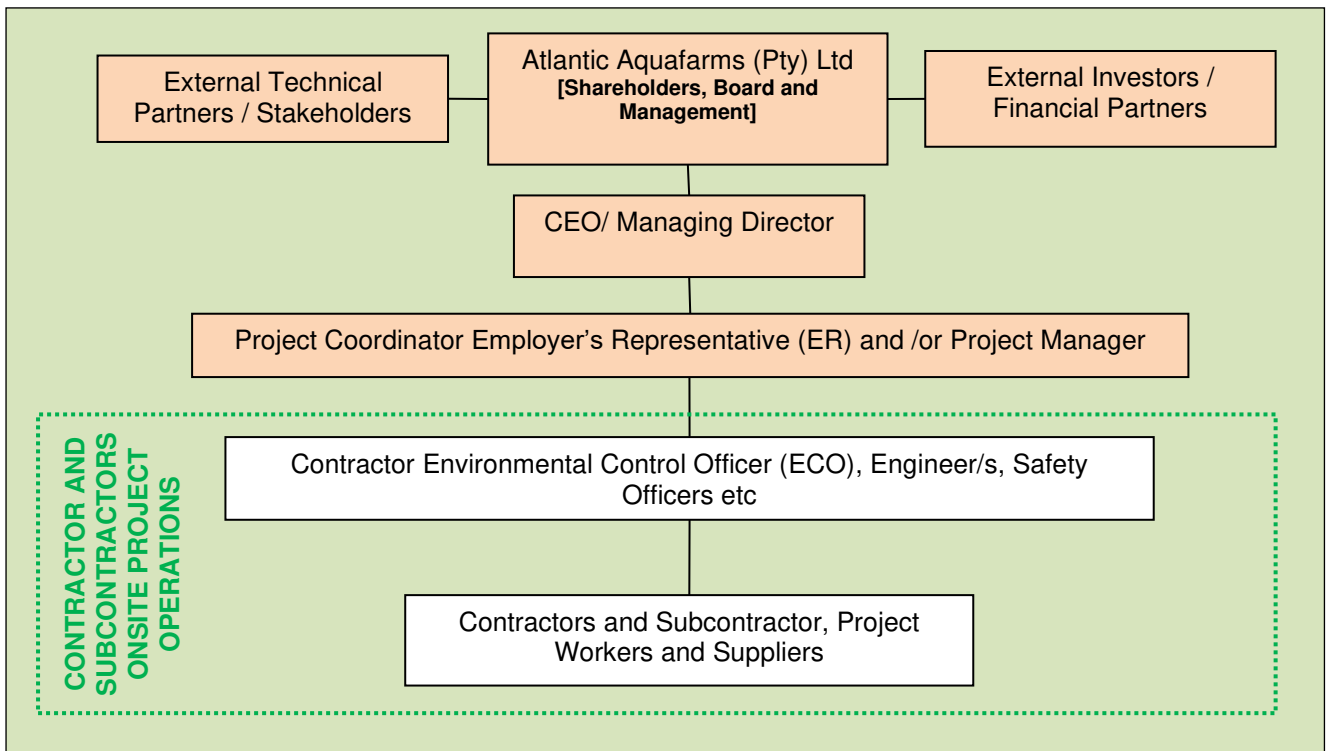


Figure 3.1: Atlantic Aquafarms (Pty) Ltd organisational structure for the proposed aquaculture project with respect to this implementation of the EMP.

3.2 Roles and Responsibilities

3.2.1 Employer's Representative (ER) / Project Manager

Atlantic Aquafarms (Pty) Ltd is to appoint an **Employer's Representative (ER)** with the following responsibilities:

- ❖ Act as the Employer's (Atlantic Aquafarms (Pty) Ltd) on-site project manager and implementing agent;
- ❖ Appoint the Environmental Control Officer (ECO);
- ❖ Ensure that the Employer's responsibilities are executed in compliance with the relevant legislation and this EMP;

