PROPOSED REPAIR, MAINTENANCE AND UPGRADE OF EXISTING INFRASTRUCTURE AND THE DEVELOPMENT OF ROCK REVETMENT AT THE ARNISTON FISHING HARBOUR, WESTERN CAPE

DEA REF NR: 14/12/16/3/3/1/1768

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P. O. Box 1058
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7654
Date: June 2017

Executive Summary Of Draft Basic Assessment Report

a. Project Description

1. Background & Locality:

The coastline at Arniston Harbour is orientated South to North (facing East) (see Arniston in *Figure 1* for locality) and is exposed to south westerly swell. The site is characterised by sandy beaches and rocky outcrops. The shoreline is exposed and subject to dynamic coastal conditions. From satellite images the breaker zone was measured > 400 m during a storm event. Furthermore, the sediment is clear on satellite images which indicate high concentrations of sediment in suspension. This is also an indication of high wave energy.

A coastal setback study for the Overberg District was conducted by SSI during 2012. Apart from the coastal setback line, the study also estimated high risk areas with regards to coastal erosion based on wave run-up, topography, sea level rise, wave conditions, etc. The area highlighted red in the *Figure 2* below was identified as a high risk urban area during the study, which include the harbour area and slipway and harbour embankment.

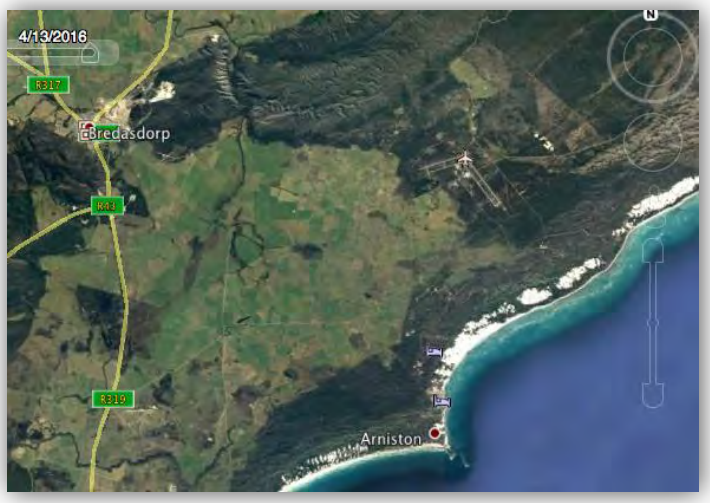

Figure 1: Location map

Figure 2: Arniston harbour – coastal erosion high risk area highlighted in red.

Pieter Badenhorst Professional Services cc has been appointed by Mott MacDonald Pty Ltd as the independent environmental practitioner to handle the Environmental Impact Assessment and the Environmental Authorisation application for the project.

2. Proposed Development

The application is for the repair and maintenance work to existing harbour infrastructure and the development of a rock revetment in order to protect the harbour embankment. The proposed rock revetment has a development footprint of approximately 5870m².

Repair and maintenance work

Existing infrastructure which requires repair and maintenance work include the slipway, harbour fence and winch room. *Figure 3* below illustrates the harbour layout.

NB! The abovementioned activities are all maintenance and repair work within the existing footprint and will not increase the development footprint of the existing harbour. It therefore, does not constitute a listed activity in terms of the EIA Regulations, 2017 (as per the correspondence, dated 13 March 2017, from the Department of Environmental Affairs – Reference number: 14/12/16/3/1/1/102).

Figure 3: The application site, Arniston Harbour layout.

Embankment

The proposed development includes the development of a rock revetment since the harbour embankment is eroding. The rock revetment will be a new development which will increase the development footprint of the existing harbour. The proposed rock revetment will have a development footprint of approximately 5870m².

The embankment protects the harbour infrastructure above the slipway and is located along the entire length of the seaward facing boundary of the harbour facility (about 95m in total) (see *Figure 4* below).

Figure 4: Location of embankment.

Significant erosion of embankment by wave action and wave run-up, has resulted in severe slippage/failure of large portions of the embankment, thereby undermining the fence perimeter and parking area above (see *Figure 5* below). The continuing undermining of the embankment is putting harbour infrastructure (buildings) at risk. There is limited vegetative cover providing stability. Some sections of the embankment appear to be builders' fill used to reclaim land. Presence of heavy foreign objects used in fill material, to reclaim land for the parking area, is evident.

Figure 5: Arniston harbour embankment.

The embankment requires protection through the appropriate coastal sea defence and rock revetment is

deemed the preferred option. The typical concept detail of rock revetment is shown in the following *Figure 6*.

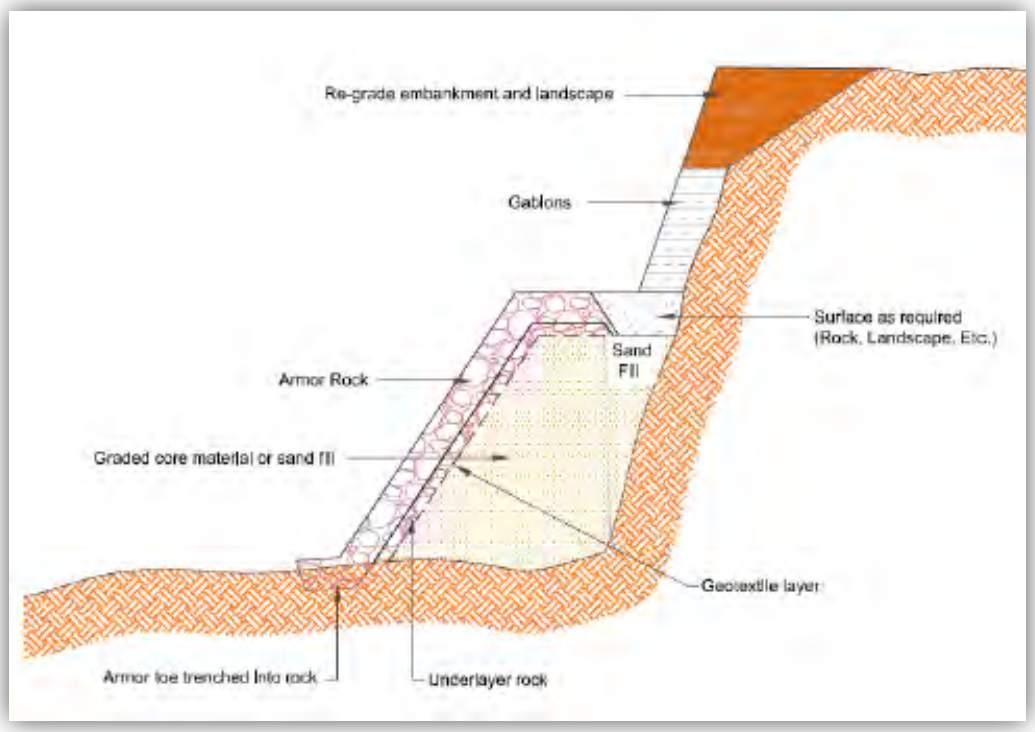

Figure 6: Typical rock revetment design

The construction methodology will be as follows:

- New coastal defence required (rock revetment)
- Excavation for a toe into beach and shaping of embankment to take revetment
- Geotextile layer placed against insitu
- Underlayer rock to be placed and shaped by excavator
- Armour rock to be positioned by crane

NB! The structure is new and footprint will be increased therefore a basic assessment will be required.

b. Needs and Desirability

They are summarised for this project as follows:

SOCIALLY:

The development will meet the local and regions needs through providing temporary job opportunities during the development phase and creating a safe operating harbour for fishermen to use, which in turn has positive impact on the economy. In addition, the visual aspect and sense of place is in line with the surroundings, as the proposed development will be located at an existing harbour and will be for the protection of the harbour infrastructure.

ECONOMICALLY:

The development will have a positive impact by improving the economy of local workers through providing job opportunities during the development phase and creating a safe operating harbour for fishermen to use.

ENVIRONMENTALLY:

The development will have a possible negative impact on the seashore, however the development of the rock revetment will be kept strictly to the proposed development footprint.
It will, however, have many positive impacts that include:

- Will provide temporary job opportunities for local workers during the development phase.
- Provide protection to harbour infrastructure.
- Provide the local community and fisherman to fully utilise a safe and operating harbour.

c. Alternatives

Alternative 1 (preferred alternative)

The preferred alternative entails the development of a rock revetment (see *Figure 7* below) as a coastal protection measure. The construction methodology will be as follows:

- New coastal defence required (likely rock revetment),
- Excavation for a toe into beach and shaping of embankment to take revetment,
- Geotextile layer placed against insitu,
- Underlayer rock to be placed and shaped by excavator, and
- Armour rock to be positioned by crane.

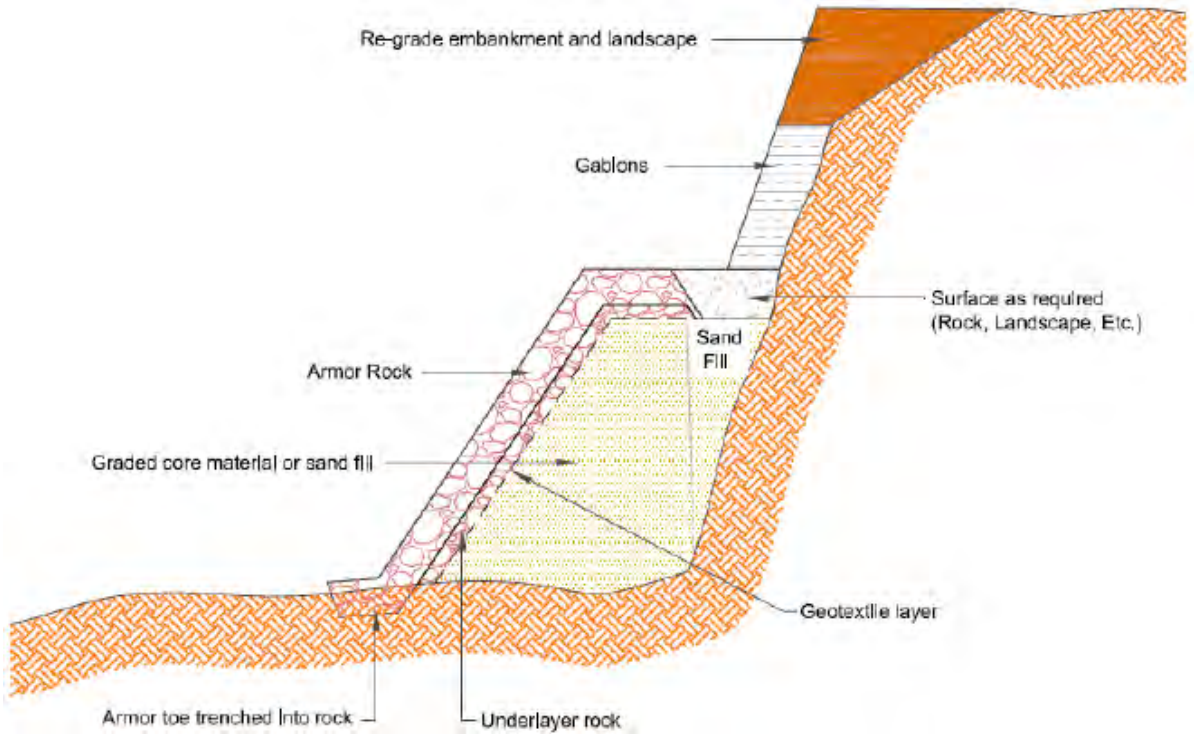

Figure 7: Cross section of rock revetment, for Alternative 1

The proposed impacts will be only during the development phase and will it will only affect the specific site.

Temporary employment opportunities will be created during the development phase and the activity will contribute to local economy by providing a safe operating harbour for fishermen.

Alternative 2

Alternative 2 entails the development of geotextile sandbag containers (see *Figure 8* below) as a coastal protection measure.

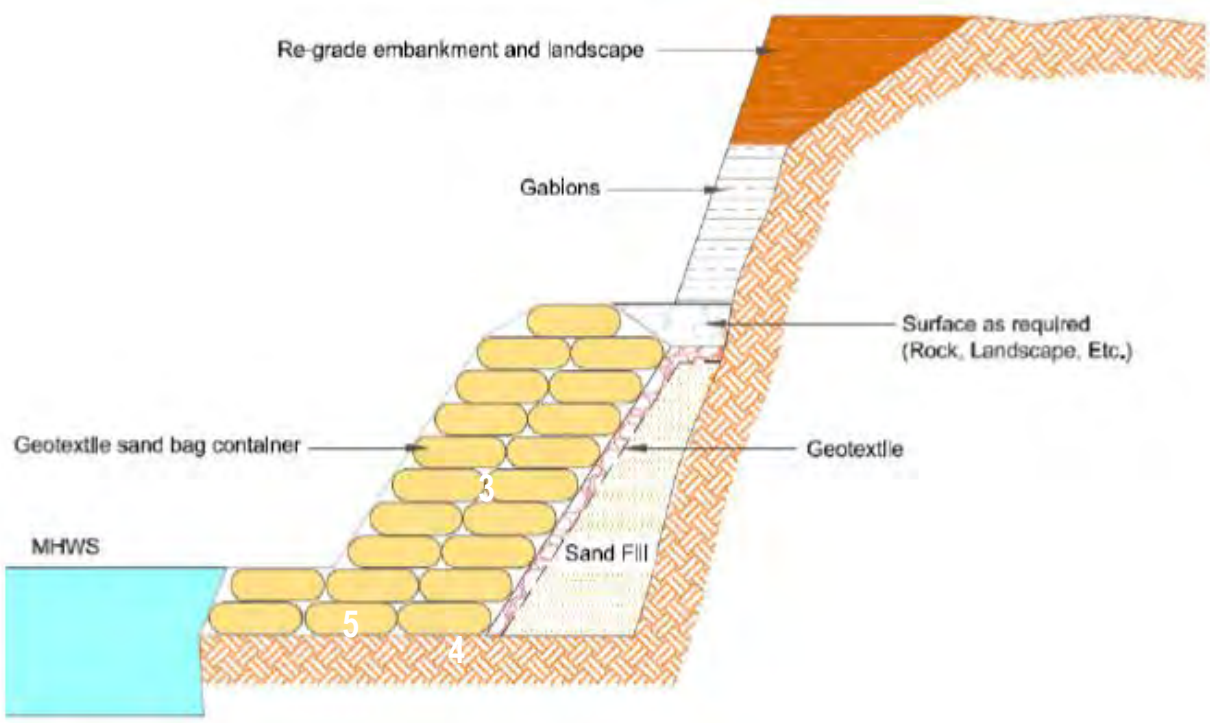

Figure 8: Cross section of geotextile sandbag containers, for Alternative 2.

Alternative 3

Alternative 3 entails the development of a vertical structure combination (see *Figure 9* below) as a coastal protection measure.

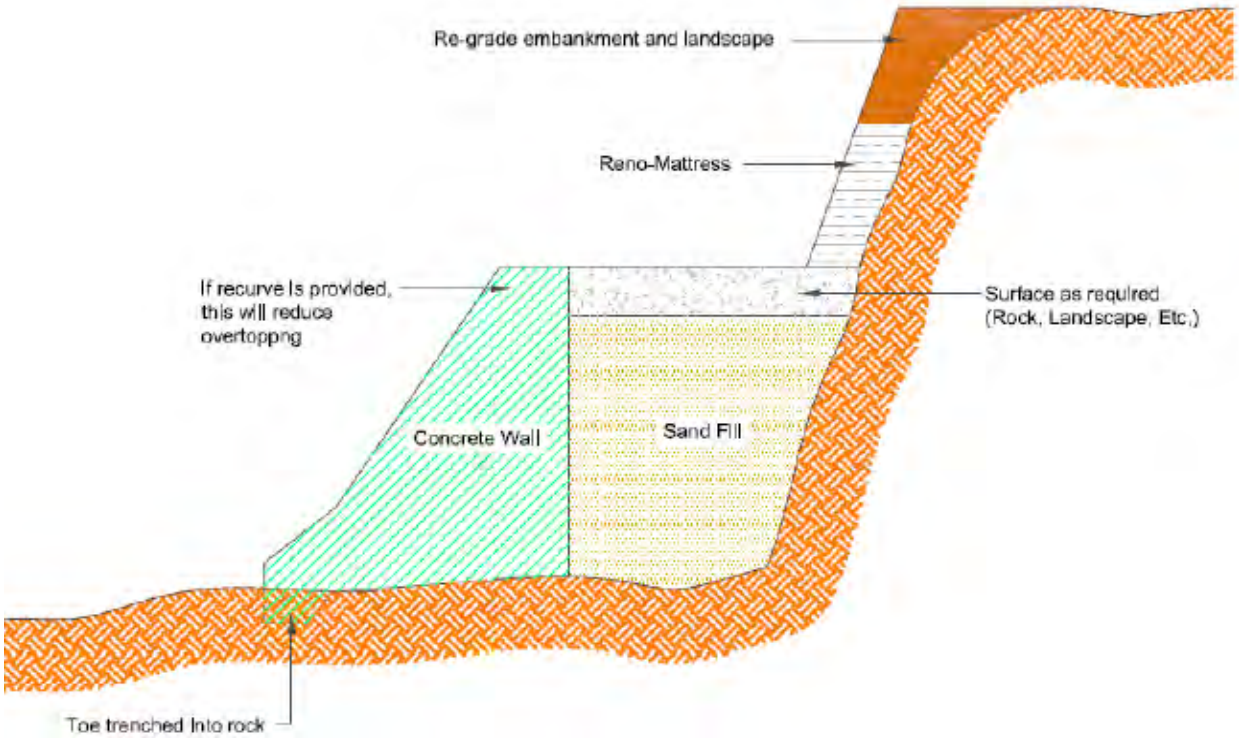

Figure 9: Cross section of a vertical structure combination, for Alternative 3.

