

ENVIRONMENTAL SCOPING
ASSESSMENT REPORT AND
E.S.M.P. FOR:

2016

CONTRACT NO RA/CS-NP/04-2010: PROJECT PROPOSALS FOR PARTIAL IMPROVEMENTS OF TR 2/1: WALVIS BAY –SWAKOPMUND AND THE UPGRADING TO FREEWAY STANDARDS OF MR44 AND MR36: WALVIS BAY –SWAKOPMUND (THE ROAD BEHIND THE DUNES)



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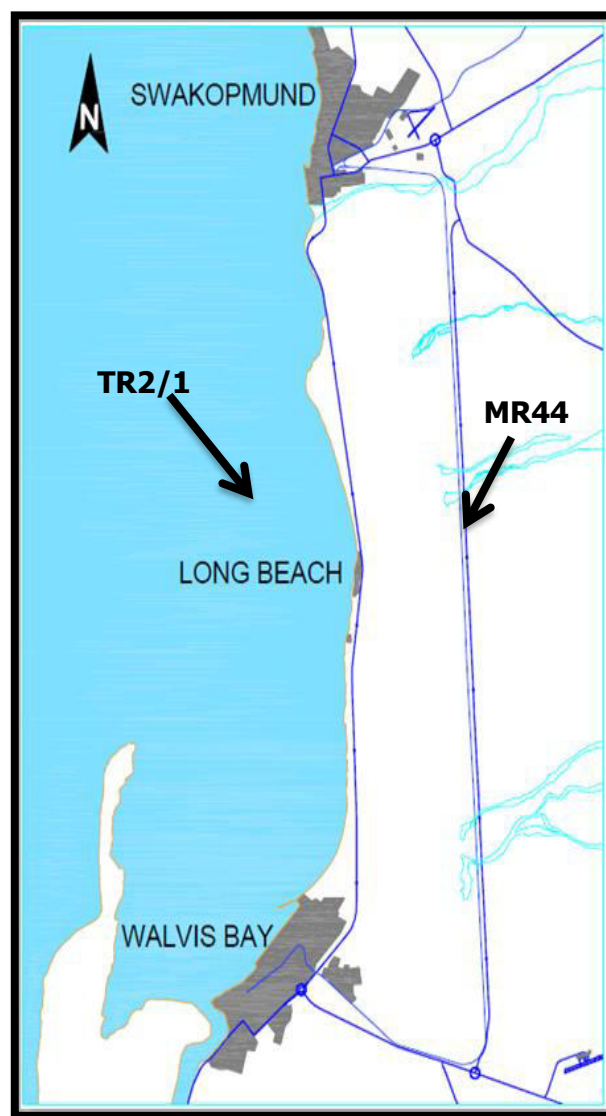
1. INTRODUCTION

1.1 Background and Importance of the Project

The Erongo Region on the west coast of Namibia has, in recent years, experienced significant economic growth, largely due to a sharp increase in mining activities in the area. This upsurge in industrial development has led to a huge escalation in traffic, including heavy traffic, between Walvis Bay and Swakopmund on both the TR2/1 (B2 Walvis Bay to Swakopmund) (the coastal road) and the MR44 (the road behind the dunes, parallel to the railway line).

Besides sustaining heavy industrial use, particularly between Walvis Bay and the intersection with the MR55 (the road that leads to Langer Heinrich Uranium mine as well as the proposed Etango, Reptile and Husab uranium projects), the MR44 is also an important tourist road for some of those travelling through the Namib-Naukluft Park, including traffic to and from the Giant Welwitschia and the Moon Landscape.

As a result, the Roads Authority is considering upgrading the MR44 to freeway standard. It is presently thought that it would specifically be dedicated to transit traffic, other vehicles travelling between the two towns and heavy vehicles (especially those travelling to and from the Walvis Bay harbour), leaving the coastal road mainly for access to those settled closer to the beach as well as easing the traffic flow on that road (TR2/1 Walvis Bay to Swakopmund). Once the MR44 is upgraded to freeway standard the plan is for mostly heavy vehicles to use this road, with the exception of those specifically delivering goods or services to developments and communities at the coast.



The upgraded road is not anticipated to deviate significantly from the existing road alignment but paving the road will induce, among others, visible changes in the scenery, higher travelling speeds, reduced dust generation, potential increase in noise and other pollution related to vehicular traffic. Conversely, the effects of traffic generated pollution are anticipated to be reduced on the coastal road.

Upgrading of this road to divert heavy traffic from the coastal road is consistent with the recommendations of the Uranium Rush Strategic Environmental Assessment for the central Namib

Uranium Rush (SAIEA 2011) as well as the Strategic Environmental Assessment for the coastal areas of the Erongo and Kunene Regions (Skov *et al*, 2007).

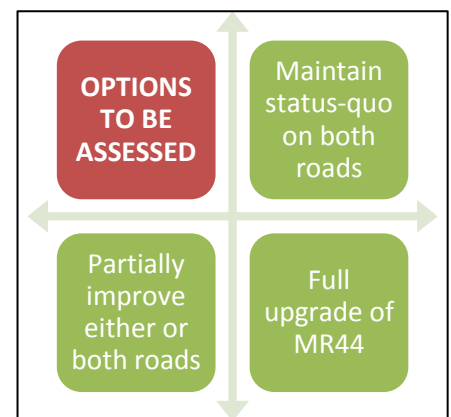
1.2 Feasibility Study

A Feasibility Study investigation was launched to determine the viability of upgrading the roads as mentioned above. The Feasibility Study for this project commenced on 1 September 2011 completed by May 2012. The Study consisted of various phases, which in broad terms include:

- Fieldwork and surveys – including public consultation, environmental impact assessment, traffic surveys, engineering surveys, geotechnical investigations and road safety assessments;
- Engineering design – including preliminary pavement-, drainage- and geometric design;
- Feasibility evaluation and reporting – including cost estimation, economic assessment and reporting.

