PROPOSED REPAIR, MAINTENANCE AND UPGRADE OF EXISTING INFRASTRUCTURE AND THE DEVELOPMENT OF AN ACCESS ROAD AT THE STRUISBAAI FISHING HARBOUR, WESTERN CAPE

READ REF NR: WILL BE INCLUDED WHEN OBTAINED

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Date: September 2017

Executive Summary of Draft Basic Assessment Report

a. Project Description

1. Background & Locality:

Struisbaai is located about 220 km east of Cape Town. The coastline can be characterised as sandy beached with rocky outcrops and is in pristine condition. Figure 1 below illustrates the harbour location as well as the general coastline characteristics.

Struisbaai harbour consists of a 185m long main breakwater, two small offloading quays, a jetty and three slipways. A trot mooring system inside the harbour basin is used. The trot mooring system consists of a network of long and heavy ground chains anchored, with risers at intervals and offers 56 trot moorings.

Figure 1: Locality of Struisbaai harbour

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, dredging of sand in the harbour basin and the development of an access road (approximately 7m wide and 105 m in length) through an area containing indigenous vegetation with a development footprint of approximately 735m².

Repair and maintenance work

Existing infrastructure which requires repair and maintenance work include quay 1 and 2, slipways 1,2 and 3, jetty, breakwater and rock revetment. Figure 2 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 06 March 2017, from the Department of Environmental Affairs – Reference number: 14/12/16/3/1/1/104).

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Figure 2: The application site, Struisbaai Harbour - layout.

Dredging of sand within the harbour basin

Sediment build-up occurs alongside the breakwater on the up-drift side, (south side), due to longshore sediment transport travelling south to north. This beach has reached its storage capacity and sediment is rounding the breakwater and being deposited in the harbour basin through wave action.

Sediment is also being blown directly over the breakwater into the harbour basin. This sediment rounding the breakwaters is being deposited in front of the slipways creating problems with launching and recovery of boats.

Sediment build-up in the harbour basin has led to the need for dredging. The Struisbaai harbour requires dredging of material over a relatively large area to depths ranging from 1 to 2m. The harbour's entrance channel and basin extent is still visible, but is covered by this layer of sediment. Approximately 38 000m³ of sediment would need to be dredged out in order to reinstate the harbour to acceptable conditions. Dredged sand (approximately 38 000m³) will be deposited on the beach as show below (see Figure 3 below).

The proposed beach nourishing exercise is considered as the preferred option (see Figure 4).

The proposed area for dredging is shown in Figure 3.

Figure 3: Proposed area dredging area

Figure 4: Proposed method of disposal and disposal areas

NB! The abovementioned dredging and beach nourishment activities does not trigger a listed activity as the exclusion applies and will be included in an MMP (as per the correspondence, dated 06 March 2017, from the Department of Environmental Affairs – Reference number: 14/12/16/3/1/1/104), which will be included in the Basic Assessment Report for commenting purposes.

Access road

An access road of approximately 7m and 105m long will be constructed within an area containing indigenous vegetation. The proposed development footprint of the road will be approximately 735m². The location of the proposed road can be seen on Figure 5. The proposed access road will be developed in an area containing indigenous vegetation.

Figure 5: Proposed access road location

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. Since the development of the access road is related to the dredging and beach nourishment activities, the access road will help create a safe operating harbour for fishermen and the local community 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/next to an existing harbour and will be for the repair and maintenance work of the harbour.

ECONOMICALLY:

The development will have a positive impact by improving the economy of local workers through providing job opportunities during the construction phase.

ENVIRONMENTALLY:

The development will have a negative impact on a portion of natural vegetation and the loss of vegetation would be kept strictly to the application site.

It will, however, have many positive impacts that include:

- Will provide temporary job opportunities for local workers during the construction phase and during maintenance work.
- Will restrict sediment build up in the harbour basin, since the development of the access road is related to the dredging activities.

c. Alternatives

Alternative A (preferred alternative)

The preferred alternative proposes to clear approximately 735m^2 of indigenous vegetation for the development of an access road. The proposed road will be 105m long and 7m wide.

Figure5: Clearance of 735m² of indigenous vegetation for the development of the proposed access road (indicated in yellow), for Alternative 1

The impact will be permanent and will limited to the development footprint.

Additional employment opportunities will be created during the construction phase and the activity will ensure access to the beach with minimum impact on the surrounding indigenous vegetation.

Alternative B

Alternative B entails the development of a road using the route of the existing road (see below Figure 6). This alternative is not preferred since the road is longer and will have a greater impact on the surrounding vegetation. This alternative will be more expensive in terms of construction and transport of sediment costs, since the road will be longer. This alternative will have a greater impact in the beach since the vehicles transporting the sediment will have to drive a greater distance on the beach.

Figure 6: The development of the proposed access road (indicated in red), sing the route of the existing road, for Alternative 2

No-go alternative (compulsory)

If the no-go alternative is implemented, the repair and maintenance work will proceed, however the proposed road will not be developed.

No employment opportunities will be created during the construction phase as construction of a road will not be taking place.

d. Public Participation

Public participation included the following:

ADVERTISEMENTS

An advertisement was placed in the Suidernuus newspaper 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

Notice Boards were placed at the harbour entrance and at the library.

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 26 September until 25 October 2017.

Hard copies of the report were sent to the Struisbaai library, Department of Environmental Affairs: Oceans and Coasts, the Municipal manager, Heritage Western Cape, CapeNature, 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

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. Background & Locality:

Struisbaai is located about 300 km east of Cape Town. The coastline can be characterised as sandy beached with rocky outcrops and is in pristine condition.Figure 1 Figure 1.1 below illustrates the harbour location with regards to the Goukou Estuary as well as the general coastline characteristics.

Struisbaai harbour consists of a 185m long main breakwater, two small offloading quays, a jetty and three slipways. A trot mooring system inside the harbour basin is used. The trot mooring system consists of a network of long and heavy ground chains anchored, with risers at intervals and offers 56 trot moorings.

Figure 1:

Figure 1.1: Locality of Struisbaai harbour

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Repair and maintenance work

Existing infrastructure which requires repair and maintenance work include quay 1 and 2, slipways 1,2 and 3, jetty, breakwater and rock revetment. Figure 2.1 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 06 March 2017, from the Department of Environmental Affairs – Reference number: 14/12/16/3/1/1/104).

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Figure 2.1: The application site, Struisbaai Harbour - layout.

Dredging of sand within the harbour basin

Sediment build-up occurs alongside the breakwater on the up-drift side, (south side), due to longshore sediment transport travelling south to north. This beach has reached its storage capacity and sediment is rounding the breakwater and being deposited in the harbour basin through wave action.

Sediment is also being blown directly over the breakwater into the harbour basin. This sediment rounding the

breakwaters is being deposited in front of the slipways creating problems with launching and recovery of boats.

Sediment build-up in the harbour basin has led to the need for dredging. The Struisbaai harbour requires dredging of material over a relatively large area to depths ranging from 1 to 2m. The harbour's entrance channel and basin extent is still visible, but is covered by this layer of sediment. Approximately 38 000m³ of sediment would need to be dredged out in order to reinstate the harbour to acceptable conditions. Dredged sand (approximately 38 000m³) will be deposited on the beach as show below (see Figure 2.2 below).

The disposal of the dredged material would require special attention as this greatly affects production, risk and overall dredging costs dramatically. The proposed beach nourishing exercise is considered as the preferred option (see Figure 2.3).

The proposed area for dredging is shown in Figure 2.2.

Figure 2.2: Proposed area dredging area

Figure 3: Proposed method of disposal and disposal areas

NB! The abovementioned dredging and beach nourishment activities does not trigger a listed activity as the exclusion applies and will be included in an MMP (see Appendix I) (as per the correspondence, dated 06 March 2017, from the Department of Environmental Affairs – Reference number: 14/12/16/3/1/1/104), which will be included in the Basic Assessment Report for commenting purposes.

Access road

An access road of approximately 7m and 105m long will be constructed within an area containing indigenous vegetation. The proposed development footprint of the road will be approximately 735m². The location of the proposed road can be seen on Figure 4. The proposed access road will be developed in an area containing indigenous vegetation.

Figure 4: Proposed access road location

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. 983/327	
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 not triggered since the proposed project will consist of maintenance and dredging in the harbour basin and an entrance channel will be required with the intension to replenish the beach. Further, a Maintenance Management Plan (MMP) will be compiled for on-going maintenance dredging in the harbour basin and at the entrance channel and the deposition/disposal. The MMP does not constitute a listed activity but will be included in the Basic Assessment Report for commenting purposes by interested and affected parties.
GN. R. 985 Item 4: The development of a road wider than 4 metres with a reserve less than 13,5 metres. i. Western Cape i. Areas zoned for use as public open space or equivalent zoning; ii. Areas outside urban areas; (aa) Areas containing indigenous vegetation; (bb)Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined; or iii. Inside urban areas: (aa)Areas zoned for conservation use; or (bb)Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority	An access road (7m wide) will be constructed through an area consisting of vegetation. This activity will be triggered as an access road wider than 4m will be constructed through an area containing indigenous vegetation.

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	34º 48’ 01.93”	20º 03’ 32.09”
• Middle/Additional point of the activity	34º 48’ 01.23”	20º 03’ 34.18”
• End point of the activity	34º 47’ 59.95”	20º 03’ 34.91”
Alternative S2 (if any)		
• Starting point of the activity	34º 48’ 01.93”	20º 03’ 32.09”
• Middle/Additional point of the activity	34º 48’ 02.12”	20º 03’ 37.35”
• End point of the activity	34º 48’ 02.24”	20º 03’ 41.23”
~~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	
Route Alternative (preferred or only alternative): Development of an access road	<u>Alternative A:</u> The preferred alternative proposes to clear approximately 735m² of indigenous vegetation for the development of an access road. The proposed road will be 105m long and 7m wide.  **Figure5: Clearance of 735m² of indigenous vegetation for the development of the proposed access road (indicated in yellow), for Alternative 1** The impact will be permanent and will limited to the development footprint. Additional employment opportunities will be created during the construction phase and the activity will ensure access to the beach with minimum impact on the surrounding indigenous vegetation. <u>Alternative B:</u> Alternative B entails the development of a road using the route of the existing road (see below Figure 6). This alternative is not preferred since the road is longer and will have a greater impact on the surrounding vegetation. This alternative will be more expensive in terms of construction and transport of sediment costs, since the road will be longer. This alternative will have a greater impact in the beach since the vehicles transporting the sediment will have to drive a greater distance on the beach.

Figure 6: The development of the proposed access road (indicated in red), sing the route of the existing road, for Alternative 2

e) No-go alternative

If the no-go alternative is implemented, the repair and maintenance work will proceed, however the proposed road will not be developed.

No employment opportunities will be created during the construction phase as construction of a road will not be taking place.

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)	735m²
Alternative 2	1772m²

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

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;
- 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 an access road is required to access the one site where dredging of sand will take place.			
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 create some temporary employment opportunities which is a key action identified by the PSDP.			
(b) Urban edge / Edge of Built environment for the area	~~YES~~	NO	Please explain
The property falls outside of the Urban edge of Struisbaai.			
(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 an access road will provide access to the beach site where dredging will take place. Dredging at the proposed site will ensure sediment will not be transported into the harbour. It will also provide temporary employment during the development phase. Providing protection to harbour infrastructure and boats, which 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 outside the urban edge of Struisbaai. The proposed development will not require any additional services.			
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 development of an access road will entail clearance of indigenous vegetation. The preferred alternative (Alternative A) will result in clearance of a smaller section of indigenous vegetation, whereas Alternative B will result in the clearance of a larger section of indigenous vegetation.			
9. Is the development the best practicable environmental option for this land/site?	YES	~~NO~~	Please explain
Yes, the development will result in the clearance of a smaller section of indigenous vegetation.			
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. Sediment from the proposed dredging site is being transported into the harbour, which negatively impacts on the harbour as the harbour basin is continuously becoming shallower. This may lead to the harbour basin being unable to accommodate boats. Therefore, the small negative impact of the development of an access road within 100m of the high-water mark in order for dredging activities 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.			
11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	~~YES~~	NO	Please explain
The proposed development is related to the maintenance of the harbour – providing access to the dredging site in order to prevent sediment transport into the harbour.			
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
Direct and immediate measures to attack poverty The fishing industry is an important part of our economy. Through the development of the access road, maintenance dredging can be done in order to provide a more suitable and functional harbour for fishermen. It also promotes inclusive growth, providing citizens with the means to improve their own lives and boost their incomes. This project will also contribute to help fight unemployment by employing local community members in the construction phase.	

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 low impact on the environment.
(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 having a well-functioning harbour while at the same time, have minimal negative impacts on the natural environment.

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. Since the development of the access road is related to the dredging and beach nourishment activities, the access road will help create a safe operating harbour for fishermen and the local community 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/next to an existing harbour and will be for the repair and maintenance work of the harbour.

ECONOMICALLY:

The development will have a positive impact by improving the economy of local workers through providing job opportunities during the construction phase.

ENVIRONMENTALLY:

The development will have a negative impact on a portion of natural vegetation and the loss of vegetation would be kept strictly to the application site.

It will, however, have many positive impacts that include:

- Will provide temporary job opportunities for local workers during the construction phase and during maintenance work.
- Will restrict sediment build up in the harbour basin, since the development of the access road is related to the dredging activities.

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 Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008)	Permit for vehicle use in the coastal area for construction or maintenance of infrastructure authorised by law.	Department of Environmental Affairs: Oceans and Coasts	Pending
National Environmental Management: Integrated Coastal Management Act (Act No. 24 of 2008)	Permit for dumping at sea	Department of Environmental Affairs: Oceans and Coasts	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	The harbour buildings are on erven 848 and 1394. No erf indicated for the harbour itself.	
Portion number	N/A	
SG Code	C01100080000139400000 C01100080000084800000	

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	☒				

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	

Comment from SAHRA indicated that historical fish traps are located at the Struisbaai harbour and requested that an HIA be conducted. HIA has been conducted and the following was concluded:

"*An inspection of the boulder bed at spring low tide produced no immediate evidence of stone wall fish traps close to the harbour. There are however some significant complexes of these towards St Mungo Bay and onwards into the Agulhas National Park. Noted however were two open areas in the beds that may once have been tidal fish traps, however there was no evidence of standing walling. Given the fact that there is no associated walling the heritage significance of these features is considered to be low and unworthy of grading. What is evident from a 1938 aerial photograph is the bay which now contains the harbour and the surrounds, contained a large complex of fish traps, the majority of which have been destroyed, while others may have survived under the reclaimed land*."

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:

An Archaeological Impact Assessment was conducted by ACO Associates CC (Appendix E).

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, 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]

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	Struisbaai dredging estimated at R 9 million (excluding VAT)	
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?	R 6,4 million	
What percentage of this will accrue to previously disadvantaged individuals?	95 %	
How many permanent new employment opportunities will be created during the operational phase of the activity?	120	
What is the expected current value of the employment opportunities during the first 10 years?	R 43,2 million	
What percentage of this will accrue to previously disadvantaged individuals?	95 %	

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)~~	The proposed access road is not located within a CBA or ESA.

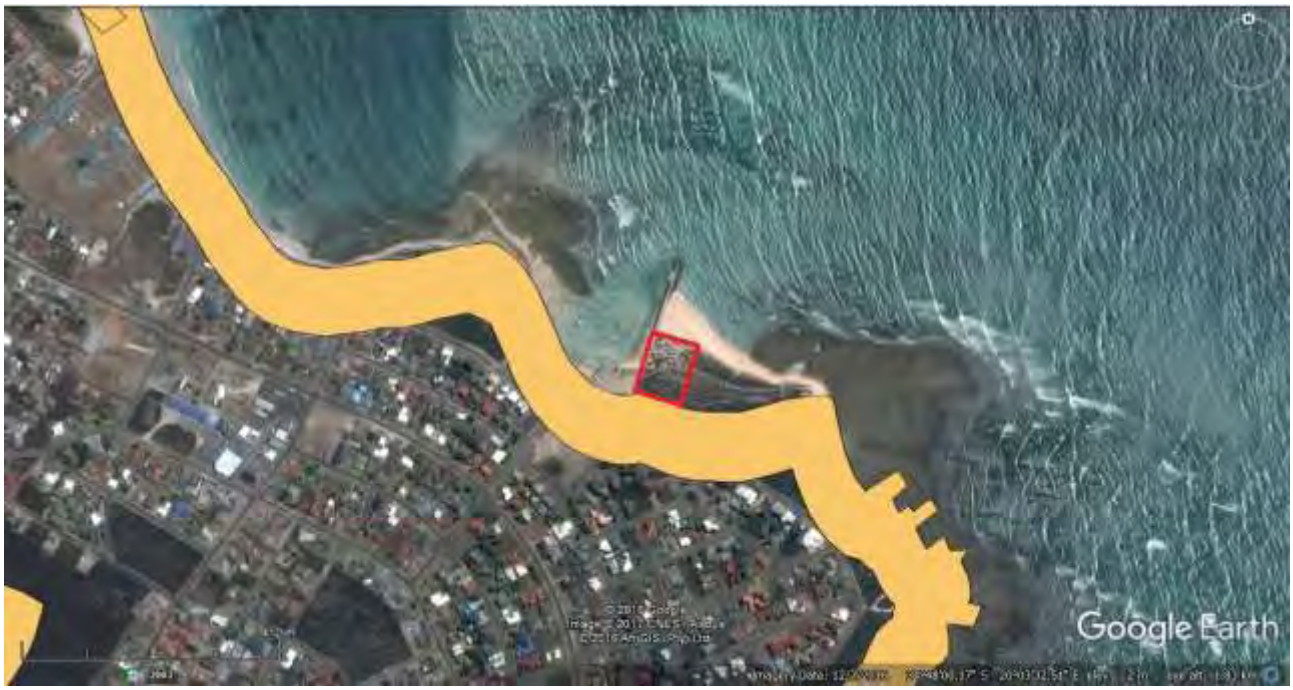


Figure 7: Part of the terrestrial Critical Biodiversity Areas map for the Western Cape province overlaid on Google Earth ™. The orange area is an Ecological Support Area (ESA). The study area (indicated in red) falls outside the ESA.

b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (Including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).
~~Natural~~	90%	Indigenous vegetation occurs on site.
~~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)	10%	Foot paths and existing roads exist.

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)

Mucina et al. (2006) mapped the vegetation as found in the study area as Overberg Dune Strandveld. Overberg Dune Strandveld has a conservation status of Least Threatened. Overberg Dune Strandveld occurs along the Agulhas Peninsula on coastal limestone formations. The proposed access road route is already disturbed by means of an existing road and footpaths.

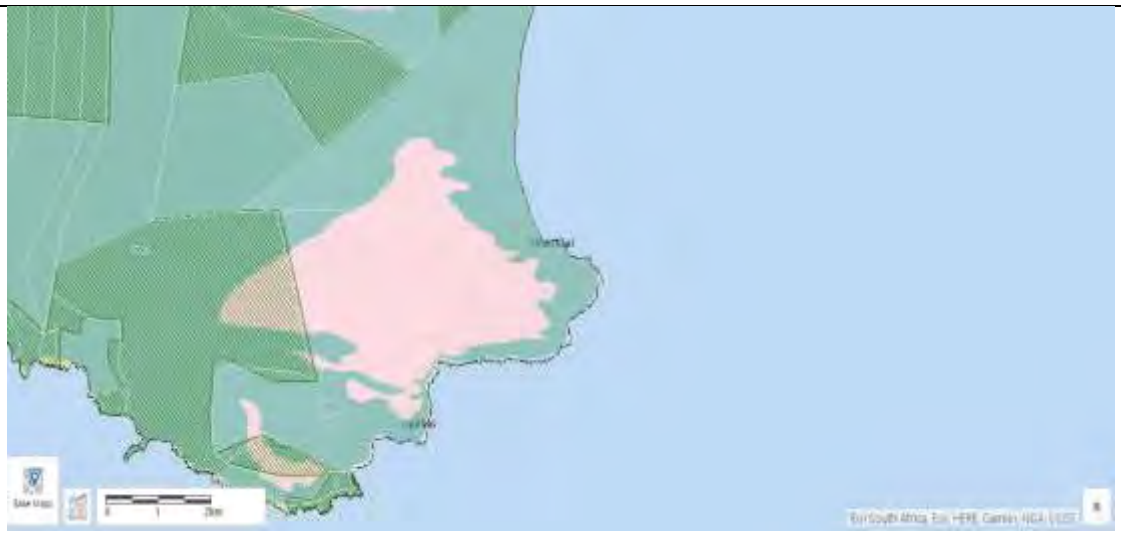


Figure 8: The Vegetation Map of South Africa, Lesotho and Swaziland (image obtained from SANBI - National Threatened Ecosystems) indicates the proposed site contains Overberg Dune Strandveld (indicated in blue).

FS 7 Overberg Dune Strandveld

Distribution Western Cape Province: Scattered patches from Rooiels (Cape Hangklip area) as far east as Cape Infanta at the mouth of the Breede River, with the largest one surrounding the Agulhas Peninsula—as a rule bordering on coastal limestone formations. Altitude 0–100 m, but reaching 160 m in places.

Vegetation & Landscape Features Flat or slightly undulating dune fields of Die Plaat near Stanford and those of De Hoop, supporting up to 4 m tall, closed, evergreen, hard-leaved shrublands in moist dune slacks and wind-protected valleys and up to 1 m tall, coastal thicket in many places wind-shorn along exposed littoral situations.

Geology & Soils Deep, Recent marine-derived calcareous sands forming dunes that line the coast (Quaternary Strandveld Formation of the Bredasdorp Group), to shelly, shallow-marine sandstones and limestones of the Bredasdorp Group deposited on underlying Table Mountain Group sandstone. The most important land types include Hb (37%), Ha (31%) and Fc (18%).

Climate Mainly cyclonic rainfall varying from approximately 400 mm in the east to 600 mm in the west, mainly in winter, but still with considerable summer rainfall in the eastern regions of the unit. The winter rains are accompanied by strong northwesterly winds and cooler temperatures. The winds tend to be strong southwesterly (trade winds with average velocity of 35 km per hour) in summer. Mean daily maximum and minimum temperatures 25.1°C and 7.0°C for January and July, respectively. Mean monthly maximum and minimum temperatures for Cape Agulhas 27.1°C and 7.3°C for January and June, respectively. No incidences of snowfalls have been recorded; frost is infrequent and hail occurs occasionally. Dense mist banks regularly occur through the Overberg

region in autumn and winter. See also climate diagram for FS 7 Overberg Dune Strandveld (Figure 4.128).

Important Taxa Tall Shrubs: *Euclea racemosa* subsp. *racemosa* (d), *Metalasia muricata* (d), *Rhus crenata* (d), *R. glauca* (d), *R. laevigata* (d), *Chionanthus foveolatus*, *Cussonia thyrsiflora*, *Gymnosporia buxifolia*, *Morella cordifolia*, *Myrsine africana*, *Olea exasperata*, *Passerina corymbosa*, *Rhus lucida*, *R. undulata*, *Sideroxylon inerme*, *Tarchonanthus littoralis*. Low Shrubs: *Chrysanthemoides monilifera* (d), *Passerina paleacea* (d), *P. rigida* (d), *Pterocelastrus tricuspidatus* (d), *Aspalathus forbesii*, *Ballota africana*, *Carissa bispinosa* subsp. *bispinosa*, *Cassine peragua* subsp. *barbara*, *Chironia baccifera*, *Eriocephalus africanus* var. *africanus*, *Felicia amelloides*, *Helichrysum niveum*, *H. teretifolium*, *Lauridia tetragona*, *Otholobium bracteolatum*, *Phylica axillaris*, *P. ericoides*, *Polygala myrtifolia*, *Psoralea repens*, *Robsonodendron maritimum*. Succulent Shrubs: *Crassula nudicaulis*, *Drosanthemum candens*, *Jordaaniella dubia*, *Osteospermum fruticosum*, *Othonna dentata*, *Tetragonia decumbens*, *T. fruticosa*, *T. spicata*. Woody Climbers: *Asparagus aethiopicus*, *Cissampelos capensis*, *Solanum africanum*. Semiparasitic Shrubs: *Thesidium fragile* (d), *Osyris compressa*. Herbs: *Helichrysum crispum* (d), *Senecio elegans* (d), *Cineraria geifolia*, *Hebenstretia repens*, *Helichrysum litorale*, *Knowltonia capensis*, *Silene crassifolia*, *Stachys aethiopica*. Geophytic Herbs: *Brunsvigia orientalis*, *Chasmanthe aethiopica*, *Romulea obscura*. Succulent Herbs: *Carpobrotus acinaciformis* (d), *C. edulis*, *Crassula expansa* subsp. *expansa*. Herbaceous Climbers: *Astephanus triflorus*, *Cynanchum africanum*, *Kedrostis nana*. Graminoids: *Ischyrolepis eleocharis* (d), *Cynodon dactylon*, *Ehrharta erecta*, *E. villosa* var. *villosa*, *Ficinia lateralis*, *Thamnochortus erectus*.

Biogeographically Important Taxon (South Coast endemic) Low Shrub: *Berkheya coriacea*.

Endemic Taxa Succulent Shrub: *Lampranthus salteri*. Geophytic Herb: *Gladiolus carmineus*.