No-go alternative (compulsory)
If the no-go alternative is implemented, the repair and maintenance work will proceed, however the harbour embankment will remain the same and will continue to erode. No employment opportunities will be created during the construction phase and the eroding embankment will remain a safety risk to the public and harbour infrastructure.

d. Public Participation

Public participation included the following:

ADVERTISEMENTS

An advertisement was placed in the Suidernuus to notifying I&AP's of the proposed development, the availability of the draft BAR and of the opportunity to register for the public participation process.

NOTICE BOARDS

A Notice Board was placed at the harbour entrance.

INFORMATION AND REPORTING

All listed I&AP's and authorities were notified of the I&AP registration period via registered mail and by email.

The authorities all received a copy of the draft report together with the notification. The report was distributed for a 30 day commenting period from 23 June 2017 until 24 July 2017.

Hard copies of the report were sent to the Arniston library, Department of Environmental Affairs: Oceans and Coasts, Cape Agulhas Municipality, South African Heritage Resource Agency, Department of Agriculture, Forestry and Fisheries, Department of Environmental Affairs and Development Planning.

I&AP DATABASE

The I&AP database was compiled from registered and listed I&APs.

COMMENTS AND RESPONSES

The actual comments received will be addressed in the Comments and Response table.

Contents

Figures

Tables

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:	
Application Number:	
Date Received:	

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

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **08 December 2014**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.
14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included in the electronic copy of the report submitted to the competent authority.

Section A: Activity Information

Has a specialist been consulted to assist with the completion of this section? **YES** ~~NO~~
If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

1. Project Description

a) Describe the project associated with the listed activities applied for

1. <u>Background & Locality:</u>

The coastline at Arniston Harbour is orientated South to North (facing East) (see Arniston in *Figure 1* for locality) and is exposed to south westerly swell. The site is characterised by sandy beaches and rocky outcrops. The shoreline is exposed and subject to dynamic coastal conditions. From satellite images the breaker zone was measured > 400 m during a storm event. Furthermore, the sediment is clear on satellite images which indicate high concentrations of sediment in suspension. This is also an indication of high wave energy.

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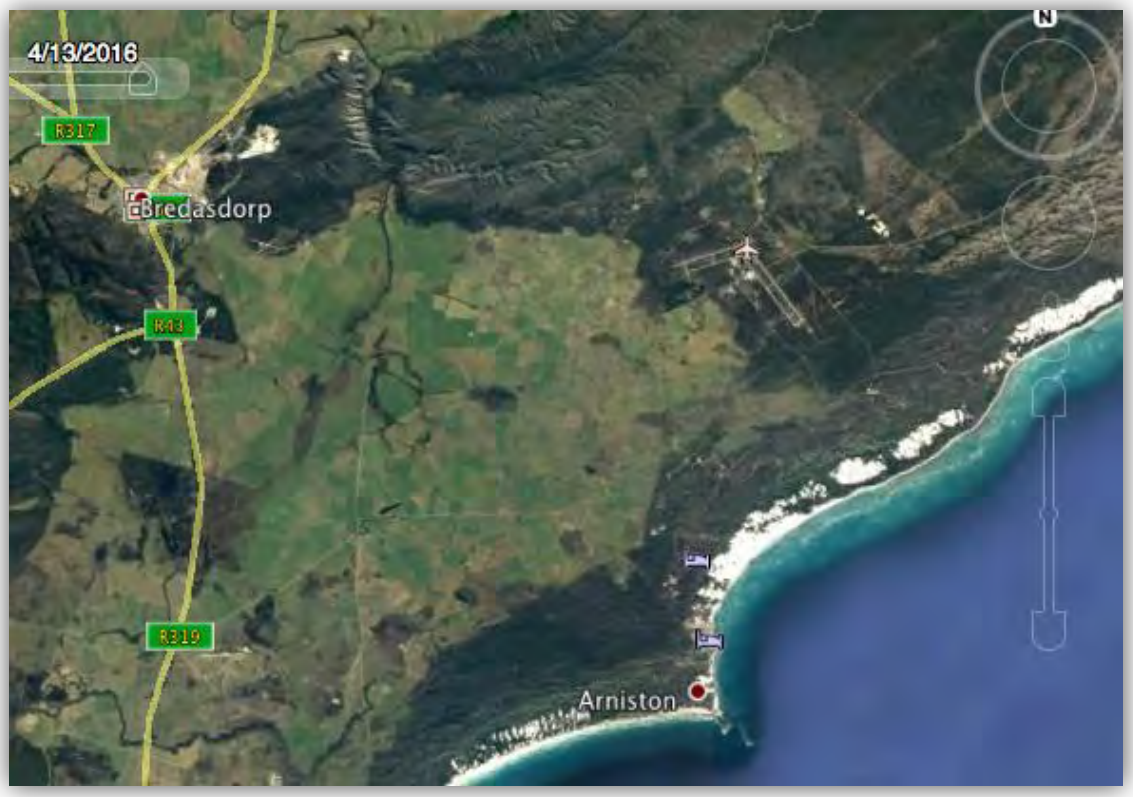

Figure 1: Locality of Arniston harbour

Figure 2: Arniston harbour – coastal erosion high risk area highlighted in red.

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Figure 3: The application site, Arniston Harbour - layout.

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The embankment protects the harbour infrastructure above the slipway and is located along the entire length of the seaward facing boundary of the harbour facility (about 95m in total) (see *Figure 4* below).

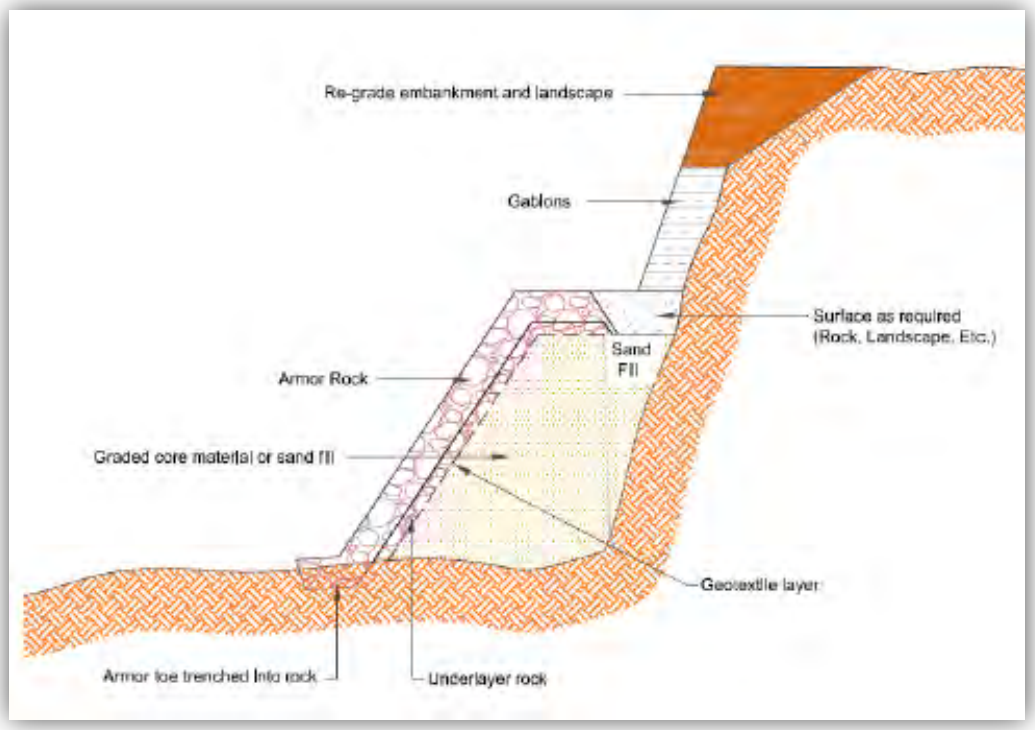
Figure 4: Location of embankment.

Significant erosion of embankment by wave action and wave run-up, has resulted in severe slippage/failure of large portions of the embankment, thereby undermining the fence perimeter and parking area above (see *Figure 5* below). The continuing undermining of the embankment is putting harbour infrastructure (buildings) at risk. There is limited vegetative cover providing stability. Some sections of the embankment appear to be builders' fill used to reclaim land. Presence of heavy foreign objects used in fill material, to reclaim land for the parking area, is evident.

Figure 5: Arniston harbour embankment.

The embankment requires protection through the appropriate coastal sea defence and rock revetment is deemed the preferred option.

The typical concept detail of rock revetment is shown in the following *Figure 6*.



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The construction methodology will be as follows:

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NB! The structure is new and footprint will be increased therefore a basic assessment will be required.

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

Listed activity as described in GN 734, 735 and 736	Description of project activity
Example: ***GN 734 Item xx xx): The construction of a bridge where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.***	***A bridge measuring 5 m in height and 10m in length, no wider than 8 meters will be built over the Orange river***
GN. R. 327	
Item 19A: The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from – (i) the seashore; (ii) the littoral active zone, an estuary or a distance of 100 metres inland of the highwater mark of the sea or an estuary, whichever distance is the greater; or (iii) the sea; — but excluding where such infilling, depositing, dredging, excavation, removal or moving— (b) is for maintenance purposes undertaken in accordance with a maintenance management plan.	This activity is triggered as the construction of a new embankment/coastal protection structure will result in depositing of more than 5m³ within 100m of the high-water mark of the sea.
Item 52: The expansion of structures in the coastal public property where the development footprint will be increased by more than 50 square metres, excluding such expansions within existing ports or harbours where there will be no increase in the development footprint of the port or harbour and excluding activities listed in activity 23 in Listing Notice 3 of 2014, in which case that activity applies.	This activity is triggered as the construction of the proposed embankment/coastal protection structure will increase the footprint of the harbour by more than 500m².
Item 55: Expansion— (i) in the sea; (ii) in an estuary; (iii) within the littoral active zone; (iv) in front of a development setback; or (v) if no development setback exists, within a distance of 100 metres inland of the high-water mark	This activity is not triggered as the exclusion clause applies. The proposed repair and maintenance of the breakwater and seawalls, as well as the repair of the slipways will take place within the existing harbour. The proposed repair and maintenance work will not result in any increase in the development footprint of

of the sea or an estuary, whichever is the greater; in respect of — (a) facilities associated with the arrival and departure of vessels and the handling of cargo; (b) piers; (c) inter- and sub-tidal structures for entrapment of sand; (d) breakwater structures; (e) coastal marinas; (f) coastal harbours or ports; (g) tunnels; or (h) underwater channels; but excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. **Item 65**: The expansion and related operation of an island,— (i) an anchored platform; or (ii) any other permanent structure or infrastructure; on or along the sea bed, where the expansion will constitute an increased development footprint, excluding expansion of facilities, infrastructure or structures for aquaculture purposes.	the harbour. This activity will not be triggered as the proposed repair and maintenance work will be within the existing harbour and on existing permanent structures on the seabed and these activities will not increase the development footprint of the existing structures.
GN R. 325	
None	
GN R. 324	
None	

2. Feasible And Reasonable Alternatives

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

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Appendix 1 (3)(h), Regulation 2014. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the

interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

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

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

a) Site alternatives

Alternative
Description
No site alternatives are being considered as the proposed development will take place at an existing harbour.

	~~Latitude (S):~~			~~Longitude (E):~~		
~~Alternative 1~~						
~~Corner A~~						
~~Corner B~~						
~~Corner C~~						
~~Corner D~~						

In the case of linear activities:

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

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

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

b) Lay-out alternatives

Alternative		
Description	Lat (DDMMSS)	Long (DDMMSS)
No layout alternatives are being considered.		

c) Technology alternatives

Alternative
No layout alternatives are being considered.

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

Alternatives	
Design Alternatives: **Coastal protection measures**	The following design alternatives were considered and assessed: • Alternative 1 – Rock revetment • Alternative 2 – Geotextile sandbag containers (GSC) • Alternative 3 – Vertical concrete structure or combination (i.e concrete structure and rock revetment) The preferred alternative (Alternative 1) entails the development of a rock revetment as a coastal protection measure. The construction methodology will be as follows: • New coastal defence required (likely rock revetment), • Excavation for a toe into beach and shaping of embankment to take revetment, • Geotextile layer placed against insitu, • Underlayer rock to be placed and shaped by excavator, and • Armour rock to be positioned by crane. Alternative 1 is deemed feasible and reasonable and is the preferred alternative. A multi criteria analysis (MCA) was carried out by Mott MacDonald on the above alternatives to assess the preferred alternative. Appendix K1: Table 1 (see Appendix K) is the MCA performed and from the analysis the preferred outcome was realized.

e) No-go alternative

The no-go alternative will result in the rock revetment not being constructed and the harbour embankment will remain unchanged, resulting in continuous embankment erosion and potential negative impacts on the harbour infrastructure, e.g. parking area.

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

3. Physical Size Of The Activity

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

Alternative:	**Size of the activity:**
Alternative 1[1] (preferred activity alternative)	5870m²
~~Alternative 2~~	
~~Alternative 3~~	

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

Alternative:	**Size of the site/servitude:**
~~Alternative 1 (preferred activity alternative)~~	
~~Alternative 2 (if any)~~	
~~Alternative 3~~	

4. Site Access

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

Describe the type of access road planned:

An existing paved road provides access to the harbour.

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

5. Locality Map

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

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s;)
- road access from all major roads in the area;

[1] "Alternative A.." refer to activity, process, technology or other alternatives.

- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;

- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

6. Layout/Route Plan

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

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

7. Sensitivity Map

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

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWS);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

8. Site Photographs

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

9. Facility Illustration

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

10. Activity Motivation

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

1. Is the activity permitted in terms of the property's existing land use rights?	YES	NO	Please explain
The proposed development of a rock revetment is for the protection of the embankment of an existing harbour.			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES	~~NO~~	Please explain
The activity will be in line with the Cape Agulhas IDP and will contribute to fishing activities and will create some temporary employment opportunities which are all key actions identified by the PSDP.			
(b) Urban edge / Edge of Built environment for the area	YES	~~NO~~	Please explain
The property falls inside of the Urban edge of Arniston.			
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES	~~NO~~	Please explain
The activity applied for is in line with the Cape Agulhas Local Municipality SDF and IDP and will not compromise the integrity of the existing approved IDP and SDF.			
(d) Approved Structure Plan of the Municipality	YES	~~NO~~	Please explain
Supporting fishing activities, ensuring investment and creating employment opportunities are all key actions identified in the local Structure Plan. This project will effectively address all three these actions.			
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	YES	~~NO~~	Please explain
The approval of this application would not compromise the integrity of the existing environmental management priorities. The proposed development will take place at an existing harbour.			
(f) Any other Plans (e.g. Guide Plan)	~~YES~~	NO	Please explain
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	~~YES~~	NO	Please explain
This is a project funded by the applicant.			
4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES	~~NO~~	Please explain
The proposed development of a rock revetment will provide protection for harbour infrastructure and safety to the community. It will also provide temporary employment during the development phase. Providing protection to harbour infrastructure will ensure a safe operating harbour that the community and fishermen can use, which in turn will contribute to the local economy.			
5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix E.)	YES	~~NO~~	Please explain
The activity will take place at an existing harbour situated inside the urban edge of Arniston. The proposed			

development is for the development of a rock revetment at the existing harbour and no additional services are required.			
6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication is on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	~~YES~~	NO	Please explain
The development will not have an impact on the municipality planning and infrastructure.			
7. Is this project part of a national programme to address an issue of national concern or importance?	YES	~~NO~~	Please explain
A section of the project will address the national concern of creating new jobs since repair and maintenance works will be done at the existing harbour which will ensure a safe and operating harbour for fishermen to use.			
8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES	~~NO~~	Please explain
The proposed rock revetment is for the protection of the embankment of the existing harbour.			
9. Is the development the best practicable environmental option for this land/site?	YES	~~NO~~	Please explain
Yes, the development will take place at an existing harbour and will ensure protection of the harbour embankment.			
10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES	~~NO~~	Please explain
The proposed development will take place within 100m of the high-water mark of the sea. The existing harbour embankment is eroding due to wave action, which negatively impacts on the harbour infrastructure located behind the embankment. The eroding embankment could lead to the failure of harbour infrastructure such as the parking area. Therefore, the small negative impact of the development of the rock revetment within 100m of the high-water mark will be outweighed by the positive socio-economic benefits of temporary job creation during the development phase as well as contributing to local and national economy through the use of an operating harbour by fishermen which in turn can sell and export their fish and fish products.			
11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	~~YES~~	NO	Please explain
12. Will any person's rights be negatively affected by the proposed activity/ies?	~~YES~~	NO	Please explain
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	~~YES~~	NO	Please explain
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	~~YES~~	NO	Please explain
15. What will the benefits be to society in general and to the local communities?			Please explain
The development will ensure public safety, protection of the harbour, better and safer fishing/boat launching infrastructure, temporary job opportunities during the construction phase and benefit local economy.			
16. Any other need and desirability considerations related to the proposed activity?			Please explain
None			
17. How does the project fit into the National Development Plan for 2030?			Please explain
Measures to attack poverty, create employment and contributing to the economy Arniston is a fishing town that attracts tourists. The town has the capability to contribute to the country's economy should its fishing industry grow and export fish. The proposed development will create a safe			

operational harbour for fishermen and the community, which will create some employment opportunities and in turn decrease poverty and improve the residents' lives.

18. Please describe how the general objectives of Integrated Environmental Management as set out in Section 23 of NEMA as amended have been taken into account.

Section 23 of NEMA	Implementation for this proposed development
(a) promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment;	The needs of people, the economy of the area and the environment were considered in developing the preferred option.
(b) identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximizing benefits, and promoting compliance with the principles of environmental management set out in section 2;	The selected development area was chosen due to the need for coastal protection measures as the existing embankment is eroding. The type of development also ensured low impacts on the environment whereas the socio-economic conditions were however not maximised directly, however the socio-economic conditions and contribution to the socio-economic conditions were secured.
(c) ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;	The selected development option ensured minimal impacts on the natural environment.
(d) ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;	The public were kept informed through distribution of information as required by the regulations.
(e) ensure the consideration of environmental attributes in management and decision making which may have a significant effect on the environment; and	Attributes such as socio economy were identified which aided the identification of the proposed development.
(f) identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 2.	Environmental management principles were used to identify the type of project, which in this case will contribute to the economy of the region while at the same time (safe working harbour), have minimal negative impacts on the natural environment. In other words, the proposed development is in line with the opportunities and constraints of the land, the surrounding area, and the region's economy.

19. Please describe how the principles of environmental management as set out in Section 2 of NEMA as amended have been taken into account.

In achieving sustainable development the focus therefore should not be restricted to environmental or nature conservation factors only. It should include economic and social realities and consider social factors such as those that determine income, quality of life, social networks, and other means aimed at maintaining and improving the well-being of people. Economic factors deal with the affordability of processes, their potential to generate an income over an extended period (into future generations) and to maintain its ability to support both the environmental and social needs of an area.

In short, if people are impoverished, there will be no environment to protect; if a project is not attractive economically, it will not be launched.

One way of testing whether a project meets with the demands of sustainability in development is to establish whether a project increases environmental, social, and economic values. Sustainable development mainly has as its aim the maintenance of environmental capital. This is achieved if the project that will be established in the developmental process is likely to provide at least the same value as is likely to be destroyed by its development.

Looking at the three tiers of NEMA principles, this development should be socially, environmentally, and economically viable.

They are summarised for this project as follows:

SOCIALLY:

The development will meet the local and regions needs through providing temporary job opportunities during the development phase and creating a safe operating harbour for fishermen to use, which in turn has positive impact on the economy. In addition, the visual aspect and sense of place is in line with the surroundings, as the proposed development will be located at an existing harbour and will be for the protection of the harbour infrastructure.

ECONOMICALLY:

The development will have a positive impact by improving the economy of local workers through providing job opportunities during the development phase and creating a safe operating harbour for fishermen to use.

ENVIRONMENTALLY:

The development will have a possible negative impact on the seashore, however the development of the rock revetment will be kept strictly to the proposed development footprint.
It will, however, have many positive impacts that include:

- Will provide temporary job opportunities for local workers during the development phase.
- Provide protection for harbour infrastructure.
- Provide the local community and fisherman to fully utilise a safe and operating harbour.

11. Applicable Legislation, Policies And/Or Guidelines

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

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management Act, 1998 (Act No. 107 of 1998): Environmental Impact Assessment Regulations, 2017	Environmental Authorisation	Department of Environmental Affairs	Pending
National Heritage Resources Act (Act No. 25 of 1999)	Notice of Intent to Develop	South African Heritage Resources Agency	Submitted

12. Waste, Effluent, Emission And Noise Management

a) Solid waste management

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

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

Any solid waste will be disposed of by the applicant

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

Not applicable

Will the activity produce solid waste during its operational phase?	~~YES~~	**NO**
If YES, what estimated quantity will be produced per month?		m^3

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

Not applicable

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

Not applicable

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

Not applicable

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

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

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

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

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

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	~~YES~~	**NO**
If YES, what estimated quantity will be produced per month?		m^3
Will the activity produce any effluent that will be treated and/or disposed of on site?	~~YES~~	**NO**

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

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

~~If YES, provide the particulars of the facility:~~

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

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

Not applicable

c) Emissions into the atmosphere

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

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.
If NO, describe the emissions in terms of type and concentration:

Emissions will be general emissions that form part of construction activities for example emissions by construction vehicles.

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?	~~YES~~	**NO**

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

e) Generation of noise

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

Describe the noise in terms of type and level:

The noise will be general noise associated with construction activities including noise from construction vehicles and equipment.

13. Water Use

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

~~Municipal~~	~~Water board~~	~~Groundwater~~	~~River, stream, dam or lake~~	~~Other~~	The activity will not use water

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:	N/A	
Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?	~~YES~~	**NO**

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

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

14. Energy Efficiency

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

The development will be done by using machinery which is fuel driven.

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

Not applicable

Section B: Site/Area/Property Description

Important notes:

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.
2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section?

~~YES~~	**NO**

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

Property description/physical address:

Province	Western Cape	
District Municipality	Overberg District Municipality	
Local Municipality	Cape Agulhas Local Municipality	
Ward Number(s)	N/A	
Farm name and number	Erven 172 & 173, Arniston	
Portion number	N/A	
SG Code	C01100020000017200000 C01100020000077300000	

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

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

Zoning not available.

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

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

~~YES~~	**NO**

1. Gradient Of The Site

Indicate the general gradient of the site.

Alternative S1:

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

Alternative S2 (if any):

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

2. Location In Landscape

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

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

3. Groundwater, Soil And Geological Stability Of The Site

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

	Alternative 1:		~~**Alternative 2 (if any):**~~		~~**Alternative 3 (if any):**~~	
Shallow water table (less than 1.5m deep)	~~YES~~	**NO**	~~YES~~	~~**NO**~~	~~YES~~	~~**NO**~~
Dolomite, sinkhole or doline areas	~~YES~~	**NO**	~~YES~~	~~**NO**~~	~~YES~~	~~**NO**~~
Seasonally wet soils (often close to water bodies)	~~YES~~	**NO**	~~YES~~	~~**NO**~~	~~YES~~	~~**NO**~~
Unstable rocky slopes or steep slopes with loose soil	**YES**	~~NO~~	~~YES~~	~~**NO**~~	~~YES~~	~~**NO**~~
Dispersive soils (soils that dissolve in water)	~~YES~~	**NO**	~~YES~~	~~**NO**~~	~~YES~~	~~**NO**~~
Soils with high clay content (clay fraction more than 40%)	~~YES~~	**NO**	~~YES~~	~~**NO**~~	~~YES~~	~~**NO**~~
Any other unstable soil or geological feature	~~YES~~	**NO**	~~YES~~	~~**NO**~~	~~YES~~	~~**NO**~~
An area sensitive to erosion	**YES**	~~NO~~	~~YES~~	~~**NO**~~	~~YES~~	~~**NO**~~

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

4. Groundcover

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

~~Natural veld – good condition[E]~~	~~Natural veld with scattered aliens[E]~~	~~Natural veld with heavy alien infestation[E]~~	~~Veld dominated by alien species[E]~~	~~Gardens~~
~~Sport field~~	~~Cultivated land~~	~~Paved surface~~	**Building or other structure**	~~Bare soil – Fire breaks~~

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

5. Surface Water

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

Perennial River	~~YES~~	**NO**	~~UNSURE~~
Non-Perennial River	~~YES~~	**NO**	~~UNSURE~~
Permanent Wetland	~~YES~~	**NO**	~~UNSURE~~
Seasonal Wetland	~~YES~~	**NO**	~~UNSURE~~
Artificial Wetland	~~YES~~	**NO**	~~UNSURE~~
Estuarine / Lagoonal wetland	~~YES~~	**NO**	~~UNSURE~~

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

Not applicable

6. Land Use Character Of Surrounding Area

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

~~Natural area~~	~~Dam or reservoir~~	~~Polo fields~~
~~Low density residential~~	~~Hospital/medical centre~~	~~Filling station[H]~~
Medium density residential	~~School~~	~~Landfill or waste treatment site~~
~~High density residential~~	~~Tertiary education facility~~	~~Plantation~~
~~Informal residential[A]~~	~~Church~~	~~Agriculture~~
~~Retail commercial & warehousing~~	~~Old age home~~	~~River, stream or wetland~~
~~Light industrial~~	~~Sewage treatment plant[A]~~	~~Nature conservation area~~
~~Medium industrial[AN]~~	~~Train station or shunting yard[N]~~	~~Mountain, koppie or ridge~~
~~Heavy industrial[AN]~~	~~Railway line[N]~~	~~Museum~~
~~Power station~~	~~Major road (4 lanes or more)[N]~~	~~Historical building~~
~~Office/consulting room~~	~~Airport[N]~~	~~Protected Area~~

~~Military or police base/station/compound~~	~~Harbour~~	~~Graveyard~~
~~Spoil heap or slimes dam~~[A]	~~Sport facilities~~	~~Archaeological site~~
~~Quarry, sand or borrow pit~~	~~Golf course~~	~~Other land uses (describe)~~

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

N/A

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

N/A

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

N/A

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

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

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

7. Cultural/Historical Features

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:	**YES**	~~NO~~
	Uncertain	
Arniston has been declared a national monument in its entirety, also a Provincial Heritage Site.		

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

Will any building or structure older than 60 years be affected in any way?	~~YES~~	**NO**

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	**YES**	~~NO~~

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

8. Socio-Economic Character

a) Local Municipality

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

Level of unemployment:

According to Statistics South Africa[2], the Cape Agulhas Local Municipality has an unemployment rate of 13,8% and a total population of around 33 038. The youth unemployment rate is 19,5%.

Economic profile of local municipality:

Cape Agulhas Municipality prides itself on a number of economic activities which play a significant role in the growth of the province and country as a whole, and which include Agriculture and agro-processing, fishing and mari-culture, manufacturing, construction and tourism. Tourism is one of the most important economic sectors in Cape Agulhas Municipality. One of the most distinctive tourist attractions which has the ability to become the single most branded item of the region is the southernmost tip of the African continent.

Cape Agulhas contributes significantly to the Cape line-fish industry. Mari-culture and the processing of marine products has the potential to become a very lucrative industry for the area. There is potential for its natural resources to be harvested and processed for commercial use.

The municipality is characterised by high levels of unemployment. 6 646 of the youth in the area is economically active (aged 15 – 34 years), of which 19,5% are unemployed.

14 630 individuals are economically active (employed or unemployed but looking for work), and of these, 13,8% are unemployed.

Level of education:

The level of education states that 3,6% has received no schooling, 9,1% has completed primary schooling, 22,5% secondary and 13% has received Higher Education. [2]

[2] http://www.statssa.gov.za/?page_id=993&id=cape-agulhas-municipality

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	Arniston revetment estimated at R14 million	
What is the expected yearly income that will be generated by or as a result of the activity?	N/A	
Will the activity contribute to service infrastructure?	~~YES~~	**NO**
Is the activity a public amenity?	**YES**	~~NO~~
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	Approximately 20 temporary	
What is the expected value of the employment opportunities during the development and construction phase?	5%	
What percentage of this will accrue to previously disadvantaged individuals?	70 %	
How many permanent new employment opportunities will be created during the operational phase of the activity?	None	
What is the expected current value of the employment opportunities during the first 10 years?	N/A	
What percentage of this will accrue to previously disadvantaged individuals?	N/A	

9. Biodiversity

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

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

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
~~Critical Biodiversity Area (CBA)~~	~~Ecological Support Area (ESA)~~	~~Other Natural Area (ONA)~~	**No Natural Area Remaining (NNR)**	

b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (Including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
~~Natural~~	~~%~~	
~~Near Natural~~	~~%~~	

~~(includes areas with low to moderate level of alien invasive plants)~~		
~~Degraded (includes areas heavily invaded by alien plants)~~	~~%~~	
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	100%	The proposed development will be taking place at an existing harbour and will entail the development of a rock revetment as the harbour embankment is eroding. Builders rubble can be seen that has been used as fill material.

c) Complete the table to indicate:

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

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

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

The coastline at Arniston Harbour is orientated South to North (facing East) and is exposed to south westerly swell. The site is characterised by sandy beaches and rocky outcrops. The shoreline is exposed and subject to dynamic coastal conditions. From satellite images the breaker zone was measured > 400 m during a storm event. Furthermore, the sediment plumes are clear on satellite images which indicate high concentrations of sediment in suspension. This is also an indication of high wave energy.

A coastal setback study for the Overberg District was conducted by SSI during 2012 (SSI, 2012). Apart from the coastal setback line, the study also estimated high risk areas with regards to coastal erosion based on wave run-up, topography, sea level rise, wave conditions, etc. The area highlighted red in the *Figure 10* below was identified as a high risk urban area during the study.

Figure 10: The coastal erosion high risk area highlighted in red.

Section C: Public Participation

1. Advertisement And Notice

Publication name	Suidernuus newspaper	
Date published	Will be included in final BAR	
Site notice position	**Latitude**	**Longitude**
	34°39'57.64"S	20°13'54.59"E
Date placed	23 June 2017	

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

2. Determination Of Appropriate Measures

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN 733.

41. (2) 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- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to- (i) illiteracy; (ii) disability; or any other disadvantage	The report will be placed on the company website, www.pbpscon.co.za to make it more accessible for consideration. The EAP detail was also available to arrange alternative methods of comment and consideration for illiterate people.
(6) When complying with this regulation, the person conducting the public participation process must ensure that- (a) information containing all relevant facts in respect of the application or proposed application is made available to potential interested and affected parties; and (b) participation by potential or registered interested and affected parties is facilitated in such a manner that all potential or registered interested and affected parties are provided with a reasonable opportunity to comment on the application or proposed application.	The executive summary will be sent to all I&APs and the report will be made available online for download from www.pbpscon.co.za. Thirty days commenting period will be made available for the dBAR, that will be distributed before handing in the application. Comments could be sent in by fax, email or written letters as well as by telephone discussion to the EAP.