The main options being considered and evaluated against each other in this Feasibility Study were to:

1. Maintain the status quo, i.e. the base or so-called “do-nothing” option,
2. Partially improve either or both roads, e.g. by extending passing lanes on TR2/1 or adding a “low-volume” seal on MR44 (as was done on MR 52 to the Langer Heinrich mine),
3. Fully upgrade MR44 to high standard surfaced road.



In conclusion, the study assessed which of the above options or combination of options are the most viable, both technically and financially. Perhaps more importantly, the study also assessed and recommends the timeframe for budgeting and implementation of these recommendations.

1.3 Terms of Reference for the Feasibility Study

In response to the development over the past ten years, the Roads Authority appointed VKE Namibia Consulting Engineers (Pty) Ltd to re-assess the current transportation situation concerning these two roads. VKE Namibia Consulting Engineers (Pty) Ltd therefore conducted the following:

- A review of the 2000 Feasibility Study for the improvement of TR 2/1 (the coastal route) between Walvis Bay and Swakopmund,
- The Feasibility Study and Preliminary Design for upgrading to bitumen surfaced standards of MR 44 between Walvis Bay and Swakopmund (the inland road behind the dunes), and
- A safety assessment of close to 60km on MR 52, from its intersection with MR 44 towards the Langer Heinrich Uranium mine.

VKE Namibia Consulting Engineers (Pty) Ltd then appointed **Enviro Management Consultants Namibia** to conduct an environmental assessment determining the environmental conditions in which this proposed project will be taking place. Also to identify sensitive environmental aspects to be considered should these roads be constructed/upgraded and further identify “red flag”

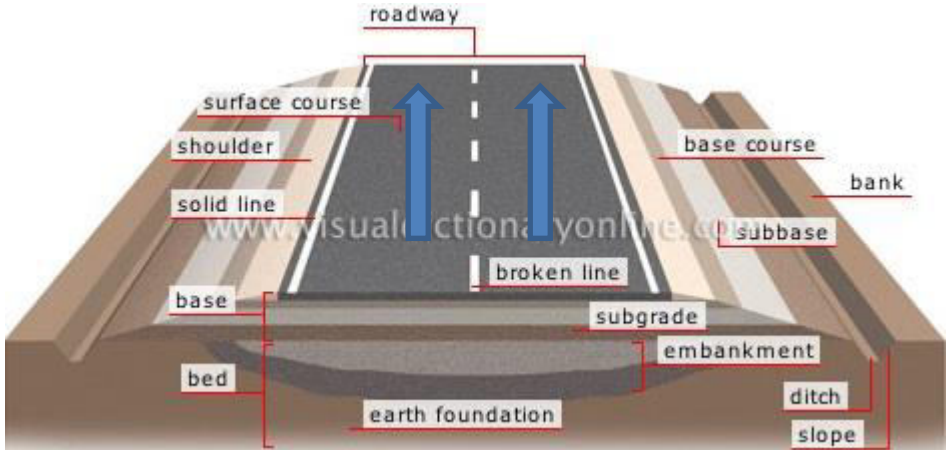
environmental issues or areas which will jeopardise or retard commencement of such a proposed project.

This document sets out to achieve the TOR in the form of this Environmental Scoping Assessment Report.

1.4 Decided Route Options

After the completion of the Feasibility Study the preferred option was indicated to be the MR44 – which is the road behind the dunes. Furthermore it was insisted that this road not only be designed and constructed as a two plus one bitumen standard road, but to upgrade it fully to a dual carriage freeway as to be found between Windhoek and Okahandja.

The following picture represents the typical bitumen road cross section applicable to a single carriageway on this project and is discussed below. For the freeway two of these sections apply which will be constructed 34m apart. It is therefore important to understand that this picture represents one- way traffic – either south or north.



1.4.1 Sub Base:

- It is layer of granular material provided above subgrade generally natural gravel. It is usually not provided on subgrade of good quality. This material is normally obtained from borrow pits alongside the planned route. Two of these layers are required for the strong pavement of the freeway.

1.4.2 Base course

- It is the layer, or layers, immediately under the wearing surface which may be bituminous or concrete and the design thickness is determined by the traffic volume.
- As base course lies close under the pavement surface it is subjected to severe loading. The material in a base course must be of extremely high quality and its construction requires high diversity and tight level tolerances. Normally this material is obtained from a commercial source, or if suitable material is available from borrow pits, a crushing plant is erected for crushing and screening thereof.

1.4.3 Surface/Wearing Course in pavement cross section:

These are the top layer of pavement which is in direct contact with the wheel of the vehicle. This is usually constructed of material in which bitumen is used as binder materials and for a freeway system the shoulders adjacent to the Base layer is also surfaced, generally with a bitumen seal.

1.4.4 Bituminous Pavement:

For good service throughout the full life a bituminous pavement must retain the following qualities.

- Resistance to cracking or ravelling.
- Resistance to weathering considering the effect of surface water, heat and cold.
- Resistance to internal moisture, particularly to water vapours.
- Tight impermeable surface or porous surface (if either is needed for long term stability of underlying base or subgrade).
- Smooth riding and none skidding surface.

The design should be done so as to meet the above requirements for a considerable number of years (need proper design and construction supervision).¹

1.4.5 Borrow Pits

Suitable material is needed for the Base, Sub-base and lower supporting pavement layers during the construction of the road. Fill material is also required to ensure that the vertical alignment of the road is according to engineering quality standards required in Namibia.



To achieve the abovementioned, suitable material is required from borrow pits. These pits are opened using various heavy duty machines and the material is hauled from the pit to the required sections of the road where the material is needed. It is imperative that the material excavated fits the engineering standards required for the construction of the road and is therefore tested on a regular basis in a field laboratory.