Conservation Least threatened. Target 36%. Some 30% statutorily conserved in De Hoop, Walker Bay and De Mond Nature Reserves and in the Agulhas National Park. A further 11% of the unit is protected in private conservation areas, such as Andrewsfield, Brandfontein-Rietfontein, Groot Hagelkraal, Hoek-van-die-Berg, Kleinrivier, Paapekuilfontein and Waterkop. More than 5% has been transformed by urban development and cultivation. Established thickets of alien *Acacia cyclops*, *A. saligna* and *Leptospermum laevigatum* are of serious concern. Erosion very low and low.

http://bgisviewer.sanbi.org

Section C: Public Participation

1. Advertisement And Notice

Publication name	Suidernuus	
Date published	22 September 2017	
Site notice position	Latitude	Longitude
	34°48'3.47"S	20°3'26.89"E
	34°48'1.11"S	20°3'23.08"E
Date placed	26 September 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	Zieff	Elsabe	Cape Agulhas Local Municipality	0284255500	0284251019	info@capeagulhas.gov.za	P.O. Box 51	Bredasdorp	7280
2	Gertse	Jakobus	Struisbaai Harbour Users Committee	0724752113		jacobusgertse378@gmail.com	15 6th Avenue	Struisbaai	7285
3	Pienaar	Jerry	Resident	0832266443		sceptre@isat.co.za			
4			Struisbaai Harbour Office	0284356220			P.O. Box 135	Struisbaai	7285

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

Surname	Initials	Representing	Tel	Fax	Email	P.O. Box	Town	Code
Williams	Briege	SAHRA	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
Smart	R	Cape Nature (Land Use Advice Unit)	021 866 8017	021 866 1523	landuse@capenature.co.za	Private Bag X5014	Stellenbosch	7599

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	Clearing of approximately 735m² of natural vegetation.	High negative
	Loss of faunal habitat The transformation of land will affect fauna on a local scale, as some fauna will be directly affected by habitat loss during land-clearing and construction activities. However, the proposed sites are not located in potential movement corridors, so impacts are likely to be on a strictly local scale.	Low negative
	Impacts on marine environment The development of an access road will occur within 100m of the high-water mark of the sea	Medium negative
	Waste – building rubble and littering Potential damage to surrounding unaltered vegetation as well as littering during construction.	Low 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). Construction activities will be of short duration, as such the significance of potential visual impacts associated with the construction phase can be considered low.	Low to medium negative
	Socio-economics Temporary job creation during the construction phase.	Medium positive
	Air pollution Dust (air) pollution caused by removal of vegetation and construction of an access road can cause a nuisance. As well as construction vehicles driving through sand.	Low negative
	Noise impact Normal construction related noise impacts are anticipated. These will be generated by the removal and construction activities. Owing to the relatively small scale of the construction activities, their temporary nature the noise impacts are anticipated to be low.	Low negative
	Spillage of diesel/oil due to poorly maintained equipment and machinery can contaminate ground and water resources as well as the marine environment.	Medium to high negative

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE PRE-MITIGATION
	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.	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 Construction excess material left onsite may attract vermin, encourage the growth of opportunistic alien vegetation and become unsightly.	Medium 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 some permanent job opportunities for local community members The development will also contribute to local and national economy	Medium positive

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE POST-MITIGATION
ALTERNATIVE 2		
CONSTRUCTION PHASE	Clearing of 1772m² of natural vegetation	High negative
	Loss of faunal habitat The transformation of land will affect fauna on a local scale, as some fauna will be directly affected by habitat loss during land-clearing and construction activities. However, the proposed sites are not located in potential movement corridors, so impacts are likely to be on a strictly local scale.	Low negative
	Impacts on marine environment The development of an access road will occur within 100m of the high-water mark of the sea	Low negative
	Waste – building rubble and littering Potential damage to surrounding unaltered vegetation as well as littering during construction.	Low negative
	Indirect impacts: Creating unnecessary large impact areas.	Low 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). Construction activities will be of short duration, as such the significance of potential visual impacts associated with the construction phase can be considered low.	Low to medium negative
	Socio-economics Temporary job creation during the construction phase.	Medium positive
	Air pollution Dust (air) pollution caused by removal of vegetation and construction of an access road can cause a nuisance. As well as construction vehicles driving through sand.	Low negative

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE POST-MITIGATION
	Noise impact Normal construction related noise impacts are anticipated. These will be generated by the removal and construction activities. Owing to the relatively small scale of the construction activities, their temporary nature the noise impacts are anticipated to be low.	Low negative
	Mixing of concrete and spillage of diesel/oil due to poorly maintained equipment and machinery can contaminate ground and water resources.	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.	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 Construction excess material left onsite may attract vermin, encourage the growth of opportunistic alien vegetation and become unsightly.	Medium 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 some permanent job opportunities for local community members The development will also contribute to local and national economy	Medium positive
NO-GO OPTION		
	Employment Employment of locals	Low negative
	Socio economic Contribution to local and national economy	Medium negative
	Sediment build up Continuation of sediment build up in the harbour and east beach	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 H, page 80.

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 proposes to clear approximately 735m² of indigenous vegetation for the development of an access road. The proposed road will be 105m long and 7m wide.

Figure 9 : Clearance of 735m² of indigenous vegetation for the development of the proposed access road (indicated in yellow), for Alternative 1

The impact will be permanent and will limited to the development footprint.

Additional employment opportunities will be created during the construction phase and the activity will ensure access to the beach with minimum impact on the surrounding indigenous vegetation.

Alternative 2

Alternative B entails to clear approximately 1772m² of indigenous vegetation for the development of a road using the route of the existing road (see below Figure 6). This alternative is not preferred since the road is longer and will have a greater impact on the surrounding vegetation. This alternative will be more expensive in terms of construction and transport of sediment costs, since the road will be longer. This alternative will have a greater impact in the beach since the vehicles transporting the sediment will have to drive a greater distance on the beach.

Figure 10: The development of the proposed access road (indicated in red), sing the route of the existing road, for Alternative 2

No-go alternative (compulsory)

If the no-go alternative is implemented, the repair and maintenance work will proceed, however the proposed road will not be developed.

No employment opportunities will be created during the construction phase as construction of a road will not be taking place.

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 removal of vegetation should only be within the development footprint.
- The proposed development footprint must be demarcated.

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: Maintenance Management Plan for dredging areas

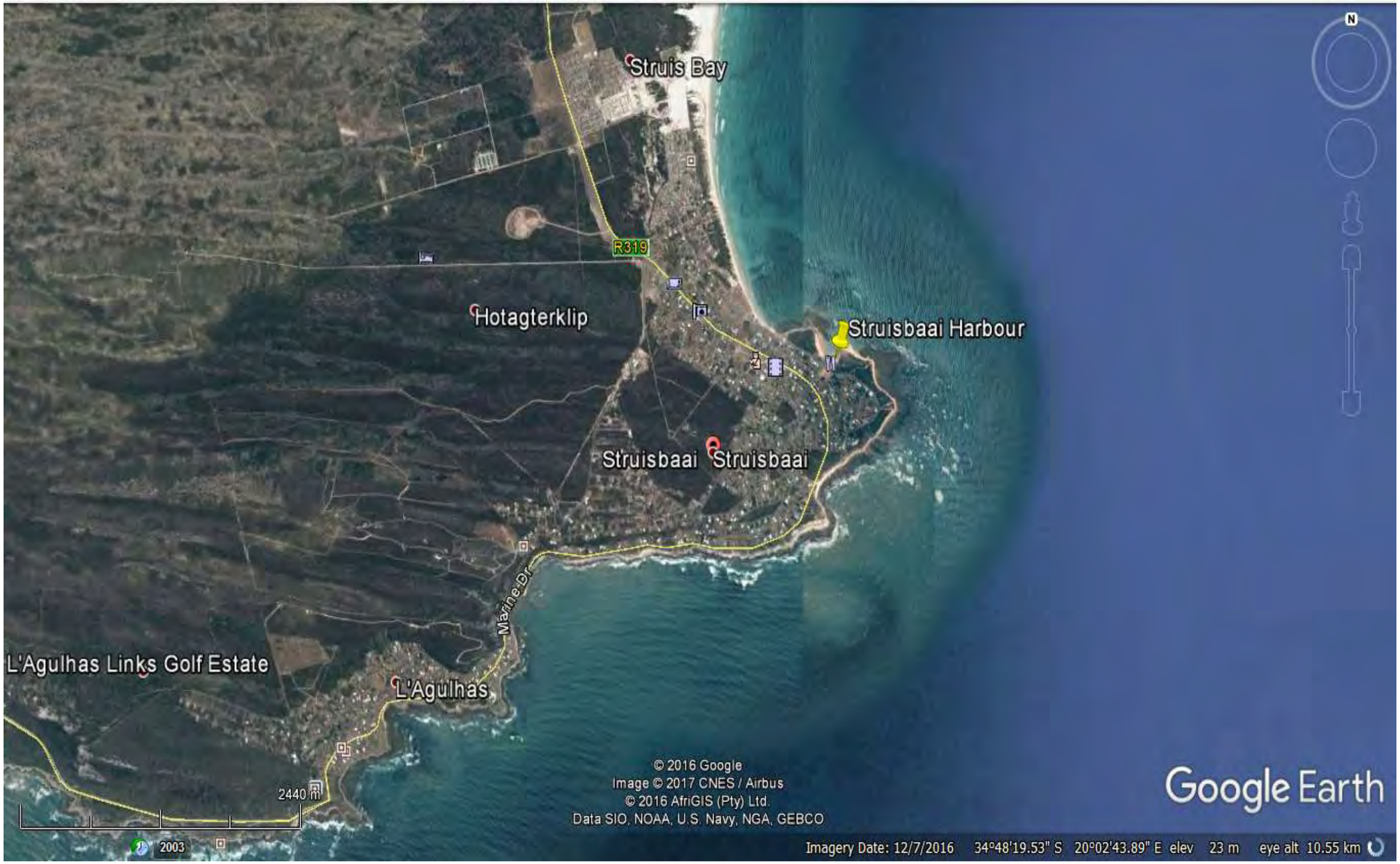
Appendix J: Details of EAP and expertise

Appendix K: Specialist's declaration of interest

Appendix L: Additional Information

Appendix A1: Maps

A3 Locality Map



Appendix A2:

Layout Plan and Sensitivity Maps

*The yellow line indicates the proposed access road.

*The area indicated in orange is identified by SANBI as an Ecological Support Area. The proposed access road is not located within a CBA.

Appendix B: Photographs

- Photograph 1 – Sediment build-up in Struisbaai harbour.

- Photograph 2 – one of the harbour slipways

Appendix C: Facility illustration(s)

Not applicable

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

None required

Appendix E: Specialist reports

Appendix E1: Heritage Impact Assessment

(Assessment conducted under Section 38 (8) of the
National Heritage Resources Act (No. 25 of 1999) as part of an EIA)

Prepared for

ACO Associates cc
Archaeology and Heritage Specialists

Prepared by
Tim Hart
Fieldwork by Liesbet Schietecatte
and Natalie Kendrick

ACO Associates
8 Jacobs Ladder
St James
Cape Town
7945

Phone (021) 706 4104
Fax (086) 603 7195
Email: Tim.Hart@aco-associates.com

Details of the specialist

This study has been undertaken by Tim Hart BA Hons, MA (ASAPA, APHP) of ACO Associates CC, archaeologists and heritage consultants.

Unit D17, Prime Park, Mocke Road, Diep River, Cape Town, 7800

Email: Tim.Hart@ACO-Associates.com

Phone: 021 7064104

Fax: 086 6037195

CURRICULUM VITAE

Name: Timothy James Graham Hart

Profession: Archaeologist

Date of Birth: 20/07/60

Parent Firm: ACO Associates

Position in Firm: Director

Years with Firm: 9

Years experience: 30 years

Nationality: South African

HDI Status: n/a

Education: Matriculated Rondebosch Boys High, awarded degrees BA (UCT) BA Hons (UCT) MA (UCT).

Professional Qualifications: Principal Investigator ASAPA, member of Association of Heritage Professionals (APHP)

Languages: Fully literate in English, good writing skills. Conversation in Afrikaans, mediocre writing skills, good reading skills. Some knowledge of Latin.

KEY QUALIFICATIONS

- Bachelor of Arts in Archaeology and Psychology
- BA Honours in archaeology
- MA in Archaeology
- Recipient of Frank Schwietzer Memorial Prize (UCT) for student excellence
- Professional member (no 50) Association of Southern African Professional Archaeologists (ASAPA)
- Principal Investigator, cultural resources management section (ASAPA)
- Professional member in specialist and generalist categories Association of Heritage Professionals (APHP)
- Committee Member Heritage Western Cape, Committee Member SAHRA
- Awarded Department of Arts and Culture and Sport award for best heritage study in 2014,

Some recent Project Experience with respect to large projects:

- Specialist Specialist consultant – Eskom's Kudu Integration project (identifying transmission line routes across Namaqualand)

- Specialist consultant – Eskom's Atantis Open Cycle Gas Turbine project, upgrade and power lines
- Specilaist consultant – Eskom's Mossel Bay Open Cycle Gas Turbine project, substations and power lines
- Specialist consultant – Eskoms proposed Omega sub-station
- Specialist consultant – Eskoms Nuclear 1 programme
- Specialist consultant – Eskoms PBMR programme
- Specialist consultant – Department of Water Affairs raising of Clanwilliam Dam project
- Specialist consultant to De Beers Namaqualand Mines (multiple projects since 1995)
- Specialist consultant – Saldanha Ore Handling Facility phase 2 upgrade
- Three years of involvement in Late Stone Age projects in the Central Great Karoo
- Wind Energy systems: Koekenaap, Hopefield, Darling, Vredendal, Bedford, Sutherland, Caledon
- Specialist consultant – Eskom nuclear 1
- Bantamsklip Nuclear 1 TX lines
- Koeberg Nuclear 1 TX lines
- Karoo uranium prospecting various sites
- HIA Houses of Parliament
- Proposed Ibhubesi gas project, West Coast of South Africa.

Experience

After graduating from UCT with my honours degree I joined the Southern Methodist University (SMU Dallas Texas) team undertaking Stone Age research in the Great Karoo. After working in the field for a year I registered for a Masters degree in pre-colonial archaeology at UCT with support from SMU. On completion of this degree in 1987 I commenced working for the ACO when it was based at UCT. This was the first unit of its kind in RSA.

In 1991 I took over management of the unit with David Halkett. We nursed the office through new legislation and were involved in setting up the professional association and assisting SAHRA with compiling regulations. The office developed a reputation for excellence in field skills with the result that ACO was contracted to provide field services for a number of research organisations, both local and international. Since 1987 in professional practise I have has been involved in a wide range of heritage related projects ranging from excavation of fossil and Stone Age sites to the conservation of historic buildings, places and industrial structures. To date the ACO Associates CC (of which I am co-director) has completed more than 1500 projects throughout the country ranging from minor assessments to participating as a specialist in a number of substantial EIA's as well as international research projects. Some of these projects are of more than 4 years duration

Together with my colleague Dave Halkett, I have been involved in heritage policy development, development of the CRM profession, the establishment of 2 professional bodies and development of professional practice standards. Notable projects I have been involved with are the development of a heritage management plan and ongoing annual mitigation for the De Beers Namaqualand Mines Division, heritage management for Namakwa Sands and other west coast and Northern Cape mining firms. Locally, I was responsible for the discovery of the "Battery Chavonnes" at the V&A Waterfront (now a conserved as a museum – venue for Da Vinci exhibition), the discovery of a massive paupers burial ground in Green Point (now with museum and memorial), the fossil deposit which is now the subject of a public display at the West Coast Fossil Park National Heritage Site as well as participating in the development of the Robben Island Museum World Heritage Site. I have teaching experience within a university setting and have given many public lectures on archaeology and general heritage related matters. I am presently running a NLF funded project to research the historic burial grounds of Green Point.

Academic Publications

Hart, T.J.G. 1987. Porterville survey. In Parkington, J & Hall, M.J. eds. Papers in the Prehistory of the Western Cape, South Africa. Oxford: BAR International Series 332.

Sampson, C.G., Hart, T.J.G., Wallsmith, D.L. & Blagg, J.D. 1988. The Ceramic sequence in the upper Sea Cow Valley: Problems and implications. South African Archaeological Bulletin 149: 3-16.

Plug, I. Bollong, C.A., Hart, T.J.G. & Sampson, C.G. 1994. Context and direct dating of pre-European livestock in the Upper Seacow River Valley. Annals of the South African Museum, Cape Town.

Hart, T. & Halkett, D. 1994. Reports compiled by the Archaeology Contracts Office, University of Cape Town. Crossmend, HARG. University of Cape Town.

Hart, T. & Halkett, D. 1994. The end of a legend? Crossmend, HARG. University of Cape Town.

Hart, T 2000. The Chavonnes Battery. Aquapolis. Quarterly of the International Center for Cities on Water. 3-4 2000.

Hine, P, Sealy, J, Halkett, D and Hart, T. 2010. Antiquity of stone walled fish traps on the Cape Coast of South Africa. The South African Archaeological Bulletin. Vol. 65, No. 191 (JUNE 2010), pp. 35-44

Klein, R.G., Avery, G., Cruz-Uribe, K., Halkett, D., Hart, T., Milo, R.G., Volman, T.P. 1999. Duinefontein 2: An Acheulean Site in the Western Cape Province of South Africa. Journal of Human Evolution 37, 153-190.

Klein, R.G., Cruz-Uribe, K., Halkett, D., Hart, T., Parkington, J.E. 1999. Paleoenvironmental and human behavioral implications of the Boegoeberg 1 late Pleistocene hyena den, northern Cape province, South Africa. Quaternary Research 52, 393-403.

Malan, A. Halkett, D. Hart, T and Schietecatte E. 2017. Grave Encounters: The history of Green Points burial grounds. Southern Cross publishing.

Smith, A., Halkett, D., Hart, T. & Mütti, B. 2001. Spatial patterning, cultural identity and site integrity on open sites: evidence from Bloeddrift 23, a pre-colonial herder camp in the Richtersveld, Northern Cape Province, South Africa. South African Archaeological Bulletin 56 (173&174): 23-33.

Smith, A., Halkett, D., Hart, T. & Mütti, B. 2001. Spatial patterning, cultural identity and site integrity on open sites: evidence from Bloeddrift 23, a pre-colonial herder camp in the Richtersveld, Northern Cape Province, South Africa. South African Archaeological Bulletin 56 (173&174): 23-33.

Halkett, D., Hart, T., Yates, R., Volman, T.P., Parkington, J.E., Klein, R.J., Cruz-Uribe, K. & Avery, G. 2003. First excavation of intact Middle Stone Age layers at Ysterfontein, western Cape province, South Africa: implications for Middle Stone Age ecology. Journal of Archaeological Science

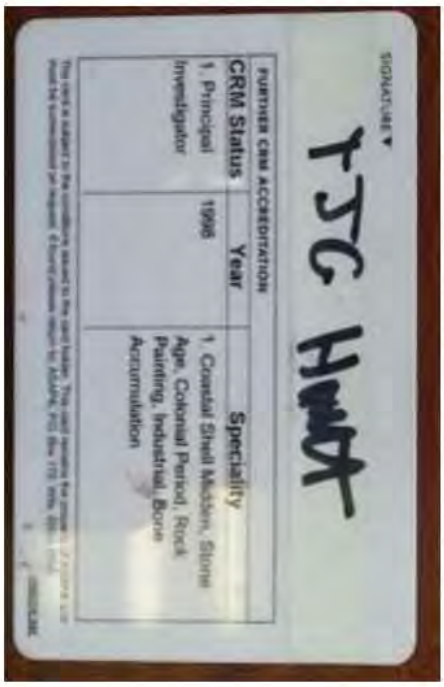
Cruz-Uribe, K., Klein, R.G., Avery, G., Avery, D.M., Halkett, D., Hart, T., Milo, R.G., Sampson, C.G. & Volman, T.P. 2003. Excavation of buried late Acheulean (mid-quaternary) land surfaces at Duinefontein 2, western Cape province, South Africa. Journal of Archaeological Science 30.

Parkington, JE. Poggenpoel, C. Halkett, D. & Hart, T.2004 Initial observations from the Middle Stone Age coastal settlement in the Western Cape In Conard, N. Eds. Settlement dynamics of the Middle Paleolithic and Middle Stone Age. Tubingen: Kerns Verlag.

Orton, J. Hart, T. Halkett, D. 2005. Shell middens in Namaqualand: two later Stone Age sites at Rooiwalbaai, Northern Cape Province, South Africa. South African Archaeological Bulletin. Volume 60 No 181

G Dewar, D Halkett, T Hart, J Orton, J Sealy, 2006. Implications of a mass kill site of springbok (Antidorcas marsupialis) in South Africa: hunting practices, gender relations, and sharing in the Later Stone Age .Journal of Archaeological Science 33 (9), 1266-127

Finnegan, E. Hart, T and Halkett, D. 2011. The informal burial ground at Prestwich Street, Cape Town: Cultural and chronological indicators for the informal Cape underclass. The South African Archaeological Bulletin Vol. 66, No. 194 (DECEMBER 2011), pp. 136-148



Declaration of independence

PROJECT:

I, **Tim Hart,** as the appointed independent specialist hereby declare that I acted as the independent specialist in this application; and that I

• regard the information contained in this report as it relates to my specialist input/study to be true and correct, and

• do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;

• have and will not have no vested interest in the proposed activity proceeding;

• have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;

• am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;

• have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;

• have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;

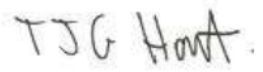
• have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;

• have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and

• am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.

Note: The terms of reference must be attached.

Signature of the specialist:



Name of company:
ACO Associates cc

Date: 27 July 2017

GLOSSARY

Archaeology: *Remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures.*

Cultural landscape: *The combined works of people and natural processes as manifested in the form of a landscape*

Heritage: *That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999.*

National Estate: *The collective heritage assets of the Nation*

SAHRA: *South African Heritage Resources Agency – the compliance authority which protects national heritage.*

Structure (historic:) *Any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith. Protected structures are those which are over 60 years old.*

Acronyms

DEAT	Department of Environmental Affairs and Tourism
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
HWC	Heritage Western Cape
LSA	Late Stone Age
MSA	Middle Stone Age
NHRA	National Heritage Resources Act
SAHRA	South African Heritage Resources Agency
WEF	Wind Energy Facility
PV	Photo-voltaic (solar) array

1 Introduction

ACO Associates CC was appointed by Pieter Badenhorst (PBPS – Environmental and Water License Consultants) to conduct an archaeological impact assessment of proposed activities at Struisbaai Harbour, Struisbaai, Western Cape. The pages that follow contain the findings of a survey of the project area as well as a discussion on the potential impacts to maritime archaeology.

1.1 The proposed activity

The application is for the repair and maintenance work to existing harbour infrastructure, dredging of sand in the harbour basin and the development of an access road (approximately 7m wide and 105 m in length) through an area containing indigenous vegetation with a development footprint of approximately 735m².

Repairs

The proposed activities, which are repairs to jetties and revetments, are all maintenance and repair work within the existing footprint and will not increase the development footprint of the existing harbour. The existing harbour was built in 1959 according to local sources (http://www.struisbaai-info.co.za/town), and expanded in 1990. In terms of the National Heritage Resources Act 25 of 2000, the harbour is not yet 60 years of age and therefore not yet generally protected.

Dredging

Siltation of the harbour has taken place which means that a significant volume of sand needs to be dredged and disposed of. The proposed depth of dredging is in the order of 1-2m which is needed to bring the harbour to serviceable condition. It is envisaged that the sand will be transported to the beach immediately to the south of the break water. The method of dredging has not yet been finalised, however it must be noted that the bulk of sediments that is to be removed has built up over the years since the harbour has been built. There is no intention to expand or deepen the harbour beyond original specification.

Disposal of dredged material

It is intended that dredged sand with be transported by truck to the beach to the south of the breakwater. The material can be put to use to build up the beach for recreational purposes.

Two alternative roads are suggested for conveyance of the sand.

The preferred alternative A is the construction of a short 105 m long road from the harbour to behind the breakwater onto the beach. The short distance is less than 300 m which does not trigger the National Heritage Resources Act.

The second alternative B is the construction of a longer road (250 m) in the area of the existing pedestrian route. This is not favoured as it will affect indigenous vegeatation.

1.2 Heritage legislation

The basis for all Heritage Impact Assessments (HIA) is the National Heritage Resources Act, No 25 of 1999 (NHRA), which in turn prescribes the manner in which heritage is assessed and managed. The NHRA has defined certain kinds of heritage as being worthy of protection, by either specific or general protection mechanisms. In South Africa the law is directed towards the protection of human made heritage, although places and objects of scientific importance are covered. The National Heritage Resources Act also protects intangible heritage such as traditional activities, oral histories, and places where significant events happened. Generally protected heritage, which must be considered in any heritage assessment, includes:

- any place of cultural significance (described below);
- buildings and structures (greater than 60 years of age);
- archaeological sites (greater than 100 years of age);
- palaeontological sites and specimens;
- shipwrecks and aircraft wrecks;
- graves and grave yards.

Section 38 of the NHRA stipulates that HIAs are required for certain kinds of development such as the rezoning of land greater than 10 000 m^2 in extent or exceeding 3 or more sub-divisions, linear developments in excess of 300 m or for any activity that will alter the character or landscape of a site greater than 5000 m^2. Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—

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

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

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

i) exceeding 5 000 m2 in extent; or

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

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

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

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

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

1.3 Cultural Landscapes (places of cultural significance)

Section 3(3) of the NHRA, No 25 of 1999 defines the cultural significance of a place or objects with regard to the following criteria:

(a) its importance in the community or pattern of South Africa's history;

(b) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;

(c) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;

(d) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;

(e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
(f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;
(g) its strong or special association with a particular community or cultural group for social cultural or spiritual reasons;
(h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
(i) sites of significance relating to the history of slavery in South Africa.

1.4 Scenic Routes

While not specifically mentioned in the NHRA, No 25 of 1999, Scenic Routes are recognised as a category of heritage resources. Baumann & Winter (2005) recommend that the visual intrusion of development on a scenic route should be considered a heritage issue.

1.5 Heritage Grading

A key tool in the assessment of heritage resources is the heritage grading system which uses standard criteria. In the context of an EIA process, heritage resources are graded following the system established by Winter & Baumann (2005) in the guidelines for involving heritage practitioners in EIA's (Table 1). The system is also used internally by Heritage Authorities around the country for guiding decisions about the future of heritage places, buildings and artefacts.[1] The website of Heritage Western Cape provides a useful guide to grading which is nationally used.[2]

Heritage specialists use the grading system to express the relative significance of a heritage resource. This is known as a field grading or a recommended grading. Official grading is done by a special committee of the relevant heritage authority; however heritage authorities rely extensively on field grading offered by consultants to inform decision making.

Table 1. Grading of Heritage Resources (Source: Winter & Baumann 2005)

Grade	Level of significance	Description
1	National	Of high intrinsic, associational and contextual heritage value within a national context, i.e. formally declared or potential Grade 1 heritage resources.
2	Provincial	Of high intrinsic, associational and contextual heritage value within a provincial context, i.e. formally declared or potential

[1] http://www.westerncape.gov.za/other/2012/9/grading_guide_&_policy_version_5_app_30_May_2012.pdf
[2] http://www.westerncape.gov.za/public-entity/heritage-western-cape

		Grade 2 heritage resources.
3A	Local	Of high intrinsic, associational and contextual heritage value within a local context, i.e. formally declared or potential Grade 3A heritage resources.
3B	Local	Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources.
3C	Local	Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources.

2 Method

The study area was visited by ACO Associates for in July 2017. The fieldwork was carried out by Tim Hart (MA), Liesbet Schietecatte MA, MSC) and assisted by Natalie Kendrick (MSC candidate). The site was visited at spring low tide and the proposed road alternatives walked. The rocky shoreline was inspected at low tide for signs of any tidal fish traps that may be affected by the proposal. Information of the likelihood of shipwreck material occurring in the harbour area was solicited from John Gribble (SAHRA) and Jaco Boshoff (Iziko Museums). The harbour was not dive surveyed or subjected to remote sensing.

2.1.1 Restrictions

No restrictions were encountered.

3 Receiving environment

Struisbaai harbour is a small but important line fishing harbour that contains moorings for fishing boats, slipways and launch facilities for ski boats, recreational craft. There is a large parking area, harbour office and small restaurants which form a recreational hub in the area. The harbour is set within a natural bay in a generally rocky shoreline, the entire complex protected by a single large breakwater on the eastern side.