- ❖ Ensure that all the necessary environmental authorisations and permits have been obtained;
- ❖ Assist the Contractor in finding environmentally responsible solutions to challenges that may arise (with input from the ECO);
- ❖ Should the ER be of the opinion that a serious threat to or impact on the environment may be caused by the construction operations, he/she may stop work; the Employer must be informed of the reasons for the stoppage as soon as possible;
- ❖ The ER has the authority to issue fines for transgressions of basic conduct rules and/or contravention of this EMP;
- ❖ Should the Contractor or his/her employees fail to show adequate consideration for the environmental aspects related to the EMP, the ER can have person(s) and/or equipment removed from the site or work suspended until the matter is remedied;
- ❖ Report to the Employer on the implementation of this EMP on site (with input from the ECO and/or independent environmental auditor);
- ❖ Maintain open and direct lines of communication between the Employer, ECO, Contractor and Interested and Affected Parties (I&APs) with regards to environmental matters, and;
- ❖ Attend regular site meetings and inspections.

3.2.2 Environmental Control Officer (ECO)

The **Environmental Control Officer (ECO)** has the following responsibilities:

- ❖ Assist the ER in ensuring that the necessary environmental authorisations and permits have been obtained;
- ❖ Assist the ER and Contractor in finding environmentally responsible solutions to challenges that may arise;
- ❖ Conduct environmental monitoring as per this EMP and other regulatory requirements ;
- ❖ Recommend on the issuing of fines for transgressions of basic conduct rules and/or contraventions of the EMP to the ER;
- ❖ Advise the ER on the removal of person(s) and/or equipment not complying with the specifications of this EMP;
- ❖ Carry out regular site inspections (on average once per week) of all construction / operational areas with regards to compliances to this EMP; report any non-compliance(s) to the ER as soon as possible;
- ❖ Organise for an independent internal audit on the implementation of and compliance to this EMP to be carried out half way through the construction period and one per year during the operational stage and the audit must be reports to be submitted to the ER who in turn must submit it to the management;

- ❖ Organise for an independent post-construction environmental audit to be carried out;
- ❖ Continuously review this EMP and recommend additions and/or changes to the EMP document;
- ❖ Monitor the Contractor's environmental awareness training for all new personnel coming onto site;
- ❖ Keep records of all activities related to environmental control and monitoring; the latter to include a photographic record of the construction / operational and environmental control and a register of all major incidents, and;
- ❖ Attend regular site meetings.

3.2.3 Contractor

The responsibilities of the **Contractor** include:

- ❖ Comply with the relevant legislation and municipal by-laws;
- ❖ Preparation and submission (to Atlantic Aquafarms (Pty) Ltd) of the following Management Plans:
 - Environmental awareness training and inductions;
 - Emergency preparedness and response;
 - Waste management, and;
 - Health, Safety and Environment (HSE).
- ❖ Ensure adequate environmental awareness training for senior site personnel;
- ❖ Environmental awareness presentations (inductions) to be given to all site personnel prior to work commencement; the ECO is to provide the course content and the following topics, at least but not limited to, should be covered:
 - The importance of complying with the relevant Namibian, international and best practice legislation;
 - Roles and responsibilities, including emergency preparedness;
 - Basic rules of conduct (Do's and Don'ts);
 - EMP: aspects, impacts and mitigation;
 - Fines for failure to adhere to this EMP;
 - Health, Safety Environment (HSE) requirements.
- ❖ Record keeping of all environmental awareness training and induction presentations, and;

- ❖ Attend regular site meetings and environmental inspection.

3.2.4 Construction Supporting Teams

The construction of the proposed aquaculture project will require an array of specialist teams working very closely with their suppliers and core Atlantic Aquafarms (Pty) Ltd onsite operations team. The following is a summary of some of the specialists that will be required during the preconstruction and construction phase as part of the team of contractors:

- ❖ All Suppliers, installer, mechanical and crane contractors, electrical contractors and civil / structural contractors, each with their respective subcontractors and suppliers, would report directly to the Employer's Representative (ER), acting as the onsite Project Manager.

4. ENVIRONMENTAL PERFORMANCE MONITORING

4.1 Overview

The monitoring process of this EMP performances for the proposed aquaculture project is divided into two (2) parts and these are:

- (i) Monitoring activities and effects to be undertaken by the Environmental Control Officer (ECO), and;
- (ii) Preparation of an Environmental Performance Monitoring reports covering all activities related to the Environmental Management Plan throughout the proposed project lifecycle to be undertaken by the Environmental Control Officer (ECO).