Another important aspect is hauling distance. The borrow pits cannot be situated too far from the section of the road where the material is needed to remain cost efficient, therefore borrow pits cannot be located too far apart, or too far from the road (incurring costs due to hauling).

Most of the borrow pits will be opened in low lying areas east of the road. These pits will be opened mostly in estuaries that have suitable gravel for the construction of the road. These areas also tend to rehabilitate faster due to higher water content.

¹ www.aboutcivil.org/road-structure-cross-section.htm

2. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

This section deals with the regulatory requirements that are applicable to this project.

NAMIBIAN LEGISLATIVE FRAMEWORK

2.1 The Constitution of Namibia

Article 95 (1) of the Constitution of Namibia states that "The State shall actively promote and maintain the welfare of the people by adopting, *inter alia*, policies aimed at the ... " maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future; in particular, the Government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian territory."

2.2 Environmental Assessment Policy (1995)

Namibia's Environmental Assessment Policy was endorsed by Cabinet and published in 1995. The Policy provides a procedure for environmental assessments, which sets out to:

- Better inform decision makers and promote accountability of decisions taken;
- strive for a high degree of public participation and involvement by all sectors of the Namibian community in the environmental assessment process;
- take into account the environmental costs and benefits of proposed policies, programmes and projects;
- take into account the secondary and cumulative environmental impacts of policies, programmes and projects; and
- Promote sustainable development in Namibia, and especially ensure that a reasonable attempt is made to minimize anticipated negative impacts and maximize the benefits of all development.

2.3 Environmental Management Act No.7 (2007)

Namibia's Environmental Management Act was passed in parliament in December 2007, and gives effect to Namibia's Environmental Assessment Policy.

The Environmental Management Act sets out the following principles of environmental management:

- (i) Renewable resources must be used on a sustainable basis for the benefit of present and future generations;
- (ii) community involvement in natural resources management and the sharing of benefits arising from the use of the resources, must be promoted and facilitated;
- (iii) the participation of all interested and affected parties must be promoted and decisions must take into account the interest, needs and values of interested and affected parties;

- (iv) equitable access to environmental resources must be promoted and the functional integrity of ecological systems must be taken into account to ensure the sustainability of the systems and to prevent harmful effects;
- (v) assessments must be undertaken for projects which may have a significant effects on the environment or the use of natural resources;
- (vi) sustainable development must be promoted in all aspects relating to the environment;
- (vii) Namibia's cultural and natural heritage including, its biological diversity, must be protected and respected for the benefit of present and future generations;
- (viii) the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term must be adopted to reduce the generation of waste and polluting substances at source;
- (ix) the reduction, re-use and recycling of waste must be promoted;
- (x) a person who causes damage to the environment must pay the costs associated with rehabilitation of damage to the environment and to human health caused by pollution, including costs for measures as are reasonably required to be implemented to prevent further environmental damage;
- (xi) where there is sufficient evidence which establishes that there are threats of serious or irreversible damage to the environment, lack of full scientific certainty may not be used as a reason for postponing cost-effective measures to prevent environmental degradation; and
- (xii) damage to the environment must be prevented and activities which cause such damaged must be reduced, limited or controlled.

2.4 Other Applicable Namibian Legislation

Other Namibian legislation of direct relevance to the Project are summarised in Table 1: List of Applicable Legislation below. Also given in this table are the Project specific implications of each relevant piece of legislation.

Table 1: List of Applicable Legislation

Statute	Provisions	Project Implications
Atmospheric Pollution Prevention Ordinance 45 of 1965	<ul style="list-style-type: none"> Part II - control of noxious or offensive gases, Part III - atmospheric pollution by smoke, Part IV - dust control, and Part V - air pollution by fumes emitted by vehicles. 	<ul style="list-style-type: none"> Application for an Air Emissions permit from the Ministry of Health and Social Services (if required).
Forest Act 12 of 2001	<p>Provision for the protection of natural vegetation.</p> <p>No regulations promulgated yet.</p> <p>Section 22(1): It is unlawful for any person to "<i>cut, destroy or remove:</i></p> <ul style="list-style-type: none"> any living tree, bush or shrub growing within 100 meters from a river, stream or watercourse on land that is not part of a surveyed erf or a local authority area without a license. Vegetation which is on a sand dune or drifting sand or on a gully unless the cutting, destruction or removal is done for the purpose of stabilizing the sand or gully. 	<ul style="list-style-type: none"> Permits should be obtained from Department of Forestry for the removal of protected trees.
Hazardous Substances Ordinance 14 of 1974	<p>Control of substances which may cause injury or ill-health or death of human beings because of their toxic, corrosive, irritant, strongly sensitising or flammable nature, and for the control of certain electronic products and radioactive material.</p> <p>Does not regulate the transport or dumping of hazardous substances.</p> <p>Regulations only relate to the declaration of certain substances as hazardous substances.</p>	<ul style="list-style-type: none"> The handling and storage of hazardous substances on the Project Site should be carefully controlled. Disposal of hazardous substances needs to be carefully controlled.
National Heritage Act 27 of 2004	Heritage resources to be conserved in development.	All archaeological sites to be identified and protected.
Nature Conservation Ordinance 4 of 1975	Requires a permit for picking (the definition of "picking" includes damage or destroy) protected plants without a permit.	In case there is an intention to remove protected species, then permits will be required.
Preservation of Trees and Forests Ordinance	Protection to tree species.	The Contractor will require a permit to remove any protected trees.
Soil Conservation Act 76 of 1969	Prevention and combating of soil erosion; conservation, improvement and manner of use of soil and	Removals of vegetation cover to be avoided and minimized at all costs.