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 733

	Surname	Initials	Representing	Tel	Fax	Email	P.O. Box	Town	Code
1	Municipal Manager & Ward Councillor	Elsabe Zieff	Cape Agulhas Local Municipality	0284255500	0284251019	info@capeagulhas.gov.za	P.O. Box 51	Bredasdorp	7280
2	Martinus	Eve	Resident	0829055060		evem@capeagulhas.gov.za	P.O. Box 876	Bredasdorp	7280
3	Newman	Roger	Arniston Hotel	0284459000	0284459633	pa@arnistonhotel.com	P.O. Box 126	Bredasdorp	7280
4	Murtz	Tony	Waenhuiskrans Vissersunie/ Fishing Union	0795233060		vissermanunie@gmail.com	P.O. Box 351	Bredasdorp	7280
5	Swart	Rebecca	Arniston Library	0284459556		waenhuiskranslibrary@gmail.com	P.O. Box 51	Bredasdorp	7280

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

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

3. Issues Raised By Interested And Affected Parties

Will be included in FBAR

Summary of main issues raised by I&APs	Summary of response from EAP

4. Comments And Response Report

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E3.

5. Authority Participation

Authorities and organs of state identified as key stakeholders:

Surname	Initials	Representing	Tel	Fax	Email	P.O. Box	Town	Code
Zieff	Elsabe	Cape Agulhas Local Municipality	0284255500	0284251019	info@capeagulhas.gov.za	P.O.Box 51	Bredasdorp	7280
Oosthuizen	Mare-Lize	Department of Environmental Affairs and Development Planning	0214835842	0214833633	Mare-lize.Oosthuizen@westerncape.gov.za	Private Bag X9086	Cape Town	8000
Williams	Briege	South African Heritage Resource Agency	0214624502	0214624509	bwilliams@sahra.org.za	111 Harrington Street	Cape Town	8001
Mbethe	Sibusiso Patrick	DEA – Oceans and Coasts	0218192508	0218192445	smbethe@environment.gov.za	Private Bag x4390	Cape Town	8000
Ndundane	Siphokazi	Department of Agriculture, Forestry and Fisheries - Fisheries Management	0214023019		SiphokaziN@daff.gov.za	Private Bag x9087	Cape Town	8000

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

6. Consultation With Other Stakeholders

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

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

A list of registered I&APs must be included as appendix E5.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

Section D: Impact Assessment

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

1. Impacts That May Result From The Planning And Design, Construction, Operational, Decommissioning And Closure Phases As Well As Proposed Management Of Identified Impacts And Proposed Mitigation Measures

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

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE PRE-MITIGATION
ALTERNATIVE 1		
CONSTRUCTION PHASE	Soil Impacts: erosion/soil loss Site excavation, and levelling has the potential to leave the site susceptible to erosion as a result of wind and storm-water.	High negative
	Impacts on marine environment The development of a rock revetment and to place a buried rock toe at base of the structure within 100m of the high-water mark of the sea.	High negative
	Waste – building rubble and littering Potential pollution of the beach/sea, as well as littering during construction.	medium negative
	Indirect impacts: Creating unnecessary large impact areas.	Low to medium negative
	Direct impacts: Visual impacts: Construction is normally associated with visual impacts. This is typically due to the presence of construction machinery, construction materials and solid waste (litter). Since the proposed development will be taking place at an existing harbour and construction will be of short duration, the significance of potential visual impacts associated with the construction phase can be considered medium.	Medium negative
	Socio-economics Temporary job creation during the construction phase.	Medium positive
	Air pollution Dust (air) pollution caused by construction activities occurring on sand can cause a nuisance. Residential area in close proximity to the harbour.	Medium negative
	Noise impact Normal construction-related noise impacts are anticipated. These will be generated by the construction activities. Owing to the relatively small scale of the construction activities and the fact that it will be of short duration, the noise impacts are anticipated to be of medium significance.	Medium negative
	Mixing of concrete and spillage of diesel/oil due to poorly maintained equipment and machinery can contaminate ground and marine environment.	Medium to high negative
	Inappropriate hazardous material (like fuel, oil, concrete and cement) storage can lead to spillages and contamination of ground water.	High negative
	Worker health and safety Inadequate attention to fire safety awareness and fire safety equipment could result in	Medium negative

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE PRE-MITIGATION
	unsafe working environment and loss of property.	
	Failure to provide adequate onsite sanitation and clean drinking water may result in runoff transferring contaminants into the surrounding environment.	Low negative
	Waste management Construction excess material left onsite may attract vermin, encourage the growth of opportunistic alien vegetation and become unsightly.	Low negative
	Littering on site may pollute the surrounding areas and become unsightly.	Low negative
	Socio-economic impacts The construction phase will create approximately 20 temporary job opportunities for local communities	Medium positive
OPERATIONAL	*Direct impacts:* Socio-economic impacts: The development of the activity will result in no permanent job opportunities for local community members	Low negative

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE POST-MITIGATION
ALTERNATIVE 2 & 3		
CONSTRUCTION PHASE	Soil Impacts: erosion/soil loss Site excavation, and levelling has the potential to leave the site susceptible to erosion as a result of wind and storm-water.	High negative
	Impacts on marine environment The development of a rock revetment and to place a buried rock toe at base of the structure within 100m of the high-water mark of the sea.	High negative
	Waste – building rubble and littering Potential pollution of the beach/sea, as well as littering during construction.	medium negative
	Indirect impacts: Creating unnecessary large impact areas.	Low to medium negative
	Direct impacts: Visual impacts: Construction is normally associated with visual impacts. This is typically due to the presence of construction machinery, construction materials and solid waste (litter). Since the proposed development will be taking place at an existing harbour and construction will be of short duration, the significance of potential visual impacts associated with the construction phase can be considered medium.	Medium negative
	Socio-economics Temporary job creation during the construction phase.	Medium positive
	Air pollution Dust (air) pollution caused by construction activities occurring on sand can cause a nuisance. Residential area in close proximity to the harbour.	Medium negative
	Mixing of concrete and spillage of diesel/oil due to poorly maintained equipment and machinery can contaminate ground and marine environment.	Medium to high negative
	Inappropriate hazardous material (like fuel, oil, concrete and cement) storage can lead to spillages and contamination of ground water.	High negative
	Worker health and safety Inadequate attention to fire safety awareness and fire safety equipment could result in unsafe working environment and loss of property.	Medium negative
	Failure to provide adequate onsite sanitation and clean drinking water may result in runoff transferring contaminants into the surrounding environment.	Low negative
	Waste management	Low negative

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE POST-MITIGATION
	Construction excess material left onsite may attract vermin, encourage the growth of opportunistic alien vegetation and become unsightly.	
	Littering on site may pollute the surrounding areas and become unsightly.	Low negative
	Socio-economic impacts The construction phase will create approximately 20 temporary job opportunities for local communities	Medium positive
OPERATIONAL	*Direct impacts:* Socio-economic impacts: The development of the activity will result in no permanent job opportunities for local community members	Low to medium negative
NO-GO OPTION		
	Employment Employment of locals	Low negative
	Socio economic Contribution to local and national economy	Medium negative
	Embankment erosion Continuation of erosion of the harbour embankment	High negative

A complete impact assessment which include process undertaken to identify, assess and rank the impacts, the activity will impose on the site through the life of the activity in terms of EIA Regulation 2014, Appendix 1(i) and (j) of GN R.982 must be included as Appendix G, page 62.

2. Environmental Impact Statement

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

Alternative 1 (preferred alternative)

The preferred alternative entails the development of a rock revetment (see **Error! Reference source not ound.** below) as a coastal protection measure. The construction methodology will be as follows:

- New coastal defence required (rock revetment),
- Excavation for a toe into beach and shaping of embankment to take revetment,
- Geotextile layer placed against insitu,
- Underlayer rock to be placed and shaped by excavator, and
- Armour rock to be positioned by crane.

Figure 7

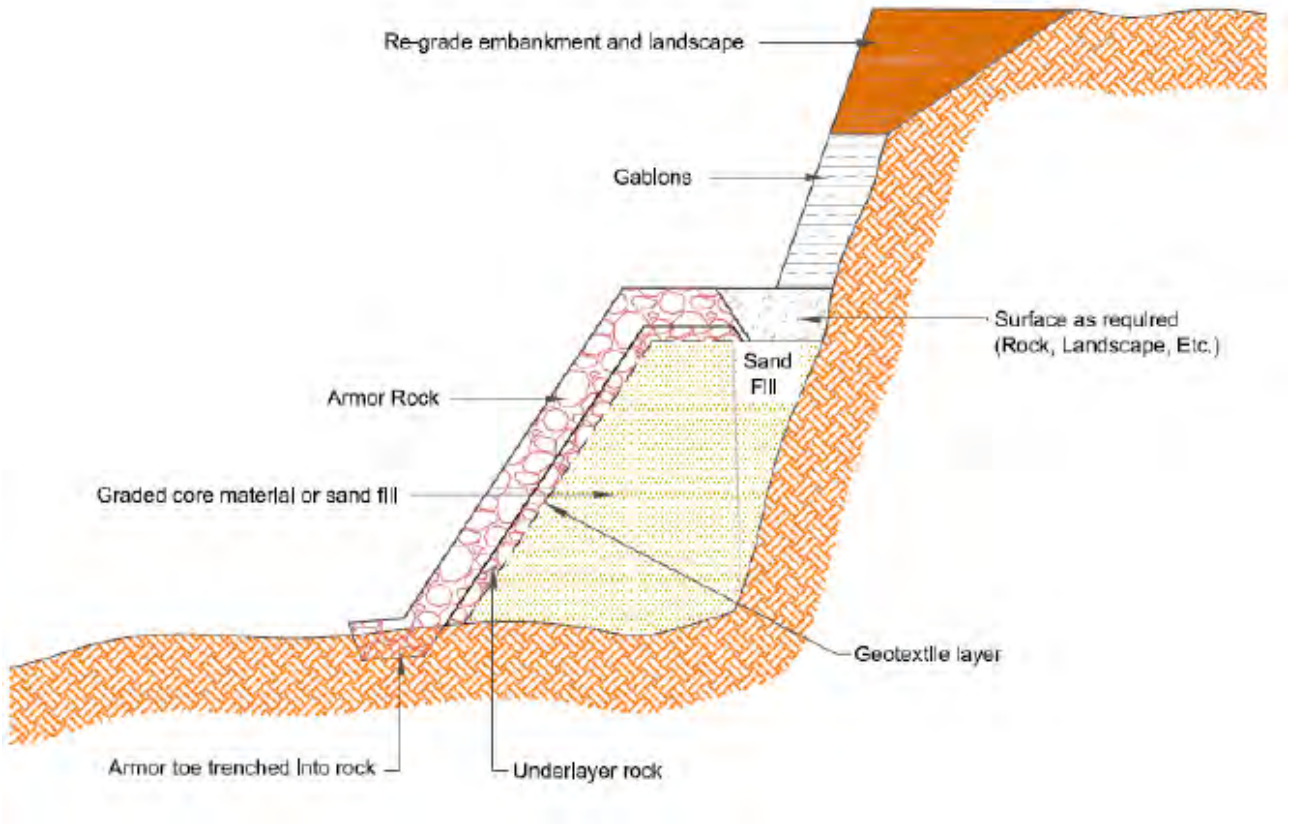


Figure 11: Cross section of rock revetment, for Alternative 1

The proposed impacts will be only during the development phase and will it will only affect the specific site.

Temporary employment opportunities will be created during the development phase and the activity will contribute to local economy by providing a safe operating harbour for fishermen.

Alternative 2

Alternative 2 entails the development of geotextile sandbag containers (see *Figure 12* below) as a coastal protection measure.

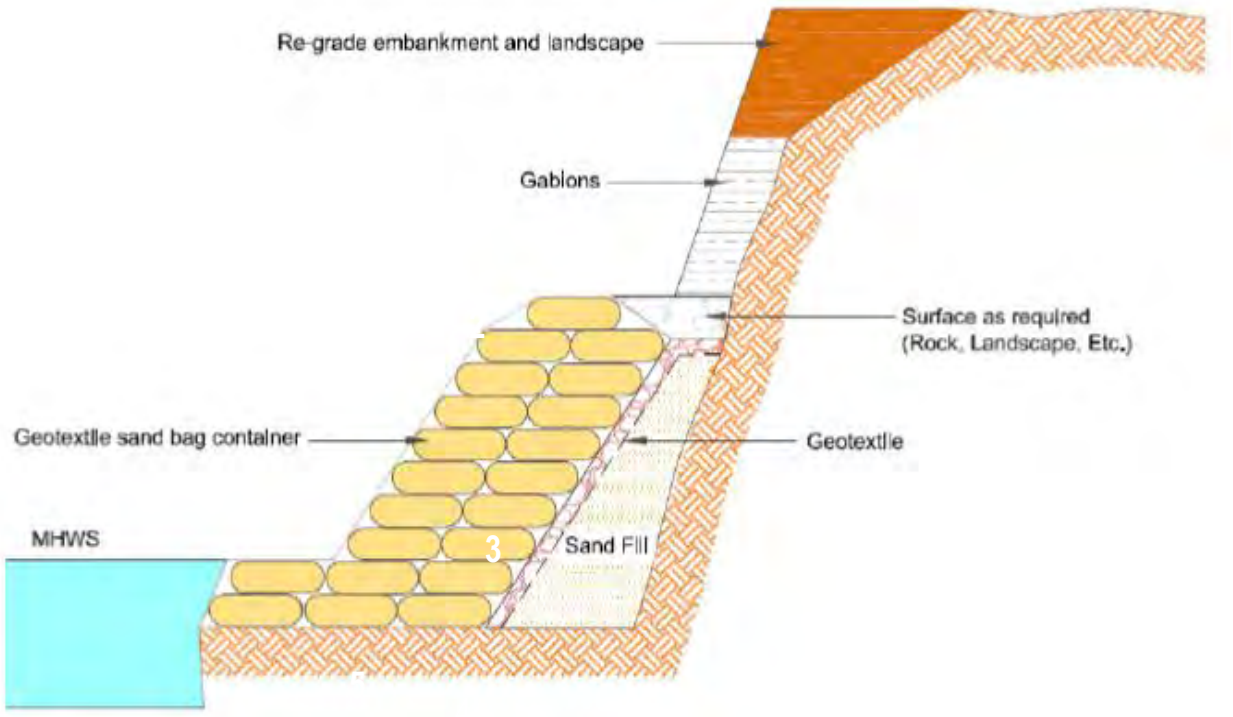


Figure 12: Cross section of geotextile sandbag containers, for Alternative 2.

Alternative 3

Alternative C entails the development of a vertical structure combination (see *Figure 13* below) as a coastal protection measure.

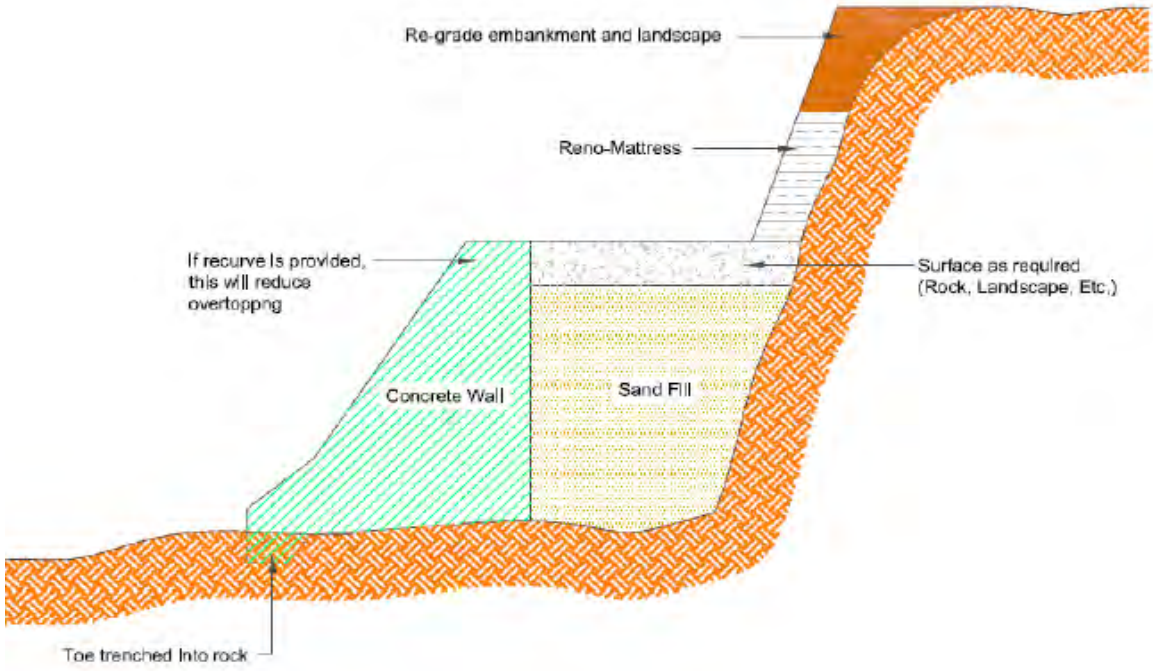


Figure 13: Cross section of a vertical structure combination, for Alternative 3.

