Strategic Environmental Assessment of the Cumulative Impacts on the Marine Ecosystem from Bulk Seabed Mining of Industrial Minerals, specifically Phosphates, off the Namibian Coast

BACKGROUND INFORMATION DOCUMENT

PURPOSE OF THIS DOCUMENT

This document provides information on the Strategic Environmental Assessment (SEA) of impacts on the marine ecosystem from potential bulk seabed mining of industrial minerals, specifically phosphorites, off the Namibian coast.

An essential part of the SEA is to solicit participation by institutional and public Interested and Affected Parties (I&APs). The first consultative stakeholder meetings will be held between the 2nd and the 10th of June 2014.

Public meetings are scheduled for:

- Lüderitz at the Nest Hotel on 3 June 2014 at 17:30, and in
- Swakopmund at the Swakopmund Hotel & Entertainment Centre on 5 June 2014 at 17:30.

Interested and Affected Parties are invited to register in writing with the Project Office:

The Administrator
Namibia Seabed Environmental Assessment Project
National Marine Information and Research Centre
P. O. Box 912
Swakopmund
Namibia
Fax: +264 64 404385
E-mail: seabed.ea@gmail.com
Web-reference:
http://www.nodc-namibia.org under NAMSEAP

Please use the attached Registration Form. Registered I&APs will be kept informed as the study develops. All relevant documentation will be available from the web-site.

WHY A STRATEGIC ENVIRONMENTAL ASSESSEMENT?

In environmental terms, the benefits and costs from exploitation of both living resources and non-living mineral commodities, directly affect the wellbeing of the Namibian nation. In order to manage the living and mineral assets of the nation responsibly and sustainably into the future, the Government of Namibia is taking a precautionary measure by carrying out a science-based assessment of the consequences of phosphate recovery from the ocean, on the marine ecosystem.

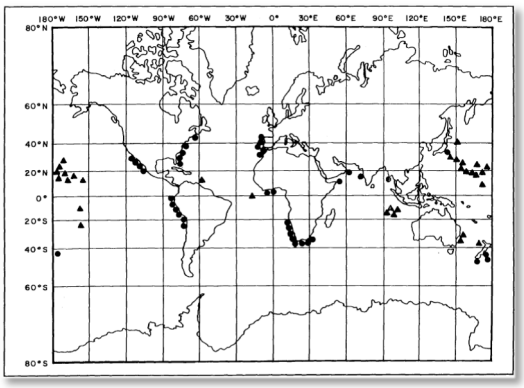
To allow time for these necessary scientific studies to be conducted, a moratorium was put in place by Cabinet Decision in September 2013. No environmental clearances have been granted for marine mining of industrial minerals in Namibian waters, and therefore mining for phosphates has not yet begun. In compliance with the moratorium, no licensing or environmental clearances for phosphate mining are presently issued.

The SEA will allow for assessment of the long-term impacts on the marine ecosystem of potential bulk seabed mining for industrial minerals, specifically phosphates. This information will contribute to sustainable utilisation of the Namibian marine resources.

The focus and scope of this environmental assessment is on investigating the cumulative impact of bulk seabed mining on the marine ecosystem of the Namibian coast, bearing in mind that the living ecosystem provides sustainable goods and services that are presently of great value to the country and will remain so if managed responsibly.

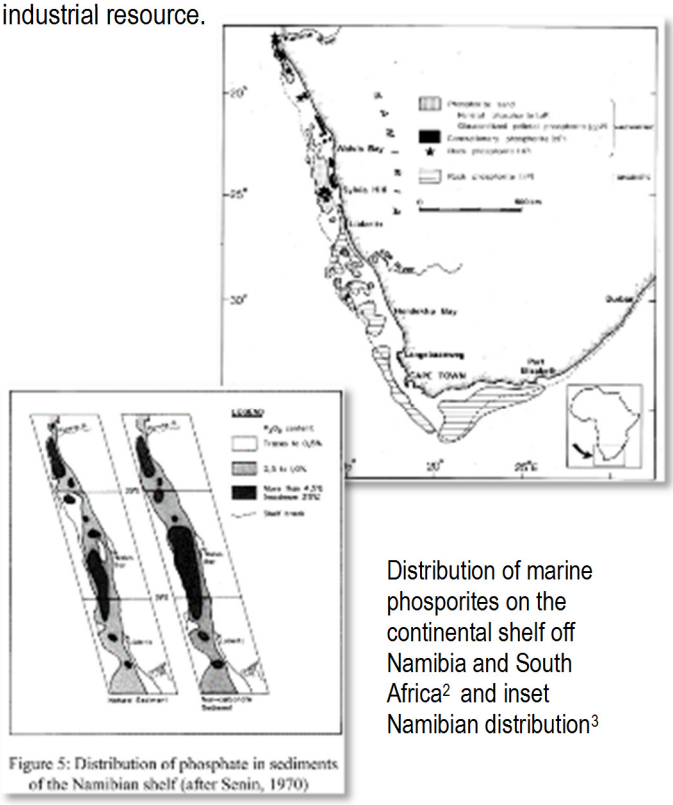
The results of the study will be used by the Government to inform decision-making on marine mineral resource extraction. This study does not address the socio-economic aspects associated with services from either living marine resources or marine phosphate (phosphorite) recovery. However, it is acknowledged that such studies would be greatly beneficial to the decision-making process.