Statute	Provisions	Project Implications
	<p>vegetation, and protection of water sources.</p> <p>The Minister may direct owners or land occupiers in respect of <i>inter alia</i> water courses. No Regulations exist to this effect.</p>	<p>Soil pollution to be avoided.</p>
<p>Water Resources Management Act 24 of 2004</p>	<p>Section 32 states that no person may abstract or use water, except in accordance with a license issued under this Act. Abstraction of water including open waters, aquifer, brackish or marine water.</p> <p>Section 46 states that any drilling to be conducted or enlargement of an existing borehole can only be conducted under a permit issued under the Act.</p> <p>Section 56 states that a person may not discharge any effluent directly or indirectly to any water resource on or under the ground or construct any effluent treatment facility or disposal site unless in compliance with a permit issued under Section 60 of the Act. Where "effluent" means any liquid discharge as a result of domestic, commercial, industrial or agricultural activities.</p> <p>Section 78 states that a person may not engage in any construction activity that impounds, blocks or otherwise impedes the flow of water in a watercourse without the Minister's written approval authorising such activity.</p>	<p>Obligation not to pollute surface water bodies.</p> <p>The following permits are required in terms of the Water Act:</p> <ul style="list-style-type: none"> • water abstraction permits that will form part of the contract obligations.
<p>Public Health Act 36 of 1919</p>	<p>Provides for the prevention of pollution of public water supplies.</p>	<p>A general obligation for the Contractor not to pollute the water bodies in the area.</p>

3. METHODOLOGY

The activities undertaken as part of the study are outlined below.

3.1 Data Collection

Data collected for the bio-physical environmental assessment comprised the following;

- **Site visit and stakeholder consultation.** A site visit was conducted at the site to determine the bio-physical conditions of the project area. During the site visit focused attention was given to any environmental aspect that might be significantly affected by the construction and operational phases of the proposed project.

During the stakeholder consultation questions were posed to the meeting surrounding any environmental aspect they consider to be sensitive with regards to the project. These comments (if any) are then taken into consideration during the impact identification and evaluation process.

- **Literature review.** No full EIA was required for this project therefore forcing the EA team to make use of available secondary data to compose an overview of the baseline conditions that exist at the proposed site. These sources include, but are not limited to, the following:
 - Atlas of Namibia – Mendelsohn et al. (2003);
 - GIS information available on the internet (MET website – www.met.gov.na);
 - Other literature available commercially (books and reviews);
 - Legislative policies and document which includes the Namibian Environmental Policy, Environmental Management Act (2007) and MCA / MCC policies and guidelines.
- **Obtaining information from team members.** Various inputs were received from team members involved in the project. This includes the technical, design and social team members as well as the Ministry of Environment and Tourism - Swakopmund. Liaising with these teams enhances the understanding of the project and therefore focuses the environmental assessment to make it site and project specific.
- **Specialist Investigation - Flora.** Colleen Mannheimer conducted a specialist flora investigation on the project. This specialist investigation was done to determine the sensitivity of the area and identify any "red flag" issues in this regard.

3.2 Identification and Assessment of Impacts

A checklist is designed to help users identify the likely significant environmental effects of proposed projects during scoping. It is to be used in conjunction with the Checklist of Criteria for Evaluating the Significance of Impacts.

There are two stages:

- **First**, identifying the potential impacts of projects;
- **Second** selecting those which are likely to be significant and therefore require most attention in the assessment.

A useful way of identifying the potential impacts of a project is to identify all the activities or sources of impact that could arise from construction, operation or decommissioning of the project, and to

consider these alongside the characteristics of the project environment that could be affected, to identify where there could be interactions between them. The two parts of the Scoping Checklist have been developed to assist in this process.

Start with the checklist of questions set out below. Complete Column 2 by answering:

- yes - if the activity is likely to occur during implementation of the project;
- no - if it is not expected to occur;
- ? - if it is uncertain at this stage whether it will occur or not.

For each activity for which the answer in Column 2 is "Yes" or "?", refer to the second part of the Scoping Checklist which lists characteristics of the project environment which could be affected, and identify any which could be affected by that activity. Information will be used about the surrounding environment in order to complete this stage. Note the characteristics of the project environment that could be affected, and the nature of the potential effects in Column 3.

Finally, the Checklist of Criteria for Evaluating the Significance of Impacts helps to complete Column 4.

This will identify those impacts which are expected to be significant. The questions are designed so that a "yes" answer will point towards a significant impact. It is often difficult to decide what is or is not significant but a useful simple check is to ask whether the effect is one that is of sufficient importance that it ought to be considered and have an influence on the development consent decision.

3.3 Assumptions and Limitations

The natural environment applicable to this application was studied using various external data sources. These sources must be assumed to be correct and true.

Site specific data was collected during the site visit and gathered during the Public Consultation Process. It must be assumed that no new information / data will influence the contents of this document.

The compilers of this document are well familiar with the site. The identified impacts and aspects as well as the proposed mitigation measures are site specific and applicable to this specific project on both the inland and coastal routes.

Data limitations concerning the natural environment may occur due to the lack of specialist investigations. The flora specialist investigation conducted as well as consultation with the Ministry of Environment and Tourism decreased these limitations.

4. AFFECTED ENVIRONMENT

4.1 General location

The project area is situated in the central Namib Desert, in the Erongo Region of Namibia, south-east of Swakopmund. The central Namib lies between the ephemeral Ugab and Kuiseb rivers, and is bounded by the Atlantic Ocean in the west and the escarpment in the east. The Dorob National Park encloses the project area with a transport corridor found along the existing MR44 and the railway line stretching from Swakopmund (north) to Walvis Bay (to the south). This corridor runs parallel with the coast on the eastern side of the dune belt.