No-go alternative (compulsory)

If the no-go alternative is implemented, the repair and maintenance work will proceed, however the harbour

embankment will remain the same and will continue to erode. No employment opportunities will be created during the construction phase and the eroding embankment will remain a safety risk to the public and harbour infrastructure.

Section E. Recommendation Of Practitioner

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?	**YES**	~~NO~~

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

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

- All conditions in the EMPr should be adhered to.
- The proposed development footprint must be demarcated.
- The proposed development must take place within the summer months.

Is an EMPr attached?	**YES**	NO

The EMPr must be attached as Appendix G.

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

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

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

_____

NAME OF EAP

_____ _____

SIGNATURE OF EAP DATE

Section F: Appendixes

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Confirmation of services by Municipality (servitude and infrastructure planning)

Appendix E: Specialist reports (including terms of reference)

Appendix F: Public Participation

Appendix G: Impact Assessment

Appendix H: Environmental Management Programme (EMPr)

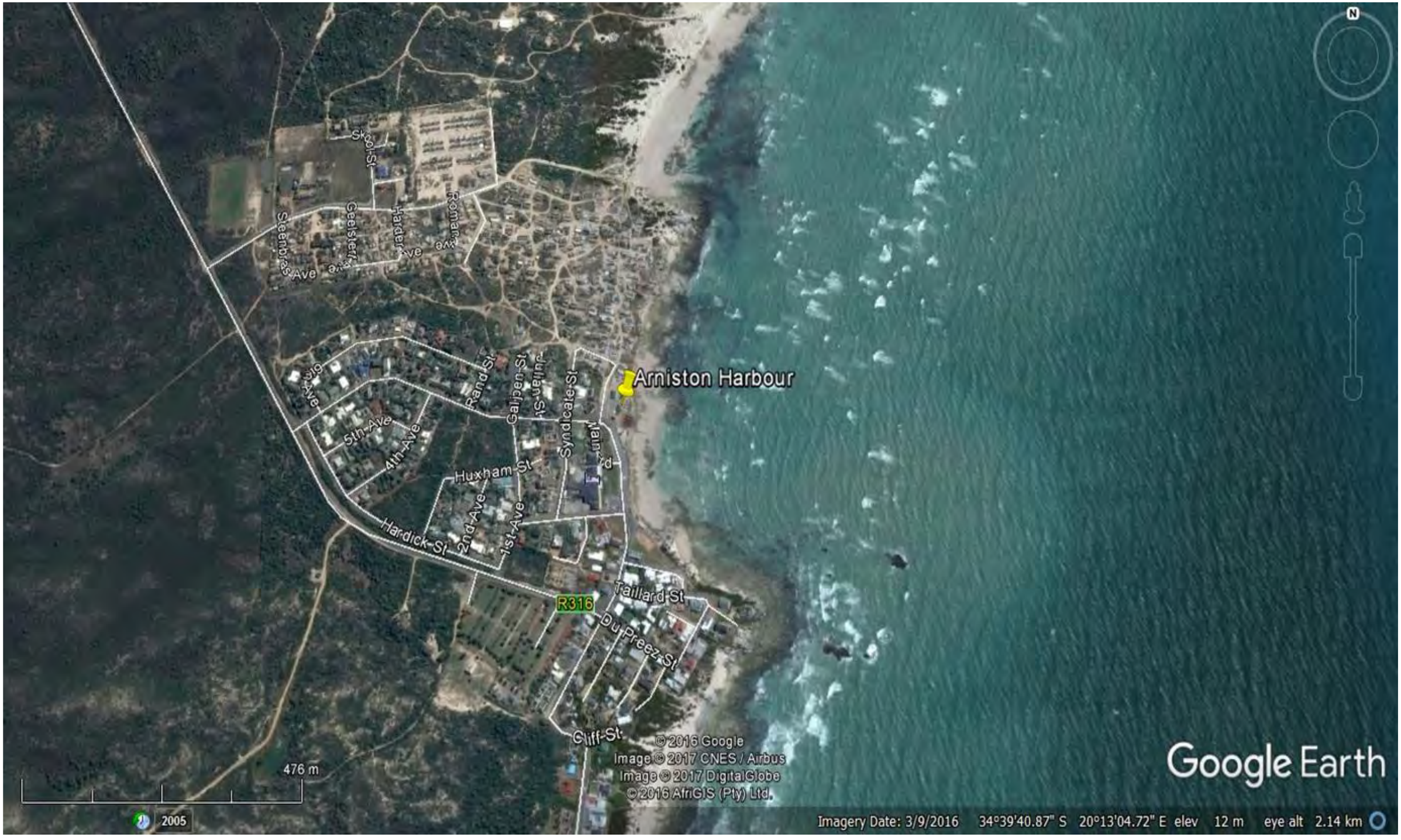
Appendix I: Details of EAP and expertise

Appendix J: Specialist's declaration of interest

Appendix K: Additional Information

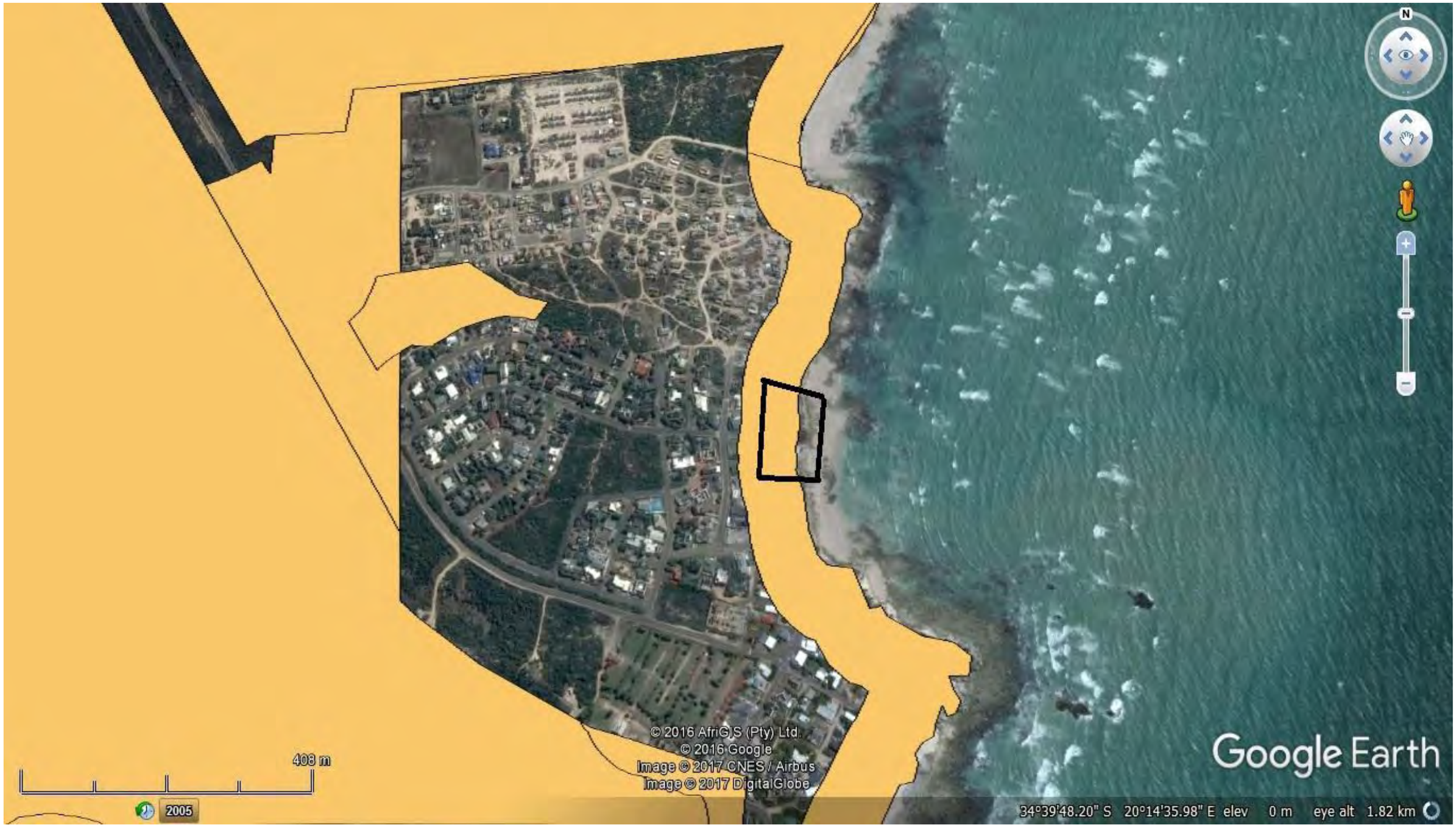
Appendix A:

A3 Locality Map



Layout Plan and Sensitivity Maps

*The red line indicates the harbour embankment.



*The area indicated in orange is identified by SANBI as an Ecological Support Area.

Appendix B: Photographs

- Photograph 1 – Eroding harbour embankment.

- Photograph 2 – Harbour slipway

Appendix C: Facility illustration(s)

Not applicable

Appendix D: Confirmation of services by Municipality (servitude and infrastructure planning)

None required

Appendix E: Specialist reports (including terms of reference)

NOT APPLICABLE

Appendix F: Public Participation

Appendix F 1: I&AP List

	Surname	Initials	Representing	Tel	Fax	Email	P.O. Box	Town	Code	Reg
1	Zieff	Elsabe	Cape Agulhas Local Municipality	0284255500	0284251019	info@capeagulhas.gov.za	P.O. Box 51	Bredasdorp	7280	
2	Martinus	Eve	Resident	0829055060		evem@capeagulhas.gov.za	P.O. Box 876	Bredasdorp	7280	
3	Newman	Roger	Arniston Hotel	0284459000	0284459633	pa@arnistonhotel.com	P.O. Box 126	Bredasdorp	7280	
4	Murtz	Tony	Waenhuiskrans Vissersunie/ Fishing Union	0795233060		vissermanunie@gmail.com	P.O. Box 351	Bredasdorp	7280	
5	Oosthuizen	Mare-Lize	Department of Environmental Affairs and Development Planning	0214835842	0214833633	Mare-lize.Oosthuizen@westerncape.gov.za	Private Bag X9086	Cape Town	8000	
6	Williams	Briege	South African Heritage Resource Agency	0214624502	0214624509	bwilliams@sahra.org.za	111 Harrington Street	Cape Town	8001	
7	Mbethe	Sibusiso Patrick	DEA – Oceans and Coasts	0218192508	0218192445	smbethe@environment.gov.za	Private Bag x4390	Cape Town	8000	
8	Ndundane	Siphokazi	Department of Agriculture, Forestry and Fisheries - Fisheries Management	0214023019		SiphokaziN@daff.gov.za	Private Bag x9087	Cape Town	8000	
9	Swart	Rebecca	Arniston Library	0284459556		waenhuiskranslibrary@gmail.com	P.O. Box 51	Bredasdorp	7280	

Appendix F2: Advertisement

Appendix F2.1: Proof of Advertisement

Appendix F2.2: Advertisement text

PUBLIC PARTICIPATION

Proposed repair, maintenance and upgrade of existing infrastructure and the development of rock revetment at the Arniston Fishing Harbour

Notice is hereby given of a public participation process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), and the Environmental Impact Assessment Regulations, 2017.

This application is for the proposed repair, maintenance and upgrade of existing infrastructure and the development of rock revetment at the Arniston Fishing Harbour. The project will include the development of rock revetment at the harbour embankment in order to protect the harbour embankment and harbour infrastructure.

The notification and registration period for I&AP's as well as commenting period will be from Monday 23 June 2017 until Thursday 24 July 2017.

As per the listed activities below the proposed development initiated a Basic Assessment Process. The following National Environmental Management Act (NEMA) listed activities are triggered:

Listing Notice 1: R327 Activity 19A ,52

Details of EAP/OBP Mische Molife Pieter Badenhorst Professional Services; P O Box 1058, Wellington, 7654 Cell: 081 371 9289; Fax: 0866721916; E-mail: mische@pbps.co.za Website: www.pbpscon.co.za	**This notification is for the Public Participation process. In order to ensure that you are identified as an interested and/or affected party (I&AP) please submit your name, contact information and interest in the matter as well as any comment to the EAP before 17:00 on 24 July 2017.**

Appendix F3: Site Notice and Locality

Appendix F3.1: Site Notice Locality

Appendix F3.2: Text and proof of site notice

Proof will be included in FBAR

PUBLIC PARTICIPATION PROCESS/PUBLIEKE DEELNAME PROSES

Proposed repair, maintenance and upgrade of existing infrastructure and the development of rock revetment at the Arniston Fishing Harbour

Notice is hereby given of a public participation process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), the Amended Regulations (2010) and the Environmental Impact Assessment Regulations, 2017.

This application is for the proposed repair, maintenance and upgrade of existing infrastructure and the development of rock revetment at the Arniston Fishing Harbour. The project will include the development of rock revetment at the harbour embankment in order to protect the harbour embankment and harbour infrastructure.

The notification and registration period for I&AP's as well as commenting period will be from 23 June 2017 until Thursday 24 July 2017.

More information on the development is available in the Basic Assessment Report which is available for comment from www.pbpscon.co.za or the EAP from Monday 23 June 2017 until Thursday 24 July 2017.

As per the listed activities below the proposed development initiated a Basic Assessment Process.

The following National Environmental Management Act (NEMA) listed activities are triggered:

Listing Notice 1: R327 Activity 19A ,52

Listing Notice 2: R325 None

Listing Notice 3: R324 None

Details of EAP/OBP Mische Molife Pieter Badenhorst Professional Services; P O Box 1058, Wellington, 7654 Cell: 081 371 9289; Fax: 0866721916; E-mail: mische@pbps.co.za Website: www.pbpscon.co.za	**In order to ensure that you are identified as an interested and/or affected party (I&AP) please submit your name, contact information and interest in the matter as well as any comment to the EAP before 17:00 on 24 July 2017. Om te verseker dat u geïdentifiseer word as 'n belanghebbende en geaffekteerde party, stuur asseblief u naam, kontak besonderhede, gekose metode van korrespondensie en belangstelling in die saak, sowel as kommentaar aan die OBP, voor 17:00 op 24 July 2017.**

Appendix F4: Proof of Notifications

Appendix F4.1: Proof of letters sent

Appendix F4.1.1: Proof of letters sent for DBAR

WILL BE INCLUDED IN FBAR

Appendix F.4.3: Notifications sent

F4.3.1: Notification letters sent to I&APs for dBAR

WILL BE INCLUDED IN FBAR

Appendix F4.3.2: Notification letter sent to authorities for dBAR

WILL BE INCLUDED IN FBAR

Appendix F5: Comments received

Appendix F5.1: COMMENTS RECEIVED ON dBAR

WILL BE INCLUDED IN FBAR

Appendix F6: Comments and Response Table

Date	Comments from	Comments received	Response from	Response received
COMMENTS RECEIVED ON DBAR				

Appendix G: Impact Assessment

Assessment criteria

The criteria for the description and assessment of environmental impacts were drawn from the National Environmental Management Act, 1998 (Act No.107 of 1998).

The level of detail was somewhat fine-tuned by assigning specific values to each impact. In order to establish a coherent framework within which all impacts could be objectively assessed it is necessary to establish a rating system, which is consistent throughout all criteria. For such purposes each aspect was assigned a value, ranging from 1-5, depending on its definition.

H-2.1 Potential Impact

This is an appraisal of the type of effect the proposed activity would have on the affected environmental component. Its description should include what is being affected and how it is being affected.