The phosphorus component used to manufacture commercial fertilizer is presently obtained from land-based phosphate deposits. The existence of several coastal and marine deposits around the world has been known for decades, though none has yet been mined.



Distribution of phosphorites along continental shelves ● and from seamonts ▲ [1]

Marine phosphate deposits off the Namibian coast have been targeted in recent years as a potential industrial resource.



Distribution of marine phosporites on the continental shelf off Namibia and South Africa[2] and inset Namibian distribution[3]

The productive Northern Benguela Upwelling system supports living marine resources that include harvested stocks of pelagic, mid-water and demersal fish, crustaceans and seals, and farmed shellfish. Marine fisheries are well-established along the whole Namibian coast within Namibia's Exclusive Economic Zone, and provide considerable income and employment to the nation. Namibia is a strong proponent of the Ecosystem Approach to Fisheries.

[1] Thiel H, Angel MV, Foell EJ, Rice AL, Schriever G 1998: Environmental risks from large-scale ecological research in the deep sea: a desk study. European Commission:Marine science and technology. Office for Official Publications of the European Communities XIV, 210 pp. ISBN 92-828-3517-0

[2] Bremner JM, Rogers J 1990: Phosphorite deposits on the Namibian continental shelf. In: Cook PJ, Shergold JH (eds) Phosphate deposits of the world. Cambridge University Press, Cambridge, pp 143–152

[3] Schneider GIC, Schreuder CP 1992: Phosphate in The Mineral Resources of Namibia. Geological Survey of Namibia

THE ENVIRONMENTAL ASSESSMENT PROCESS

Following the Cabinet directive that a SEA should be conducted, the Ministry of Fisheries and Marine Resources has been tasked as proponent for the scoping study. A technical committee nominated from key Ministries - Fisheries and Marine Resources, Mines and Energy, and Environment and Tourism is steering the process.

No specific legislation regulates the SEA process in Namibia, therefore the Namibian Environmental Impact Assessment (EIA) steps are to be followed, in terms of the Environmental Management Act (2007)[4], as outlined by the Directorate of Environmental Affairs in the Ministry of Environment and Tourism.

The Ministry of Fisheries and Marine Resources appointed an international Environmental Assessment Practitioner SINTEF to guide the Scoping Phase of the assessment.

Environmental Assessment Steps to be Followed:

Screen List of Activities
Designate EAP
Apply for Clearance
Call / Registration I&APs
Public Consultation
Draft Scoping / SEMP Report
Comments Registered I&APs
Final Scoping / SEMP Report
Draft SEA / SEMP Report
Comments Registered I&APs
Final SEA / SEMP Report

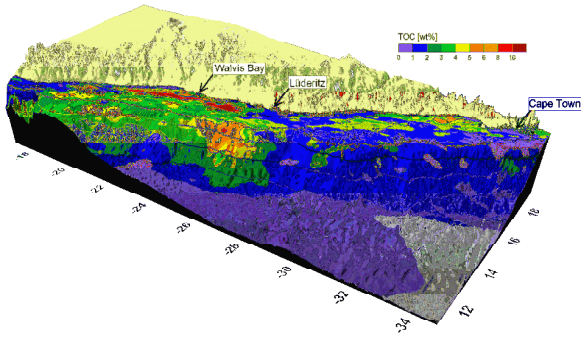
You are here

BACKGROUND INFORMATION TO HELP INFORM THE SCOPING PROCES

Namibia is rich in both biological and mineral resources. As such, it is inevitable that at some time there will be overlap in the areas where these resources are distributed and targeted for exploitation, as is the case presently with living marine resources and mineral marine phosphorites. What is not known, however, is how exploitation of both in Namibian waters will affect the functioning of the marine ecosystem as we presently know it.