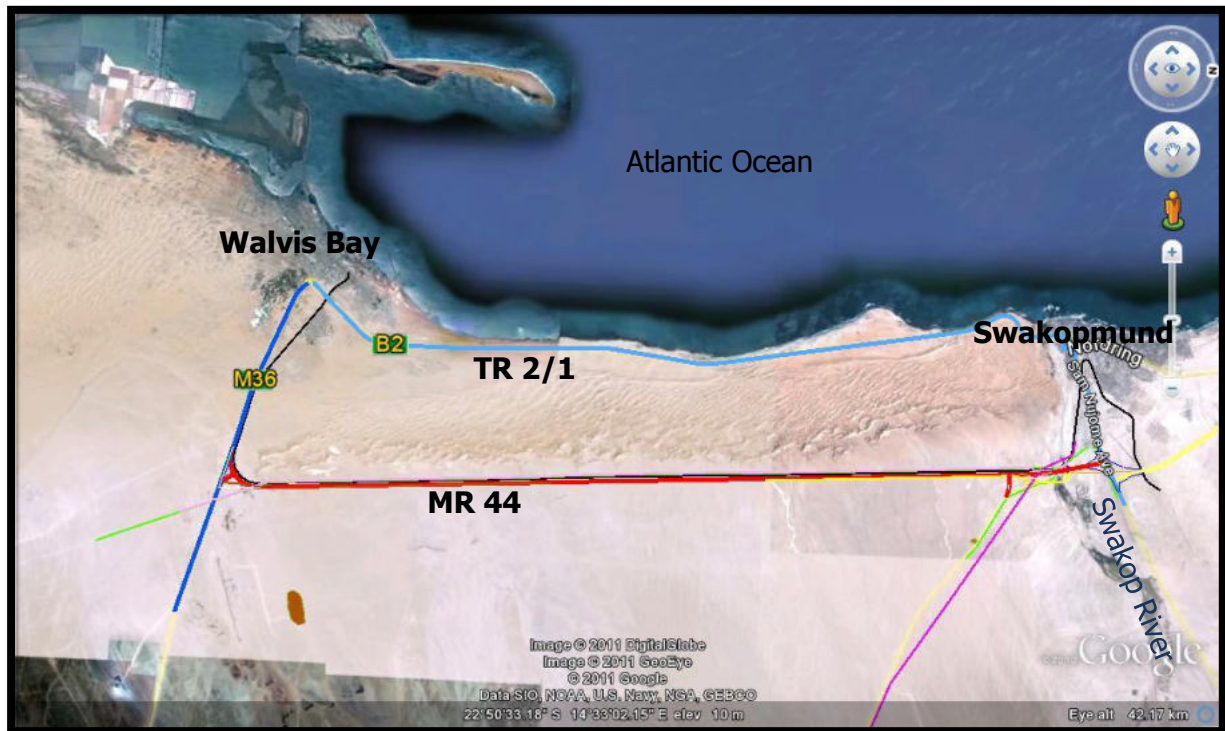


Figure 1: General Locality for the Project

4.2 Topography

The MR44 is situated on a very flat area (north – south direction) behind the topographical high points of the coastal dunes to the west. The flat plains of the Namib Desert are found to the east with some topographical high points associated with various outcrops.

4.3 Geology

The project is situated in the 5km wide coastal Cenozoic Sediments strip stretching between Swakopmund and Walvis Bay. This strip portrays the high sand dunes of the Sossus Formation, which represents an extension of the Namib dune field south of the Kuiseb River. Gravels belonging to the Gobabeb Formation form a thin surface lag around the Kuiseb River Delta and flank the river upstream on low lying terraces. Other sediments found in the area are the Tumas Sandstone

Formation, calcareous conglomerates (Leeukop Formation), fluvial deposits (Langer Heinrich Formation), gypsiferous gravelly sands and intercalated cemented grits and conglomerates.²

4.4 Soils

The project is situated in an area dominated by the soil type classical of Gypsisols. Accumulation of calcium sulphates are characterised of Gypsisols, which are restricted to the very dry areas of the central Namib. The calcium sulphate is dissolved out of the rock and soil, and then carried by percolating water beneath the surface, where it remains in a variety of forms: as powder, pebbles, stone or gypsum crystals. Some crystals grow large enough to become the very famous "Desert Rose". The crystals may also form a compact layer or crust just below the surface. Gypsisols generally have very low levels of fertility, so only the hardiest of plants will grow in them.³

4.5 Climate

4.5.1 Temperature

Average daily temperatures vary between a minimum of 10° C in the coldest month and a maximum of 32° C in the warmest month in the area (Mendelsohn et al. 2002). Due to coastal proximity frost is probably rare.

4.5.2 Wind

Southerly, westerly and south-westerly winds are prevalent, and are usually strongest between late afternoon and early evening (Mendelsohn et al. 2002).

4.5.3 Moisture

Rainfall in the Namib Desert is highly variable, unpredictable, and patchy. It varies from 0 to approximately 100 mm p.a. (Mendelsohn et al. 2002), increasing from west to east. In the west, where precipitation from rain is lowest, fog that is carried inland by wind passing over the cold Benguela current of the Atlantic Ocean is a vital source of moisture for many desert organisms. The number of fog days p.a. decreases eastwards (Olivier 1995), but fog does reach the study area and definitely provides a proportion of the moisture available.

4.6 Vegetation

The northern most section of the route initially crosses terrain comprising a sandy slope, dissected by limestone/marble ridges, that descends to the Swakop River (Figure 1). It then crosses the river, continuing on the other side up a similar slope that gradually becomes more gravelly, finally merging with the gravel plains.

² Directorate Geological Survey. 1996. The Geology of the Walvis Bay Area.

³ Atlas of Namibia. 2010. Ministry of Environment and Tourism. Sunbird Publishers.