The beach area where it is proposed that the sand be disposed of, is largely anthropomorphic in that it consists of sands that have built up against the western side of the breakwater which has formed a small vegetated dune field. It is quite likely that dredged sand was deposited here when the harbour was first built. This area has rehabilitated quite well forming a good recreational beach while a wooden pedestrian walkway provides an easy walk along the coast through indigenous vegetation.

Figure 1 An 1890 map

3.1 Archaeological background of the broader study area

The first formal research into the prehistory of the southern Cape was that published by Professor John Goodwin in 1946. This research did not involve any excavations of archaeological sites on the southern coast but was based upon a series of observations of *viswywers* (tidal fish traps) that had been built by prehistoric people - possibly the same people responsible for the accumulation of shell middens that contained numerous fish bones and fragments of pottery. Goodwin stressed the need for the archaeological investigation of sites that could provide evidence linking the contents of shell middens and the *visvywers*.

It was not until the 1970's that research by archaeologists of the South African Museum provided further insight into the prehistory of the southern Cape to the west of Cape Agulhas. Excavations by F.R. Schweitzer (1979) at Die Kelders cave near Gansbaai produced early evidence (1600 years ago) for the introduction of pottery technology and domestic stock into the Cape as well as a MSA (Middle Stone Age) occupation over 40 000 years old. More recently accelerator radio carbon dates have indicated that the Die Kelders material is nearly 2000 years old. Other excavations were carried out by the South African Museum at Byneskranskop 1 (Schweitzer and Wilson 1982) and again revealed a sequence of occupation extending back several thousand years. Excavations of shell middens in the Pearly Beach area by Graham Avery (1974,1976) showed that the remains of early domestic sheep were to be found in some of the coastal middens as

well. He suggested that the *visvywers* of this area were probably built by the same people (KhoeKhoen herders) who were responsible for accumulating the shell middens.

It is now broadly accepted by archaeologists that shortly after 2000 years ago, a new economic system was introduced to Southern Africa - namely certain groups of people adopted transhumant pastoralism (in this case with herds of fat-tailed sheep and later cattle) instead of hunting and gathering which was universally practiced in South Africa before this time. The origin of early stock keeping in Africa is still unknown.

In 1984 an area just to the west of Struisbaai was the focus of a study by archaeologists from the South African Museum and the University of Cape Town (Hall 1984). They were interested in the way in which prehistoric people were using the different kinds of environments represented in this area. The focus of this research was an area very similar in morphology to the site currently under investigation in this report in that it involved a shoreline, coastal dunes and flat coastal plains. An exhaustive survey of this area showed that the majority of archaeological sites were located directly on the shoreline, or on the edge of the inland dune field where large dunes overlook the coastal plain. The coastal plain itself was relatively devoid of archaeological material and was clearly not a popular area for Stone Age communities. The study showed that the dunefield had been favoured for occupation over the last 4000-6000`years by both earlier hunting and gathering people and possibly pastoralists later on. Further research undertaken in recent years has confirmed that prominent coastal dune systems were important settlement areas during the late Holocene (up to 5000 years ago). Prehistoric people were selecting deflation bays and inland edges of the dunefields for encampments as this provided a good location from which to exploit the seasonal water and good grazing found on the coastal plain, or the marine resources of the nearby shore. Recent work by various consulting archaeologists (ACO and ACRM) resulted in more sites being recorded, however the basic settlement pattern appears to be consistent.

3.2 *Viswywers* (tidal fish traps)

Fishing by means of the construction of tidal "dams" is used throughout the world – the materials from which the traps are built varies from place to place, however the basic principle is the same, namely the creation of tidal dams that result in the confinement of fish to an area where they can be easily collected or speared. The method is still used in Northern Natal (reed weirs and dams), similar traps were even used in the great intertidal zones of European rivers in the first millennium AD (L. Schietecatte pers comm). Stone tidal fish traps have been recorded along the southern Cape Coast, Cape Peninsula and recently at the mouth of the Berg River on the West Coast. No traps have been located along the north west coast. Avery (1974) has observed that tidal fish traps in the southern Cape were used in areas with specific characteristics: ie places where the gradient gave rise large intertidal zones where there were ample moveable boulders and rocks, shallow sheltered conditions allowed people to create gullies and dams. Avery's

research provided solid evidence that the traps were successfully used and maintained by communities at Elim into the 20th century. Although Avery's work is well researched and detailed, he was never able to answer the question of how long were fish traps is use in the Southern Cape. He hypothesized that the traps had their origin in pre-colonial times being used by Khoehoen herding communities who harvested the traps at favourable times of the year on their seasonal herding cycles. While this is a plausible hypothesis, in reality the age of use of fish traps and their association with pre-colonial herding peoples has never been rigorously scientifically tested. Recent work by Hine et al (2010) investigated a number of shell middens at nearby Vywerbaai which area spatially associated with fish traps. The middens contained very few fish bones indicating that a relationship between the fish traps and these archaeological sites was unlikely. Hine et al (2010) conducted archival research that indicated a relationship between fish traps, local farmers and mission communities which lead him to suggest an alternative hypothesis that such traps were historical in origin.

3.3 Historic period

Early settlement of the area was confined to "Strysbaai" where there was a good anchorage and a beach from which fishing boats could be launched. Notable are the vernacular 19th century houses at *Hotagterklip* (Hart and Halkett 1996) which were among the earliest in the area. Apart from the historic lighthouse, L'Agulhas was not developed until the mid-late 20th century.

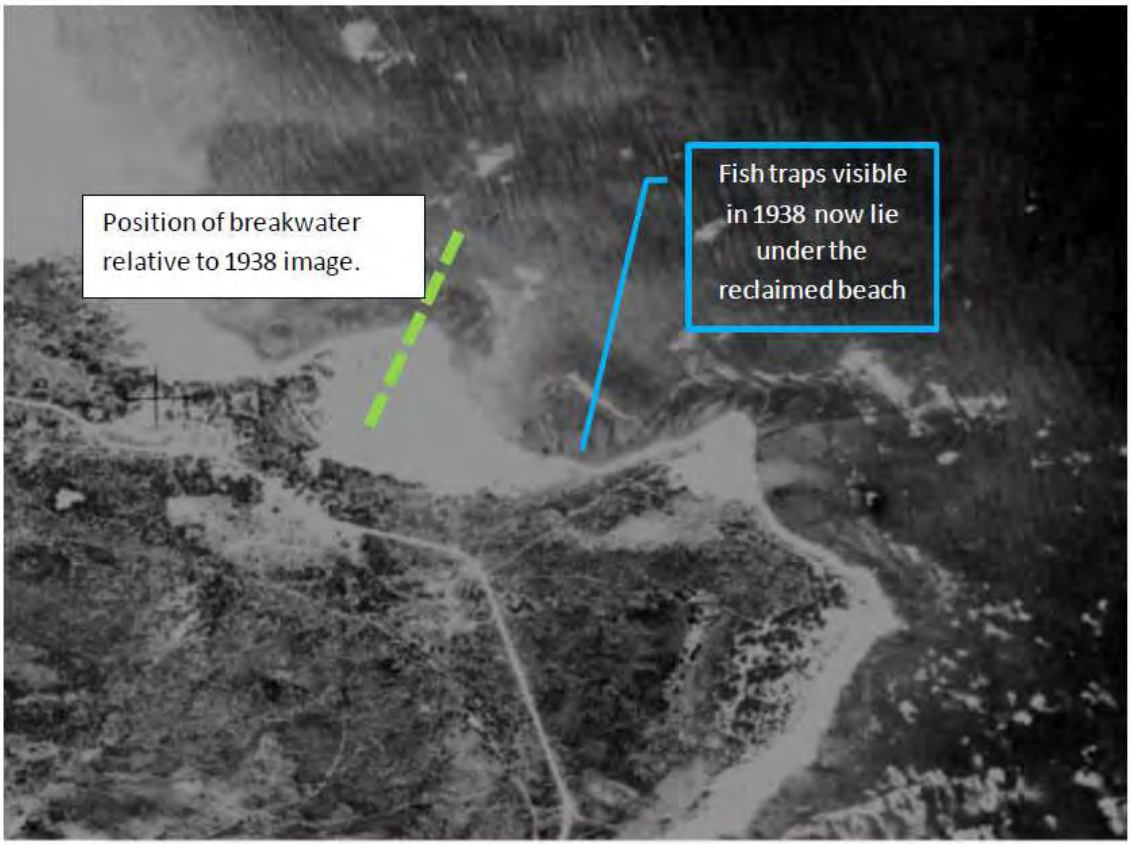
Cape Agulhas has been the scene of many shipwrecks and maritime disasters. There are shipwrecks offshore at Struisbaai and evidence of wreck sites under beach sand between Die Mond and Struisbaai (Boshoff pers comm). These range from Portuguese vessels, slavers, Dutch and English East Indiamen to more recent vessels of the 19th and 20th centuries. Very often the location of wrecks is often speculative until such time the ship is identified through field survey and archival research.

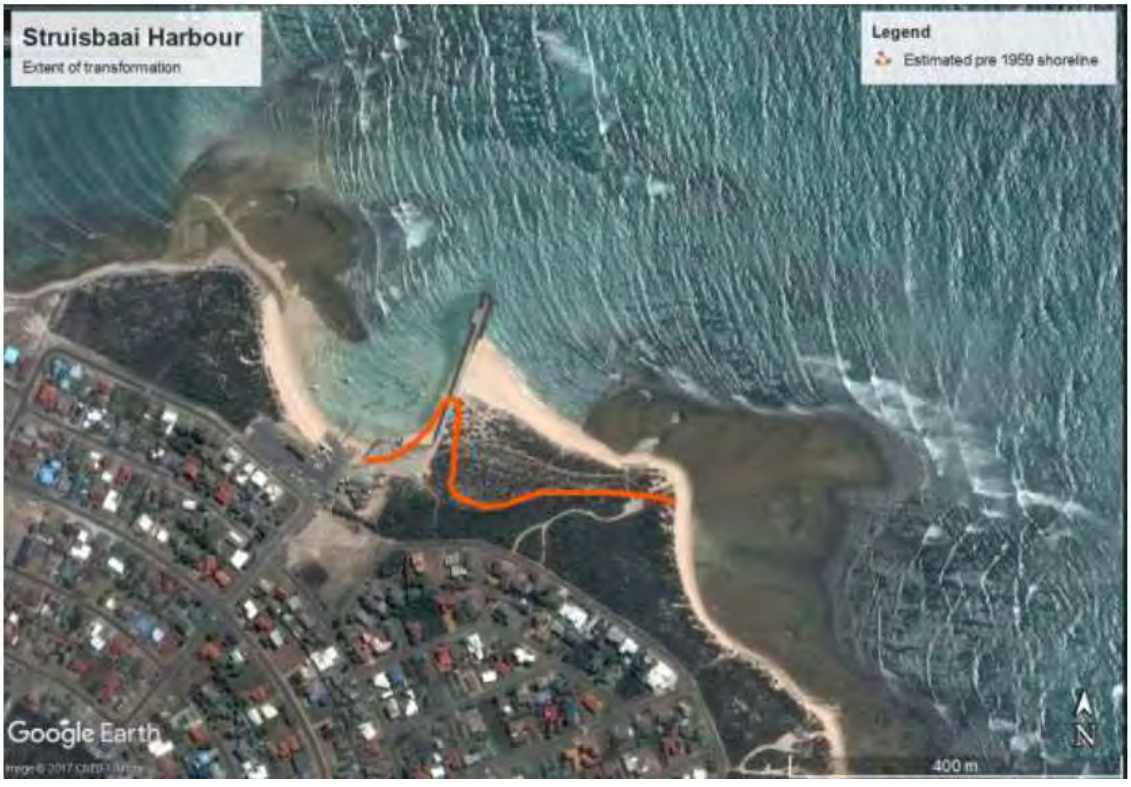
4 Archaeological heritage indicators

The heritage concerns within the project area are:

1) The possibility that building up the beach (beach nutrition) will inundate stone wall fish traps in the boulder bed area to the east of the harbour adjacent to the beach. Tidal fish traps are considered grade 1 heritage with declarations in place at Stillbaai and declaration of the Agulhas fish traps pending (Gribble pers comm).
2) The dredging of the harbour may impact shipwreck material. This will manifest itself as fragments of wood and debris in the dredging tailings.

An inspection of the boulder bed at spring low tide produced no immediate evidence of stone wall fish traps close to the harbour. There are however some significant complexes of these towards St Mungo Bay and onwards into the Agulhas National Park. Noted however were two open areas in





the beds that may once have been tidal fish traps, however there was no evidence of standing walling. Given the fact that there is no associated walling the heritage significance of these features is considered to be low and unworthy of grading. What is evident from a 1938 aerial photograph is the bay which now contains the harbour and the surrounds, contained a large complex of fish traps, the majority of which have been destroyed, while others *may* have survived under the reclaimed land.

An examination of aerial photographs has revealed that the amount of material dredged out of the harbour area is considerable in that the material was used to achieve significant land reclamation where the beach is to the east of the breakwater. The likelihood is that if there was any maritime material in the harbour area is very low as it is likely to have been destroyed circa 1959. The proposed dredging will only affect sediments that accumulated after this time.

The proposed haulage routes, in both cases cross land that has been reclaimed as a result of the 1959 harbour construction. This means that the likelihood of any pre-colonial archaeological material surviving in the path of the haulage routes Alternative A or Alternative B is zero. This was confirmed by visual inspection.

5 Assessment of impacts

Construction of haulage roads alternatives will not impact any heritage material. In heritage terms either route is acceptable.

Impacts to shipwreck material are considered to be improbable given the amount of transformation that has occurred on the seabed of the harbour.

6 Recommendations

The expected low level of impact does not justify the expense of a pre-disturbance survey of the harbour seabed, either through diving or remote sensing. It is a strong recommendation that when dredging takes place, any finds of maritime material must be immediately reported to the SAHRA maritime unit for inspection by a maritime archaeologist and further action.

In heritage terms the proposed activity is considered acceptable.

Figure 2 The above images (1938 aerial photograph and a recent google image) indicate how the 1959 building of the harbour transformed the landscape. Dredging tailings were used to reclaim land to the east of the breakwater inundating a number of fish traps (1938 image sourced from Dept of Land Affairs, Mowbray).

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	Gertse	Jakobus	Struisbaai Harbour Users Committee	0724752113		jacobusgertse378@gmail.com	15 6th Avenue	Struisbaai	7285	
3	Pienaar	Jerry	Resident	0832266443		sceptre@isat.co.za				
4	Williams	Briege	South African Heritage Resource Agency	0214624502	0214624509	bwilliams@sahra.org.za	111 Harrington Street	Cape Town	8001	
5	Mbethe	Sibusiso Patrick	DEA – Oceans and Coasts	0218192508	0218192445	smbethe@environment.gov.za	Private Bag x4390	Cape Town	8000	
6	Oosthuizen	Mare-Lize	Department of Environmental Affairs and Development Planning	0214835842	0214833633	Mare-lize.Oosthuizen@westerncape.gov.za	Private Bag X9086	Cape Town	8000	
7	Ndundane	Siphokazi	Department of Agriculture, Forestry and Fisheries - Fisheries Management	0214023019		SiphokaziN@daff.gov.za	Private Bag x9087	Cape Town	8000	
8	Smart	R	Cape Nature (Land Use Advice Unit)	021 866 8017	021 866 1523	landuse@capenature.co.za	Private Bag X5014	Stellenbosch	7599	

Appendix F2: Advertisement

Appendix F2.1: Advertisement text

PUBLIC PARTICIPATION

Proposed repair, maintenance and upgrade of existing infrastructure and the development of an access road at the Struisbaai 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, 2014, as amended.

This application is for the proposed repair, maintenance and upgrade of existing infrastructure and the development of an access road at the Struisbaai Fishing Harbour. The project will include the repair and maintenance work to existing harbour infrastructure, dredging of sand in the harbour basin and the development of an access road in order for construction vehicles to access the one dredging site.

The notification and registration period for I&AP's as well as commenting period will be from Tuesday 26 September until Thursday 25 October 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: R985 Activity 4

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 25 October 2017.

Appendix F2.2: Proof of Advertisement

Appendix F3: Site Notice and Locality

Appendix F3.1: Site Notice Locality

Site notice 1 - 34°48'3.47"S
20° 3'26.89"E

Site notice 2 - 34°48'1.11"S
20° 3'23.08"E

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 an access road at the Struisbaai 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, 2014, as amended.

This application is for the proposed repair, maintenance and upgrade of existing infrastructure and the development of an access road at the Struisbaai Fishing Harbour. The project will include the repair and maintenance work to existing harbour infrastructure, dredging of sand in the harbour basin and the development of an access road in order for construction vehicles to access the one dredging site.

The notification and registration period for I&AP's as well as commenting period will be from 26 September until 25 October 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 Tuesday 26 September until Thursday 25 October 2017.

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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: R983 None

Listing Notice 2: R984 None

Listing Notice 3: R985 Activity 4

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 25 October 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 25 October 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				

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	Clearing of approximately 735m² of natural vegetation.	High negative	The recommended mitigation is to limit area to be cleared to 735m². Additional mitigation is that the development area must be demarcated as well as the no-go areas	Long-term	Site	Probable	Medium negative
	Loss of faunal habitat The transformation of land will affect fauna on a local scale, as some fauna will be directly affected by habitat loss during land-clearing and construction activities. However, none of the proposed sites are located in potential movement corridors, so impacts are likely to be on a strictly local scale.	Low negative	Any reptiles disturbed during the construction phase should be relocated to another site and not harmed in any way.	Long term	Site	Probable	Low negative
	Impacts on marine environment The development of an access road will occur within 100m of the high-water mark of the sea.	Medium 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 damage to surrounding unaltered vegetation as well as littering during construction	Low 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

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE PRE-MITIGATION	PROPOSED MITIGATION AND MANAGEMENT	DURATION	SPATIAL	LIKELIHOOD OF POTENTIAL IMPACTS	SIGNIFICANCE POST-MITIGATION
	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.	Medium	Site	Possible	Low to medium negative
	Direct impacts: <u>Visual impacts</u>: Construction is normally associated with visual impacts. This is typically due to the presence of construction machinery, construction materials and solid waste (litter).	Low to 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	Site	Possible	Low negative
	<u>Socio-economics</u> Temporary job creation during the construction phase.	Medium positive	The activity is the mitigation. Employ local labour for construction activities	Short term	Local	Medium	High Positive
	<u>Air pollution</u> Dust (air) pollution caused by removal of vegetation and preparing area for planting can cause a nuisance. As well as construction vehicles driving through sand.	Low 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	High	Low negative
	<u>Noise impact</u> Normal construction related noise impacts are anticipated. These will be generated by the removal and construction activities. Owing to the relatively small scale of the construction activities, their temporary nature the noise impacts are anticipated to be low.	Low 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	Short term	Site	High	Low negative

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE PRE-MITIGATION	PROPOSED MITIGATION AND MANAGEMENT	DURATION	SPATIAL	LIKELIHOOD OF POTENTIAL IMPACTS	SIGNIFICANCE POST-MITIGATION
			local community and residences by the ECO. No work to be done on Sundays.				
	Spillage of diesel/oil due to poorly maintained equipment and machinery can contaminate ground and water resources.	Medium to high negative	Oil/drip trays must be placed under the machinery to avoid soil contamination All equipment and machinery must be in good condition.	Short term	Site	Possible	Low negative
	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	Possible	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	Possible	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	Local	Low negative
	<u>Waste management</u>	Medium negative	Construction rubble shall be disposed of in pre-agreed, demarcated spoil dumps. Domestic construction rubble will be kept in	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
	Construction excess material left onsite may attract vermin, encourage the growth of opportunistic alien vegetation and become unsightly.		containers. All of the above as per the EMP. The above as indicated				
	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 (duration of construction phase)	Local	probable	Medium positive
OPERATIONAL	*Direct impacts:* <u>Socio-economic impacts:</u> The development of the activity will result in some temporary job opportunities for local community members The development will contribute to local and national economy	Medium positive	The activity is in itself the mitigation	Long term	Regional	Possible	Medium positive
NO-GO OPTION							

ACTIVITY	IMPACT SUMMARY	SIGNIFICANCE PRE-MITIGATION	PROPOSED MITIGATION AND MANAGEMENT	DURATION	SPATIAL	LIKELIHOOD OF POTENTIAL IMPACTS	SIGNIFICANCE POST-MITIGATION
	Socio economic Contribution to local and National Economy	Medium negative	No jobs will be created for local community members	Long term	Local	Probable	Medium negative
	Sediment build up Sediment build up at east beach and the in the harbour.	Medium to high negative	If the proposed dreading area at east beach is not accessible no dredging can occur and sediment will continue to build up in the harbour..	Long term	Site	Probable	Medium negative

Appendix H: Environmental Management Programme (EMPr)

CONSTRUCTION & OPERATIONAL MANAGEMENT PLAN

FOR

PROPOSED REPAIR AND MAINTENANCE WORK ON EXISTING HARBOUR INFRASTRUCTURE AND THE CONSTRUCTION OF AN ACCESS ROAD AT THE STRUISBAAI HARBOUR.

Prepared by:

Misché Molife

Date: May 2017

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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

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1 Introduction

The National Department of Public Works (NDPW) has appointed the Coega Development Corporation (CDC) as Implementing Agent for the repair, maintenance and upgrade of the 13 proclaimed fishing harbours in the Western Cape. Repair of the 13 fishing harbours has been split into four discrete work packages as follows:

- **Work package 1**: Saldanha Bay and Pepper Bay;
- **Work package 2**: Hout Bay, Kalk Bay, Gordons Bay and Hermanus;
- **Work package 3:** Lamberts Bay, Laaiplek and St Helena Bay;
- **Work package 4:** Stilbaai, Struisbaai, Arniston and Gansbaai

Struisbaai harbour consists of a 185m long main breakwater, two small offloading quays, a jetty and three slipways. A trot mooring system inside the harbour basin is used. The trot mooring system consists of a network of long and heavy ground chains anchored, with risers at intervals and offers 56 trot moorings.

The applicant proposes to conduct repair and maintenance work on existing harbour infrastructure, dredge sediment in the harbour basin and east of the harbour and construct an access road (approximately 7m wide and 105 m in length) through an area containing indigenous vegetation with a development footprint of approximately 735m². Existing infrastructure which requires repair and maintenance work include quay 1 and 2, slipways 1,2 and 3, jetty, breakwater and rock revetment. Figure 1 below illustrates the harbour layout. The access road will be constructed to from the Struisbaai harbour to the beach in order for construction vehicles to access the beach for dredging activities.

Figure 1: Struisbaai harbour layout

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 conduct repair and maintenance work on existing harbour infrastructure, dredge sediment in the harbour basin and east of the harbour and construct an access road (approximately 7m wide and 105 m in length) through an area containing indigenous vegetation with a development footprint of approximately 735m². Existing infrastructure which requires repair and maintenance work include quay 1 and 2, slipways 1,2 and 3, jetty, breakwater and rock revetment. The access road will be constructed to from the Struisbaai harbour to the beach in order for construction vehicles to access the beach for dredging activities.

Repair and maintenance works:

Breakwater:

The breakwater is a conventional 185m long rubble mound breakwater with concrete crown wall (see Figure 2). The crown wall/crest element serves as an access road to Quay 1 and the head of the breakwater.

Figure 2: Struibaai harbour breakwater.

Minor concrete remedial works to the crown wall is required. Replacement and stabilisation of core material under access the road is required by means of pressurised cement grouting. At the head of the breakwater the rock revetment will require rehabilitation to return it to its initial design slope.

Construction methodology:

- Localised concrete repair to crown wall and capping slab.
- Grouting to voids under the capping slab at the head of the breakwater.
- Rehabilitation of the rock revetment at the head of the breakwater where the voids have formed. The section of rehabilitation is at quay 1 on the inside of the breakwater.
- Likely use an excavator to shape with divers assessing the positioning in the water.

Quay 1 and 2:

Precast concrete quay deck supported on concrete portal frames (see Figure 3). The quay is termed open as the seawater can pass underneath.

Figure 3: Quay 1 (left) and Quay 2 (right)

Quay 1: Precast concrete panels adjacent to the breakwater have moved, opening up gaps in the deck. The movement of panels is caused from a combination of the support concrete portal frames moving and uplift forces on the underside of the panels from breaking waves underneath the structure. Currently two panels show signs of distress. The horizontal concrete beams are showing signs of abrasion and movement away from their original position.

Quay 2: Dock authorities have condemned this structure as unsafe for use. Precast concrete panels have failed, been unseated and collapsed onto the revetment below. The concrete portal frames that the precast concrete panels are placed upon, show signs of subsidence and movement out of the vertical. This movement has opened up the joints between the concrete beams and concrete panels resulting in the failure of the quay deck.

The methodology is to stabilise the substructure and replace the damaged precast concrete panels with a new fixing down detail.

Construction methodology:

- Shore up existing concrete portal frame structure through post fixing details and bracing.
- Replace damaged precast concrete slabs with new recast slabs as required.
- Provide new fixing detail to ensure new concrete slabs remain secure.
- Localised concrete repair and patching as required.

Slipways 1, 2 and 3:

Slipway 1: 21m long concrete slipway consisting of 14 (3x3m) in situ concrete panels on a bed on screeded stone. The slipway “cuts” through the rock revetment providing access to the back of the harbour basin (Figure 4).
Slipway 2: 30m long, 15m wide slipway consisting of in situ concrete panels (Figure 5).
Slipway 3: 21m long, 11m wide slipway consist of in situ concrete panels (Figure 6).

Figure 4: Slipway 1

Figure 5: Slipways 2 and Figure 6: Slipway 3

- Slipway 1, 2 and 3 to have localised concrete repair and patching.

Jetty:

The 30m long jetty (see Figure 7) consists of concrete deck panels supported on concrete portal frames. Three concrete deck panels span between beam supports with a total of seven spans. Timber horizontal beams are fixed to the concrete portal structure with tyre fenders attached.

The jetty subsides going seawards. The joints between precast concrete panels are deteriorating from horizontal movement causing the joints to open and become vulnerable to attack. Timber members used for tyre mooring have deteriorated and this is seen by a loss of cross sectional area of the timbers (see Figure 8).

Figure 7: Jetty

Minor maintenance and repair works are required to arrest the movement. Timber members require replacing. The Bollards require rehabilitation through sand-gritting and recoating with corrosion protection paint.

Figure 8: Bollards and timber

Construction Methodology:

- Minor maintenance and repair to timber sections. Replace like for like.
- Minor maintenance and repair to bollards through gritt blasting and recoating with corrosion paint.

<u>Rehabilitation of rock revetment:</u>

The rock revetment between Slipway 2 and the breakwater is in poor condition due to settlement of the crest and washout of fines/backfill material from behind the revetment. Bulging at the toe was evident due to sliding and displacement of the rocks (see Figure 9).

Figure 9: Subsiding of rock revetment

Construction methodology:

- Assess the position of the toe through trial pits to establishing the footprint
- Remove rock in sections to insert geotextile layer
- Rehabilitate toe to original footprint position
- Reinstate the rock armour
- If required raise the crest level to reduce overtopping
- Backfill and reinstate parking area behind - See Figure 10 for rock revetment design.