Atlantic Aquafarms (Pty) Ltd will be required to report to the Ministry of Environment, Forestry and Tourism the environmental performances for every six (6) months or as may be required / provided for in the conditions of the Environmental Clearance Certificate. The reporting process will form part of the ongoing environmental monitoring programme. Environmental monitoring programme is part of the EMP performances assessments and will need to be compiled and submitted as determined by the regulators. The process of undertaking appropriate monitoring as per specific topic and tracking performances against the objectives and documenting all environmental activities is part of internal and external auditing to be coordinated by the Environmental Control Officer (ECO) / External Consultant / Suitable qualified in-house resource person. Tables 4.1 – 4.9 outline the type of information that shall need to be recorded on a regular by the Environmental Control Officer (ECO) as part of the monitoring process of the activities and the effects.

The second part of the monitoring of this EMP performance will require an ongoing reporting process outlining all the activities related to the effectiveness of this EMP to be undertaken by the Environmental Control Officer (ECO). The types of the data sets to be used in the preparation of such a report are outlined in Tables 4.1 - 4.9. The objective will be to ensure that corrective actions are reviewed and steps are taken to ensure compliance with this EMP implementation as well as all regulatory requirements, standards and guidelines. The report shall outline the status of the environment and any likely environmental liabilities.

Table 4.1: Monitoring of environmental performance implementation / environmental awareness training.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Is there an Environmental awareness training programme?					
How many people have been given environmental awareness training?					
Is a copy of the EMP on site?					
How effective is the awareness training? Do people understand the contents of the EMP? Where are the weaknesses? Ask 3 people at random various questions about the EMP.					

Table 4.2: Monitoring of environmental performance for the temporal and permanent structures.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are the temporal and permanent structures positioned to avoid sensitive potential sensitive sites?					
Has new infrastructure been created? If so, what, and how well planned / built with respect to environment?					
Have toilets been provided? Where are they situated?					
Do receptacles for waste have scavenging animal proof lids?					
What litter is there – who is littering?					
Are there facilities for the disposal of oils / etc and how often is it removed to an approved disposal site?					
Is there evidence of oil / diesel spills? Bunding or not?					
Housekeeping					

Table 4.3: Environmental data collection.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are records being kept?					
Birds' mortality records?					
Noise level?					
Air Quality?					
Have archaeological sites been found / disturbed / described?					
Other key environmental data sets?					

Table 4.4: Health and safety.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Is there a First Aid Kit on site?					
Are dangerous areas clearly marked off?					
Do vehicles appear to maintain the recommended speed limits?					
Do vehicles drive with headlights on at all times?					

Table 4.5: Recruitment of labour.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
What labour source is used?					
How has the recruitment practice been done?					

Table 4.6: Management of the natural habitat and surficial materials management.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Has there been any development done on or very close sensitive areas?					
Has anyone been caught with plants or animals in their possession?					
Has there been wilful or malicious damage to the environment?					
Has topsoil / seed bank layer been removed from demarcated development areas and appropriately stored?					

Table 4.7: Tracks and off-road driving.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are existing tracks used and maintained?					
What new tracks have been developed and are they planned?					
What evidence is there of off-road driving? Who appears to be responsible?					
Are corners being cut, what type of turning circle are there? Three point turns vs. U turns?					
Have unnecessary tracks been rehabilitated and how well?					
Comments					

Table 4.8: Management of water resources.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
How is potable water supplied and how often? Position of tanks?					
Is water being wasted?					
Is there any leakage from pipes or taps?					
Has casing been left when boreholes hit water and have any records of water strikes been kept? Were water samples taken and RWL measured?					

Table 4.9: Public relations.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Have any complaints been made about the construction and or operational activities by the public If so, what, and how was the issue resolved?					

5. ENVIRONMENTAL AWARENESS

5.1 Atlantic Aquafarms (Pty) Ltd Environmental Policy

Table 5.2 summarises the environmental statement with respect to environmental commitment that Atlantic Aquafarms (Pty) Ltd will implement as part of the company environmental policy.

Table 5.1: Environmental statement.