Although several Namibian endemic species were observed here, including *Zygophyllum stapffii* (Dollar Bush), *Psilocaulon salicornioides*, *Senecio engleranus* and *Arthroerua leubnitziae* (Succulents), they are all reasonably widespread and common, and are not regarded as of conservation concern in the context of this project. Several protected species are known to inhabit these ridges in the central Namib, including *Hoodia pedicellata*, *H. officinalis*, *Aloe namibensis* and *Lithops gracilidelineata*, but in such close proximity to a major town this area is highly unlikely to have any left, due to illegal collecting, and none were observed in the vicinity of the route during this study. The riverine vegetation consists mainly of common halophytic species, several of which are aliens. No protected trees are present in the area likely to be affected by the road. **Vegetation sensitivity: Low.**⁴



Figure 2: Typical terrain in Zone A.

Zone B is the longest section, running in a north-south direction from just south of the Swakop River down to the junction with the MR36. It runs parallel to the railway line, crossing a typical central Namib undulating sandy-gravel plain incised from east to west by ephemeral sandy washes that vary from very small to large, broad drainage lines such as the Tumas River (Figure 2).

Virtually all of the extremely sparse vegetation is concentrated in the larger washes, where endemics such as *Zygophyllum stapffii*, *Arthroerua leubnitziae*, *Hermbsaedia spathulifolia*, *Senecio engleranus* and *Heliotropium oliveranum* are quite common. The existing road appears to have had virtually no impact on these washes and/or species, and it is unlikely that the new one will either, providing that drainage is not compromised in the larger washes (especially the Tumas River), but maintained by means of culverts. This is also important for the vegetation west of the railway line, and at the base of the dunes, where the restricted range endemic *Trianthena hereroensis* and the well-known !nara (*Acanthosicyos horridus*), which is a protected species, occur.

Vegetation sensitivity: Generally low, medium in the washes.⁵

⁴Coleen Mannheimer. 2012. Specialist Flora Investigation EIA Report.

⁵ Coleen Mannheimer. 2012. Specialist Flora Investigation EIA Report.



Figure 3: Typical terrain in Zone B. Note the concentration of vegetation in the wash, where drainage westwards under the railway line have been maintained by the use of culverts.

The last zone is somewhat diverse, travelling through what appears to be a small salt pan and a rocky ridge (Figure 3) before crossing the southern edge of the main dune field. No plants of conservation concern were found here.



Figure 4: This small rocky ridge near Walvis Bay was not found to harbour any species of conservation concern.

4.6.1 Lichens

Lichen cover was found to be extremely low to almost non-existent over most of the route. This is consistent with the maps of the major lichen fields by Schultz (2006), which indicate that the route will not affect any major lichen fields

4.7 Fauna

The Atlantic coast, offshore islands, coastal wetlands, coastal dunes and plains contain many endemic animals, breeding bird colonies, specialised fog-dependent lichens and vegetation, succulent flora, reptiles etc. Of the 62 species of seabirds recorded in Namibian waters, 20 are only rare vagrants. Twelve species breed along the Namibian coast in particular on offshore islands and man-made platforms. These include the endangered African Penguin, African Black Oystercatcher and the rare breeding endemic Damara Tern which is of specific importance for this project. This bird is listed as an Endangered Species and its breeding habits are endemic to Namibia. They occur in the dune belt between Swakopmund and Walvis Bay but are restricted to the western parts of the dunes closest to the coastal line. No evidence was found of any breeding activity alongside the MR44 route situated on the inland side of the dunes. Discussions with the Ministry of Environment and Tourism confirmed this observation resulting in a low significance with regards to the project.



Other common fauna to be found in these areas are Springbok, Black-backed jackal, Brown hyena, Gerbil and various reptiles and lizards – none of which are endangered or have legal protective status.⁶

4.8 Surface Hydrology

The area alongside the proposed project is very flat with some drainage patterns dominating the area. One of these is the Swakop River to the north of the site. This river poses some engineering challenges but the environment associated with the river is not affected by the proposed project. The other secondary drainage lines are from the Tumas River flowing in an east-western direction and cross the existing inland route (MR44) perpendicular. Proper drainage culverts should be built to allow the river to flow without any obstruction. Smaller drainage lines were also noted alongside the MR44 carrying water produced by sporadic rains inland in a westerly direction towards the dunes.

4.9 Land Use

The proposed project is situated in a narrow transport corridor stretching from Swakopmund to Walvis Bay. This corridor is situated on the eastern part of the dunes (inland dune area). There is an existing road (MR44) and a railway line parallel to the MR44 running in a north – south direction. To the west of the railway line some areas are dedicated for recreational activities and others are conservation areas reserved for the breeding grounds for the Damara Tern (alongside the coast). No special land use restrictions are present in this transport corridor. The new proclaimed Dorob National Park surrounds the proposed project, but does not affect the current land use or legal status of the transport corridor.

⁶ http://www.nacoma.org.na/Our_Coast/FaunaFlora.htm

5. PUBLIC PARTICIPATION PROCESS

The methodology followed during the public participation process was to make use of existing communications between VKE Consulting Engineers and the relevant stakeholders and interested and affected parties, as well as personal interviews conducted by Enviro Management Consultants Namibia. It is important to note that Urban Dynamics conducted a full **Social Impacts Assessment** for this project and is attached to this document. This report includes all the details of I&AP engagements and consultations. The following are just an extract of the meetings that were held.

The objectives of the meetings were to inform the various Stakeholders and the general Public about the project and to receive any comments or concerns with regards to the design of the proposed route, the natural environment that will be affected by the project as well as the social impact this project might have.

The first meeting was held on the 19th September 2011 in the offices of the Erongo Regional Council and the second was held on the 23rd September 2011. The objectives of these meetings were to share information about the project with the relevant stakeholders. Some questions were asked with regards to the technical part of the project. The project was well received with very little negative commentary / concerns.