The marine ecosystem

Namibia lies within the northern part of the Benguela upwelling system - one of the four global eastern boundary upwelling systems, which are characterized by wind-driven upwelling of nutrient-rich water that fuels high biological production and resulting deposit of organic-rich sediments on the seabottom. The wide, deep continental shelf and slope comprises soft organic-rich sediment.



The sediment rich in total organic carbon (TOC) off the Namibian coast[5]

Because the biological production in the overlying seawater water contributes to the sediment, and sediments contribute soluble nutrients into the seawater, the seabed is an integral and active component of the ecosystem. Animals, including fish, live there. In the sediment intense microbial activity controls processes of organic-carbon decay and remineralisation. Oxygen concentrations in the sediments are largely anoxic and contain hydrogen sulphide as a breakdown product.[6] [7]

The Biological Marine System

At the basis of the marine food chain are the billions of micro-organisms, including bacteria, which flourish in seawater: these are distributed throughout the water and sediments. Biological productivity in the ocean begins with the microscopic plant cells called phytoplankton or microalgae.

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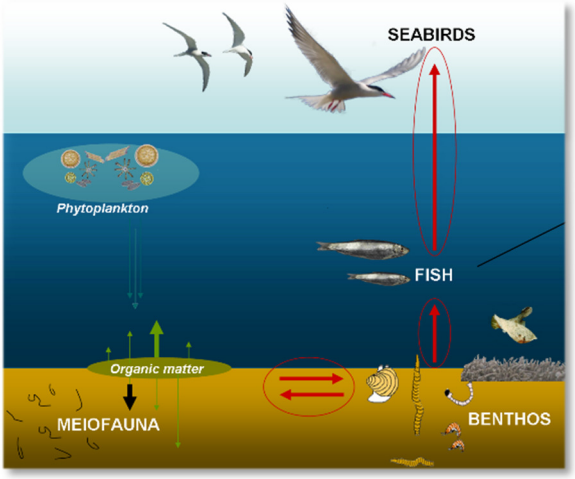
[4] Environmental Management Act : Act no. 7 of 2007, Government Gazette no. 232 of 27 December 2007 and regulations thereunder

[5] Inthorn M et al. 2006: Compilation of organic carbon distribution and sedimentology in the surface sediments on the continental margin offshore southwestern Africa. doi:10.1594/PANGAEA.351146 *Supplement to:* Inthorn M, Wagner T, Scheeder G, Zabel M 2006: Lateral transport controls distribution, quality and burial of organic matter along continental slopes in high-productivity areas. *Geology*, 34(3), 205-208, doi:10.1130/G22153.1

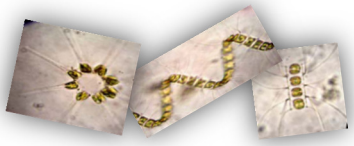
[6] Ferdelman TG, Fossing H, Neumann K, Schulz HD 1998: Sulfate reduction in surface sediments of the south-east Atlantic continental margin between 15º 38' S and 27º 57'S (Angola and Namibia). Limnol Oceanogr., 44, 650-661

[7] Brüchert V, Jørgensen BB, Neumann K, Riechmann D, Schlösser M, Schulz H 2003: Regulation of bacterial sulfate reduction and hydrogen sulfide fluxes in the central Namibian coastal upwelling zone. Geochimica et Cosmochimica Acta, 67, 4505-4518

The seabed is an integral component of the marine ecosystem[1].



In general terms this primary production determines the biological productivity of the area. Primary production off Namibia is considered to be amongst the highest in the world)[8]. This is due to the Benguela upwelling current.



From the microscopic basic building blocks, the complex marine food webs develops within a 3-dimensional liquid environment where there are few solid boundaries to physical, chemical or biological interactions.

The biological marine system off Namibia contributes many goods and services to the nation:

Existing industry

Fisheries and Mariculture

Fishing industries are based on quota-catch of assessed commercial stocks of Hake, Monkfish, Horse mackerel, Sardine, Rock lobster, Deep-sea crab, and Seals. Sole and Kingklip are important by-catch species.

Mariculture industries are based on shellfish species of Oysters, Abalone and Mussels.

[8] Carr M-L 2002: Estimation of potential productivity in Eastern Boundary Currents using remote sensing. Deep-Sea Research II 49, 59–80

All fishery activities are regulated in terms of the Marine Resources Act (2000)[9] and regulations thereunder; with aquaculture activities regulated by the Aquaculture Act (2002)[10] and regulations thereunder. Conservation measures for capture fisheries include the prohibition of trawling in water depths of less than 200m, and for hake, in less than 300m south of latitude 25ºS. Midwater trawling is not allowed in waters shallower than 200m Harvest of migratory species such as Tuna is internationally regulated.