H-2.2 Extent

The physical and spatial scale of the impact is classified as:

Local

The impacted area extends only as far as the activity, e.g. a footprint.

Site

The impact could affect the whole, or a measurable portion of the site.

Regional

The impact could affect the area including the neighbouring erven, the transport routes and the adjoining towns.

H-2.3 Duration

The lifetime of the impact, which is measured in relation to the lifetime of the proposed base?

Short term

The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than any of the phases.

Medium term

The impact will last up to the end of the phases, where after it will be entirely negated.

Long term

The impact will continue or last for the entire operational lifetime of the Development, but will be mitigated by direct human action or by natural processes thereafter.

Permanent

This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.

H-2.4 Intensity

The intensity of the impact is considered here by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself. These are rated as:

Low

The impact alters the affected environment in such a way that the natural processes or functions are not affected.

Medium

The affected environment is altered, but functions and processes continue, albeit in a modified way.

High

Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

H-2.5 Probability

This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:

Improbable

The possibility of the impact occurring is none, due either to the circumstances, design or experience.

Possible

The possibility of the impact occurring is very low, due either to the circumstances, design or experience.

Likely

There is a possibility that the impact will occur to the extent that provisions must therefore be made.

Highly Likely

It is most likely that the impacts will occur at some stage of the Development. Plans must be drawn up before carrying out the activity.

Definite

The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on.

H-2.7 Determination of Significance – With Mitigation

Significance is determined through a synthesis of impact characteristics. It is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. In this case the prediction refers to the foreseeable significance of the impact after the successful implementation of the

suggested mitigation measures. Significance with mitigation is rated on the following scale:

No significance

The impact will be mitigated to the point where it is regarded to be insubstantial.

Low

The impact will be mitigated to the point where it is of limited importance.

Low to medium

The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.

Medium

Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.

Medium to high

The impact is of great importance. Through implementing the correct mitigation measures the negative impacts will be reduced to acceptable levels.

High

The impact is of great importance. Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of great importance, and, taken within the overall context of the project, is considered to be a fatal flaw in the project proposal. This could render the entire development option or entire project proposal unacceptable.

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE PRE-MITIGATION	PROPOSED MITIGATION AND MANAGEMENT	DURATION	SPATIAL	LIKELIHOOD OF POTENTIAL IMPACTS	SIGNIFICANCE POST-MITIGATION
ALTERNATIVE 1							
CONSTRUCTION PHASE	Soil Impacts: erosion/soil loss Site excavation, and levelling has the potential to leave the site susceptible to erosion as a result of wind and storm-water.	High negative	Construction should take place during the summer months and at lower tides and when wave actions are not too rough. Soil erosion impacts will be lower.	Short term	Site	Probable	Medium negative
	Impacts on marine environment The development of a rock revetment and to place a buried rock toe at base of the structure within 100m of the high-water mark of the sea.	High negative	Construction should take place during the summer months and at lower tides and when wave actions are not too rough.	short term	Site	Probable	Low negative
	Waste – building rubble and littering Potential pollution of the beach/sea, as well as littering during construction.	medium negative	Any waste produced should be removed by the applicant. Waste and litter drums should be positioned around the site for use by construction personnel. These drums should be regularly emptied and waste removed to the Municipal landfill. Construction personnel should be instructed not to dump any removed materials on the untransformed vegetation around the site.	Short term	Local	Probable	Low negative
	Indirect impacts: Creating unnecessary large impact areas.	Low to medium negative	Work areas must be demarcated before commencement of construction in consultation with the ECO. This will ensure that the impacts areas are as small as practically possible.	Short term	Site	Probable	Low negative

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE PRE-MITIGATION	PROPOSED MITIGATION AND MANAGEMENT	DURATION	SPATIAL	LIKELIHOOD OF POTENTIAL IMPACTS	SIGNIFICANCE POST-MITIGATION
	Direct impacts: Visual impacts: Construction is normally associated with visual impacts. This is typically due to the presence of construction machinery, construction materials and solid waste (litter). Since the proposed development will be taking place at an existing harbour and construction will be of short duration, the significance of potential visual impacts associated with the construction phase can be considered medium.	Medium negative	Implementation of a Construction phase Environmental Management Plan (EMP) that ensures good site keeping and effective waste management will address these impacts.	Short term	Local	Probable	Low negative
	Socio-economics Temporary job creation during the construction phase.	Medium positive	The activity is the mitigation. Employ local labour for construction activities	Short term	Site	Possible	Low to medium positive
	Air pollution Dust (air) pollution caused by construction activities occurring on sand can cause a nuisance. Residential area in close proximity to the harbour.	Medium negative	Cleared surfaces must be dampened whenever possible and especially in dry and windy conditions to avoid excessive dust generation. Any sand excavated, must be removed from site or covered.	Short term	Site	Possible	Low negative
	Noise impact Normal construction-related noise impacts are anticipated. These will be generated by the construction activities. Owing to the relatively small scale of the construction activities and the fact that it will be of short duration, the noise impacts are anticipated to be of medium significance.	Medium negative	All construction vehicles must be in a good working order to reduce possible noise pollution. Work hours during the construction phase shall be strictly enforced unless permission is given (07H00 – 18H00). Permission shall not be granted without consultation with the local community and residences by the ECO. No work to be done on Sundays.	Short term	Local	Probable	Low negative
	Mixing of concrete and spillage of diesel/oil due to poorly maintained equipment and	Medium to high negative	Concrete and other materials must not be mixed directly on the ground, or during	Short term	Local	Medium	Low negative

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE PRE-MITIGATION	PROPOSED MITIGATION AND MANAGEMENT	DURATION	SPATIAL	LIKELIHOOD OF POTENTIAL IMPACTS	SIGNIFICANCE POST-MITIGATION
	machinery can contaminate ground and marine environment.		rainfall events when the potential for transport to the stormwater system is the greatest (as per the EMPr). Concrete and other materials must be mixed only in the area demarcated for this purpose and on an impermeable substratum. Oil trays must be placed under the machinery to avoid soil contamination				
	Inappropriate hazardous material (like fuel, oil, concrete and cement) storage can lead to spillages and contamination of ground water.	High negative	All hazardous chemicals must be properly stored in a secure, bunded and contained area. (Follow measures described in the EMPr).	Short term	Site	High	Low negative
	<u>Worker health and safety</u> Inadequate attention to fire safety awareness and fire safety equipment could result in unsafe working environment and loss of property.	Medium negative	Equipment should be present on site at all times as per Occupational Health and Safety Act. This must be controlled by independent consultant. No open fires will be allowed on site unless in a demarcated area identified by the ECO.	Short term	Site	High	Low negative
	Failure to provide adequate onsite sanitation and clean drinking water may result in runoff transferring contaminants into the surrounding environment.	Low negative	Adequate sanitary and ablutions facilities must be provided for as indicated in the EMP.	Short term	Site	Possible	Low negative

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE PRE-MITIGATION	PROPOSED MITIGATION AND MANAGEMENT	DURATION	SPATIAL	LIKELIHOOD OF POTENTIAL IMPACTS	SIGNIFICANCE POST-MITIGATION
	<u>Waste management</u> Construction excess material left onsite may attract vermin, encourage the growth of opportunistic alien vegetation and become unsightly.	Low negative	Construction rubble shall be disposed of in pre-agreed, demarcated spoil dumps. Domestic construction rubble will be kept in containers. All of the above as per the EMP. The above as indicated	Short term	Site	Possible	Low negative
	Littering on site may pollute the surrounding areas and become unsightly.	Low negative	Littering by the employees of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite. All waste must be removed from the site and transported to a licensed landfill site.	Short term	Site	Possible	Low negative
	Socio-economic impacts The construction phase will create approximately 20 temporary job opportunities for local communities	Medium positive	The action is the mitigation	Short term	Site	Local	Low negative
OPERATIONAL	*Direct impacts:* <u>Socio-economic impacts:</u> The development of the activity will result in no permanent job opportunities for local community members The development will contribute to local and national economy	Medium positive	No jobs will be created during the operational phase.	Long term	Regional	Possible	Medium negative
NO-GO OPTION							
	Direct impacts: <u>Socio-economic impacts:</u>	Low negative	No employment opportunities will be available during the operational	Long term	Local	Possible	Low to medium negative

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE PRE-MITIGATION	PROPOSED MITIGATION AND MANAGEMENT	DURATION	SPATIAL	LIKELIHOOD OF POTENTIAL IMPACTS	SIGNIFICANCE POST-MITIGATION
	The development of the activity will result in no permanent job opportunities for local community members		phase.				

Appendix H: Environmental Management Programme (EMPr)

CONSTRUCTION & OPERATIONAL MANAGEMENT PLAN FOR

PROPOSED CONSTRUCTION OF ROCK REVETMENT AT THE ARNISTON HARBOUR.

Prepared by:

Mischké Molife

Date: June 2017

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List of abbreviations

EA	Environmental Authorisation
DEA&DP	Department of Environmental Affairs and Development Planning
ECO	Environmental Control Officer
EMPr	Environmental Management Programme
RE	Resident Engineer
ROD	Record of Decision

Details of EAP

Company of Environmental Assessment Practitioner (EAP):	Pieter Badenhorst Professional Services cc	
EAP Name:	Mische Molife	
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	Wellington	Postal code: 7655
Telephone:	021 873 7228	Cell: 081 371 9289
Email:	mische@pbps.co.za	Fax: 086 672 1946
EAP Qualifications:	Pieter Badenhorst – 41 years experience (16 @ CSIR) in environmental management; report writing; project management; facilitation also including preparing EMPr's. Mische Molife – BSc in Biodiversity and Conservation Biology; 3 years experience in EIA at the Western Cape Department of Environmental Affairs and Development Affairs; currently a consultant in environmental management.	
EAP Registration/Associations:	Pieter – IAIAsa; Pr Eng; SAICE	

1. Introduction

The applicant proposes to construct rock revetment to prevent continuous erosion of the harbour embankment and to protect harbour infrastructure. The project is located at the Amiston harbour, to the North and South of the existing slipway, which will be approximately 95m in length as shown in Figure 1.

Figure 1: Harbour embankment and rock revetment location

The rock revetment will be approximately 65m on the north and 30m on the south of the harbour slipway in order to ensure sufficient protection to the harbour.

This document is a requirement for environmental authorization which will be shown in Appendix A. On approval by DEA&DP the developer must ensure that its conditions are implemented by making the document available to the contractor and also ensure that an ECO or Resident Engineer are appointed and systems are in place to evaluate compliance. The contractor(s) is expected to familiarise himself with the contents of this document and to implement its conditions.

Overall the EMP will aim to:

- Control the construction activities in such a way that negative impacts on the physical environment, sensitive areas and surrounding areas are prevented or minimised.
- Ensure that mitigation and rehabilitation measures are implemented where required.

Please note that this document does not replace any other regulations, laws and bylaws that the contractor must adhere to. It specifically does not replace the regulations of the Occupational Health and Safety act of 1993 (Act No. 85 of 1993).

Funding for the implementation of the Construction EMP is the financial responsibility of the developer. Note that the architectural/design guideline for the rock revetment must be accepted by the municipality prior to the commencement of construction activities.

The project locality and environmental issues are shown in section 2 with the construction EMP in section 3 and the operational EMP in section 4.

2. Project description and environmental issues

The applicant proposed constructing rock revetment along the Arniston harbour embankment. Significant erosion of embankment by wave action and wave run-up, has resulted in severe slippage/failure of large portions of the embankment, thereby undermining the fence perimeter and parking area above (see Figure 2 below). The embankment protects the harbour infrastructure above the slipway and is located along the entire length of the seaward facing boundary of the harbour facility. The continuing undermining of the embankment is putting harbour infrastructure (buildings) at risk. There is limited vegetative cover providing stability.

The project is located at the Arniston harbour, to the North and South of the slipway, which will be approximately 95m in length as shown in Figure 1 above.

Figure 2: Eroding harbour embankment

The construction methodology will be as follows:

- New coastal defence (rock revetment),
- Excavation for a toe into beach and shaping of embankment to take revetment,
- Geotextile layer placed against insitu,
- Underlayer rock to be placed and shaped by excavator, and
- Armour rock to be positioned by crane.

The proposed design concept of the rock revetment is shown in Figure 3.

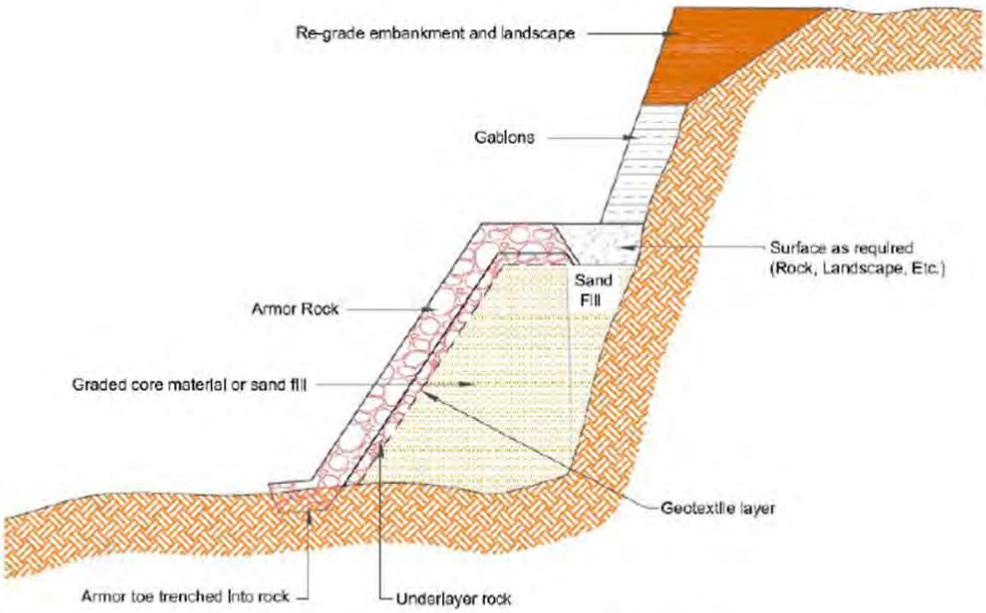

Figure 3: Cross section of rock revetment

3. Management Programme – Construction

Please note that all contractors on the site must be made aware of this EMP and they must at all
times adhere to the procedures specified.

3.1. Contractual obligations

1) The Contractor shall acknowledge receipt of copies of the EMP and confirm in writing that he has familiarised himself with the contents thereof;
2) The Contractor shall comply with all environmental obligations imposed by the RE/ECO.
3) The Contractor shall co-operate fully with the RE/ECO and use his best endeavours to ensure that the objectives of the EMP are fulfilled in the course of the Contractor's execution of the works or the relevant part thereof.
4) The Contractor must ensure that all workers are given environmental awareness training on the requirements of the EMP. This must form part of the Contractor's contract agreement. The RE/ECO must be informed in writing of implementation.
5) Preference must be given to local labour.

3.2. Monitoring

An Environmental Control Officer (ECO) will implement and monitor environmental control of the development. The ECO duties will be as follows:

- Ensure implementation and monitoring of the EMPr.
- Make changes to the EMPr as required.
- Visit the site regularly on atleast a weekly basis.
- Prepare reports as required by mitigation measures or by the EA.
- Maintain a photographic record of the work and environmental issues.
- These visits must take place prior to construction and site clearing, after construction and 6 months after construction.
- Site visit reports must be compiled which includes photographic evidence and recommendations. The report should be made available to the contractor, the applicant and applicable authorities.
- An audit report must be complied within 6 months of construction.

3.3. Penalties

Penalties will be instituted for non-compliance. The penalty is over and above the cost of rectifying the problem and/or damage. Penalties will vary on a sliding scale from R 1 000 to R 20 000 for non-serious to serious issues as determined by the RE/ECO. Repeat offenses will have a higher penalty.

These penalties must be paid into a separate account to be administered by the HOA. The RE/ECO will decide how the penalties, if any, are to be spent on measures improving the environment. Cape Agulhas Municipality must identify a responsible person who must attend all site meetings – and will therefore be aware of all penalties and fines.