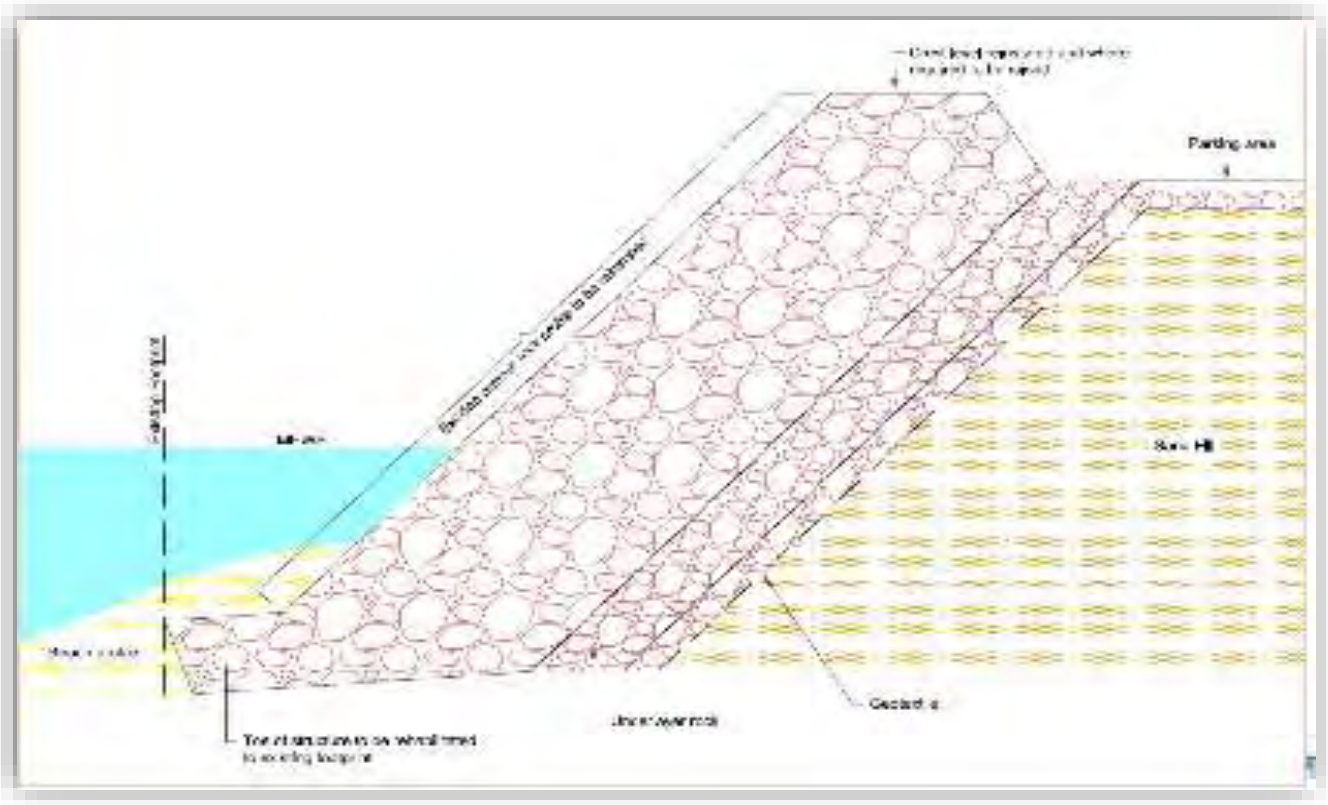

Figure 10: Rock revetment design

Dredging:

Sediment build-up occurs alongside the breakwater on the up-drift side, (south side), due to longshore sediment transport travelling south to north. This beach has reached its storage capacity and sediment is rounding the breakwater and being deposited in the harbour basin through wave action. Sediment is also being blown directly over the breakwater into the harbour basin. This sediment rounding the breakwaters is being deposited in front of the slipways creating problems with launching and recovery of boats.

Sediment build-up in the harbour basin has led to the need for dredging. The Struisbaai harbour requires dredging of material over a relatively large area to depths ranging from 1 to 2m. The harbour's entrance channel and basin extent is still visible, but is covered by this layer of sediment. Approximately 34000m³ of sediment would need to be dredged out in order to reinstate the harbour to acceptable conditions. Figure 11 below indicates where the dredging areas will be, as such the proposed access road is required to gain access to the one dredging site.

Figure 11: Dredging site location

Mechanical excavation, using land-based equipment, of accreted beach sand on Struisbaai Eastern beach and carting material to Western beach to be dumped via allocated route (see Figure 12 below) and spread as such to comply with all required Environmental mitigation measures. Maintenance dredging of sediment above acoustically reflective material in the Struisbaai harbour basin. The Struisbaai harbour basin is fitted out with an Anchor Block and Chain Grid mooring system which would need to be located, uplifted and stored on land in a temporary storage area prior to the bulk dredging works, unless an Alternative Proposal from the Contractor is accepted by the Engineer.

Figure 12: Proposed method of disposal and disposal areas

The proposed access road will be constructed in an area containing Overberg Dune Strandveld, which is classified as a Least Threatened Ecosystem in terms of the National Environmental Biodiversity Act No. 10 of 2004. The location of the access road is illustrated in Figure 13 below.

Figure 13: Access road location.

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

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

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

Dust
- o Dust control.

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

Emergency
- o Emergency construction method statements.

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

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

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

Piling, jacking and thrust boring
- o 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.
- o Rehabilitation of street or hardened surfaces after construction is complete.
- o Retaining walls and gabions.

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

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

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

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

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

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

3.6 Site clearing

1) Prior to earthworks (including site clearance) starting on site, a search and rescue operation for bulbs and other indigenous plants of value, as detailed in the environmental approval shall be undertaken.
2) The stripping and separation of topsoil shall occur as stipulated by the Engineer/ECO. As a guide the upper 250mm of soil (topsoil, which includes roots and leaf litter) shall be placed separately. This shall be used for rehabilitation of disturbed areas.

3.7 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.

3.8 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.

3.9 Conservation of environmentally sensitive areas

3.9.1 Vegetation

The proposed site contains indigenous vegetation, Overberg Dune Strandveld, classified as a Least Threatened Ecosystem in terms of the National Environmental Management Biodiversity Act No. 10 of 2004.

3.9.2 Animals

The site is located on a dune, 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.

3.9.3 Dune rehabilitation

The proposed road will be constructed on a dune, which will entail the clearance of indigenous vegetation. The dune provides some coastal protection and constitutes indigenous vegetation. In order to prevent erosion from taking place, all disturbed areas (areas removed of vegetation, excluding the road) must be re-vegetated with the vegetation removed during site clearing activities.

3.10 Permit requirements

3.10.1 ORV Regulations

3.10.2 Dredging at sea

3.10.3 Beach nourishment

3.11 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.

3.12 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.

3.13 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.

3.14 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.

3.15 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.

3.16 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.

3.17 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.

3.18 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.

3.19 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.

3.20 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.

3.21 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 road, excavation and backfill is optimised.

Dredged material pumped to the appropriate position shall be deposited to a maximum height of 1.5m above the initial ground level at a position below the high-water mark where beneficial use of dredged material have been identified as a viable solution. Should this material not be completely received by the wave action so as to laterally distribute the material over the complete area, the Contractor shall level off and push this material into the ocean at low-tide until such time that the material disperses adequately.

Material dumped on the beach by means of dump trucks will be dumped at a position below the high-water mark and an appropriate dump spacing in order to avoid a localised accretion of more than 1.5m above the initial ground level. Should this material not be completely received by the wave action so as to laterally distribute the material over the complete area, the Contractor shall level off and push this material into the ocean at low-tide until such time that the material disperses adequately.

3.22 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.

3.23 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.

3.24 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.

3.25 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.

3.26 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 ManagementProgramme – 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.

4.2 Maintenance dredging

Maintenance of the dredging areas have been included in a Maintenance Management Report.

Appendix I: Maintenance Management Plan for dredging areas

Struisbaai Fishing Harbour Maintenance Management Plan

Report Prepared for

Coega Development Corporation

On behalf of

National Department of Public Works

Report Prepared by

Pieter Badenhorst Professional Services cc

July 2017

Struisbaai Fishing Harbour

Maintenance Management Plan

Coega Development Corporation

On behalf of

National Department of Public Works

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Profile and Expertise of EAPs

Pieter Badenhorst Professional Services cc has been appointed by Coega Development Corporation (CDC) on behalf of the National Department of Public Works (DPW) as the independent consultants to compile a Site Specific Maintenance Management Plan (MMP) for the Struisbaai fishing harbour.

As required by the National Environmental Management Act 107 of 1998 (NEMA), the qualifications and experience of the key individual practitioners responsible for this project are detailed below.

Details of EAP

Company of Environmental Assessment Practitioner (EAP):	Pieter Badenhorst Professional Services cc	
EAP Name:	Mische Molife	
Postal Address:	P. O. Box 1058	
	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	

Statement of PBPS Independence

Neither PBPS nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any pecuniary or other interest that could be reasonably regarded as being capable of affecting their independence or that of PBPS.

PBPS has no beneficial interest in the outcome of the assessment which is capable of affecting its independence.

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Acronyms and Abbreviations

CDC	Coega Development Corporation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
MMP	Maintenance Management Plan
NDPW	National Department of Public Works
NEMA	National Environmental Management Act 107 of 1998 as amended
PBPS	Pieter Badenhorst Professional Services cc

Glossary

Environment	The external circumstances, conditions and influences that surround and affect the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historical and cultural aspects.
Environmental Management Measures	Requirements or specifications for environmental management, as presented in the MMP.
Generic MMP	The generic document applicable to environmental management at all the proclaimed fishing harbours. The generic MMP will be appended to, and form part of the Site Specific MMP for each of the individual fishing harbours.
Maintenance dredging	The removal of accumulated sediment to the original depth of the harbour, but excluding any additional deepening or capital dredging. This excludes dredging for the upgrading of structures.
Method Statement	A mandatory written submission by the Contractor to the ECO setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity.
Mitigation Measures	Actions identified to manage (avoid, minimise or optimise) potential environmental impacts which may result from the development.

Site Specific MMP	The Site Specific MMP is applicable to a single fishing harbour only and contains site specific information. The generic MMP will be appended to, and form part of the Site Specific MMP for each of the individual fishing harbours.

1 Introduction

1.1 Background and Introduction

The National Department of Public Works (NDPW) has appointed the Coega Development Corporation (CDC) as Implementing Agent for the repair, maintenance and upgrade of the 13 proclaimed fishing harbours in the Western Cape. Repair of the 13 fishing harbours has been split into four discrete work packages as follows:

- **Work package 1**: Saldanha Bay and Pepper Bay;
- **Work package 2**: Hout Bay, Kalk Bay, Gordons Bay and Hermanus;
- **Work package 3:** Lamberts Bay, Laaiplek and St Helena Bay;
- **Work package 4:** Stilbaai, Struisbaai, Arniston and Gansbaai.

CDC has appointed SRK Consulting (South Africa) (Pty) Ltd (SRK) to compile a Generic Maintenance Management Plan (MMP) applicable to all 13 fishing harbours and based on which Site Specific MMPs can be compiled for each harbour. The Generic MMP, together with the Site Specific MMP, (collectively referred to as "the MMP") aims to meet the requirements of the National Environmental Management Act 107 of 1998, as amended (NEMA) and the Environmental Impact Assessment (EIA) Regulations, 2014, for an approved MMP for maintenance activities.

1.2 Purpose and Structure of the MMP

The MMP aims to ensure that all future repairs and maintenance to the fishing harbours are undertaken in an environmentally responsible manner, in compliance with relevant environmental legislation. The MMP consists of two components:

- **The Site Specific MMP**: which contains only site specific information applicable to a single fishing harbour; and
- **The Generic MMP**: which contains information and requirements applicable to the management of all fishing harbours and will allow for consistency in environmental management for all harbours in the Western Cape.

For each harbour, the Generic MMP will supplement (and be appended to) the Site Specific MMP.

1.2.1 Structure of the Site Specific MMP

The Site Specific MMP (this document) contains only information specific to Struisbaai harbour and consists of the following sections:

Section 1: Background and Introduction

Provides an introduction and background to the project, outlines the purpose of the Site Specific MMP and how it relates to the Generic MMP.

Section 2: Site Description

Describes the location and characteristics of Struisbaai harbour, provides property owner details and an overview of the receiving biophysical and socio-economic environment.

Section 3: Description of Proposed Works

Describes the maintenance and repair works currently proposed, noting that the MMP will also be applicable to future works, the details of which may not yet be available.

Section 4: Potential Impacts

Identifies and provides a qualitative assessment of the significance of the potential impacts of the proposed works on the receiving environment, assuming the specifications of the MMP are adequately implemented.

1.2.2 Structure of the Generic MMP

The Generic MMP consists of the following sections, which would be applicable to all fishing harbours:

Section 1: Background and Introduction

Provides an introduction and background to the project and outlines the purpose of this document, as well as the Site Specific MMPs.

Section 2: Governance Framework

Provides a brief summary and interpretation of relevant legislation.

Section 3: Potential Impacts

Provides a generic description of the potential environmental impacts associated with repair and maintenance works within harbour environments as well as identifying (high level) generic mitigation measures.

Section 4: Environmental Management Measures

Provides the management measures applicable during the long-term maintenance of the harbour including the roles and responsibilities for implementation of the MMP, compliance and monitoring requirements as well as detailed environmental management measures to be implemented.

1.3 Scope of the MMP

The scope of repair and maintenance activities addressed in the MMP includes:

- Placement of rock (more than 5 m^3) within the footprint of existing rock revetments;
- Maintenance dredging of the harbour basin; and
- Disposal or deposition of dredged material either below or within 100 m of the high-water mark of the sea.

The following activities, if proposed in any of the fishing harbours, do not require an MMP in terms of NEMA and are excluded from the scope of this MMP. These activities should be undertaken in compliance with the Generic Environmental Management for the proclaimed fishing harbours (SRK Report Number 509310/02) to ensure compliance with the "*duty of care*" requirement in terms of Section 28(1) of NEMA:

- Removal of sunken fishing vessels;
- Repair and maintenance of existing marine structures including (but not limited to) breakwaters, quays, slipways, jetties, copings etc.;
- Maintenance and repair of quay furniture (bollards, fenders and access ladders);
- Repair and maintenance of harbour machinery and equipment e.g. cranes;

- Placement of rock (less than 5 m^3) within the footprint of existing rock revetments;
- Placement of armour units within the footprint of existing breakwaters; and
- Maintenance or replacement of fencing.

The following activities, if proposed in any of the fishing harbours, are not considered maintenance activities and are excluded from the scope of this MMP. Such activities may require more extensive authorisation procedures and would require screening of relevant legislation:

- The construction of any new structures in the harbour, coastal public property or within 100 m of the high-water mark of the sea and any maintenance or repair works which increase the development footprint of the harbour; and
- The dredging, excavation, infilling or depositing of more than 5 m^3 of material either below or within 100 m of the high-water mark of the sea, which is not for maintenance purposes (e.g. capital dredging or construction of new rock revetments); and
- The removal of 300 m^2 or more of indigenous vegetation within 100 m of the high water mark of the sea.

1.4 Review of the MMP

The MMP will be reviewed and updated every 5 years particularly in response to changes in relevant legislation. Review of the MMP will be done in consultation with the competent authority (in this case the National Department of Environmental Affairs [DEA]) and will be subject to any public consultation required by the competent authority.

1.5 Specific governance framework

This section provides the specific legislative framework for Struisbaai harbour that has informed and guided the preparation of this MMP. The overarching applicable legislation is presented in Chapter 2 of the Generic MMP whereas this section specifically focuses on the municipal and local strategic plans or bylaws that could have an influence on the maintenance and repair works to be undertaken within Struisbaai harbour.

2 Site Location and Description

Struisbaai is located about 220 km east of Cape Town. The coastline can be characterised as sandy beached and is in pristine condition. Figure 1 below illustrates the harbour location as well as the general coastline characteristics. Figure 2 illustrates the sediment build-up within the harbour and one of the slipways can be seen on Figure 3.

Figure 1: Locality of Struisbaai harbour

Figure 2: Struisbaai harbour – sediment build-up

Figure 3: Struisbaai harbour – one of the harbour slipways

Existing harbour infrastructure include quay 1 and 2, slipways 1,2 and 3, jetty, breakwater and rock revetment. Figure 4 below illustrates the harbour layout.

Figure 4: Struisbaai harbour layout

Breakwater:

The breakwater is a conventional 185m long rubble mound breakwater with concrete crown wall (see Figure 5). The crown wall/crest element serves as an access road to Quay 1 and the head of the breakwater.

Figure 5: Struisbaai harbour breakwater

Quay 1 and 2:

Precast concrete quay deck supported on concrete portal frames (see Figure 6). The quay is termed open as the seawater can pass underneath.

Figure 6: Quay 1 (left) and Quay 2 (right)

Slipways 1, 2 and 3:

Slipway 1: 21m long concrete slipway consisting of 14 (3x3m) in situ concrete panels on a bed on screeded stone. The slipway "cuts" through the rock revetment providing access to the back of the harbour basin (Figure 7).

Slipway 2: 30m long, 15m wide slipway consisting of in situ concrete panels (Figure 8).

Slipway 3: 21m long, 11m wide slipway consist of in situ concrete panels (Figure 9).

Figure 7: Slipway 1

Figure 8: Slipway 2

Figure 9: Slipway 3

Jetty:

The 30m long jetty (see Figure 10) consists of concrete deck panels supported on concrete portal frames. Three concrete deck panels span between beam supports with a total of seven spans. Timber horizontal beams are fixed to the concrete portal structure with tyre fenders attached.

Figure 10: Jetty

Rehabilitation of rock revetment:

The rock revetment between Slipway 2 and the breakwater is in poor condition due to settlement of the crest and washout of fines/backfill material from behind the revetment. Bulging at the toe was evident due to sliding and displacement of the rocks. See Figure 11 below.

Figure 11: Subsiding of rock revetment

Construction methodology:

- Assess the position of the toe through trial pits to establishing the footprint
- Remove rock in sections to insert geotextile layer
- Rehabilitate toe to original footprint position
- Reinstate the rock armour
- If required raise the crest level to reduce overtopping
- Backfill and reinstate parking area behind - See Figure 12 for rock revetment design.

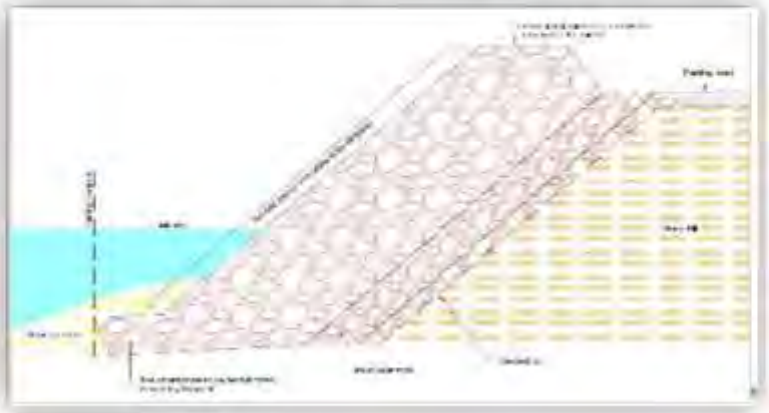

Figure 12: Rock revetment design

Surrounding areas:

Residential areas are located to the south and west of the harbour. Areas that consist of indigenous vegetation (Overberg Dune Strandveld) are located to the west and east of the harbour. The Overberg Dune Strandveld has a conservation station of Least Threatened ecosystem. Sections of the aforementioned areas are classified as Ecological Support Areas, as seen in Figure 13 below. Footpaths and vehicle access routes have been created through the indigenous vegetation on the eastern side of the harbour.

Figure 13: Part of the terrestrial Critical Biodiversity Areas map for the Western Cape province overlaid on Google Earth™. The orange area is an Ecological Support Area (ESA)

2.1 Property Owner Details

The details of the property owner are presented in Table 2-1 below.

Table 2-1: Property Owner Details

Name of Company	National Department of Public Works
Contact Person	Vuyo Ngonyama
Position	Director: Property Management
Postal Address	Private Bag X9027, Cape Town, 8000
Telephone	(021) 402 2102
Fax	(021) 419 2978
Email	vuyo.ngonyama@dpw.gov.za

If there are more than 1, attach list along with copies of notices of MMP to property owners).

3 Description of Proposed Works

3.1 Current Works

Maintenance Dredging:

Sediment build-up occurs alongside the breakwater on the up-drift side, (south side), due to longshore sediment transport travelling south to north. This beach has reached its storage capacity and sediment is rounding the breakwater and being deposited in the harbour basin through wave action. Sediment is also being blown directly over the breakwater into the harbour basin. This sediment rounding the breakwaters is being deposited in front of the slipways creating problems with launching and recovery of boats.

Sediment build-up in the harbour basin has led to the need for dredging. The Struisbaai harbour requires dredging of material over a relatively large area to depths ranging from 1 to 2m. The harbour's entrance channel and basin extent is still visible, but is covered by this layer of sediment.

Approximately 38 000m³ of sediment would need to be dredged out in order to reinstate the harbour to acceptable conditions. Figure 14 below indicates where the dredging areas will be.

Figure 14: Dredging site locations

Beach sand that accreted outside the main Breakwater on the Eastern Beach shall be removed by the Contractor by means of conventional on-land earthworks equipment as such to ensure compliance to all required Environmental mitigations. The Contractor shall conduct this work utilising sequence planning, equipment configuration and transportation arrangements as such to avoid excessive spillage and/or leakage of the material en route to the area where beach nourishment is to be conducted. The excavated material shall be end-tipped at the Western beach and spread as such to comply with the details of Beneficial Use of Materials in this Specification, all Environmental mitigation measures and applicable legislation.

The Struisbaai basin sediment shall be dredged and pumped to the Western beach as part of the Beach Nourishing exercise. The Struisbaai harbour basin is fitted out with an Anchor Block and Chain Grid mooring system which would need to be located, uplifted and stored on land in a temporary storage area prior to the bulk dredging works, unless an Alternative Proposal from the Contractor is accepted by the Engineer. Figure 15 indicates the proposed transport routes for the dredged sediment. The Contractor and his subcontractors shall only access the Struisbaai harbour via Harbour Road off Main Road. Access for trucks to receive the material stemming from the excavation at the Eastern Beach shall be via a new constructed road over the vegetated dune system (Environmental Authorisation has been applied for). Truck Access to the Western Beach area to conduct beach replenishment work shall be via Harbour Road into Main Road and then into Protea Road towards a large parking area. Foot access to the Western beach for the purposes of monitoring and alterations to dredge pipes shall be from the corner of Kusweg Noord Street and Malvern Drive.

Figure 15: Proposed dredging plan for the Struisbaai harbour and accreted sediment removal at the east beach and the proposed disposal/beach nourishment location on west beach

Beneficial use of the dredge spoil is favoured over disposal into the ocean at Struisbaai, beach nourishment has been identified as the most appropriate disposal option for the proposed 38,000 m³ of dredged sediment. Beach sediment sampling in Struisbaai has been conducted to determine whether the sediment to be removed is suitable for beach nourishment. The nourishment initiative involves the removal of accreted sediment from the beach east of the harbour wall as well as within the harbour itself, and placement of this material on the beach to the west of the harbour. Sampling took place on Thursday 13th April during low tide (10 am). Beach sediment samples were taken at six sites, three along the beach and three down the gradient of the beach at both the extraction location (to the east of the harbour) and the disposal location (to the west of the harbour). Additionally, the particle size results from the previous dredge site seafloor sampling campaign, collected from within the harbour, are also compared to those of the disposal site to determine their validity for disposal. The analysis of grain size distributions at the receiving and extraction sites at Struisbaai has shown that the grain size and distribution is relatively similar at both the targeted extraction and nourishment sites and that nourishment is therefore a suitable disposal.

The Contractor shall provide the Engineer ten(10) days notification prior to this confirmatory trial pit investigation. The position and level of the main Breakwater Rock protection structure's toe shall be surveyed in by the Contractor on the day of the trial pit investigation.

The Contractor shall submit a survey report detailing the findings of this trial pit investigation within two(2) days of the survey date. Final alignment and levels, utilising the data supplied by the Contractor, shall be provided by the Engineer within three(3) days of receiving the Contractor's Survey Report.

The Contractor shall locate, uplift and remove the 21 No. Anchor Blocks and associated chains in the main harbour basin and the 12 No. Anchor blocks and associated chains in the secondary West basin to an allocated temporary storage area on land. The Anchor blocks and chains shall be cleaned by means of mechanical removal of marine growth, followed by high-pressure washing in order to enable an inspection by the Engineer.

The 12 No. Anchor Blocks in the Secondary West Basin can be removed along with the Western-most 9 No. Anchor Blocks forming part of the main basin's Anchor Block and Chain Grid Mooring System to enable access for Dredging works to about 50% of the area to be dredged. Once this area

has been dredged and re-instated, the remaining 12 No. Anchor Blocks and chains on the Eastern side of the main basin can be removed to provide access for the dredging works.

The Contractor shall locate and remove the known obstructions, for example loose tyres, as identified during the Geophysical Survey form the Struisbaai Harbour basin.

The Contractor shall dredge out the sediment above the Acoustic Reflective Material. The Acoustic Reflective Material, being either bedrock or consolidated dense material not removable by means of dredge pumping, could occur in a pattern of alternating valleys and ridges. The sediment trapped in a valley between two ridges need not be removed is the ridges are left exposed with no sediment overlying this area and if the material in the valley is at a level as such as not to compromise the navigable depth dictated by the ridge apex levels.

The sediment shall be dredged, handled and distributed at the Eastern Beach as part of the beach replenishment exercise by the Contractor in accordance to this Specification, all Environmental mitigation measures and applicable legislation.

The Contractor shall re-instate the Anchor Block and Chain Grid Mooring system after the Dredging works have been completed and signed off by the Engineer and Employer. The Re-instatement of the Anchor Block and Chain Grid Mooring System is likely to include minor concrete repairs to the Anchor Blocks and replacement of the Chain system.

3.1.1 Alternatives Considered

Two alternatives with respect to the dredged sediment were considered. These two alternatives included dumping the dredged sediment at sea or utilising the dredged sediment for beach nourishment. Utilising the dredged sediment for beach nourishment has been considered the preferred alternative since the dredged sediment would be used for a good purpose.

3.2 Future Works

The works described above are as currently proposed. It should however be noted that this MMP is applicable to all future maintenance and repair activities proposed at Struisbaai harbour.

Any future works proposed will need to be discussed with the relevant authorities prior to the commencement of such activities to determine the need for any additional authorisation requirements (if works fall outside the scope of this document) or activity specific environmental management measures.