The contribution to the economy by marine fisheries

The contribution of marine fisheries to Namibia's Gross Domestic Product remains stable at around 4%. Fishery products are sold around the world: to Africa, the European Union, China, Japan, USA, Australia and others. Harvested from unpolluted Namibian waters, the products easily comply with stringent food safety requirements of importing countries.

The fisheries sector employs directly approximately 13000 people most of whom are Namibians. Indirect support services to the fishery industry include: vessel and fish processing factory maintenance; engineering companies; NAMPORT harbour fees; fuel bunkerage; road-, sea- and airfreight transport; municipalities through electricity and water costs; and ships agency and stevedoring.

Coastal Tourism and Conservation

Tourists to the coast are important contributors to the economy of the country. Attracted to the ocean and natural unspoilt beauty of the marine environment, tourists enjoy beaching, bathing and water sports in unpolluted water, recreational angling, boat-based and land-based sightseeing tours.

Thirty three species of cetaceans are found in Namibian waters, including whales from Antarctica. Turtles are found in northern warmer waters.

The Namibia Islands' Marine Protected Area spans nearly a million hectares of sea area in southern Namibia, and promotes protection of seabird breeding sites on the small islands.

[9] Marine Resources Act: Act 27 of 2000, Government Gazette no. 2458 of 27 December 2000 (and regulations thereunder)
[10] Aquaculture Act: Act no.18 of 2002, Government Gazette no.2888 of 30 December 2002 (and regulations thereunder)

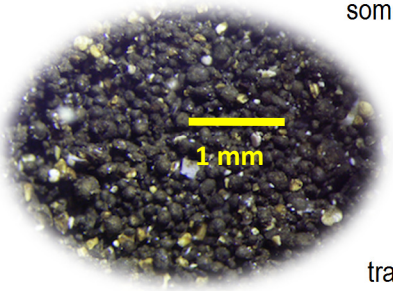
Upcoming proposed industry

Marine phosphate mining

The regulation of industrial mineral mining activities in Namibia is by the Ministry of Mines and Energy, in terms of the Minerals Act (1992)[11] and regulations thereunder.

Phosphate occurrences observed on the shelf occur as

i. Small rounded to spherical grains less than 0.3mm in diameter in all sediment types with an average phosphate content of 22%
ii. Phosphatised organic remains
iii. Phosphate nodules and concretions occurring usually in diatomaceous sediments and oozes often contaminated with hydrogen sulphide. In some of these formations the P_2O_5 content can be as high as 30 %[12].



Mining activity would involve removal of surface sediments, and transfer of this bulk to the coast for onshore processing and beneficiation.

The potential contribution to the Namibian economy by marine phosphate mining would depend on several aspects not presently known, importantly driven by market demand and the global commodity price.

Direct employment for phosphate recovery and processing in Namibia would be determined by the scale of mining and processing. Indirect support services to this marine mining industry would include vessel hire and maintenance, engineering companies, NAMPORT harbour fees, fuel bunkerage, freight transport, and municipalities through electricity and water costs. Markets for fertilizer are mainly the big crop-food producers: India, South America, US, Europe, Canada, and China.

SCOPING EXCERSISE FOR THIS SEA

Bulk removal of seabed for mining of phosphates from the ocean has not been permitted anywhere else in the world, therefore there are no international regulatory measures to follow and there is no information available on consequences expected with regard to marine life.

In order to assess and guide future management of the Namibian natural resources, the present state of the marine environment must first be known for parameters of most likely concern. Relevant aspects, which need further investigation, have been identified to give Namibia the needed facts. The pilot project will

- develop the Main Project
- describe the scientific content, which will
  - assess pre-mining state of the marine environment off the Namibian Coast
  - cover all seasons: this will involve field studies and laboratory analyses/tests
- calculate the costs of the Main Project.

Details will be presented at the consultative stakeholder meetings in Namibia, June 2014.

You are invited to participate in the Scoping Phase of the study to help flesh out the framework for the SEA and help ensure the sustainable management of the Namibian marine environment.

[11] Minerals Act: Act no. 33 of 1992 Government Gazette no.564 of 31 December 1992 (and regulations thereunder)
[12] Schneider GIC, Schreuder CP 1992: Phosphate in The Mineral Resources of Namibia. Geological Survey of Namibia