3.4. Environmental awareness training

1) All the Contractors employees and Sub-contractors employees and suppliers employees that spend more than 1 day a week or four days a month on site, must attend an Environmental Awareness Training course presented by the Contractor the first of which shall be held within one week of the commencement date. Subsequent courses shall be held as and when required.
2) The Engineer/ECO will provide the contractor with the course content for the environmental awareness-training course, and the contractor shall communicate this information to his employees on the site, to any new employees coming onto site, to his sub-contractors and his suppliers.
3) A translator will be made available to translate the language of instruction to the relevant language among the three official languages of the Western Cape Province, for the benefit of any personnel that are not proficient in the language of instruction.
4) The Contractor shall apply the Engineer/ECO with a monthly report indicating the number of employees that will be present on site during the following month and any changes in this number that may occur during the month.
5) The Contractor shall submit a Method Statement detailing the logistics of the environmental awareness-training course.

3.5. Methodology statement

A methodology statement must be compiled by the contractor(s) before any construction or landscaping activity may commence. The statement must describe how the activity will be undertaken and environmental controls implemented. The statement must include a site establishment plan indicating areas for the camp, cement mixing, No-Go areas, etc. The RE/ECO must approve the methodology statement.

The activity indicated below will as a minimum require a statement. The contractor must identify any other statements that will be required as part of the project implementation.:

Access routes
- Upgrading and construction of access routes.
- Rehabilitation of temporary access routes.
- Location of proposed access routes.

Camp establishment
- Layout and preparation of the construction camp.
- Method of installing fences required for "no go" areas, working areas and construction camp areas.
- Preparation of the working area.

Contaminated water
- Contaminated water management plan, including the containment of runoff and polluted water.

Dust
- Dust control.

Earthworks
- Method for the control of erosion during bulk earthwork operations.
- Method of undertaking earthworks, including hand excavation and spoil management.

Emergency
- Emergency construction method statements.

Erosion control
- Method of erosion control, including erosion of spoil material

Fire, hazardous and poisonous substances
- Handling and storage of hazardous wastes.
- Emergency spillage procedures and compounds to be used.
- Emergency procedures for fire.
- Use of herbicides, pesticides and other poisonous substances.
- Methods for the disposal of hazardous building materials including asbestos, fibre claddings, refrigerants and coolants.

Fuels and fuel spills
- Methods of refuelling vehicles.
- Details of methods for fuel spills and clean up operations.
- Refuelling of construction vehicles in areas located within 100m of the high-water mark.
- Method of refuelling dredger during dredging operations.

Piling, jacking and thrust boring
- The method of piling operation (e.g. driven or bored) or in situ casting or pre-cast pile structures.

Rehabilitation
- Rehabilitation of disturbed areas and revegetation after construction is complete.
- Rehabilitation of street or hardened surfaces after construction is complete.
- Retaining walls and gabions.

Solid waste management
- Solid waste control and removal of waste from Site.
- Methods for the disposal of vegetation cuttings, tree trunks, building materials or rubble generated by construction.

Sources of materials
- Details of materials imported to the site (where applicable).

Sensitive environments
- Proposed construction methods within any sensitive environments. These can include but are not limited to wetlands, intertidal zones and estuaries.

Traffic
- Traffic safety measure for entry/ exit onto/ off public roads.
- Traffic control when crossing roads or pedestrian routes with construction activities.

Wash areas

- Location, layout, preparation and operation of all wash areas, including vehicle wash, workshop washing and paint washing and clearing.

Water abstraction

- Methods of abstraction and utilisation of water from natural water resources.
- Details of any well point provision.

3.6. Demarcation and protection

1) Proper access control must be implemented to ensure that only authorised people obtain access to the site. No-Go areas must be clearly demarcated prior to commencing of demolition and/or earthworks/building operations.
2) The contractor must ensure that fencing and/or demarcations are maintained for the duration of the project.
3) Demarcate 25m (or as agreed with the ECO) measuring from the existing embankment to the harbour. A section of the harbour parking area should also be properly demarcated to be used for the construction site. Traffic control measures must be implemented.
4) Public access to the beach must not be impaired except for the demarcated area where construction is taking place.
5) Watercourses are seen as No-Go areas.
6) Construction will take place in two sections, namely the northern section and the southern section.
7) Sheet piling with rock or alternatively a sand berm must be used to protect the excavation and construction work. This sheet piling and rock or sand berm must be installed from sea side. After construction the section's sheet piling and rock should be removed from the sea side and moved to the next section.
8) Construction should preferably not take place during spring tides but decision on work and safety conditions will be taken by the RE. During high tides sheet piling and the sand berm will be used to protect the excavation and construction works.
9) The construction of the excavation, reno mattress and seawall should run concurrently with no more than 10m of the excavation exposed before installation of the reno, and no more than 10m of the reno exposed before installation of seawall.
10) Excavation, blinding, installation of reno mattress and placing of concrete units should be done in sequence, with the one not running ahead of the other by more than 20m to avoid risk of rework.

3.7. Contractor's camp

1) The Contractor's camp, offices and storage facilities shall not be located within an environmentally sensitive area. The camp's position must be approved by RE/ECO.
2) The camp must be fenced as agreed with the RE/ECO.
3) Water from the kitchens, showers, sinks etc., shall be discharged in a manner approved by the RE/ECO.

3.8. 3.8 Conservation of environmentally sensitive areas

3.8.1 Vegetation

Sparse grass is located on the proposed site.

3.8.2 Animals

The site is located on the beach and it is therefore unlikely that any animal life would be present. However, should any animal life be encountered it must be carefully removed and none may be harmed or killed. Most animals will move away naturally except possibly snakes. Any problems must be reported to the RE/ECO.

3.9. Surface and groundwater pollution

1) The Contractor shall take all reasonable steps to prevent pollution of surface and groundwater as a result of his activities. Such pollution could result from release (accidental or otherwise) of chemicals, oils, fuels, paint, and sewage, water from excavations, construction water, water carrying soil particles or waste products (pollutants expected to be only from machinery) .
2) The Contractor shall provide water and/or washing facilities at the construction camp for personnel.
3) In the event of any pollution entering any water body, the Contractor shall inform the RE/ECO immediately.
4) The contractor will be responsible for any cleanup costs involved should pollution, erosion or sedimentation have taken place.

3.10. Noise control

1) Working hours will be restricted to normal working hours.
2) All noise and sounds generated by plant or machinery must adhere to SABS 0103 specifications for the maximum permissible noise levels for residential areas.
3) All plant and machinery are to be fitted with adequate silencers.
4) No sound amplification equipment such as sirens, loud hailers or hooters may be used on site, after normal working hours, except in emergencies.
5) If work is to be undertake outside normal working hours, permission must be obtained from the Cape Agulhas Municipality.
6) Acceptable noise levels according to SABS 10103 Code of Practice 45dBA in rural district during the day and 35dBA at night. The applicant must comply/adhere to this requirement.

3.11. Erosion control

The Contractor shall take all reasonable precautions to prevent soil erosion resulting from a diversion, restriction or increase in the flow of stormwater or water resulting from its operations and activities, to the satisfaction of the RE/ECO.

3.12. Dust control

DUST - generated by works

1. Sand stockpiles are to be covered with hessian, shadecloth or DPC plastic.
2. Stockpiles are to be located in sheltered areas and the usable/cut face orientated away from the direction of the prevailing wind for that season.

3. Excavating, handling or transporting erodable materials in high wind or when dust plumes visible shall be avoided.
4. If high winds prevail the Engineer shall decide whether water dampening measures or cessation of activities is required, and if necessary they shall have the authority to temporarily stop certain of the works until wind conditions become more favourable.

Dust – generated by roads and vehicle movement

1. If access roads are generating dust beyond acceptable levels dust suppression measures must be initiated. These include, but are not limited to the following:
   - Reduction of travelling speeds along the road.
   - Restriction of vehicle or plant usage.
   - Application of chemical soil binders.
   - Application of a suitable sacrificial road surfacing.

2. If water is to be used for dust suppression, then only the critical areas should be watered. The use of water carts or hand watering is preferable. Overhead sprayers shall not be permitted in windy conditions, as the evaporation loss is too high. Watering is to be supervised to prevent unnecessary water wastage, and runoff into potentially sensitive areas. Preferable watering times are early morning and late afternoon/evening. Water restrictions are to be observed if in place.

3.13. Fires

1) Although there is a low risk of fire on this site the Contractor shall take all reasonable and active steps to avoid increasing this risk.
2) No open fires or naked flames for heating or cooking shall be allowed on Site. Stoves and other electrical equipment shall only be permitted in the Contractor's camp and never be left unattended.
3) The Contractor shall ensure that all personnel are aware of any fire risk and the need to extinguish cigarettes before disposal.
4) The Contractor shall have fire-fighting equipment on site and ensure that all personnel are taught how to use it.
5) The Contractor shall identify the authorities responsible for fighting fires in the area and shall liaise with them regarding procedures should a fire start. The Contractor shall ensure that his staff are aware of the fire danger at all times and are aware of the procedure to be followed in the event of a fire. The Contractor shall also ensure that all the necessary telephone numbers etc. are posted at conspicuous and relevant locations in the event of an emergency. The Contractor shall advise the relevant authority of a fire as soon as one starts and shall not wait until he can no longer control it.
6) Should a contractor be found responsible for the outbreak of a fire, he shall be liable for any associated costs.

3.14. Water management

1) The Contractor shall provide water for drinking and construction purposes.
2) Taps are to be attached to secure supports and leaking taps and hosepipes are to be repaired immediately.
3) Watering as dust suppression must be undertaken as a last resort. It is preferable that sand stockpiles be covered rather than watered.

4) Any abstraction from natural water sources such as a stream or groundwater will require a Method Statement for approval by the RE/ECO.

3.15. Waste management

1) A waste minimisation approach must be followed. This requires recycling wherever possible. All waste from construction will be used as fill in the dam wall.
2) Refuse refers to all solid waste, including construction debris (cement bags, wrapping materials), waste and surplus food, food packaging, organic waste etc.
3) The Contractor shall be responsible for the establishment of a refuse control and removal system that prevents the spread of refuse within and beyond the construction sites.
4) The Contractor shall ensure that all refuse is deposited in refuse bins, which he shall supply and arrange to be emptied on a weekly basis. Refuse bins shall be of such a design that the refuse cannot be blown out and that animals or birds are not attracted to the waste and spread it around. Refuse bins shall be water tight, wind-proof and scavenger-proof and shall be appropriately placed throughout the site. Refuse must also be protected from rain, which may cause pollutants to leach out. Refuse bins shall be appropriately placed throughout the Site and shall be conspicuous (e.g. painted bright yellow).
5) Refuse shall be disposed of at an approved waste site. Refuse shall not be burnt or buried on or near the Site.
6) The Contractor shall provide labourers to clean up the Contractor's camp and Site on a weekly basis.
7) The Contractor shall also clean the Contractor's camp and Site of all structures, equipment, residual litter and building materials at the end of the contract.

3.16. Toilets

1) The Contractor shall be responsible for providing all sanitary arrangements for construction and supervisory staff on the site. A minimum of one chemical toilet shall be provided per 15 persons. Toilets provided by the Contractor must be easily accessible and within a practical distance from the workers. Toilets shall be located within areas of low environmental importance. The toilets shall be of a neat construction and shall be provided with doors and locks and shall be secured to prevent them blowing over. Toilets shall be placed outside areas susceptible to flooding. The toilets must be mobile and must follow the construction as it moves along the beach front.
2) The Contractor shall keep the toilets in a clean, neat and hygienic condition. The Contractor shall supply toilet paper at all toilets.
3) The Contractor shall be responsible for the cleaning, maintenance, servicing and emptying of the toilets on a regular basis (by chemical contractor). No waste to be dumped in the bush or stream. The Contractor shall ensure that the toilets are emptied before the builders' or other holidays and the waste be stored and disposed of at an appropriate place off site. The Contractor shall ensure that no spillage occurs when chemical toilets are cleaned and emptied. The Contractor shall supply a contingency plan for spills from toilets.
4) Performing ablutions in any other area is strictly prohibited.

3.17. Fuel and chemical management

1) Fuel may be stored on site providing the following is strictly adhered to:

- All necessary approvals with respect to fuel storage and dispensing shall be obtained from the appropriate authorities.
- The Municipal Fire Chief (or as applicable) must be informed and consulted i.t.o Fire Regulations.
- The Contractor shall ensure that all liquid fuels and oils are stored in tanks with lids, which are kept firmly shut and under lock and key at all times.
- The Contractor shall stand any equipment that my leak, and does not have to be transported regularly, on watertight drip trays to catch any pollutants. The drip trays shall be of a size that the equipment can be placed inside it. Drip trays shall be cleaned regularly and shall not be allowed to overflow.
- All hazardous material (e.g., oils, Petrol or diesel) used on site must be disposed of at an approved hazardous waste facility or with the services of a licensed waste transportation company. All certificates of disposal and weigh bridge slips need to be signed by all relevant officials and kept as records on the premises.
- The contractor will be responsible for the cleaning up of any spill and associated costs.
- Areas for storage of fuels and other flammable materials shall comply with standard fire safety regulations and may require the approval of the Municipal Fire Chief (in urban areas) or RE/ECO.
- Temporary above ground storage tanks may be permitted at the discretion of the Municipal Fire Chief based on the merit of the situation, provided that the following requirements are complied with:

  - Written application together with a plan and authority from the Municipality shall be forwarded to the Municipal Fire Chief (in urban areas) or RE/ECO at least fourteen (14) days prior to the installation being erected on site. Written permission shall be obtained from the chief fire officer for the erection of the installation.
  - The drawn plan shall be acceptable to the Municipal Fire Chief (in urban areas) or RE/ECO and to contain the following information:
    - The scale,
    - The name and address of the premises,
    - The number and the quantity of the tanks,
    - The position of the tanks in relation to the boundary, other flammable or combustible materials, etc.,
    - The size and construction materials used for the bund,
    - The product to be kept in the tank, and
    - Any other information relevant to the situation.

2) Location

- The fuel storage area shall be located at one of the following locations: (provide a list of acceptable locations for the fuel storage are).
- The Engineer/ECO shall be advised of the area that the Contractor intends using for the storage of fuel.
- The location of the fuel storage area will be determined by the Municipal Fire Chief (in urban areas) and be approved by the Engineer/ECO/EO.
- The tanks shall be erected at least 3.5 metres from buildings, boundaries and any other combustible or flammable materials.

3) Signs/good practice/ safety precautions

- Symbolic safety signs depicting "No Smoking", "No Naked Lights" and "Danger" conforming to the requirement of SABS 1186 are to be prominently displayed in and around the fuel storage area. The volume capacity of the tank shall be displayed.
- No smoking shall be allowed in the vicinity of the stores.
- The capacity of the tank shall be clearly displayed and the product contained within the tank clearly identified using the emergency information system detailed in SABS 0232 part 1.
- There shall be adequate fire-fighting equipment at the fuel storage and dispensing area or areas.
- Fuel

4) Tanks

- The storage tank shall be removed on completion of the works.
- The storage tank shall be on the premises only for as long as the contract last.
- All such tanks to be designed on constructed in accordance with a recognised code.
- The rated capacity of tanks shall provide sufficient capacity to permit expansion of the product contained therein by the rise in temperature during storage.

5) Bunds/storage areas

- Tanks shall be situated in a bunded area the volume of which shall be at least 150% of the volume of the largest tank. The floor of bund shall be smooth and impermeable constructed of concrete or plastic sheeting with impermeable joints with a layer of sand over to prevent perishing. The bund wall shall be of concrete or formed of well-packed earth with the impermeable lining extending to the crest. The floor of the bund shall be sloped forwards an oil trap or sump to enable any spilled fuel and/or fuel-soaked water to be removed.
- A bacterial hydrocarbon digestion agent that is effective in water approved by the Engineer/ECO/EO shall be installed in the sump.
- The tanks and bunded areas shall be covered by a roofed structure to prevent the bunded area from filling with rainwater. This structure shall be constructed in such a way, and to the approval of the Engineer/ECO/EO, to ensure that it is wind resistant.
- Any water that collects in the bund shall not be allowed to stand and shall be removed within one day and taken off site to a disposal site approve by the Engineer/ECO/EO, and the bacterial hydrocarbon digestion agent shall be replenished.

6) Empty containers

- Only empty and externally clean tanks may be stored on the bare ground. All empty and externally dirty tanks shall be sealed and stored on an area where the ground has been protected.