3.3 Specialist Studies

The following investigations and/or specialist studies have been undertaken to inform works at Struisbaai fishing harbour:

- Sediment contamination study by Lwandle Consulting (Appendix B)
- Sediment specialist study by Lwandle Consulting (Appendix C)

The proposed discharge of dredged sediment onto the east Beach as well as the assessment of potential impacts and identification of relevant mitigation and management measure during dredging and discharge of sediment were informed by the Sediment Specialist Studies undertaken by Lwandle Consulting (Appendix B and C). This sediment contamination study confirmed that the sediments complied with relevant sediment quality guidelines and were not considered contaminated.

4 Impacts on Receiving Environment

A qualitative description of the types of impacts associated with maintenance and repair activities at all fishing harbours is provided in Section 3 of the Generic MMP. The significance and status of the potential impacts associated with the proposed works at Struisbaai harbour are rated below, assuming implementation of the requirements of the MMP.

Table 4-1: Significance of potential impacts at during maintenance and repair works at Struisbaai

Impact	Status	Significance	Description
Impact of noise disturbance on surrounding communities	**-ve**	**Low**	Noise caused by construction equipment and vehicles can cause a nuisance. Construction work will be done during general working hours. As such noise disturbance is anticipated to be low.
Impact of emissions from construction activities on air quality	**-ve**	**Low**	Dust (air) pollution caused by construction activities can cause a nuisance. As well as construction vehicles driving through sand. Excavating, handling or transporting erodable materials in high wind or when dust plumes visible shall be avoided. 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. Sediment should be covered when transported.
Delays to other road users associated with increased traffic	**-ve**	**Insignificant**	Construction vehicles transporting dredged material will only utilise certain roads and drive when dredged material needs to be transported.
Loss of terrestrial vegetation and habitat	**-ve**	**Low**	Loss of vegetation will occur during the construction of the access road across the vegetated dune system at the eastern beach (Environmental Authorisation has been applied for).
Disturbance of marine habitat within the dredge footprint	**-ve**	**Low**	Due to the fact the harbour and channel area is constantly utilised by boats, it is anticipated that little disturbance to the marine environment will occur.
Enhanced turbidity and sedimentation in surrounding habitat	**-ve**	**Low**	It is anticipated that this will have a low negative effect as the natural movement of sand will continue.
Nutrient release and associated algal blooms	**-ve**	**Insignificant**	It is anticipated that nutrient release and associated algal blooms will be insignificant.
Toxicity of trace metals and other contaminants in the dredged sediment to marine life	**-ve**	**Low**	It is anticipated that toxicity of trace metals, etc. will be low as marine life will move from the dredging areas once activities start.
Impact of marine pollution during construction	**-ve**	**Insignificant**	Pollution of the marine environment is anticipated to insignificant as adequate mitigation measures will be put in place.
Increased employment, income	**+ve**	**Low**	Only some temporary employment

and skills development			opportunities will be provided.
Visual Impact of dredging activities	**-ve**	**Low**	Visual impacts of dredging activities at the east beach will be low as the vegetated dune will act as screening. Construction activities will be of short duration.
Loss of cultural heritage resources	**-ve**	**Insignificant**	Only the necessary repair and maintenance work will be done to the existing harbour infrastructure. Dredging activities is not anticipated to have an impact on cultural heritage resourses.

5 Site Specific Environmental Management Requirements

5.1 Roles and Responsibilities

The key role players during maintenance and repairs of the fishing harbours are described in detail in Section 4.2 of the Generic MMP (Annexure A). The long term maintenance of Struisbaai is however currently the responsibility of the National Department of Public Works.

5.2 Additional Environmental Management Requirements

In additional to the generic environmental management requirements included in the Generic MMP, the following additional management requirements must be implemented at Struisbaai Harbour.

Table 5.2.1 – Additional environmental management and mitigation measures that must be implemented at Struisbaai Harbour/beach replenishment site

Maintenance Management Measures						
Aspect	**ID**	**Mitigation measure / Procedure**	**Responsible**	**Implementation Timeframe**	**Monitoring Methods[1] (where applicable)**	**Performance Indicators**
Dredging and Beach Replenishment	1.	Avoid dredging and beach replenishment during the peak spring/summer holiday seasons (October – April).	NDPW/Consultant	Duration of dredging and beach replenishment		Minimal disturbance to beachgoers on the beach
	2.	Cordon off the discharge area on East Beach during Beach replenishment.	NDPW/Consultant	Duration of beach replenishment		Incidences of the public accessing the discharge area

	3.	Closely monitor the deposition of sand and redistribute any excessive sand build up on the beach if this occurs.	Engineer & Contractor	Duration of beach replenishment	Visual inspection of sand build-up	No excessive build up of sand on the beach during or directly following deposition
Management of windblown sand	4.	Remo ve sand build-up along the seawall adjacent to the road to a level approximatel y 1.5 m below the top of the sea wall to create a sand trap.	NDPW/Consultant/Municip ality	As required (when sand reaches 0.5m from the top of the seawall).	Visual inspection of sand build-up	Amount of sand blowing over seawall
	5.	Slope the beach surface toward the sea to prevent ponding (accumulatio n of water).	NDPW/Consultant/Municip ality	When sand build-up is removed from seawall	Visual inspection for ponding	Occurrence of ponding
	6.	Sweep roads and sidewalks adjacent to the Beach frequently to remove sand.	NDPW/Consultant/Municip ality	As required	Visual inspection for windblow n sand on roads and sidewalks	Roads and sidewalks free of sand
	7.	Clean stormwater drains and catch pits frequently.	NDPW/Consultant/Municip ality	As required to prevent blockage	Visual inspection for blocked drains due to windblow n sand	Occurrence of blocked drains due to windblown sand

6 Site Specific Environmental Management Requirements

In additional to the generic environmental management requirements included in the Generic MMP, the following additional management requirements must be implemented at Struisbaai:

- The Contractor shall be responsible for the sufficiency and capacity of Equipment, machinery, and tools to undertake the Services.
- All marine Equipment used to provide and inspect the services shall be subject to the requirements of the South African Maritime Safety Association (SAMSA). The Contractor's floating Equipment shall be maintained in a satisfactory and seaworthy condition and shall have adequate attendance by competent seamen at all times.
- Special care must be taken to locate and protect the existing services before any work may commence within the vicinity of these services.
- Survey pegs and reference marks shall be pointed out to the Contractor on Site. The Contractor is solely responsible for the setting out of the works from the pegs and reference marks.
- The Contractor shall provide and maintain for the duration of the Contract durable temporary automatic, continuously recording tide gauges at two locations agreed by the Engineer. The equipment shall be fixed in readily visible positions where practicable, and shall be arranged so that the tide level is readable to an accuracy of ± 25mm at any time. The Contractor shall keep daily records of all the tide levels measured in an agreed computer-readable electronic format. Data points shall represent the tide level at intervals not exceeding 5 minutes.
- The operation of construction vehicles on existing roads or streets shall be limited to traffic with an axle load not exceeding that allowed by the Road Traffic Ordinance of the authority concerned, or any amendment thereof.
- All access roads used by the Contractor shall be rehabilitated to their original condition on completion of the Contract. The Contractor must note that no additional payment will be made for construction, maintenance and rehabilitation of any access roads to the site.
- The Contractor shall provide and maintain on site at all times a site diary in which shall be recorded on a daily basis details of weather conditions, work performance for each day, site personnel, plant and equipment, rate of progress and any other pertinent details related to the contract.

Prepared by

Mische Molife

Pieter Badenhorst Professional Services - Environmental Consultant

Reviewed by

Pieter Badenhorst

Environmental Consultant

Appendices

Appendix A:

Generic Maintenance Management Plan: Western Cape Proclaimed Fishing Harbours

Western Cape Proclaimed Fishing Harbours

Generic Maintenance Management Plan

Report Prepared for

Coega Development Corporation

On behalf of

National Department of Public Works

Report Number 509310/01

Report Prepared by

srk consulting

July 2017

Western Cape Proclaimed Fishing Harbours Generic Maintenance Management Plan

Coega Development Corporation

On behalf of

National Department of Public Works

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SRK Project Number 509310

July 2017

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Peer Reviewed by:

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Partner

Authors:

Sharon Jones

Profile and Expertise of EAPs

SRK Consulting (South Africa) (Pty) Ltd (SRK) has been appointed by Coega Development Corporation (CDC) on behalf of the National Department of Public Works (DPW) as the independent consultants to compile a Generic Maintenance Management Plan (MMP) applicable to all fishing harbours in the Western Cape.

SRK Consulting comprises over 1 300 professional staff worldwide, offering expertise in a wide range of environmental and engineering disciplines. SRK's Cape Town environmental department has a distinguished track record of managing large environmental and engineering projects and has been practising in the Western Cape since 1979. SRK has rigorous quality assurance standards and is ISO 9001 accredited.

As required by the National Environmental Management Act 107 of 1998 (NEMA), the qualifications and experience of the key individual practitioners responsible for this project are detailed below.

Project Director: Christopher Dalgliesh, BBusSc (Hons); MPhil (EnvSci)
Certified with the Interim Board for Environmental Assessment Practitioners South Africa (CEAPSA)
Chris Dalgliesh is a Partner at SRK Consulting and the Head of the Environmental Department in Cape Town. He has over 24 years of experience as an environmental consultant working on a broad range of EIA, auditing, environmental planning and management, public consultation and environmental management system projects. Chris's experience includes managing and co-ordinating major EIAs throughout Southern Africa and South America in the mining, energy, land-use planning and development, water and waste management, and industrial sectors.

Project Manager: Sharon Jones, BSc Hons (Env. Sci); MPhil (EnviroMan)
Certified with the Interim Board for Environmental Assessment Practitioners South Africa
Sharon Jones is a Principal Environmental Consultant with over 18 years' experience. Sharon has managed a broad range of projects in South Africa, Mozambique, Angola, Suriname, Namibia and the DRC, with particular experience in Port and marine-based projects, mining and large infrastructure projects (e.g. airports and dams). In addition to managing various ESIAs, her experience includes the development of Environmental Management Frameworks, Environmental Management Plans and due diligence reviews and gap analysis studies against IFC and World Bank Standards. Sharon holds a BSc (Hons) and MPhil (Env) and is a registered Professional Natural Scientist (Environmental Science) with SACNASP and a CEAPSA.

Statement of SRK Independence

Neither SRK nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any pecuniary or other interest that could be reasonably regarded as being capable of affecting their independence or that of SRK.

SRK has no beneficial interest in the outcome of the assessment which is capable of affecting its independence.

SRK's fee for completing this Report is based on its normal professional daily rates plus reimbursement of incidental expenses. The payment of that professional fee is not contingent upon the outcome of the Report.

Disclaimer

The opinions expressed in this Report have been based on the information supplied to SRK by CDC and their consultants. The opinions in this Report are provided in response to a specific request from CDC to do so. SRK has exercised all due care in reviewing the supplied information. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of SRK's investigations, and those reasonably foreseeable. These opinions do not

necessarily apply to conditions and features that may arise after the date of this Report, about which SRK had no prior knowledge nor had the opportunity to evaluate.

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Acronyms and Abbreviations

CDC	Coega Development Corporation
CER	Contractors Environmental Representative
DEA	Department of Environmental Affairs
DEA:O&C	Department of Environmental Affairs: Oceans and Coasts
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
GN	Government Notice
HWC	Heritage Western Cape
ICMA	Integrated Coastal Management Act 24 of 2008
MLRA	Marine Living Resources Act 18 of 1998
MMP	Maintenance Management Plan
MPA	Marine Protected Area
MSDS	Material Safety Data Sheets
NDPW	National Department of Public Works
NEMA	National Environmental Management Act 107 of 1998 as amended
NEM:ICMA	National Environmental Management; Integrated Coastal Management Act 24 of 2008
NEM:WA	National Environmental Management: Waste Act 59 of 2008
NHRA	National Heritage Resources Act 25 of 1999
RP	Responsible Person
SAHRA	South African Heritage Resources Agency
SRK	SRK Consulting (South Africa) (Pty) Ltd

Glossary

Contractor	Any company appointed by the Proponent to undertake construction or related activities on site, and will include the main Contractor for any aspect of the works, as well as any Sub-Contractors.
Contaminated water	Water contaminated by activities on site, e.g. concrete water and run-off from plant / personnel wash areas / quays.
Dredging	The removal of accumulated sediment and/or debris from the bottom of the ocean, generally to allow for better navigation.
Dumping at sea	In the context of this document, dumping at sea is limited to the disposal of dredged sediments at an approved location on the floor of the ocean, either inside or outside of the harbour boundaries.
Environment	The external circumstances, conditions and influences that surround and affect the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historical and cultural aspects.
Environmental Authorisation	The authorisation by a competent authority of a listed activity or specified activity in terms of National Environmental Management Act 107 of 1998 as amended (NEMA).
Environmental Control Officer	A suitably qualified and independent individual appointed by the proponent to monitor compliance with the Maintenance Management Plan and general good environmental practice on site during the repair and maintenance activities at various fishing harbours.
Environmental Impact Assessment	A process of evaluating the environmental and socio-economic consequences of a proposed course of action or project.
Environmental incident	Environmental incident refers to an accident or unexpected occurrence related to the project, including fire, spills, pollution events, explosions, etc leading to negative environmental impacts.
Environmental Management Measures	Requirements or specifications for environmental management, as presented in the MMP.
Equivalent spherical diameter	The equivalent spherical diameter (or ESD) of an irregularly shaped object (in this case sand particle) is the diameter of a sphere of equivalent volume.
General waste	Waste that does not pose an immediate hazard or threat to health or to the environment, and includes domestic waste, building and demolition waste, business waste, inert waste and any waste classified as non-hazardous waste in terms of the regulations made under section 69 of the National Environmental Management: Waste Act 59 of 2008.
Generic MMP	The generic document applicable to environmental management at all the proclaimed fishing harbours. The generic MMP will be appended to, and form part of the Site Specific MMP for each of the individual fishing harbours.
Hazardous substance	A substance (including materials and waste) that can have a deleterious (harmful) effect on the environment and those substances declared hazardous substances in terms of the Hazardous Substances Act 15 of 1973.

Hazardous waste	Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within the business waste, residue deposits and residue stockpiles.
Maintenance dredging	The removal of accumulated sediment to the original depth of the harbour, but excluding any additional deepening or capital dredging. This excludes dredging for the upgrading of structures.
Method Statement	A mandatory written submission by the Contractor to the Environmental Control Officer (ECO) setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity.
Mitigation Measures	Actions identified to manage (avoid, minimise or optimise) potential environmental impacts which may result from the development.
Pollution	Pollution refers to the contamination of air, water, soil or the environment by a foreign substance or matter.
Proponent	The person or organisation implementing the project.
Resources	The personnel, financial, equipment and technical requirements necessary for the successful completion of mitigation measures and for monitoring activities.
Site Specific MMP	The Site Specific MMP is applicable to a single fishing harbour only and contains site specific information. The generic MMP will be appended to, and form part of the Site Specific MMP for each of the individual fishing harbours.
Solid waste	All solid waste including construction debris, chemical waste, broken / redundant equipment, oil filters, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).
Sub-Contractors	A Sub-Contractor is any individual or Contractor appointed by the main Contractor, to undertake a specific task on site.

1 Introduction

1.1 Background and Introduction

The National Department of Public Works (NDPW) has appointed the Coega Development Corporation (CDC) as Implementing Agent for the repair, maintenance and upgrade of the 13 proclaimed fishing harbours in the Western Cape. Repair of the 13 fishing harbours has been split into four discrete work packages as follows:

- **Work package 1**: Saldanha Bay and Pepper Bay;
- **Work package 2**: Hout Bay, Kalk Bay, Gordons Bay and Hermanus;
- **Work package 3:** Lamberts Bay, Laaiplek and St Helena Bay;
- **Work package 4:** Stilbaai, Struisbaai, Arniston and Gansbaai.

CDC has appointed SRK Consulting (South Africa) (Pty) Ltd (SRK) to compile a Generic Maintenance Management Plan (MMP) applicable to all 13 fishing harbours and based on which Site Specific MMPs can be compiled for each harbour. The Generic MMP (this report), together with the Site Specific MMP, (collectively referred to as "the MMP") aims to meet the requirements of the National Environmental Management Act 107 of 1998, as amended (NEMA) and the Environmental Impact Assessment (EIA) Regulations, 2014, for an approved MMP for maintenance activities.

1.2 Proponent Details

The NDPW will be responsible for the long-term maintenance of all fishing harbours and as such will be responsible for the implementation of the MMPs. Relevant proponent contact details are presented in Table 1-1 below.

Table 1-1: Proponent Details

Name of Company	National Department of Public Works
Contact Person	Vuyo Ngonyama
Position	Director: Property Management
Postal Address	Private Bag X9027, Cape Town, 8000
Telephone	0214022102
Email	vuyo.ngonyama@dpw.gov.za

1.3 Purpose and Structure of the MMP

The MMP aims to ensure that all future repairs and maintenance to the fishing harbours are undertaken in an environmentally responsible manner, in compliance with relevant environmental legislation. The MMP consists of two components:

- **The Site Specific MMP**: which contains only site specific information applicable to a single fishing harbour; and
- **The Generic MMP**: which contains information and requirements applicable to the management of all proclaimed fishing harbours and will allow for consistency in environmental management for all proclaimed fishing harbours in the Western Cape.

For each harbour, the Generic MMP will supplement (and be appended to) the Site Specific MMP.

1.3.1 Structure of the Site Specific MMPs

The Site Specific MMPs, which will be prepared for each harbour, will contain only information specific to the relevant fishing harbour and consists of the following sections:

Section 1: Background and Introduction

Provides an introduction and background to the project, outlines the purpose of the Site Specific MMP and how it relates to the Generic MMP.

Section 2: Site Description

Describes the location and characteristics of the harbour, provides property owner details and an overview of the receiving biophysical and socio-economic environment.

Section 3: Description of Proposed Works

Describes the maintenance and repair works currently proposed, noting that the MMP will also be applicable to future works, the details of which may not yet be available.

Section 4: Potential Impacts

Identifies and provides a qualitative assessment of the significance of the potential impacts of the proposed works on the receiving environment, assuming the specifications of the MMP are adequately implemented.

Section 5: Site Specific Environmental Management Requirements

Lists any additional environmental management requirements specific to the harbour in question, and which are **not** included in the Generic MMP.

1.3.2 Structure of the Generic MMP

The Generic MMP (**this document**) consists of the following sections, which would be applicable to all proclaimed fishing harbours:

Section 1: Background and Introduction

Provides an introduction and background to the project and outlines the purpose of this document, as well as the Site Specific MMPs.

Section 2: Governance Framework

Provides a brief summary and interpretation of relevant legislation.

Section 3: Potential Impacts

Provides a generic description of the potential environmental impacts associated with repair and maintenance works within harbour environments and identifies (high level) generic mitigation measures.

Section 4: Environmental Management Measures

Provides the management measures applicable during the long-term maintenance of the harbour including the roles and responsibilities for implementation of the MMP, compliance and monitoring requirements as well as detailed environmental management measures to be implemented.

1.4 Scope of the MMP

The scope of repair and maintenance activities addressed in the MMP includes:

- Placement of rock (more than 5 m^3) within the footprint of existing rock revetments;
- Maintenance dredging of a harbour basin; and
- Disposal or deposition of dredged material either below or within 100 m of the high-water mark of the sea (i.e. at a marine disposal site or for beach replenishment).

The following activities, if proposed in any of the fishing harbours, do not require an MMP in terms of NEMA and are excluded from the scope of this MMP. These activities should be undertaken in compliance with the Generic Environmental Management Plan (EMP) for the proclaimed fishing harbours (SRK Report Number 509310/02) to ensure compliance with the "*duty of care*" requirement in terms of Section 28(1) of NEMA. The activities are as follows:

- Removal of sunken fishing vessels;
- Repair and maintenance of existing marine structures including (but not limited to) breakwaters, quays, slipways, jetties, copings etc.;
- Maintenance and repair of quay furniture (bollards, fenders and access ladders);
- Repair and maintenance of harbour machinery and equipment e.g. cranes;
- Placement of rock (less than 5 m^3) within the footprint of existing rock revetments;
- Placement of armour units within the footprint of existing breakwaters; and
- Maintenance or replacement of fencing.

The following activities, if proposed in any of the fishing harbours, are not considered maintenance activities and are excluded from the scope of this MMP. Such activities may require more extensive authorisation procedures, which would require screening against relevant legislation:

- The construction of any new structures in the harbour, coastal public property or within 100 m of the high-water mark of the sea and any maintenance or repair works which increase the development footprint of the harbour; and
- The dredging, excavation, infilling or depositing of more than 5 m^3 of material either below or within 100 m of the high-water mark of the sea, which is not for maintenance purposes (e.g. capital dredging or construction of new rock revetments); and
- The removal of 300 m^2 or more of indigenous vegetation within 100 m of the high water mark of the sea.

1.5 Review of the MMP

The MMP will be reviewed and updated every five years particularly in response to changes in relevant legislation. Review of the MMP will be done in consultation with the competent authority (in this case the National Department of Environmental Affairs [DEA]) and will be subject to any public consultation required by the competent authority.

2 Governance Framework

This section provides the legislative framework that has informed the preparation of this (Generic) MMP. Local by-laws or strategic plans, regulated by each municipality that may be applicable are presented in Section 1.4 of the site specific MMP.

2.1 National Environmental Management Act 107 of 1998, as Amended

NEMA establishes a set of principles that all authorities have to consider when exercising their powers. These include the following:

- Development must be sustainable;
- Pollution must be avoided or minimised and remedied;
- Waste must be avoided or minimised, reused or recycled;
- Negative impacts must be minimised; and
- Responsibility for the environmental consequences of a policy, project, product or service applies throughout its life cycle.

Section 28(1) states that "*every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring*". If such degradation/pollution cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution. These measures may include:

- Assessing the impact on the environment;
- Informing and educating employees about the environmental risks of their work and ways of minimising these risks;
- Ceasing, modifying or controlling actions which cause pollution/degradation;
- Containing pollutants or preventing movement of pollutants;
- Eliminating the source of pollution; and
- Remedying the effects of the pollution.

Legal requirements for this project

The NDPW has a responsibility to ensure that the proposed activities conform to the principles of NEMA. NDPW is obliged to take actions to prevent pollution or degradation of the environment in terms of Section 28 of NEMA. This MMP will help the NDPW to conform with the principles of NEMA during the long-term maintenance of the fishing harbours.

2.2 EIA Regulations, 2014

Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities which may not commence without an Environmental Authorisation (EA) issued by the competent authority. In this context, Listing Notices 1[1], 2[2] and 3[3] of the EIA Regulations, 2014, list activities that require EA in terms of NEMA ("NEMA listed activities"). Certain listed activities are exempt from the requirement for EA if they are undertaken for maintenance purposes, and in accordance with an approved MMP.

Table 2-1 indicates the listed activity that is applicable to the proposed works (including dredging, disposal of dredge spoil and the movement or deposition of rock for any other maintenance purposes) and which is exempt from the requirement for EA on the approval of this MMP.

Table 2-1: NEMA listed activity applicable to the project

No.	Listed activity
Listing Notice 1	
19 A	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; or (ii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water 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- (f) will occur behind a development setback; (g) is for maintenance purposes undertaken in accordance with a maintenance management plan; or (i) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour...

Legal requirements for this project:

As the proposed works will involve the excavation and / or deposition of more than 5 m³ of material within a distance of 100 m of the high-water mark of the sea, NDPW requires the approval of this MMP to commence maintenance dredging activities and the excavation or deposition of dredge spoil or any other rock, sand etc., where such activities may increase the development footprint of the harbour or port.

It is the NDPW's responsibility to ensure that no other listed activities are triggered during ongoing maintenance works, or that, if they are, relevant processes are followed to obtain EA. Note that the approval of this MMP does not authorise any other listed activities that may be applicable.

2.3 National Environmental Management: Integrated Coastal Management Act 24 of 2008

The South African government is a signatory to the London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972) (the London Convention) and to the 1996 Protocol to the London Convention (the London Protocol). The London Convention and London Protocol regulate the deliberate disposal of waste materials in the marine environment.

[1] GN R327 of 2017.
[2] GN R325 of 2017.
[3] GN R324 of 2017.

The London Protocol states that 'Each Contracting Party shall develop a national Action List to provide a mechanism for screening candidate wastes and their constituents on the basis of their potential effects on human health and the marine environment.' Annex II of the London Protocol provides guidance on the assessment of wastes or other material that may be considered for dumping at sea.

In South Africa, the National Environmental Management Integrated Coastal Management Act 24 of 2008 (NEM: ICMA) gives effect to the provisions of the London Convention and London Protocol.

The NEM: ICMA provides for the integrated management of the coastal zone, including the promotion of social equity and best economic use, while protecting the coastal environment.

Chapter 7 of the Act establishes integrated permitting procedures and other measures to ensure the protection and sustainable use of the coastal zone and its resources. This includes the requirement that adequate consideration be given to the objectives of this Act when considering applications for EA for any development within the coastal zone, and the consideration of impacts on coastal public property, the coastal protection zone and coastal access land.

In terms of the Section 71(1) of the NEM: ICMA, an application for a dumping at sea permit will be required for the offshore disposal of dredged material. Such an application requires the characterisation (analysis) of the sediment to be disposed of offshore against the National Action List (as required by the London Convention), details regarding the selection and characterisation of the dredge disposal site and an assessment of the potential impacts of the offshore disposal of dredged material.

Legal requirements for this project:

The MMP covers maintenance dredging and the disposal of dredged material associated with maintenance dredging. The disposal of dredged material below the high water mark of the sea will require a dumping at sea permit. Material to be dredged should be subject to sediment analysis to confirm contamination levels. If found to exceed the action levels in the National Action List for the Screening of Dredged Material, the material is not considered suitable for marine disposal, and must either be suitably diluted prior to disposal or disposed of at a licenced on-shore hazardous waste disposal site.

It is NDPW's responsibility to undertake the required sediment sampling and analysis, which should inform the identification of potential beneficial uses of the material or a suitable dredge disposal site.

2.4 National Environmental Management: Control of Use of Vehicles in the Coastal Zone GN Regulations 496 of 27 June 2014

In terms of Section 3 of the NEM: Control of Use of Vehicles in the Coastal Zone Regulation, the use of vehicles within the coastal area is permissible without a permit on (*inter alia*):

- A public road; and
- Private land, by the owner, or with the written permission of the owner or lawful occupier of that land.

In terms of Section 4 of the Regulations, a permit is required for the use of a vehicle in a coastal area for the purposes of the construction or maintenance of infrastructure authorised by any law. The competent authority is the DEA: O&C and the vehicle access permit for the construction or maintenance of infrastructure must be granted by the Minister.

Legal requirements for this project:

The construction or maintenance of infrastructure in the coastal zone which requires the use of vehicles in the coastal zone would require a permit for the use of vehicles in this zone (or exemption from the requirements of these regulations).