The third meeting was held in Walvis Bay where the public was invited to attend and comment on the project. Again, the project was well received with few concerns concerning the bio-physical environment. Here is a summary of the various meetings and comments received applicable to the bio-physical environment related to this document:

PUBLIC MEETING HELD ON 15 TH NOVEMBER 2011 – PROTEA HOTEL WALVIS BAY	
NAME	COMMENT
Dr. J. Henschel	<ol style="list-style-type: none"> 1. Find out where animals like jackals cross at night, e.g. Bird Island, or somewhere along north part of long beach: install traffic calming measures 2. If TR2/1 is expanded, heed location of Damara Tern nesting areas.
Mr. J. Paterson	<ol style="list-style-type: none"> 1. Concern is that Damara Tern breeding areas should not be disturbed. 2. Borrow pits for construction must be completely rehabilitated after project is completed.
Langer Heinrich Mine Representative	A Question about the level of environmental investigation that will be conducted during the Feasibility Phase of the project. The answer indicated that a Baseline Report will be drafted and submitted to MET inclusive of a Specialist Flora Investigation.

5.1 Public Participation Meeting Full Minutes

The Public Participation Meeting was held at the Protea Hotel, Walvis Bay, commenced 10:15 AM, and was chaired by Mr Ernst Simon. The meeting closed at 12:30.

The meeting was introduced as a scoping meeting, to introduce the project to the public and receive feedback on any pressing issues and concerns that should be investigated as part of the study.

No significant social and environmental key issues were raised by the public, other than those already identified by the social and environmental consultants. Only the Comments, Questions and Answers posed during the meeting are therefore recorded herein.

Questions and Clarifications

Abbreviations:

- A: Answer
- C: Comment
- Q: Question
- BB: Mr Ben Boshoff (VKE Namibia)
- ES: Mr Ernst Simon (Urban Dynamics)
- RdT: Mr Rian du Toit (EMC Namibia)
- RA: Roads Authority
- WBCG: Walvis Bay Corridor Group

Q: What is being planned now for the road: Arandis - Swakopmund? A dual carriageway is probably necessary for this section?

A (BB): This section of the national road network does not fall within the scope of this study. However, the provision of roads by the Roads Authority is done based on traffic volumes. Once the road is reaching maximum carrying capacity, the necessary upgrade will in all likelihood be undertaken.

Q: How will the NamWater supply pipeline at the intersection of MR44 and TR 2/2 (Swakopmund - Usakos) be accommodated?

A (BB): The pipeline will be lowered once MR44 is being upgraded to allow a level intersection with TR2/2

Q: Will the current rehabilitation of the road Okahanja - Karibib not be continued up to Swakopmund and can the upgrade to dual carriageway from Arandis then not be included in that upgrade?

A (BB): Refer to earlier answer regarding the provision and upgrade of roads based on traffic volumes.

Q: What is the plan in terms of the crossing of MR44 over the Swakop River?

A (BB): Both a low-level causeway structure and a large bridge will be evaluated as crossing options. In the long-term a bridge will be required, however, the initial cost at this point in time may be too high to justify the bridge now. This will be evaluated during this study, and recommendations made to the Roads Authority.

Q: What is the time schedule for this project, and when will the road (MR44 - the inland road) be built?

A (BB):	This feasibility study is scheduled for completion by May 2012. Depending on the outcome of the study, the Roads Authority will then need to set the necessary budget and appoint a consultant to perform the detailed design of the road. This process may take about two years. After design, a contractor will be appointed for construction, which should be completed after another two years. If the correct procedures are followed, the road will therefore be completed only by 2016. (This will incidentally be the time by which traffic volume projections indicate that this road will become necessary to ensure efficient traffic movement between Walvis Bay and Swakopmund.)
Q:	What is the Environmental Impact Assessment Process going to be for this project, how in-depth, and what level of clearance will be required?
A (RdT):	This study will assess Environmental Impacts at a scoping level. The aim is to identify any high-risk issues, none of which were identified at this point. In all likelihood, only a baseline assessment report will be submitted and required to obtain a clearance from the Ministry of Environment and Tourism for the go-ahead of this project.
Q:	(On MR44) the incline from the Swakop river to TR2/2 is very steep, and during wet weather conditions the road surface is too smooth for heavy vehicles to drive up this incline. What can be done about this (now)?
A (BB):	The road will be designed to high geometric standards, allowing sufficient sight distance for a 120km/h speed limit. It will also be designed to reduce steep inclines to a minimum, with a maximum of 4% grades over distances of not more than 400m. The Roads Authority will in all likelihood not consider short-term solutions whilst the study is ongoing. Any improvements now would be short-lived and be money wasted on abortive work.
C: (Hon. Kandjala)	Express disappointment that the road (MR44) will not be built now already. More frustration will now have to be endured by people travelling behind slow-moving trucks and taking unnecessary risks to ensure that they reach their destination in time.
C: Traffic Police	Commuters are frustrated. Something has to be done to divert (heavy) vehicle traffic to behind the dunes. This has to be properly planned however. The current speed reduction from 100km/h to 80km/h in the area of Langstrand and Dolphin Beach is a frustration, rather than a solution.
C: Unitrans	The haulage operator has no objection to using MR44
C: Hon Kandjala	A bylaw may have to be passed to force heavy traffic to use MR44 to relieve the traffic problem now.
Q: J Smith WBCG	Explain what is meant with "limitation to Walvis Bay growth"
A (BB):	Walvis Bay cannot easily develop within the dune area to the south and north east. Its geographical growth will therefore happen along the coast towards Swakopmund, which will result in the current TR2/1 becoming an arterial, serving the local urban community. MR44 will therefore have to take over in the future as the main through-road for long-distance traffic.