7) Filling/dispensing methods

- Any electrical or petrol-driven pump shall be equipped and positioned so as not to cause any danger of ignition of the product.
- If fuel is dispensed from 200 litre drums, the proper dispensing equipment shall be used. The drum shall not be tipped in order to dispense fuel. The dispensing mechanism of the fuel storage tank shall be stored in a waterproof container when not in use.
- Adequate precautions shall be provided to prevent spillage during the filling of any tank and during the dispensing of the contents.

8) Method statements

- A method statement is required for filling of and dispensing from storage tanks.

3.18. Vehicles and access roads

1) Site vehicles shall only be permitted within the demarcated construction site or on existing roads to the site, as required to complete their specific tasks. Vehicular traffic shall be limited so as not to cause unnecessary damage to the natural environment.
2) The safety of other road users must be ensured at all times. The Contractor shall prevent public access to the construction site.
3) A section of the harbour will be used for construction. The contractor shall place fencing and temporary new jersey barriers for protection.

3.19. Stockpiling of materials

The Contractor shall temporarily stockpile excavated sand and topsoil materials in such a way that the spread of materials is minimised, and thus the impact on the natural vegetation. The stockpiles must be placed within areas demarcated for this purpose on the beach. The RE/ECO shall approve stockpile areas.

All excavated sand will be stockpiled and used for backfill. The contractor should time his work
so that the construction of the rock revetment, excavation and backfill is optimised.

3.20. Heritage remains

Should any heritage remains be exposed during excavations, these must immediately be reported to the Provincial Heritage Resources Authority of the Western Cape, Heritage Western Cape. Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from Heritage Western Cape.

3.21. Contingency planning

In the of a spill or leak of product into the ground and/or water courses (e.g. that of hazardous substances used for the construction phase), such incidents must be reported (within 14 days) to all the relevant authorities including the Directorate: Pollution Management in accordance with Section 30(10) of the National Environmental

Management Act No. 107 of 1998 (NEMA) and Section 20(3) of the National Water Act No. 36 of 1998 (NWA), that pertains to the control of emergency incidents and the remediation of the affected area. All necessary documentation must be completed and submitted within the prescribed timeframes. An incident log must be maintained by the Resident Engineer/ECO.

Containment, clean-up, and remediation must commence immediately.

3.22. Energy efficiency & waste minimization measures

The following design measures will be considered for energy and water saving measures:

- Household waste to be separated and recycled (glass, paper, green/garden waste).
- The use of energy saving bulbs in all structures, alternatively use low voltage or compact fluorescent lights are to be used in this project.

3.23. Environmental Control Officer or Resident Engineer

An Environmental Control Officer (ECO) or resident engineer will implement environmental control of the development. The RE/ECO duties will be as follows:

- Ensure implementation and monitoring of the EMP.
- Make changes to the EMP as required.
- Visit the site at least twice a week.
- Maintain a photographic record of the work and environmental issues.

3.24. Documentation control

The RE/ECO will maintain a file containing the following:

1) Copy of the EMP
2) Methodology statement(s) by the contractor(s)
3) Site establishment plan
4) Letter from contractor(s) indicating that he has familiarised himself with the contents of the EMP.
5) Letter from contractor(s) on environmental awareness training
6) Tracking table (see Appendix B).

4. Management Programme – Operational

4.1. Maintenance

1) The new works must be maintained to ensure construction integrity.
2) Photographs must be taken during storm events to serve a monitoring of the new works and areas where the new works are not implemented to identify areas where new protection is required.
3) Stormwater manholes must be regularly cleaned of sand to ensure optimum operation of the outlets to the sea.

Appendix A: Environmental authorisation

Appendix B: Tracking Table

Requirement	Received		Date	Comment
	Yes	No		
Methodology statement				
Site establishment plan				
Letter re contents of EMP				
Letter re awareness training				

Appendix C: Complaints Register

Date	Time	Nature of complaint	Details of complaint

Appendix I: Details of EAP and expertise

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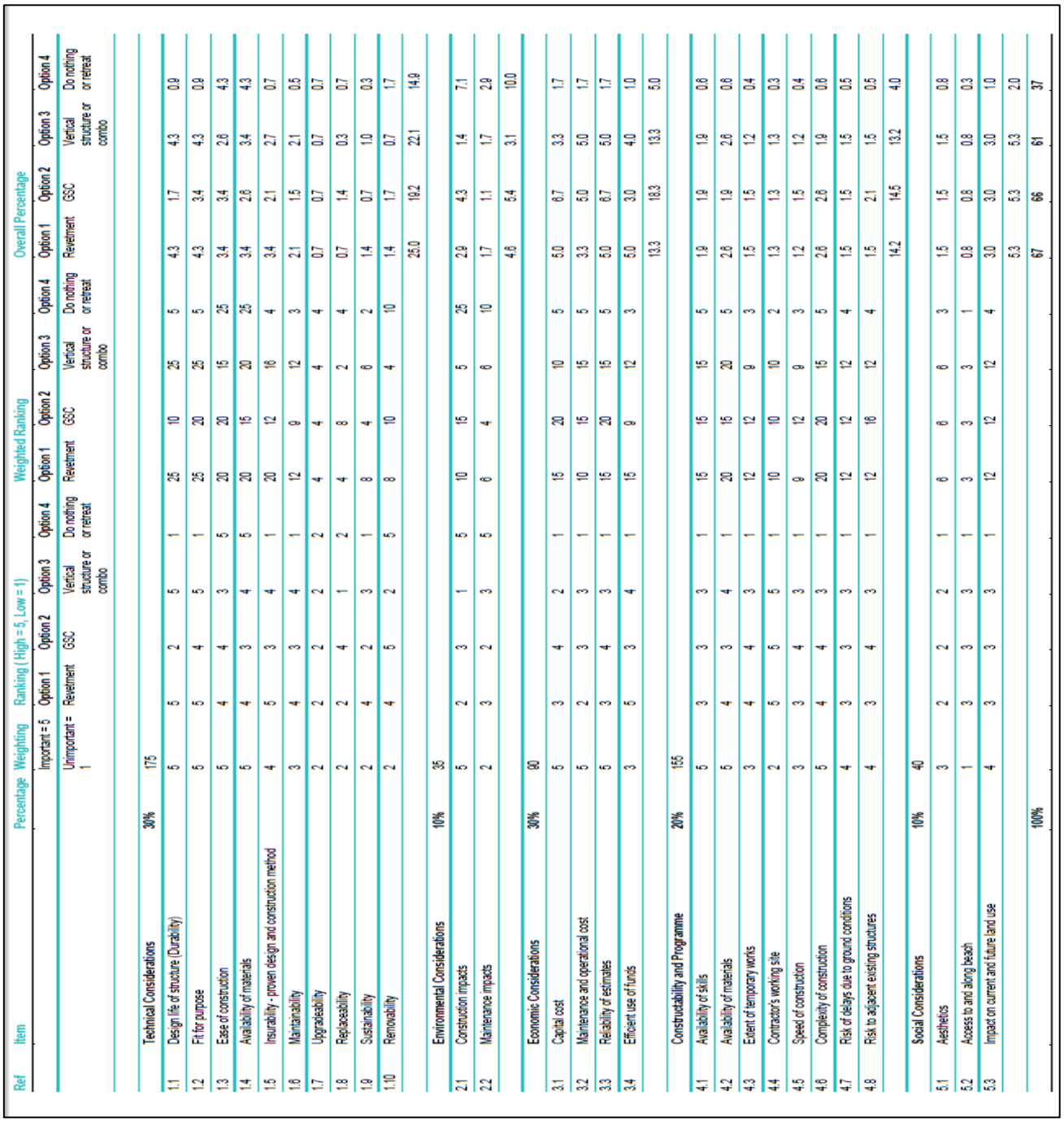
Pieter Badenhorst

Nationality	South African	
Date of birth	25 March 1951	
Qualifications	B.Sc. B.Eng. (Civil)	University of Stellenbosch 1973
	M Eng. (Irrigation)	University of Stellenbosch 1977
	B Hons. (B&A)	University of Stellenbosch 1992
	MBA	University of Stellenbosch 1993
Special courses	• Project Management (5/1990), GROMAN, Stellenbosch; • Project Management Diploma (2-7/91), Damelin Management School, Cape Town; • Time Management (7/91), FSA-Contact group, Cape Town; • Advanced Project Management, GROMAN (9/91), Stellenbosch; • Environmental Auditing (11/93), Inst. of Environmental Assessment, Lincoln, England; • SPIN Complex Selling (2/94), Sales Productivity Associates, Johannesburg; • Presentation (3/94), Whitehead Morris, Johannesburg; • Public participation - Participlan (10/94), CSIR/Univ. Cape Town	
Professional membership	Professional engineer, member of the Engineering Council of South Africa Member of the South African Institute of Civil Engineers Member of International Association for Impact Assessment (South Africa)	
Career	**Since 1997**	Own consultancy
	1997	CSIR, Environmentek; Provincial Business Development Manager
	1995 - 1996	Gulf Petrochemical Services LLC, Business Development Engineer (Sultanate of Oman & UAE) and CSIR Marketing Manager Middle East (Sultanate of Oman, UAE & Qatar).
	1993 - 1994	CSIR, Ematek, Coastal Development Programme; Marketing Manager
	1992	Study for MBA
	1982 - 1991	CSIR, Ematek, Coastal Development Programme; Project Manager
	1981	Municipality of Somerset West; Deputy Town Engineer
	1979 - 1980	Municipality of Kuils River; Town Engineer
	1978	Municipality of Klerksdorp; Senior Engineer (water)
	1974 - 1977	Department of Water Affairs; Assistant Engineer
Current position	Owner of Pieter Badenhorst Professional Services CC. As a private consultant now provide consultancy services in Environmental/coastal Management, Environmental Engineering, Public Participation and Project Management.	
Professional experience	39 years experience in civil, municipal and environmental engineering as well as business development. Civil experience in heavy construction with Department of Water Affairs. Municipal experience includes Senior Engineer, Klerksdorp, Town Engineer of Kuils River and Deputy Town Engineer of Somerset West. Nearly 16 years at CSIR in environmental management (estuarine and coastal), business management, coastal engineering and project management. Work and lived two years in Middle East working in business development, project management for CSIR contracts, tender preparation and environmental management advice. Have extensively traveled the coastlines of Australia and USA to study coastal management. Other overseas visits were undertaken to UK, Netherlands and Australia to investigate commercialisation of CSIR products and general business opportunities. Now mainly involved with environmental studies and management. Have produced various technology research reports for CSIR. The following projects were undertaken for DEAT: a Coastal Management Technical Guide; project managed the Adopt A Beach and Interpretive Signage projects as well as public participation components; initiated and implemented the Blue Flag campaign in South Africa. A number of impact studies were/are undertaken for various clients including major developments with/without golf courses and eco estates. Produced various Scoping and Environmental Impact Reports, Environmental Management Plans and an Environmental Management Framework. Act as Environmental Control Officer for many developments including Thesen Islands Canal development (Knysna), Pezula Private Estate development (Knysna), George Mall development, Leisure Isle Boat Club upgrade (Knysna), Breakwater Bay (George), St Helena Bay development and various building sites. Have undertaken a number of asset assessments for Municipalities. Presented a third year course in Coastal Management at Cape Technikon.	
Publications/ Contracts (A full list is available on request)	• Scoping and Environmental Impact reports. • Environmental Management Plans –construction and operation. • Basic Assessment Reports • S24G Applications • Waste License Applications • Water Use License Applications • Quarry applications/EMPRs • Contract reports on coastal and estuarine environmental management, coastal engineering and monitoring (including a beach monitoring project along the KZN coastline) and various reports on implementation of the Blue Flag campaign. • Contract reports in business management include market research and technology requirements (environment, food and textile/clothing industries). • Publications include CZM Technical Guide, CZM Guidelines and Coastal Processes. Research publications on sedimentation in estuaries and low-level environmental monitoring techniques. • Formed part of the Estuarine and Coastal Unit (ECRU) team that compiled the "Estuaries of the Cape" series. • Formed part of the team that compiled the Policy and Principles& Objectives for Coastal Zone Management in the RSA – for Council of the Environment. • Formed part of the team that developed Norms and Standards for inclusion into NEMA. • Feasibility studies for Department of Environment Affairs & Tourism and Department of Water Affairs. • EIA Review for DEAT on proposed Cape Town Harbour expansion • Member of team – SA Wetland audit for SANBI	

Appendix J: Specialist's declaration of interest

Appendix K: Additional Information

Appendix K1: Table 1 - Multi Criteria Analysis (MCA)



Ref	Item	Percentage	Weighting	Ranking (High = 5, Low = 1)				Weighted Ranking				Overall Percentage			
			Important = 5 Unimportant = 1	Option 1 Revetment	Option 2 GSC	Option 3 Vertical structure or combo	Option 4 Do nothing or retreat	Option 1 Revetment	Option 2 GSC	Option 3 Vertical structure or combo	Option 4 Do nothing or retreat	Option 1 Revetment	Option 2 GSC	Option 3 Vertical structure or combo	Option 4 Do nothing or retreat
	Technical Considerations	30%	175												
1.1	Design life of structure (Durability)		5	5	2	5	1	25	10	25	5	4.3	1.7	4.3	0.9
1.2	Fit for purpose		5	5	4	5	1	25	20	25	5	4.3	3.4	4.3	0.9
1.3	Ease of construction		5	4	4	3	5	20	20	15	25	3.4	3.4	2.6	4.3
1.4	Availability of materials		5	4	3	4	5	20	15	20	25	3.4	2.6	3.4	4.3
1.5	Insurability - proven design and construction method		4	5	3	4	1	20	12	16	4	3.4	2.1	2.7	0.7
1.6	Maintainability		3	4	3	4	1	12	9	12	3	2.1	1.5	2.1	0.5
1.7	Upgradeability		2	2	2	2	2	4	4	4	4	0.7	0.7	0.7	0.7
1.8	Replaceability		2	2	4	1	2	4	8	2	4	0.7	1.4	0.3	0.7
1.9	Sustainability		2	4	2	3	1	8	4	6	2	1.4	0.7	1.0	0.3
1.10	Removability		2	4	5	2	5	8	10	4	10	1.4	1.7	0.7	1.7
												25.0	19.2	22.1	14.9
	Environmental Considerations	10%	35												
2.1	Construction impacts		5	2	3	1	5	10	15	5	25	2.9	4.3	1.4	7.1
2.2	Maintenance impacts		2	3	2	3	5	6	4	6	10	1.7	1.1	1.7	2.9
												4.6	5.4	3.1	10.0
	Economic Considerations	30%	60												
3.1	Capital cost		5	3	4	2	1	15	20	10	5	5.0	6.7	3.3	1.7
3.2	Maintenance and operational cost		5	2	3	3	1	10	16	15	5	3.3	5.0	5.0	1.7
3.3	Reliability of estimates		5	3	4	3	1	15	20	15	5	5.0	6.7	5.0	1.7
3.4	Efficient use of funds		3	5	3	4	1	15	9	12	3	5.0	3.0	4.0	1.0
												13.3	18.3	13.3	5.0
	Constructability and Programme	20%	155												
4.1	Availability of skills		5	3	3	3	1	15	15	15	5	1.9	1.9	1.9	0.6
4.2	Availability of materials		5	4	3	4	1	20	15	20	5	2.6	1.9	2.6	0.6
4.3	Extent of temporary works		3	4	4	3	1	12	12	9	3	1.5	1.5	1.2	0.4
4.4	Contractor's working site		2	5	5	5	1	10	10	10	2	1.3	1.3	1.3	0.3
4.5	Speed of construction		3	3	4	3	1	9	12	9	3	1.2	1.5	1.2	0.4
4.6	Complexity of construction		5	4	4	3	1	20	20	15	5	2.6	2.6	1.9	0.6
4.7	Risk of delays due to ground conditions		4	3	3	3	1	12	12	12	4	1.5	1.5	1.5	0.5
4.8	Risk to adjacent existing structures		4	3	4	3	1	12	16	12	4	1.5	2.1	1.5	0.5
												14.2	14.5	13.2	4.0
	Social Considerations	10%	40												
5.1	Aesthetics		3	2	2	2	1	6	6	6	3	1.5	1.5	1.5	0.8
5.2	Access to and along beach		1	3	3	3	1	3	3	3	1	0.8	0.8	0.8	0.3
5.3	Impact on current and future land use		4	3	3	3	1	12	12	12	4	3.0	3.0	3.0	1.0
												5.3	5.3	5.3	2.0
		100%										67	66	61	37

Appendix L: Financial Provision (if applicable)

NOT APPLICABLE