2.5 Marine Living Resources Act 18 of 1998

The Marine Living Resources Act 18 of 1998 (MLRA) governs Marine Protected Areas (MPAs) and states in section 43 that:

(2) No person shall in any marine protected area, without permission in terms of subsection (3)—

(b) take or destroy any fauna and flora other than fish;

(c) dredge, extract sand or gravel, discharge or deposit waste or any other polluting matter, or in any way disturb, alter or destroy the natural environment;

(e) carry on any activity which may adversely impact on the ecosystems of that area.

Legal requirements for this project:

A number of MPAs have been declared under the MLRA. The proximity of the proposed works to any MPAs must be determined and care must be taken to avoid any possible impact on these areas.

2.6 National Heritage Resources Act 25 of 1999

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act 25 of 1999 (NHRA). The enforcing authority for this act is the South African National Heritage Resources Agency (SAHRA). In the Western Cape, SAHRA has delegated this authority to Heritage Western Cape (HWC), however, SAHRA remains the custodian of heritage resources below the high-water mark of the sea. In terms of the Act, historically important features such as graves, trees, archaeological artefacts/sites and fossil beds are protected. Similarly, culturally significant symbols, spaces and landscapes are also afforded protection. Archaeological material is defined in the NHRA to include "*any vessel or aircraft, or any part thereof, which was wrecked in South Africa, as well as any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers worthy of conservation".*

In terms of Section 34 of the NHRA, "*no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site"*.

Section 38(1) of the NHRA specifies activities that trigger the need for the proponent to notify SAHRA of the proposed development, in order for SAHRA to determine the need for further Heritage Assessment. Relevant triggers which may be applicable to works undertaken within the fishing harbours include:

- Construction of any structure over 300 m in length; and
- Any development or activity that will change the character of a site (i) exceeding 5 000 m^2 in extent, (ii) involving three or more existing erven or subdivisions thereof.

Legal requirements for this project:

If the proposed works trigger any of the activities listed in Section 38 (1) of the NHRA (e.g. dredging and the disposal of dredge spoil in areas with a total extent exceeding 5 000 m^2), involve any structures older than 60 years, or have the potential to impact on any known heritage/archaeological

resources (including wrecks), the proponent is required to notify SAHRA of the proposed activities via the SAHRIS database and undertake any assessments deemed necessary by SAHRA.

2.7 National Environmental Management: Waste Act 59 of 2008

The National Environmental Management: Waste Act 59 of 2008 (NEM:WA) aims to (amongst other things) regulate waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.

The Act makes provision for the listing of waste management activities that have, or are likely to have, a detrimental effect on the environment and may not be undertaken without a Waste Management Licence (WML) issued by the competent authority. The competent authority for WML applications is the DEA for applications involving hazardous waste.

A person wishing to undertake a waste management activity listed under Category C of GN R921 must comply with the Norms and Standards for Storage of Waste, 2013 (GN R926).

Legal requirements for this project:

The on-shore disposal of any waste at a location which is not a registered landfill site suitable for the relevant type of waste (as defined in the NEM:WA) will require a WML. The temporary storage of waste for a period exceeding 90 days will need to comply with the Norms and Standards for Storage of Waste.

3 Impacts on Receiving Environment

While the significance of impacts of the proposed works will largely depend on the receiving environment, the nature of the impacts associated with the work at all fishing harbours is likely to be fairly similar. A description of the types of impacts which may be anticipated as well as key mitigation requirements are provided in Table 3-1. The key mitigation measures have largely been converted into specific management requirements in Section 4.4, however, these should also be considered during planning of proposed maintenance and repair works.

The significance of relevant impacts at each of the fishing harbours is discussed in the Site Specific MMP for each harbour.

Table 3-1: Description of potential impacts and key mitigation measures

Impact	Description	Key mitigation measures
Higher noise levels adversely affecting surrounding communities	Increased noise levels may be generated by construction vehicles and equipment and dredging activities (depending on the dredging methodology). The level of disturbance experienced by surrounding communities will depend on emitted noise levels, ambient noise levels in the area, the nature of surrounding land uses as well as the proximity of sensitive receptors to the area in which works will be undertaken.	• Limit noisy activities to "normal working hours" or as otherwise required by local bylaws. • Notify surrounding land users of particularly noisy activities (e.g. blasting).
Increased emissions during construction adversely affecting air quality	Emissions from construction vehicles and, potentially, dust generated by vehicle movements or the handling of materials could affect the local air quality temporarily. The impact on surrounding communities will once again be determined by the proximity of sensitive receptors to the area in which works will be undertaken.	• Maintain vehicles and equipment to prevent excessive emissions. • Avoid activities that may generate dust (e.g. handling or stockpiling of material) during particularly windy conditions. • Cover stockpiles with shade cloth or similar material to prevent windblown dust.
Delays to other road users associated with increased traffic	While repair and maintenance activities are likely to be of short duration with limited need for large construction equipment/vehicles on site, the transport of materials to and from the site may lead to some localised increases in traffic.	• Avoid the movement of large construction vehicles/deliver of materials etc. to the site during peak traffic hours.
Loss or disturbance of terrestrial vegetation and habitat	Loss of terrestrial vegetation and habitat is considered extremely unlikely given the fact that works addressed in this MMP are limited to maintenance and repairs to existing harbour facilities. The loss or disturbance of terrestrial vegetation and habitats could occur due to the establishment of site camps or storage/laydown areas or infrastructure associated with e.g. handling of dredged sand used for beach replenishment.	• Confine all works, including the establishment of site camps and storage areas to hardened surfaces or previously disturbed areas as far as practically possible.
Disturbance of marine habitat within the footprint of proposed dredging.	Any benthic marine biota within the footprint of (or directly adjacent to) the proposed dredging activities will be removed, disturbed or smothered. Given that the scope of works covered by this MMP is limited to maintenance dredging it is expected that these habitats would previously have been significantly disturbed during harbour construction, previous maintenance activities and on ongoing use. As such marine biodiversity is expected to be low and unlikely to include sensitive marine habitats. It should also be noted that sandy marine habitats (such as beaches) are adapted to recover quickly from disturbance since these coastal systems naturally undergo regular erosion and accretion events.	• Limit the footprint of dredging as far as practically possible.
Disturbance of marine habitats by the disposal/deposition of dredged material.	Depending on the contaminants contained in the dredged material (if any), and the selected option for the disposal or deposition/re-use of dredged material, these operations could have a significant impact on undisturbed or sensitive marine or coastal	• Sample and analyse sediments to be dredged to confirm sediment type, particle size and levels of contamination. • Based on the outcomes of the sediment analysis, determine

Impact	Description	Key mitigation measures
	habitats.	the most suitable option for the disposal of dredge spoil / opportunities for reuse of the material and identify relevant mitigation measures applicable to the local conditions. • Apply for a dumping at sea permit if disposal of dredged material is proposed within the marine environment.
Elevated turbidity and sedimentation in surrounding habitat	Dredging and disposal of dredge spoil will result in the suspension of sediments in the water column, with potential impacts on marine ecology or other water users in the area (e.g. aquaculture activities). In an existing harbour environment, which is likely to be sheltered, the increased turbidity and sedimentation levels are likely to be contained inside the harbour boundaries, where marine life is likely to have been disturbed in the past, and unlikely to include sensitive marine habitats.	• Monitor turbidity or water quality if required, as determined on a case by case basis depending on the presence of sensitive marine habitats or water users occur (or if specified as a condition of the dumping at sea permit). • Select dredge methodologies that limit turbidity and sedimentation, where possible.
Nutrient release and associated algal blooms	Dredging and dredge disposal activities may release nutrients trapped in the dredged sediments, increasing nutrient levels in the water column and potentially leading to algal blooms. This may affect water quality and surrounding water users who may be sensitive to water quality. High nutrient levels in sediment are most likely to occur in existing fishing harbours where organic waste (e.g. fish waste) is dumped or discharged into the harbour.	• Sample and analyse sediments to be dredged to determine nutrient levels in the sediment and the risk of elevating nutrient levels in the water column significantly, where there is a likelihood of high nutrient levels. • If required, monitor nutrient levels in the water column during dredging.
Liberation of trace metals and other contaminants in dredged sediment, affecting marine life	Contaminants in sediments could be released into the water column during dredging and disposal of dredged material, potentially affecting marine biota and other water users in the area.	• Evaluate (analyse) trace metal / contaminant levels against the thresholds in the National Action List published by DEA in terms of the London Convention for guidance on acceptable threshold levels. • If toxicity levels are high, dispose of dredged material on land (at a suitable waste disposal site) and monitor toxicity levels in close proximity to sensitive marine aquatic habitats or water users.
Release/discharge of contaminants during construction, affecting marine life	Contaminants released into the water column during construction activities could affect marine biota and other water users in the area.	• Control run-off and discharge of any contaminated water into the marine environment. • Position potentially polluting activities so as to prevent spills into the marine environment.
Increased employment, income and skills development	Although the duration of repair and maintenance works is likely to be relatively short, opportunities exist for local employment, skills development and support of local industries with positive impacts on the local economy.	• Encourage the use of local contractors and staff and sourcing of materials form local suppliers where relevant skills and resources are available.
Visual impact of dredging	Dredge plumes (sediment suspended in the water column) will be visible on the surface and may have a visual impact, especially when viewed from an elevated location.	• Manage dredging and dredge disposal activities to limit dredge plumes where sensitive visual receptors exist (e.g.

Impact	Description	Key mitigation measures
activities	Assuming dredging and dredge disposal activities are relatively limited, dredge plumes are likely to be small and present for only a short period. The significance of the impact would depend on the presence of sensitive receptors.	through the use of silt screens if feasible).
Loss or disturbance of cultural heritage resources	Loss or disturbance of cultural heritage resources could occur due to disturbance of material (including wrecks) of archaeological or heritage value of structures older than 60 years. The terrestrial and marine portions of the site have been significantly disturbed by previous development, and dredging operations, and it is thus extremely unlikely that any material of archaeological value would be encountered. Most of the fishing harbours however include structures older than 60 years.	• Notify SAHRA of the proposed works on structures older than 60 years and undertake relevant heritage studies required by SAHRA. • Monitor dredging activities and report any archaeological material that may be uncovered to SAHRA, who will advise on further actions required.
Impact of constrained functionality of the harbour on other users	During maintenance and repair works, there may be constrained functionality of the harbour which could be disruptive to other users. This is however likely to be short-lived and the functionality would improve once the repairs and maintenance have been completed.	• Keep other harbour users informed of the proposed timing of potentially disruptive works and maintain open channels of communication with stakeholders.

4 Environmental Management Measures

4.1 Environmental Management Objectives

The environmental management objectives of the MMP include the following:

- Ensure that environmental management measures, structures or mechanisms are taken into account during the planning of harbour repairs and maintenance;
- Ensure that relevant environmental management measures are clearly documented and understood by all relevant parties;
- Ensure that all activities are undertaken in a way that will minimise potential negative effects on the surrounding environment and maximise possible benefits;
- Ensure that suitable organisational, record keeping and reporting structures are put in place to monitor implementation of environmental management measures during all future repairs and maintenance activities; and
- Ensure that the roles and responsibilities for management of various components are clearly defined.

4.2 Roles and Responsibilities

The key role players during maintenance and repairs of the fishing harbours are anticipated to be as follows:

- Proponent (NDPW), where relevant represented by their Implementing Agent;
- Engineer / Responsible Person[4] (RP), who will oversee the activities of the contractors on site;
- Environmental Control Officer (ECO);
- Contractors responsible for the maintenance and repair activities; and
- Any sub-contractors hired by the contractor.

The anticipated management structure (organogram) is presented in Figure 4-1 below and shows the proposed lines of communication for maintenance activities. NDPW retains overall responsibility for maintenance and the implementation of the MMP.

[4] Engineers may not be appointed for all maintenance activities. Should a Resident Engineer not be appointed, then this role will be fulfilled by a representative from the NDPW.

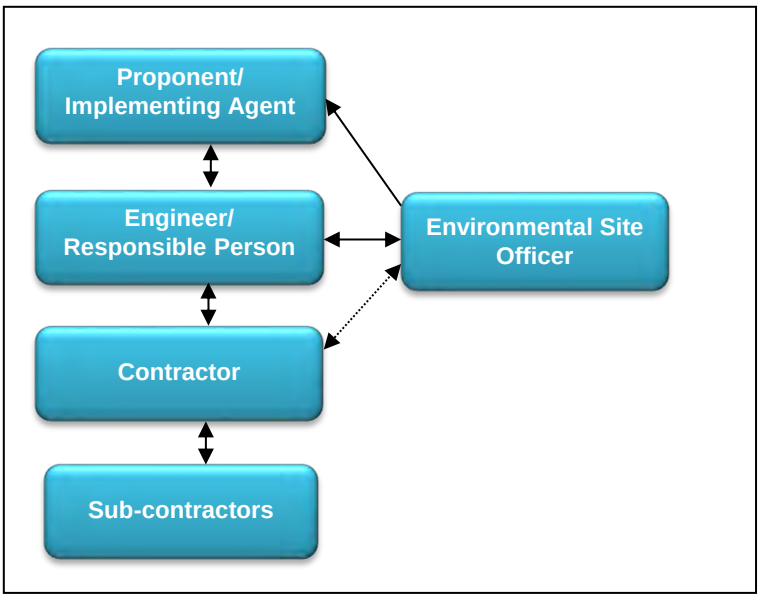

Figure 4-1: Reporting structure

Key roles and responsibilities with respect to the implementation of the MMP are outlined below.

Proponent (NDPW):

NDPW (through their Implementing Agent if applicable) has overall responsibility for management of maintenance activities. In terms of environmental management, the proponent will:

- Appoint suitably experienced Engineers, if required, who will be responsible for the overall management of activities on site;
- Identify any activities not covered by the scope of this MMP, and determine the need for, and where required, obtain relevant authorisations;
- Ensure that the Engineers are aware of the requirements of the MMP, implement the MMP and monitor the Contractor's activities on site;
- Ensure that the Contractor is aware of and contractually bound to the provisions of this MMP by including the relevant environmental management requirements in tender and contract documents, as appropriate;
- Appoint a suitably qualified and experienced ECO to oversee environmental management of the required works;
- Ensure that the Contractor remedies environmental problems timeously and to the satisfaction of the Engineer and authorities (when necessary); and
- Notify the authorities should problems not be remedied timeously.

Responsible Person:

NPDW will appoint suitably qualified Engineers (if necessary), who in turn will designate a responsible person (RP) to oversee activities of the Contractor. This role will be fulfilled either by the Resident Engineer or a suitably qualified representative of NDPW. The RP shall:

- Ensure that the Contractor is duly informed of the MMP and associated responsibilities and implications of this MMP prior to commencement of maintenance activities;
- Identify the need for, and request/provide Method Statements for future maintenance and repair works;
- Monitor the Contractor's activities with regard to the requirements outlined in the MMP;
- Report any environmental emergencies/concerns to the NDPW immediately; and
- Ensure that non-compliance is remedied timeously and to the satisfaction of the relevant authorities.

Environmental Control Officer:

The ECO shall be a suitably qualified/experienced environmental professional or professional firm, appointed by the proponent, for the duration of repair or maintenance works. The ECO shall:

- Request Method Statements from the Contractor prior to the start of relevant activities, where required, and approve these (as appropriate) without causing undue delay;
- Monitor, review and verify compliance with the MMP by the main Contractor, as well as any sub-contractors and specialist contractors;
- Undertake site inspections at least twice a month to determine compliance with the MMP;
- Identify areas of non-compliance and recommend corrective actions (measures) to rectify them in consultation with NDPW, the RP and the Contractor, as required;
- Compile a checklist highlighting areas of non-compliance following each ECO inspection;
- Ensure follow-up and resolution of all non-compliances;
- Provide feedback for continual improvement in environmental performance;
- Respond to changes in project implementation or unanticipated activities which are not addressed in the MMP, and which could potentially have environmental impacts, and advise NDPW, the RP and Contractor as required;
- Act as a point of contact for local residents and community members; and
- Undertake a site closure inspection, which may result in recommendations for additional clean-up and rehabilitation measures.

Contractor:

The Contractor will be required to appoint or designate a Contractor's Environmental Representative (CER) who will assume responsibility for the Contractor's environmental management requirements on site and be the point of contact between the Contractor, the ECO and the RP. The CER shall:

- Ensure that all activities on site are undertaken in accordance with the MMP and /or an approved Method Statement which applicable;
- Monitor the Contractor's activities with regard to the requirements outlined in the MMP;
- Ensure that all employees and Sub-contractors comply with the MMP;
- Immediately notify the RP and ECO of any non-compliance with the MMP, or any other issues of environmental concern; and
- Ensure that non-compliance is remedied timeously and to the satisfaction of the RP and ECO.

The Contractor has a duty to demonstrate respect and care for the environment. The Contractor will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the MMP, environmental regulations and relevant legislation.

Sub-contractors:

All Sub-contractors will be required to:

- Ensure that all employees are duly informed of the MMP and associated responsibilities and implications of this MMP prior to maintenance activities;
- Ensure that all activities on site are undertaken in accordance with the MMP;
- Monitor employees' activities with regard to the requirements outlined in the MMP;
- Immediately notify the RP and ECO of any non-compliance with the MMP, or any other issues of environmental concern; and
- Ensure that non-compliance is remedied timeously and to the satisfaction of the RP and ECO.

The Sub-contractor has a duty to demonstrate respect and care for the environment. The Sub-contractor will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the MMP, environmental regulations and relevant legislation, resulting from their presence on site.

4.3 Compliance and Monitoring

4.3.1 Method Statements

A Method Statement is a document setting out specific details regarding the plant, materials, labour and method the Contractor proposes using to carry out certain activities, usually activities that may have a detrimental effect on the environment. It is submitted by the Contractor to the RP and ECO.

The purpose of a Method Statement is for the Contractor to provide additional details regarding the proposed methodology for certain activities, and for the RP and ECO to confirm that these meet the requirements of the MMP and acceptable environmental practice. This allows the MMP to be less prescriptive and affords the Contractor a certain amount of flexibility or to amend stipulations in the MMP, if approved by the ECO. It also provides a reference point to detect deviations from the agreed approach to an activity and allows for the proposed approach and methods for undertaking future maintenance and repair activities to be clearly documented and agreed on prior to commencement.

Each Method Statement will address environmental management aspects relevant to the activity and will typically provide detailed descriptions of items including, but not necessarily limited to:

- Nature, timing and location of activities;
- Procedural requirements and steps;
- Management responsibilities;
- Material and equipment requirements;
- Transportation of equipment to and from site;
- Method for moving equipment / material while on site;
- How and where material will be stored;
- Emergency response approaches, particularly related to spill containment and clean-up;
- Response to compliance / non-conformance with the requirements of the MMP; and
- Any other information deemed necessary by the RP.

Detailed method statements may also be requested by the ECO for certain aspects of the works proposed. The following list provides examples of Method Statements that may be requested from the Contractor:

- Dredging;
- Disposal of dredge spoil;
- Deposition of material for beach replenishment;
- Environmental awareness;
- Material and equipment storage and delivery;
- Fuel storage, dispensing and fuel spills;
- Waste management;
- Management of contaminated water;
- Erosion and stormwater control;
- Cement batching; and
- Any others considered relevant by the ECO or RP.

The Method Statements will be submitted by the Contractor to the RP and ECO not less than **14 days** prior to the intended date of commencement of an activity. The RP and ECO shall accept / reject the Method Statement within **4 days**. An activity covered by a Method Statement shall not commence until the RP and ECO have accepted such method and once accepted, the Contractor shall abide by the relevant Method Statement. A pro forma Method Statement is attached in

Appendix A, although a suitable Method Statement format can be agreed between the RP, ECO and Contractor.

4.3.2 Environmental Records and Reports

Environmental records and reports required during maintenance activities are listed in Table 4-1.

Table 4-1: Reports required during maintenance

Report	Frequency	From	To
Environmental Checklist	Daily (Weekly)	CER	RP (& ECO)
Environmental Compliance Report	Fortnightly	ECO	NDPW & RP
Site Closure Audit	End of Contract	ECO	NDPW

Environmental Checklist

The CR will undertake daily site inspections to check on the implementation of the MMP by the Contractor and complete a brief report/checklist after the inspection. The completed checklists shall be submitted to the RP at the end of each inspection. This checklist should be discussed between the CR and the RP during the initial site inspection, and agreement reached on the preferred format and content.

The checklists will be submitted to the ECO on a weekly basis, however any issues of environmental concern should be reported to the ECO immediately.

Environmental Compliance Report

The ECO will undertake regular site inspections (at least twice a month) to check on the implementation of the MMP by the Contractor and complete an Environmental Compliance/Progress Checklist Report after each inspection, detailing any environmental issues, non-compliance and actions to be implemented. Environmental Compliance Reports will be submitted to the RP and NDPW and a full record will be kept for submission to the Local Authority and/or DEA on request, or as stipulated in the Dumping at Sea Permit.

Site Closure Audit

The ECO will undertake a final site closure audit on completion of the maintenance activities. The purpose of this is to confirm compliance with all site closure requirements identified by the ECO, and that the site has been left in an environmentally suitable condition. If outstanding environmental requirements are observed during this inspection, a further inspection must be carried out to confirm compliance. The Site Closure Audit report must be submitted to NDPW and DEA (if required) for record purposes.

4.3.3 Corrective Action

Corrective action is a critical component of the implementation–review–corrective action–implementation cycle and it is through corrective action that continuous improvement can be achieved. Where repeated non-compliance is recorded, procedures may need to be altered accordingly to avoid the need for repeated corrective action.

If environmental compliance monitoring by the CR and ECO indicates non-conformance with the MMP or approved Method Statements, the RP will formally notify the Contractor through a Corrective Action Request. The Corrective Action Request documents:

- The nature of the non-conformance/environmental damage;
- The actions or outcomes required to correct the situation; and

- The date by which each corrective or preventive action must be completed.

Upon receipt of the Corrective Action Request, the Contractor will be required to produce a Corrective Action Plan, which will detail how the required actions will be implemented. The Corrective Action Plan must be submitted to the ECO for approval prior to implementation. Once it has been approved, the corrective action must be carried out within the time limits stipulated in the Corrective Action Request.

Additional monitoring by the CER, ECO and RP will then be required to confirm the success or failure of the corrective action.

4.4 Management Measures

The environmental management and mitigation measures that must be implemented during all maintenance activities, as well as responsibilities and timelines for the implementation of these measures and monitoring thereof, are presented in Table 4-2 (for all repair and maintenance works), and Table 4-3 (applicable to dredging and dredge disposal).

Table 4-2: Environmental management and mitigation measures that must be implemented for all maintenance and repair works

Maintenance Management Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods[5]	Performance Indicators
General environmental management	1.	Include the EMP in all tender documents to ensure that sufficient resources are allocated to environmental management by the Contractor.	NDPW/Engineer	Prior to call for tenders	• NDPW to check tender documents and contract	• Incorporated in tender documents
	2.	Screen all proposed works (method statements for future works) and confirm that no NEMA listed activities or the need for any other authorisations are triggered by the works proposed.	NDPW	Prior to approval of Method Statement(s)	• Method statement	• Approved method statement
	3.	Appoint/designate a suitable ECO prior to the start of maintenance and repair activities to monitor and ensure compliance with the EMP.	NDPW	Prior to the start of activities	• Appointment of ECO	• Appointment of ECO
	4.	Notify the local authority of the proposed works and confirm the applicability of any bylaws which may affect the works.	NDPW/ECO	Prior to the start of activities	• Communication with local authority	• Confirmation from local authority
	5.	Obtain permission from DEA:O&C in terms of the Control of Use of Vehicles in the Coastal Area Regulations for vehicles driving on the beach (if required).	NDPW/Contractor	Prior to commencement of maintenance activities	• Communication with DEA:O&C	• Permission from DEA:O&C
	6.	Limit all construction and repairs to the existing footprints of marine structures, unless relevant authorisations are in place	NDPW	During design	• Method statements and confirmation from Engineer	• No change in footprint of structures • Authorisation for changes in footprint of marine structures
Protection of Heritage Resources	7.	Notify SAHRA of any proposed works on structures old than 60 years and undertake relevant heritage assessments if required.	NDPW	Prior to commencement of maintenance activities	• Submission on SAHRIS portal	• Permit from SAHRA to commence with works
	8.	Report all exposed marine/terrestrial heritage resources to the HWC and/or SAHRA. Heritage resources uncovered/disturbed must not be disturbed further until advice has been obtained from the relevant heritage authority on how they should be dealt with.	Contractor and RP	When potential remains exposed	• Photographs of find. • Visual inspections of excavations.	• Records of correspondence.
	9.	Ensure that all Contractors and Sub-contractors are made aware of the potential existence of heritage resources (terrestrial and marine), and are instructed on the correct procedure for preserving the integrity thereof.	Contractor/ECO	Before construction activities commence	• Attendance registers of awareness sessions.	• Register of all workers that completed the awareness session
Records and Administration	10.	Ensure the Environmental Method Statements are approved and filed on site.	Contractor and ECO	Before relevant construction activities commence	• Internal Audit	• Approved Method Statements signed and filed.

[5] Unless otherwise indicated, monitoring will be undertaken by the ECO.

Maintenance Management Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods[5]	Performance Indicators
	11.	Maintain a copy of the EMP and any other environmental authorisations/permits/licences on site.	NDPW	Duration of maintenance activities	• Internal Audit	• Approved documents available on site.
	12.	Maintain a complaints register for all complaints. The register must list: • Complainant name and contact details; • Date complaint was lodged; • Person who recorded the complaint; • Nature of the complaint; • Actions taken to investigate the complaint and outcome of the investigation; • Action taken to remedy the situation; and Date on which feedback was provided to complainant.	ECO	Throughout activities	• Inspect complaints register	• Availability of register on site • Designated person to maintain register • Complaints logged • Complaints followed up and closed out
Environmental Awareness	13.	Provide environmental awareness training to all personnel on site. Training should include discussion of: • Potential impact of waste and effluent on the marine environment; • Suitable disposal of waste and effluent; • Key measures in the EMP relevant to workers' activities; and • How incidents and suggestions for improvement can be reported. Ensure that all attendees remain for the duration of the training and on completion sign an attendance register that clearly indicates participants' names.	Contractor and ESO	On site establishment and ongoing	• Check training attendance register • Observe whether activities are executed in line with EMP requirements during ECO site visits	• Register of workers that completed environmental training • Compliance of Contractor with the EMP
Site establishment	14.	Submit a method statement for site establishment for approval by the ESO at least two weeks prior to the start of activities.	Contractor	Prior to commencement of maintenance activities and ongoing	• Method statement • Visual inspections of site	• Approved method statement • Register of illegal entries • Site boundaries demarcated and demarcation maintained • Signage in place • No vegetation cleared or disturbed.
	15.	Demarcate site boundaries upon establishment and ensure that plant, labour and materials remain within site boundaries.				
	16.	Do not clear any vegetation and do not place any plant/materials on vegetation (excluding grassed areas).				
	17.	Designate any locally sensitive areas beyond the boundary of the site as "No go" areas for all personnel on site. No vehicles, machinery, materials or people shall be permitted in the "No go" area at any time without the express permission of the ECO.				
	18.	Place signage in suitable locations to warn members of the public of maintenance activities taking place and to limit access to work areas that may pose a safety risk.				