Atlantic Aquafarms (Pty) Ltd Environmental Statement
<p style="text-align: center;">Atlantic Aquafarms (Pty) Ltd is Committed to:</p> <ol style="list-style-type: none">1. Fully comply with all applicable environmental regulations in force in Namibia;2. Fully comply with all applicable by-laws and regulations from the Walvis Bay Municipality;3. Committed to precautionary approach in all our environmental strategies;4. Exercising appropriate environmental care in accordance with the provisions of this EMP.5. Committed to promoting the development of open and constructive partnerships with the all the relevant stakeholders to address environmental concerns and advance necessary protection measures.6. The advancement of scientific knowledge to be applied in the identification and effective resolution of real environmental challenges associated with aquaculture development in Namibia.7. Continuously encouraging Pollution Prevention (P2), Cleaner Production (CP), Waste Minimisation, Reuse and Recycling efforts.8. Conducting regular internal and external audits of all our operations to ensure adherence to this policy and compliance to all relevant regulations throughout the lifecycle of the proposed aquaculture project.

5.2 Environmental Personnel Register

Table 5.2 shows the Environmental Personnel Register to be signed by every person who receives or attends the Environmental Awareness Training or who has the training material explained to him or her or in possession of the training material.

6. CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Conclusions

Mitigation measures for both positive and negative impacts have been proposed and management strategies are provided in this Environmental Management Plan (EMP Vol. 3 of 3) for the following development stages:

- (i) Planning and permitting;
- (ii) Preconstruction;
- (iii) Construction, and;
- (iv) Operational.

This Environmental Management Plan (EMP) Report Vol. 3 of 3 incorporating all the constraints, relevant mitigation measures with respect to likely positive and negative impacts and recommendations have been prepared for implementation by the developer / operator. This EMP implementation and monitoring activities covers all the stages of the proposed aquaculture project lifecycle.

9.2 Recommendations

The following are the recommended actions to be implemented by the Atlantic Aquafarms (Pty) Ltd as a part of the management of the impacts through implementations of the EMP covering the entire lifecycle (permitting and planning, preconstruction, construction and operational stages) of the proposed project activities:

- (i) The proponent must obtain all other necessary permits (Environmental Clearance Certificate), licenses (Aquaculture License) and land consents / ownership as may be applicable before implementation of the project;
- (ii) The proponent must implement and adopt precautionary approach by developing and implementing measures aimed at protection the terrestrial and marine physical, biological and socioeconomic receiving environments;
- (iii) The proponent must contract an Environmental Control Officer/ Consultant / suitable in-house resources person to lead and further develop, implement and promote environmental culture through awareness raising of the workforce, contractors and subcontractors;
- (iv) The proponent / Environmental Control Officer/ Consultant / suitable in-house resources person MUST work with the local experts in making sure that mitigation measures to minimise the impacts on receiving environment (terrestrial and marine physical, biological and socioeconomic environments) are fully implemented and monitoring measures are put place;
- (v) Before undertaking detailed site-specific activities (implementing the actual physical disturbance of the land surface) such as creating access routes, powerline route and selection of actual location of the proposed aquaculture project, the proponent /Environmental Control Officer/ Consultant / suitable in-house resources person should consider the sensitivity of the local area in terms

of the local flora and fauna or relocation process and may work with or get advice from the fauna and flora specialist consultant / local experts as may be required;

- (vi) The proponent must provide human and financial resources, for the implementation of the proposed mitigations measures and effective environmental management and monitoring thereof throughout the lifecycle of the proposed project activities;
- (vii) The proponent must develop a simplified environmental induction and awareness programme for all the workforce, contractors and subcontractors and where contracted service providers are likely to cause negative environmental impacts, these will need to be identified and contract agreements need to be developed with costing provisions for environmental liabilities;
- (viii) The proponent must develop and implement a monitoring programme that will fit into the overall company's Environmental Policy and Management Systems (EMS), and;
- (ix) The proponent must /Environmental Coordinator / Consultant / Suitable in-house resource person must regularly (as may be required by the regulators) prepare and submitted to the regulators environmental monitoring reports as maybe required by law.

All the responsibilities to ensure that the recommendations of this EMP Report are executed accordingly, rest with the proponent (**Atlantic Aquafarms (Pty) Ltd**). The company must provide all appropriate resource required for the effective implementation of this EMP. It is the responsibility of **Atlantic Aquafarms (Pty) Ltd** to make sure that all members of the workforce including contractors and subcontractors are aware of the provisions of this EMP Report and its objectives.

END