Maintenance Management Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods[5]	Performance Indicators
Waste management	19.	Ensure that no litter and debris reaches the marine environment during maintenance activities. Should this occur, remove such waste/litter from the marine environment immediately.	Contractor	Throughout activities	• Visual inspection of waste collection areas • Visual inspection of construction areas (litter) • Check waste disposal slips	• Presence of litter • Availability of rubbish bins • Frequency at which rubbish bins are emptied • Register of frequency of collection and volume of general and hazardous waste sent to final destination • Total volume of general and hazardous waste stored on site vs onsite storage capacity • Evidence of waste separation on site
	20.	Train all staff of the effects of debris and litter in the marine environment and appropriate disposal procedures.				
	21.	Ensure that waste material is not placed where it may be exposed to stormwater.				
	22.	Aim to minimise waste through reducing and re-using (packaging) material.				
	23.	Collect recyclables separately and deliver these to suitable facilities or arrange for collection.				
	24.	Prevent littering by staff at work sites by providing bins or waste bags in sufficient locations.				
	25.	Provide separate bins/waste bags for hazardous / polluting materials and mark these clearly. Remove hazardous / polluting materials from the site at regular intervals and dispose of these materials at a licensed waste disposal facility with a Class appropriate to the type of waste being disposed of.				
	26.	Prohibit any burning or burying of waste on site.				
Effluent and waste water management	27.	Prevent discharge of any pollutants, such as cements, concrete, lime, chemicals, and hydrocarbons into watercourses or the sea.	Contractor	Throughout activities	• Visual inspections	• Containment of all potentially polluted run-off • Register of suitable disposal of contaminated water from containment basins
	28.	Direct run-off from areas with a high risk of accidental releases of oil or hazardous materials (e.g. fuelling or fuel transfer locations, truck washing bays, concrete swills etc.) into containment basins or conservancy tanks and dispose of contaminated water at an approved site.				
	29.	Prevent illegal washing out of containers in water bodies.				
	30.	Do not dispose of any material of any kind in the sea at any time and under any circumstances. Any person that is deemed to have authorised, supervised, instructed, permitted or carried out such an act, shall be permanently removed from site.				
Concrete/Cement Work	31.	Batch cement (where unavoidable on site) in a bunded area on mortar boards and not directly on the ground (unless in a paved area and approved by the ECO).	Contractor	Throughout activities	• Visual inspection and approval by ECO.	• Number of incidents of batching outside bunded

Maintenance Management Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods[5]	Performance Indicators
	32.	Physically remove any remains of concrete, either solid, or liquid, immediately and dispose of as waste.				area • Contamination of water and soil • Visible litter / waste on site • Register of disposal of excess material.
	33.	Place cement bags in bins and dispose of bags as waste to a licensed waste disposal facility.				
	34.	Sweep / rake / stack excess aggregate / stone chip / gravel / pavers into piles and dispose at a licensed waste disposal facility.				
Hazardous materials	35.	Locate hazardous material storage facilities on an impermeable surface as far as practically possible from the water's edge.	Contractor	Throughout activities	• Visual inspection of hazardous materials handling and storage areas	• Number of incidents of non-compliance with safety procedures concerning hazardous materials, including waste materials • Number of spills of hazardous materials, including waste materials • Cost of cleaning up spills • Evidence of contamination and leaks
	36.	Ensure that contaminants (including cement) are not placed directly on the ground (e.g. mix cement on plastic sheeting) to prevent runoff reaching the marine environment.				
	37.	Develop (or adapt and implement) procedures for the safe transport, handling and storage of potential pollutants.				
	38.	Avoid unnecessary use and transport of hazardous substances.				
	39.	Keep Material Safety Data Sheets (MSDS) for all hazardous materials on site and ensure that they are available for reference by staff responsible for handling and storage of materials.				
Transportation and refuelling	40.	Undertake regular maintenance of vehicles and identify and repair minor leaks and prevent equipment failures.	Contractor	Throughout activities	• Visual inspection of vehicles, machinery and refuelling/maintenance areas	• Number of incidents of non-compliance • Number of leaks and spills • Cost of cleaning up spills • Availability of spill containment and clean up equipment on site.
	41.	Undertake any on-site refuelling of vehicles/machinery (only of essential) on a sealed surface.				
	42.	Use appropriately sized drip trays for all refuelling – ensure these are strategically placed to capture any spillage of fuel, oil, etc.				
	43.	Undertake maintenance and repair of vehicles off-site at an appropriate facility (unless unavoidable and with permission of the ESO).				
	44.	Clean up any spills immediately, through containment and removal of free product and appropriate disposal of contaminated soils/material.				
	45.	Keep spill containment and clean-up equipment on site and utilise as per product specification.				
Noise management	46.	Limit noisy activities to day-time from Monday to Friday or in accordance with relevant municipal bylaws, if applicable, where sensitive receptors are located close to the proposed works.	Contractor	Throughout activities	• Site inspections	• Number of registered complaints

Maintenance Management Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods[5]	Performance Indicators
	47.	Comply with the applicable municipal and / or industry noise regulations.				
	48.	Notify adjacent residents before particularly noisy activities will take place.				
	49.	Maintain (offsite) all generators, vehicles and other equipment in good working order to minimise exhaust fumes and excess noise.				
	50.	Control the use of radios, television sets and other such equipment by workers to maintain noise levels so as to avoid disturbance of neighbouring residents/tenants.				
	51.	Enclose diesel generators used for power supply on site to reduce unnecessary noise.				
	52.	If complaints regarding noise are received, investigate potential noise reduction measures such as mufflers on equipment.				
	53.	No unregulated blasting is permitted on site. Submit a Method Statement to the ESO if blasting is required.				
Dust Management	54.	Avoid activities that may generate dust (e.g. handling or stockpiling of material) during particularly windy conditions.	Contractor	Throughout activities	• Keep record of incidents and complaints • Observation of dust plumes	• Number of incidents and complaints
	55.	Cover stockpiles with shade cloth or similar material to prevent windblown dust.				
Traffic Management	56.	Manage activities so as to minimise impacts on road traffic as far as possible.	Contractor	Throughout activities	• Keep record of incidents and complaints • Visually inspect vehicles for any obvious faults or overloading	• Number of incidents and complaints • Condition of vehicles
	57.	Use appropriate road signage, in accordance with the South African Traffic Safety Manual, providing flagmen, barriers etc. at the various access points when necessary.				
	58.	Ensure that large vehicles are suitably marked to be visible to other road users and pedestrians.				
	59.	Ensure that all safety measures are observed and that drivers comply with the rules of the road.				
	60.	Investigate and respond to complaints about traffic.				
	61.	Avoid the delivery of construction equipment and materials to the site during local peak traffic hours.				
Housekeeping	62.	Clean up any spills immediately.	Contractor	Throughout activities	• Visually inspect areas inside and outside the	• Number of contaminations noted on
	63.	Regularly inspect all equipment and machinery for leaks or damage.				

Maintenance Management Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods[5]	Performance Indicators
	64.	Repair any defects as soon as possible. In the case of leaks, ensure that the leaking water or effluent is captured and not released into the environment.			plant for pollution	site
	65.	Keep the site clean, especially during the rainy season when pollutants can wash into the sea with the stormwater.				
Fire Management	66.	Ensure that no fires are permitted on or adjacent to site.	Contractor	Throughout activities	• Inspect fire extinguishers and certificates	• Number of fire incidents • Certified extinguishers in appropriate locations
	67.	Ensure that no smoking is permitted on the site.				
	68.	Ensure that sufficient fire-fighting equipment is available on site.				
	69.	Ensure that all personnel on site are aware of the location of firefighting equipment on the site and how the equipment is operated.				
	70.	Suitably maintain firefighting equipment.				
Ablution facilities	71.	Provide ablution facilities (i.e. chemical toilets unless suitable toilet facilities are available) further than 100 m from the high-water mark for all site staff at a ratio of 1 toilet per 15 workers.	Contractor	Throughout activities	• Visual inspections • Records of waste disposal	• Number of incidents of staff not using facilities • Number of pollution incidents
	72.	Secure all temporary / portable toilets to the ground to the satisfaction of the RP to prevent them toppling due to wind or any other cause.				
	73.	Maintain toilets in a hygienic state (i.e. toilet dispensers to be provided, toilets to be cleaned and serviced regularly).				
	74.	Ensure that no spillages occur when the toilets are cleaned or emptied.				
Response to environmental pollution	75.	In the event of environmental pollution, e.g. through spillages, immediately stop the activity causing the problem.	Contractor	Throughout activities	• Maintain register of pollution events and response • Following resumption of activities, frequently inspect repaired equipment to ensure proper functioning	• Number of incidents • Time activities stopped • Number of recurring incidents • Availability and completeness of register
	76.	Only resume activity once the problem has been stopped or (in the case of spillages) the pollutant can be captured without reaching the marine environment.				
	77.	Repair faulty equipment as soon as possible.				
	78.	Treat hydrocarbon spills, e.g. during refuelling, with adequate absorbent material, which then needs to be disposed of at a suitable landfill.				
	79.	In the event of equipment, litter and debris entering the sea, remove these immediately.				
	80.	Notify the relevant authorities within one day of an environmental pollution event. Inform at least the following parties: • NDPW, • ECO; and • DEA.				

Maintenance Management Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods[5]	Performance Indicators
Closure and Rehabilitation	81.	Remove all equipment, vehicles, equipment, waste and surplus materials, site office facilities, temporary fencing and other items from the site.	Contractor	Once activities are complete	• Visual inspection of site • Keep record of rehabilitation measures	• Records of waste disposal • State of areas on and surrounding the site • Site Closure Audit report
	82.	Spread excavated (uncontaminated) soil in areas adjacent to the site and not removed as spoil.				
	83.	Clean up and remove any spills and contaminated soil in the appropriate manner.				
	84.	Do no bury discarded materials on site or on any other land not designated for this purpose.				
	85.	Rehabilitate all areas affected by the works to at least the same condition as was present prior to activities commencing.				
	86.	Compile and submit the Site Closure Audit report to NDPW and DEA.				

Table 4-3: Environmental management and mitigation measures for dredging and dredge disposal

Maintenance Management Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods (where applicable)[6]	Performance Indicators
Define dredge volumes and determine dredging frequencies	1.	Define / estimate the limits for maintenance dredging volume /time interval for the harbour to determine dredge frequency. This should ensure that dredge volumes do not become excessive and to constrain accumulation of contaminants. Time interval can be calculated according to the rates at which the fishing harbour 'captures' sediments.	NDPW/Consultant	Prior to dredging or determining suitable dredge disposal options	-	• Estimate of dredge volume limits/time interval
Sampling and characterisation of sediments	2.	Consult DEA: Oceans and Coasts before any maintenance dredging is undertaken to determine any sampling requirements.	NDPW/Consultant	Prior to dredging or sediment sampling	-	• Confirmation of sampling requirements from DEA: O&C
	3.	For small dredge volumes (below 30 000 m^3) in low traffic ports[7] if sediment is predominantly fine sand or coarser (i.e.>80% of sediment is > 63 µm [equivalent spherical diameter]) the probability of the sediment containing elevated trace metal concentrations or other sediment bound toxins is low, and it is unlikely that sediment sampling and analysis will be required. Where these conditions are not met, sample and characterise sediments to be dredged.		Prior to dredging or determining suitable dredge disposal options	• Sampling and laboratory analysis of sediments	• Sediment analysis report with recommendation regarding sediment disposal and management during dredging
	4.	Compile a sediment analysis report to gauge compliance with relevant contamination thresholds in the National Action List (NAL – see Appendix B) published by DEA in terms of the London Convention 1972 (or other relevant standards published by DEA) and making recommendations regarding the need for further testing and the suitability for unconfined open water disposal, based on the following general principles (see Annexure B for more detailed classifications): • Sediments with trace metal concentrations below Level 1 (as specified in the NAL) are suitable for unconfined open water disposal and require no further testing. • Sediments with trace metal concentrations above Level 1 but below Level 2 may require further testing before disposal at sea. • Sediments with trace metal concentrations exceeding Level 2 should not be disposed of at sea without suitable dilution or				

[6] Unless otherwise indicated, monitoring will be undertaken by the RP.

[7] Where ship traffic is largely limited to fishing vessels and exclude deep sea demersal trawl, tuna bait boats, and ocean long liners.

Maintenance Management Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods (where applicable)[6]	Performance Indicators
		treatment.				
Identification of suitable dredge spoil disposal options	5.	Determine suitable dredge spoil disposal options based on outcomes of sediment analysis and recommendations of qualified specialist, taking into account the following options and collate into a brief dredge disposal report: • Beneficial use e.g. beach replenishment or use as building material. (This should be considered the preferred option) • Offshore disposal at a site that will allow for dispersion of sediments • Offshore disposal at a site that will limit the dispersion of sediments • Disposal on shore at a hazardous (Class A) waste disposal site (if contaminated) • On shore bioremediation and use/ disposal at a general (Class B) waste disposal site	NDPW/Consultant	Prior to disposal of dredge spoil	-	• Consideration of dredge disposal options • Motivation for disposal rather than beneficial use
	6.	Determine the need for authorisations or permits for the selected disposal solution and where required proceed with the relevant permitting process.			-	• Confirmation of need for permits and authorisations
	7.	Determine whether there is an approved marine dump site in close proximity to the harbour, and consult DEA: O&C regarding the possibility of disposing additional dredge spoil at the existing dump site.			-	• Confirmation of existing marine dumping sites
Use of sediment for beach replenishment	8.	If beach replenishment is identified as a suitable option for the beneficial use of dredged material, consult the local and/or provincial authorities responsible for management of the relevant beach and identify site specific management requirements (see site specific MMP).	NDPW/Consultant	Prior to undertaking beach replenishment	-	• Confirmation from relevant authority responsible for beach management that beach replenishment is an acceptable option. • Site specific management requirements.
Identification of suitable offshore dredge disposal sites (where there is no existing marine dump site)	9.	Where offshore disposal is proposed, identify ideally two suitable candidate dredge spoil disposal sites, taking into account: • Long term dredge disposal requirements • Costs of disposal and associated infrastructure requirements • Proximity of disposal sites to dredge sites (harbours) • Seafloor space required to accommodate the dredge spoil volume • Characteristics of the proposed dredge disposal site	NDPW/Consultant	Prior to disposal of dredge spoil	-	• Dump site selection report

Maintenance Management Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods (where applicable)[6]	Performance Indicators
		(bathymetry, topography, uniformity etc.) • Location in proximity to known important biodiversity features or sensitive (natural or human receptors) Identify dredge disposal sites with the following characteristics: • Similar sediment granulometry to the dredge spoil • Where wave and/or current driven turbulence is sufficient to facilitate incorporation of dumped sediments back into the local sediment dynamics and avoid the creation of large mounds of dredge spoil A uniform sedimentary area (with no reefs or other features) large enough to accommodate the dredge spoil volume See Dump Site Selection Protocol (Appendix C) for further guidance.				
	10.	When identifying the extent of seafloor space required to accommodate the dredge spoil volume: • Dumped sediment should not reduce water depth at the disposal site by more than 10% for offshore disposal sites. (This is not applicable inside the harbour where sediment will not influence wave dynamics) • Take into account wave action and migration ability of benthos at the dredge disposal site			-	• Details included in dump site selection report
Characterisation of candidate dredge disposal sites (where there is no existing marine dump site)	11.	Undertake sediment sampling and a high level environmental survey to characterise the dredge disposal sites including: • Coarse bathymetry • Absence/presence of reefs • Sediment granulometry • Levels of trace metals in the sediment • Oceanographic circulation patterns • Biodiversity assessment (if required by DEA: Oceans and Coasts, depending on the dump site location and size) The number of samples required should be informed by the size of the proposed dredge disposal site, the condition of the site as well as the location of the site.	NDPW/Consultant	Prior to disposal of dredge spoil	-	• Details included in dump site selection report
Dumping at Sea Permit	12.	If a valid Dumping at Sea Permit has not been granted, apply for and obtain a Dumping at Sea Permit in terms of the NEM:ICMA prior to the disposal of dredge spoil at sea (either within or outside of harbour boundaries). See Guidance on applying for Dumping as Sea Permit attached as Appendix D.	NDPW/Consultant	Prior to disposal of dredge spoil	-	• Application for Dumping at Sea Permit

Maintenance Management Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods (where applicable)[6]	Performance Indicators
	13.	Include the following information in the submission of the Dumping at Sea Permit application to DEA:O&C: • Sediment analysis report (see item 4 above) • Dump site selection report (see item 9 - 11 above), ideally proposing more than one potential disposal site • Maps depicting proposed dump site location • An estimate of future dredge disposal requirements • An estimate of annual volumes of dredge material to be disposed of • Required/proposed validity of dumping at sea permit				
	14.	Provide DEA: O&C with the name of the dredging contractor prior to the commencement of dredging to allow for the Dumping at Sea Permit to be updated to include this information.			-	• Dumping at Sea permit with correct dredge contractors details
Dredging and dredge disposal	15.	Determine and implement site specific dredging and dredge disposal mitigation and monitoring measures taking into account: • Contamination levels in sediments • Proximity to sensitive environments or water users • Proposed dredge methodology • Proposed dredge volumes • Selected dredge disposal methodology and (where application) location of dredge disposal site	NDPW/Consultant	Prior to commencement of and during dredging or dredge disposal	-	• Site specific dredging and dredge disposal mitigation measures
	16.	Ensure that the dredging contractor is aware of the MMP, the Dumping at Sea Permit and any other relevant authorisations prior to the commencement of dredging activities, and that they are aware of their relevant environmental management obligations in terms of these documents.	NDPW/Consultant	On appointment of dredge contractor	-	• Copies of relevant documents issued to dredge contractor • Compliance with MMP and dumping at sea permit conditions
	17.	Implement all relevant conditions of the Dumping at Sea Permit during dredging activities	Contractor	Duration of dredging and dredge disposal	-	• Compliance with MMP and dumping at sea permit conditions
Monitoring during dredging and dredge spoil disposal	18.	Implement monitoring requirements (if any) specified in the Dumping at Sea Permit issued by the DEA: O&C during dredging and dredge spoil disposal.	Contractor	As specified in the Dumping at Sea Permit	• As specified in the Dumping at Sea Permit	• Compliance with the monitoring requirements specified in the Dumping at Sea Permit.
Long term monitoring of dredge spoil disposal site	19.	If sediments in the dredge spoil and dredge spoil disposal site are similar, no long term monitoring of the dredge spoil disposal site is required, unless otherwise specified in the Dumping at Sea permit.	NDPW/Consultant	1 year after disposal	• Sediment sampling and analysis	• Monitoring report

Maintenance Management Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods (where applicable)[6]	Performance Indicators
	20.	If sediments in the dredge spoil and dredge spoil disposal site are not similar, sample sediments at the dredge disposal site and analyse contaminant levels 1 year after disposal to demonstrate whether the dredge spoil has been mixed into the overall sediment body (simple statistical analysis of variance approach). This would provide insight on the suitability of the site for future disposal.				
Safety	21.	Maintain a marine exclusion zone around the dredge areas to prevent unauthorised access and injury to third parties.	Contractor	Designate exclusion zone before dredging activities commence	• Visual inspection.	• Clearly delineated exclusion zone.
	22.	Inform other users of the harbour about the exact timing and location of construction/dredging activities through the issuing of notices to surrounding land users		Before dredging activities commence	• Internal Audit.	• Record of communication.
	23.	Conduct visual inspection of area to be dredged for marine fauna/mammals immediately before commencing with dredging activities, to avoid injury.		Before dredging activities commence	• Visual inspections.	• Records of sightings.
	24.	Avoid dredging at night.		Ongoing	• Visual inspections at night.	• No dredging at night.
Oil Spill Contingency Plan	25.	Update any relevant oil spill contingency plan or develop a new oil spill contingency plan to be implemented in the event of an oil spill during dredging, dredge disposal and vessel salvaging activities. (See Appendix E)	Contractor	Prior to dredging activities	• Submission of oil spill contingency plan to ECO for approval	• Approved oil spill contingency plan
	26.	Include the use of physical containment or recovery equipment including a variety of booms, barriers, and skimmers, as well as natural and synthetic sorbent materials in the case of a spill, as well as the use of sorbent materials in the final stages of clean up.				
Heritage Resources	27.	Report all exposed marine/terrestrial heritage resources to the HWC and/or SAHRA. Heritage resources uncovered/disturbed must not be disturbed further until advice has been obtained from the relevant heritage authority on how they should be dealt with.	Contractor and RP	When potential remains exposed	• Photographs of find. • Visual inspections of excavations.	• Records of correspondence.
	28.	Ensure that all Contractors and Sub-contractors are made aware of the potential existence of heritage resources (terrestrial and marine), and instructed on the correct procedure for preserving the integrity thereof.	ECO	Before construction activities commence	• Attendance registers of awareness sessions.	• Occurrence of awareness sessions.

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Appendices

Appendix A:

Method Statement Pro Forma

METHOD STATEMENT PRO FORMA

CONTRACT:……..……... **DATE:**……

PROPOSED ACTIVITY (give title of method statement):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

START AND END DATE OF WORKS FOR WHICH METHOD STATEMENT IS REQUIRED:

Start Date:	End Date:

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated maps and plans where possible):

Note: please attach extra pages if more space is required

Appendix B:

National Action List

The National Action List is currently being revised and DEA:O&C should be consulted for the most up-to-date version.

Appendix C:

Dump Site Selection Protocol

DUMP-SITE SELECTION

Site selection considerations

1. Proper selection of a dump-site at sea for the reception of waste is of paramount importance. Information required to select a dump-site shall include:

   1. Physical, chemical and biological characteristics of the water column and the sea-bed;

   2. Location of amenities, values and other uses of the sea in the area under consideration;

   3. Assessment of the constituent fluxes associated with dumping in relation to existing fluxes of substances in the marine environment; and

   4. Economic and operational feasibility.

2. Guidance for procedures to be followed in dump-site selection can be found in a report of the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP Reports and Studies No. 16 - Scientific Criteria for the Selection of Waste Disposal Sites at Sea). Prior to selecting a dump-site, it is essential that data be available on the oceanographic characteristics of the general area in which the site is to be located. This information can be obtained from the literature but field work should be undertaken to fill the gaps.

Required information includes:

1. The nature of the seabed, including its topography, geochemical and geological characteristics, its biological composition and activity, and prior dumping activities affecting the area;

2. the physical nature of the water column, including temperature, depth, possible existence of a thermocline/pycnocline and how it varies in depth with season and

weather conditions, tidal period and orientation of the tidal ellipse, mean direction and velocity of the surface and bottom drifts, velocities of storm-wave induced bottom currents, general wind and wave characteristics, and the average number of storm days per year, suspended matter; and

3. The chemical and biological nature of the water column, including pH, salinity, dissolved oxygen at surface and bottom, chemical and 8 biochemical oxygen demand, nutrients and their various forms and primary productivity.

3. Some of the important amenities, biological features and uses of the sea to be considered in determining the specific location of the dumpsite are:

1. The shoreline and bathing beaches;

2. Areas of beauty or significant cultural or historical importance;

3. Areas of special scientific or biological importance, such as sanctuaries;

4. Fishing areas;

5. Spawning, nursery and recruitment areas;

6. Migration routes;

7. Seasonal and critical habitats;

8. Shipping lanes;

9. Military exclusion zones; and

10. Engineering uses of the seafloor, including mining, undersea cables, desalination or energy conversion sites.

Size of the dump-site

4. Size of the dump-site is an important consideration for the following reasons:

1. It should be large enough, unless it is an approved dispersion site, to have the bulk of the material remain either within the site limits or within a predicted area of impact after dumping;

2. It should be large enough to accommodate anticipated volumes of solid waste and/or liquid wastes to be diluted to near background levels before or upon reaching site boundaries;

3. It should be large enough in relation to anticipated volumes for dumping so that it would serve its function for many years; and

4. It should not be so large that monitoring would require undue expenditure of time and money.

Site capacity

5. In order to assess the capacity of a site, especially for solid wastes, the following should be taken into consideration:

1. The anticipated loading rates per day, week, month or year;

2. Whether or not it is a dispersive site; and

3. The allowable reduction in water depth over the site because of mounding of material.

Evaluation of potential impacts

6. An important consideration in determining the suitability of a waste for dumping at a specific site is the degree to which this results in increased exposures of organisms to substances that may cause adverse effects.

7. The extent of adverse effects of a substance is a function of the exposures of organisms (including humans). Exposure, in turn, is a function, inter alia, of input flux and the physical, chemical and biological processes that control the transport, behaviour, fate and distribution of a substance.

8. The presence of natural substances and the ubiquitous occurrence of contaminants means that there will always be some pre-existing exposures of organisms to all substances contained in any waste that might be dumped. Concerns about exposures to hazardous substances thus relate to additional exposures as a consequence of dumping. This, in turn, can be translated back to the relative magnitude of the input fluxes of substances from dumping compared with existing input fluxes from other sources.

9. Accordingly, due consideration needs to be given to the relative magnitude of the substance fluxes associated with dumping in the local and regional area surrounding the dump-site. In cases where it is predicted that dumping will substantially augment existing fluxes associated with natural processes, dumping at the site under consideration should be deemed inadvisable.

10. In the case of synthetic substances, the relationship between fluxes associated with dumping and pre-existing fluxes in the vicinity of the site may not provide a suitable basis for decisions.

11. Temporal characteristics should be considered to identify potentially critical times of the year (e.g., for marine life) when dumping should not take place. This consideration leaves periods when it is expected that dumping operations will have less impact than at other times. If these restrictions become too burdensome and costly, there should be some opportunity for compromise in which priorities may have to be established concerning species to be left wholly undisturbed. Examples of such biological considerations are:

1. Periods when marine organisms are migrating from one part of the ecosystem to another (e.g., from an estuary to open sea or vice versa) and growing and breeding periods;

2. Periods when marine organisms are hibernating on or are buried in the sediments; and

3. Periods when particularly sensitive and possibly endangered species are exposed.

Contaminant mobility

12. Contaminant mobility is dependent upon several factors, among which are:

1. Type of matrix;

2. Form of contaminant;

3. Contaminant partitioning;

4. Physical state of the system, e.g., temperature, water flow, suspended matter;

5. Physio-chemical state of the system;

6. Length of diffusion and advection pathways; and

7. Biological activities e.g., bioturbation.

Appendix D:

Guidance on Applying for Dumping at Sea Permit

Guidance on applying for a Dumping at Sea Permit under the Integrated Coastal Management Act 2008 (Act No. 24 of 2008).

1. Introduction

This document provides some guidance on the methods and requirements when applying for a Dumping at Sea Permit in terms of Chapter 8 (71) of the Integrated Coastal Management Act 2008 (Act No. 24 of 2008) (ICM Act). The focus of the guide is specifically on the disposal of dredged material into designated open water disposal sites.

Section 71(1)(a) of the ICM Act provides that "A person who wishes to dump at sea any waste or other material must apply in writing to the Minister in the form stipulated by the Minister for a dumping permit that authorises the waste or other material to be loaded aboard a vessel, aircraft, platform or other structure and to be dumped at sea".
In ……. 2012, the Minister's authority to issue dumping permits was officially delegated to the Chief Director: Integrated Coastal Management, in the Branch: Oceans and Coasts.

2. Documents required

All requests to dispose of waste and other matter into the marine environment must be submitted on an official application. "Annex 4 contains a summary of supporting documents required as part of that application".

The supporting documentation required will largely depend on the type of application submitted for evaluation. Failure to provide the listed/required documentation may result in an unsuccessful application.

Documentation:

- Scientific report (sediment analysis)
- Maps depicting proposed dumpsite location
- Application fee payment receipt
- Completed and signed application form
- Approved Environmental Authorisation in accordance with the Environmental Impact Assessment process in the case of capital dredging projects.

3. Maintenance Dredging

Maintenance dredging is routinely undertaken to maintain port depths and to further supply beach nourishment schemes with clean sediment from sand trap areas (Sand Bypass Systems). Maintenance Dredging does not require the completion of an Environmental Impact Assessment. National Environmental Management Act, EIA regulations, Listed Item 1 Activity 16 (c) "Construction or earth moving activities in the sea, an estuary, or within the littoral active zone or a distance of 10 meters inland of high water mark of the sea or an estuary, whichever is the greater in respect of but excluding such construction or earth moving activities is undertaken for purposes of maintenance of the facilities. However, the following supporting documentation is required as part of the application:

a. Sediment Heavy Metal Assessments – Assessments of contaminants must be completed in line with the National Action List for the assessment of dredged material requiring unconfined open water disposal (Annex 2). In addition, the test result should not be older than 3 years from the date at which the samples were collected. The assessment for contamination in sediment is not limited to heavy metals. The Department may require additional Persistent Organic Pollution (POPs) testing, at the expense of the applicant, if reasonable concern suggests a high presence of POPs in the sediment proposed for disposal. Furthermore, the

Department may request a biological testing of the sediment if initial chemical analyses suggest a significant probability of biological effects.

With reference to the new Action List (Annex 2), a decision on whether or not to require biological testing, or to prohibit disposal of the sediment at sea, is determined as followed:

I. If none of the metals measures exceed the Action Levels, then no biological testing is required, and the material can be dumped;
II. If Action Levels for both Annex I metals (Cd and Hg) are exceeded, or the combined level of Cd and Hg is >5ug/g, then biological testing is required;
III. If Action Level for either of the Annex I metal, and two or more of the Annex II metals are exceed, then biological testing is required;
IV. If the Action Levels of three or more Annex II metal are exceeded, and the total of Annex II metals is >500 ug/g, then biological testing is required;
V. If the combined level of Annex II is >100 ug/g, then biological testing is required;
VI. If either of the Prohibition Levels for the Annex I metals is exceeded, or if the prohibition Level of two or more of the Annex II is exceeded, dumping will not be allowed.

b. **Disposal Site Map and Co-ordinates** – A detailed diagram of the disposal site and areas proposed for disposal must be (Annex 3). It is preferred that a side-scan sonar or bathymetric survey of the proposed disposal area, not older than 12 months, be attached to the application. These maps will assist the Department with managing the level of mounting in the disposal site as well as current trends of sediment movement over time. The co-ordinates submitted should preferably be in the following format:

I. Degrees, Minutes, seconds
II. Decimal Degrees

4. Capital Dredging Projects

Disposal of dredged spoil would require further assessment and approvals as opposed to maintenance operations. The application procedure and requirements would follow that of maintenance operation as indicated earlier. However, the following additional documentation is required:

a. **An approved Environmental Authorisation** – The Department requires a completed Environmental Impact Assessment report and subsequent approved Environmental Authorisation to undertake the activity. Specialist marine studies may be required as part of the EIA process before a permit may be considered.

5. Sand By-Pass

Currently, authorised sand by-pass operations fall outside the scope of the Section 71 of the ICM Act. Such activities are not considered dumping because by definition it involves the lawful depositing of a substance for a purpose other than mere disposal of it (see the ICM Act definition of 'dumping'). Sand by-pass schemes nevertheless require an Environmental Authorisation under the National Environmental Management Act. Listed Item 1, Activity 18 (ii) "The infilling or depositing of any material of more than 5 cubic metre into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from the sea.

6. Compliance Monitoring

The Department reserves the right to undertake site inspections in order to assess the permit holder's compliance with the permit conditions stipulated.

7. Payment Procedure and Administration

Once the Department has received all relevant documentation which would include a signed application form, a payment of R 300 (which is subject to change at the Departments discretion) would be required. The details of the payment process will be communicated to the applicant by an Official of the Department. No assessment of the received application(s) will take place proof of payment has been provided. Please note that the application fee is non-refundable, regardless of the application outcome.

Applicants are required to pay the prescribed fee within 30 days of invoice date, or interest may be levied upon the application.

8. Processing time

45 working days for the review (this has been repealed by new ICM Act as from May 2015).

9. Completed application forms should be sent to:

The Director: Coastal Pollution Management
Tel: (021) 819 2439

Contact Person:
Ms Nokuzola Sukwana
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Appendix E:

Guidelines for Development of an Oil Spill Contingency Plan

Guidelines for development of an Oil Spill Contingency Plan

A plan for action needs to be prepared in anticipation of a spill of a marine contaminant, such as oil. Contingency plans are essential because they establish practical plans of action for all types of spills so that, when spills do occur, a quick response can minimize the damage. Site or project specific oil spill contingency plans must be aligned with any local oil spill contingency plans and must be submitted to Coastal Pollution Management for approval.

The first step in developing a plan is to learn as much about the area as possible.

- Contingency plans normally include the following:
    - Identification of authority and a chain of command in the case of a spill;
    - A list of persons and organizations that must be immediately informed of a spill;
    - An inventory of available trained spill personnel and spill response equipment;
    - A list of actions that must be taken (in order of priority);
    - A communication network to coordinate response;
    - Probable oil movement patterns under different weather conditions; and
    - Sensitivity maps and other technical data.
- In developing the contingency plan, the following must be taken into consideration:
    - Important or sensitive physical and biological resources within or near the area, such as marshes, unusual flora (plant life) and wildlife resources such as fish, shellfish, marine mammals and birds;
    - Important habitat areas required by particular species for spawning, feeding or migration;
    - Tides, currents and local climatic conditions, such as wind and severe weather patterns;
    - Shoreline characteristics; and
    - Proximity to roads, trained response personnel, oil spill clean-up equipment, etc

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Appendix B:

Sediment specialist study by Lwandle Consulting

SEDIMENT SPECIALIST STUDY

WESTERN CAPE SMALL HARBOURS

Struisbaai Sediment Report

PREPARED FOR:

TRITAN SURVEY

REPORT REF.: LT-JOB-521 W2 - V-1

MAY 2017

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Report Version and Quality Control:

Date	Report No. and Revision No.	Created	Reviewed	Released
02/05/2017	LT-JOB-521 – Struisbaai Sampling - V1	Lisa Holton	Kate Dodds	Robin Carter

EXECUTIVE SUMMARY

As part of the National Department of Public Works (NDPW) Small Harbours Programme, Tritan Surveys (Tritan) has been awarded the work package covering the proclaimed fishing harbours in the Western Cape at Arniston, Gansbaai, Stilbaai and Struisbaai.

Dredging is proposed in Struisbaai. Beneficial use of the dredge spoil is favoured over disposal into the ocean and at Struisbaai, Tritan has identified beach nourishment as the most appropriate disposal option for the proposed 38,000 m^3 of dredged sediment. Lwandle Technologies carried out beach sediment sampling in Struisbaai to determine whether the sediment to be removed is suitable for beach nourishment at the proposed location west of harbour. The nourishment initiative involves the removal of accreted sediment from the beach east of the harbour wall as well as within the harbour itself, and placement of this material on the beach to the west of the harbour. Sediment particle size analysis was carried out from both the excavation and nourishment sites to identify whether the granulometry and distribution of sediment is similar in both locations, hence providing a good match for nourishment.

The surveyed sites showed similar grain size distributions and sediment from all locations is predominately composed of sand. This similarity qualifies the targeted source material for beach nourishment at the receiving beach.

Contents

Figures

Tables

1 INTRODUCTION

The Coega Development Corporation is responsible for the implementation of the National Department of Public Works (NDPW) Small Harbours Programme. The aim of this programme is to accelerate projects pertaining to the improvement of infrastructure, day-to-day operations and aesthetics at 13 proclaimed harbours in the Western Cape. These projects include repairs of existing infrastructure, dredging of harbour basins, characterisation of basin sediments and identification of suitable disposal locations for the dredged material. The 13 proclaimed harbours were divided into several work packages and the contracts for services in each work package awarded separately.

Tritan Surveys (Tritan) has been awarded the work package covering the proclaimed fishing harbours at Arniston, Gansbaai, Stilbaai and Struisbaai in the Western Cape. Dredging is proposed to take place at Gansbaai and Struisbaai. As such, the sediment properties have been characterised to determine whether dredged material is fit for disposal at sea according to the National Action List (DEA, 2012). The results show that Arniston, Gansbaai, Stilbaai and Struisbaai sediments are uncontaminated by heavy metals and/or the measured organic compounds and would therefore qualify for unconfined open ocean disposal. Beneficial use of the dredge spoil is favoured over disposal in the ocean, and at Struisbaai, Tritan has identified beach nourishment as the most appropriate disposal option for the proposed 38,000 m^3 of dredged sediment (Figure 1.1).

Tritan Survey Pty Ltd. (Tritan) contracted Lwandle Technologies (Pty) Ltd (Lwandle) to carry out beach sediment sampling in Struisbaai to determine whether the sediment to be removed is suitable for beach nourishment. The nourishment initiative involves the removal of accreted sediment from the beach east of the harbour wall as well as within the harbour itself, and placement of this material on the beach to the west of the harbour. Accordingly, sediment particle size analysis is required from both the excavation (source) and nourishment sites to identify whether the granulometry and distribution of sediment is similar in both locations, hence providing a good match for nourishment.

Figure 1.1 Proposed dredging plan for Struisbaai harbour and accreted sediment removal at the east beach and the proposed disposal location on west beach.

2 METHODS

Sampling took place on Thursday 13th April during low tide (10 am). Beach sediment samples were taken at six sites, three along the beach and three down the gradient of the beach at both the extraction location (to the east of the harbour) and the disposal location (to the west of the harbour) (Figure 2.1). Additionally, the particle size results from the previous dredge site seafloor sampling campaign, collected from within the harbour, are also compared to those of the disposal site to determine their validity for disposal. Samples were returned to Cape Town, where particle size analysis to 75 microns was carried out by Geoscience Laboratories (Pty) Ltd.

Figure 2.1 Sediment sampling locations carried out at low tide on the 13th April 2017

3 RESULTS & DISCUSSION

Ideally, the material from the source beach should be similar in grain size distribution to the receiving beach. This is seen to be true for Struisbaai in the results of the grain size analysis for all sites as summarised in Table 3.1. Sediment texture classes are defined as **clay** (< 0.002 mm), **silt** (0.002 - 0.075 mm), **sand** (0.075 – 4.75 mm) and **gravel** (>4.75 mm) (Wentworth 1922). The particle size analysis results show that the median particle size (D_{50}) of the sediment samples ranged between 0.11 mm and 1.0 mm, classifying all the sediments as fine to coarse sand (Table 3.1).

Table 3.1 Sampling data for all sites sampled at Struisbaai during the dredge characteristics (Tritan) and the beach sampling campaigns (Lwandle). The medium particle size (D_{50}), sediment class and observed beach profile are included.

Name	Lat	Lon	D50 (mm)	Class	Beach Profile
SE 1	-34.79950145	20.05958604	0.5	Medium Sand	On steep slope between low water and high water marks
SE 2	-34.79968648	20.0598294	0.5	Medium Sand	On steep slope between low water and high water marks
SE 3	-34.79988632	20.06011782	0.73	Coarse Sand	On steep slope near low water mark
SE 4	-34.80013056	20.06055047	1	Coarse Sand	On steep slope near low water mark
SE 5	-34.79973089	20.05974828	0.5	Medium Sand	On high end of beach just before it levels out
SE 6	-34.79963467	20.05991953	0.6	Coarse Sand	On edge of low water - fairly steep slope
SW 1	-34.79861328	20.05264574	0.5	Medium Sand	Level - near high water mark
SW 2	-34.79811738	20.05175341	0.11	Fine Sand	Level - near high water mark
SW 3	-34.79738463	20.05096925	0.11	Fine Sand	Level - near high water mark
SW 4	-34.79660006	20.05034733	0.5	Medium Sand	Slight slope - near high water mark
SW 5	-34.79819879	20.05165427	0.5	Medium Sand	On slope in front of walkway - above high water mark
SW 6	-34.79803596	20.05185256	0.11	Fine Sand	Very flat and slightly lower area with slow draining water at low tide
SBGS 1	-34.800159	20.058765	0.15	Fine Sand	
SBGS 2	-34.799092	20.058783	0.5	Medium Sand	
SBGS 3	-34.799753	20.057731	0.5	Medium Sand	

Beaches are three dimensional features that vary temporally and spatially in form and composition (Stauble, 2005). Along with grain size it is important to access the beach profile of the receiving beach. This was achieved through observations during the field survey and must only be used as relative gradients. The extraction beach to the east of the harbour has a steep profile (Figure 3.1), whilst the receiving beach has a gently sloping profile with slow drainage of water at low tide (Figure 3.2). Shore armouring is present on the receiving beach, which provides evidence of efforts to prevent erosion, hence justifying the need for replenishment (Figure 3.2 B). Both beaches culminate landward in established vegetated dune systems, these are more extensive at the east beach since development along the shore has limited their extent along the west beach. Dune plants, help maintain the shoreline by stabilizing the dunes and should not be destroyed during beach nourishment (Figure 3.1 E & Figure 3.2 B). Additionally, any sand relocation should not smother or encroach on the historic fish traps directly to the west of the harbour as seen in Figure 3.2 B.

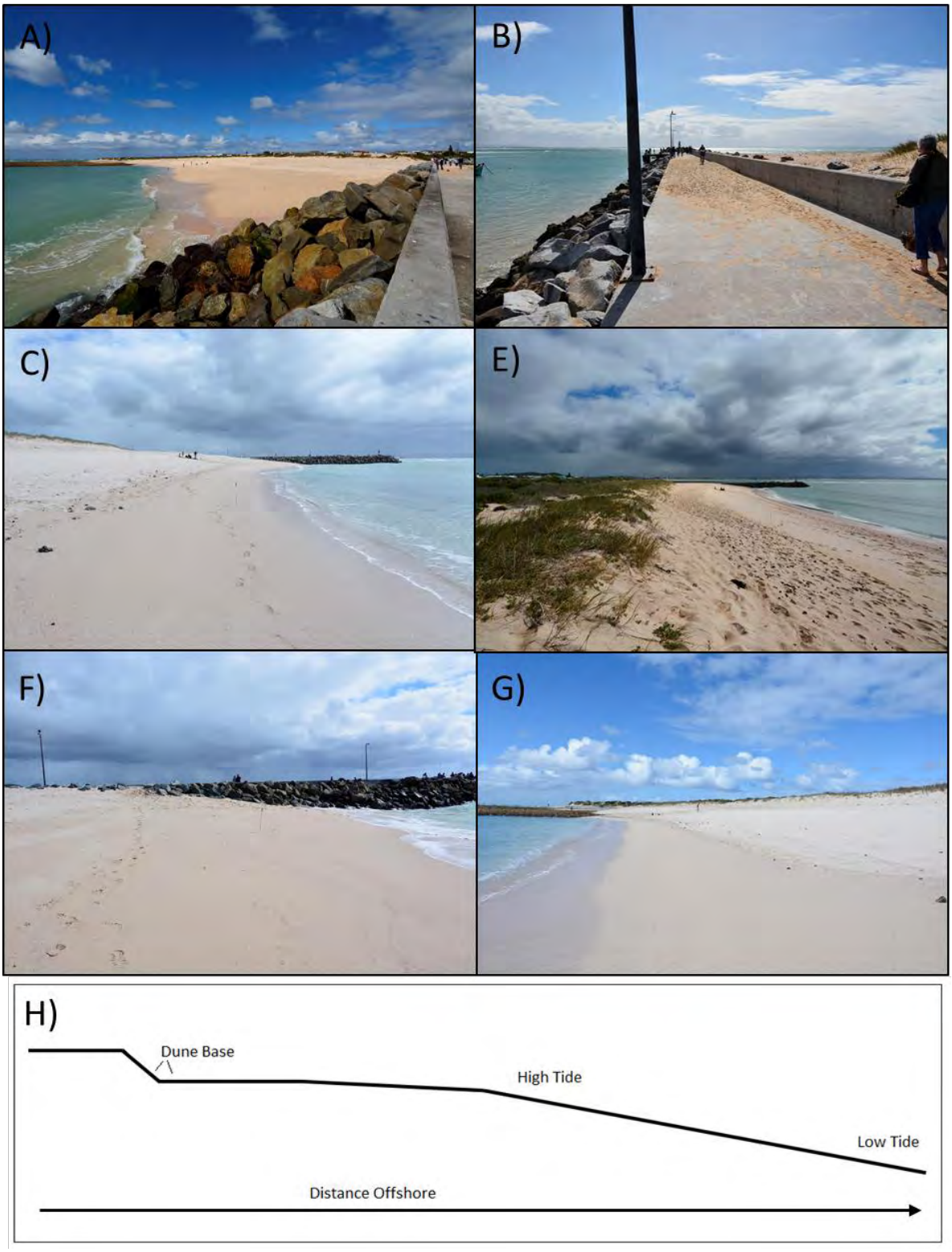

Figure 3.1 Photos taken of the sediment extraction beach (east of the harbour) during low tide (10 am) on the 13th April 2017. A) View from the harbour wall looking east along the beach. B) Wind driven sand accretion on the harbour wall itself. C) View from the far east of the beach back towards the harbour wall demonstrating the relatively steep slope of the beach profile. D) Dune system at the top of the beach, looking back towards the harbour. E) Beach profile at low tide at

sampling station 2. F) View towards the west of the beach from station 2. G) Schematic of the observed beach profile during sampling.

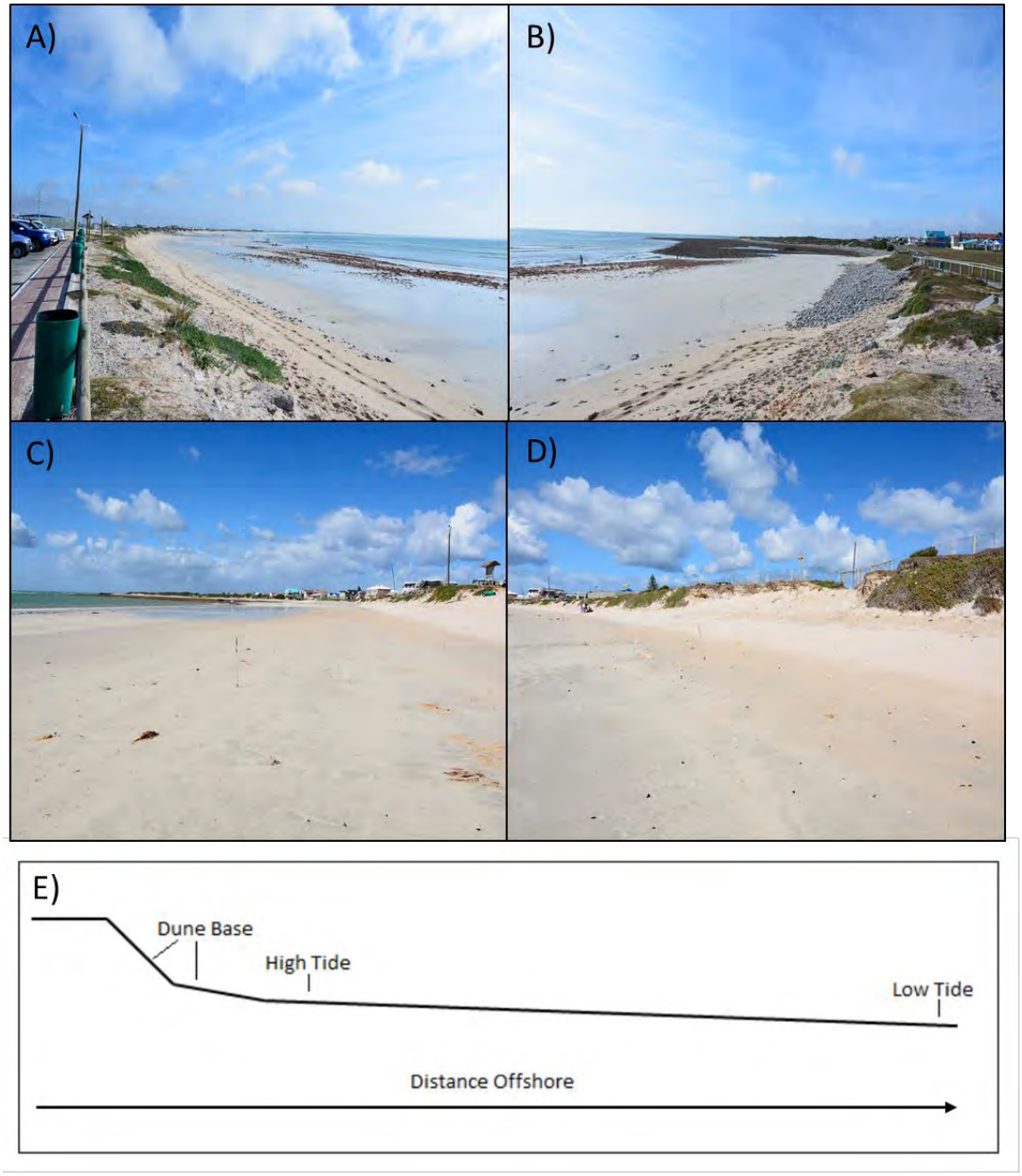

Figure 3.2 Photos taken at low tide of the sediment receiving beach (west of the harbour) during low tide (10 am) on the 13th April 2017. A) View from the car park looking south west along the beach. B) View from the car park looking south east towards the harbour, historic fish traps can be seen in the distance and shore armouring in the centre. C & D) Two views of the gently sloping beach profile, alongshore and up shore towards the dunes. E) Schematic of the observed beach profile during sampling.

Sand size classes varied in both a cross-shore and long-shore direction (Figure 3.3). Grain size and distribution is relative to the cumulative energy of the coastal processes (wind, wave and currents)

acting on the beach, in general resulting in steep beaches having coarser grain sizes than flatter beaches that have finer grains (Stauble, 2005). This is evident at Struisbaai, where the east beach which has a steeper profile is characterised by medium to coarse grain material, while the west beach has more finer sediments and a relatively flat profile. Fine sediments are also evident in the south-east corner of the harbour, these are likely to have accumulated due to windblown sediment overspill from the east beach (Figure 3.1 B) and low flow deposition within the harbour itself. The harbour sediments contain a relatively low quantity of fine sands, silts and clay. However, as less than 10% silt/clay content was identified at all sites, and these sites comprise predominately sand, the donor sediments are seen as a good match for nourishment of the west beach.

Figure 3.1 Grain size distribution at the A) receiving beach west of the harbour, B) dredge sites within the harbour and C) removal beach east of the harbour.

4 CONCLUSIONS

The analysis of grain size distributions at the receiving and extraction sites at Struisbaai has shown that the grain size and distribution is relatively similar at both the targeted extraction and nourishment sites and that nourishment is therefore a suitable disposal option for the Struisbaai location. Nourishment on the west beach should provide a wider upper beach during high tide for recreational use and will feed sediment to the adjacent beach through longshore drift. Equally, removal of sand from the east beach will reduce the profile of the beach and should reduce the current overspill of windblown material onto the harbour wall and into the harbour.

5 REFERENCES

DEA (2012). Revision of National Action List for the Screening of Dredged Material.

Stauble (2005). A Review of the Role of Grain Size in Beach Nourishment Projects. U.S. Army Engineer Research and Development Center.

Wentworth (1922). A Scale of Grade and Class Terms for Clastic Sediments. *The Journal of Geology.* **30 (**5). University of Chicago Press. Pp 377-392.

Appendix C:
Declaration by Parties

National Department of Public Works (NDPW)

I, _____, representing NDPW, record as follows:

We have read and understood this Maintenance Management Programme (MMP).

I am aware of NDPW's responsibilities in terms of complying with, enforcing and implementing the provisions of the MMP.

I undertake to comply with those requirements of the applicable environmental laws, approvals and obligations arising out of the MMP in the discharging of my obligations.

Signed:_____ Name:_____

Position:_____ Date:_____

[Contractor]

I/we, _____ record as follows:

I/ we, the undersigned, do hereby declare that I/ we am/ are aware of the requirement by [Proponent] that construction activities will be carried out with due regard to their impact on the environment.

In view of this requirement, I/ we will, in addition to complying with the letter of the terms of the Contract dealing with protection of the environment, also take into consideration the spirit of such requirements and will, in selecting appropriate sub-contractors, employees, plant, materials and methods of construction, in-so-far as I/ we have the choice, include in the analysis not only the technical and economic (both financial and with regard to time) aspects but also the impact on the environment of the options. In this regard, I/ we recognise and accept the need to abide by the "precautionary principle" which aims to ensure the protection of the environment by the adoption of the most environmentally sensitive construction approach in the face of uncertainty with regard to the environmental implications of construction.

I/we have signed the Declaration of Understanding with respect to the Maintenence Management Programme.

Signed:_____ Date:_____

[Contractor]

Appendix J: Details of EAP and expertise

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E-mail: pbps@iafrica.com

Pieter Badenhorst

Nationality	South African		
Date of birth	25 March 1951		
Qualifications	B.Sc. B.Eng. (Civil) M Eng. (Irrigation) B Hons. (B&A) MBA	University of Stellenbosch University of Stellenbosch University of Stellenbosch University of Stellenbosch	1973 1977 1992 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** **1997** **1995 - 1996** **1993 - 1994** **1992** **1982 - 1991** **1981** **1979 - 1980** **1978** **1974 - 1977**	Own consultancy CSIR, Environmentek; Provincial Business Development Manager Gulf Petrochemical Services LLC, Business Development Engineer (Sultanate of Oman & UAE) and CSIR Marketing Manager Middle East (Sultanate of Oman, UAE & Qatar). CSIR, Ematek, Coastal Development Programme; Marketing Manager Study for MBA CSIR, Ematek, Coastal Development Programme; Project Manager Municipality of Somerset West; Deputy Town Engineer Municipality of Kuils River; Town Engineer Municipality of Klerksdorp; Senior Engineer (water) 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 K**: Specialist's declaration of interest**

Appendix L: Additional Information

NOT APPLICABLE