C: J Smith WBCG	Expected traffic volume increase is in the order of 10 to 15% (heavy vehicles) according to Walvis Bay Corridor Group (WBCG) projections Discussions have been held in the past to divert heavy traffic to MR44, this was however not supported strongly by the RA and transport sector. Eventually, a two lane highway is anticipated between Walvis Bay and Swakopmund The "big picture" has to be kept in mind, whereby the Walvis Bay harbour will serve as import and export hub for neighbouring countries - resulting in more than usual traffic) (Note: this has already been assessed as part of the study) A transportation masterplan will be developed for all modes of transport for the entire Namibia - this will guide future transport network development.
Q:	Can the railway not take over and reduce the number of heavy vehicles operating on the road.
A (BB):	This is unlikely to happen within the analysis period of this project (the next 20 years), and will, if at all, only have a marginal effect, i.e. no significant reduction in heavy vehicles.
C: J Smith	Railway will become more important in the future to transport goods to and from Walvis Bay. Transnamib is in the process of upgrading their assets.
C: (Rössing)	Roads Authority should be commended on their planning effort Reducing speed limit on TR2/1 will be counter-productive as it increases frustration and leads to people taking more chances. Rössing personnel busses would prefer to use MR44, but the current road geometry and surfacing make it very dangerous, especially during adverse weather (mist and sandstorms), to use that road. The lives of employees are at higher risk when using that road than the coastal road.
Q:	Why is a partial upgrade being considered, why not upgrade to dual carriageway highway standards right away?
A:	Again, traffic volumes determine the need for roads. Current projections indicate that building a freeway would be over-expenditure. Development must be sustainable, i.e. spend money on what is necessary.
Q:	What provision can be made during the planning phase to allow for future addition of cycling and pedestrian lanes? The provision of space for these should be done now to allocate the adequate space. The influx of people to the coast due to industry will mean that these people may want to also spend their leisure time walking and cycling. This has to be planned for.
A (BB):	Sufficient space is available within the existing 60m road reserve for addition of such lanes in the future.
Q: (Hon Kandjala)	Can the crosses indicating the death of people on the road not be replaced by something friendlier? They scare away visitors. Also, what will happen to these graves if the road is widened?
A: (ES)	The crosses are illegally built in the road reserve and will be removed during any upgrade process. These crosses are not actual graves, no relocation of graves is necessary.
Q:	If the crosses are hazards, why were palm trees allowed to be planted along the road leading out of Walvis Bay?

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- A: (BB)** The Roads Authority objected to the planting of the palm trees because these are a maintenance problem as they trap windblown sand on the road, thereby introducing a further hazard. The Municipality of Walvis Bay however allowed and accepted responsibility for these trees and the maintenance and removal of accumulated sand around these.
-
- C:** Law enforcement should be more visible along the road, at least until such time when the inland road is built, to ensure more disciplined driver behaviour along the coastal road.

6. ENVIRONMENTAL IMPACT ASSESSMENT

Checklists offer the advantage of simplicity. They bring structure to gathering and classifying information, to identifying potential environmental impacts, and to thinking about possible mitigation options. They also help in reaching tentative conclusions on the extent of environmental impact. A simple checklist comprise of the following categories:

Checklists are widely used in EIA processes to guide decision-making, especially during the pre-feasibility and planning phases of the project lifecycle, when it is most critical to anticipate adverse impacts and to include mitigating measures in projects. Checklists are designed:

- To help **identify significant negative impacts** by providing the right questions to ask regarding the various project activities and the respective environmental components that may be affected. Checklists can be used to determine environmental impact thresholds, thus indicating whether a full-scale EIA is needed for a particular project;
- To provide a **systematic approach** to the environmental screening of development projects. A checklist forces the assessment to consider a standardised set of activities or effects for each proposed action, thus bringing uniformity to the assessment process;
- To indicate **how and why certain project activities have environmental impacts** which will allow planners to transfer those principles to the screening of projects not specifically addressed by the checklists?
- To assist in **identifying appropriate mitigation measures** to be incorporated into the project design; and,
- To **increase environmental awareness and understanding** of the relationship between environmentally sound practices and sustainable development.⁷

The following questionnaire checklist was used during the identification, evaluation and significant rating of environmental aspects associated with this project based on the methodology mentioned in section 3.2 of this document.

⁷ Directorate of Environmental Affairs, 2008. Procedures and Guidelines for Environmental Impact Assessment (EIA) and Environmental Management Plans (EMP), Directorate of Environmental Affairs, Ministry of Environment and Tourism, Windhoek.

PART 1 OF THE SCOPING CHECKLIST: QUESTIONS ON PROJECT

CHARACTERISTICS

1. Will construction, operation or decommissioning of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)?

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
1.1	Permanent or temporary change in land use, land cover or topography including increases in intensity of land use?	Yes	The quarry operations will permanently alter the land use, land cover and, for the borrow pits - topography of the area. Cutting and filling alongside the road. No Land use changes will take place.	Medium significance because of mitigation measures that can be implemented. Low significance due to the small scale of cutting and filling.
1.2	Clearance of existing land, vegetation and buildings?	Yes	Clearing of vegetation for construction operations influencing the vegetation, soils and topography.	The effect might be of low significance. The endemism of the vegetation is low alongside the MR44 road and existing borrows pit areas.
1.3	Creation of new land uses?	No		
1.4	Pre-construction investigators egg boreholes, soil testing?	Yes	Material testing will be conducted prior to borrow pit identification and material allocation for construction. The topography will be altered as well as flora and soils.	Low significance due to the extent.
1.5	Construction works?	Yes	Construction activities involve the road, bridge over the Swakop River and culverts for the drainage lines.	The impact might be low and the impacts can further be mitigated.
1.6	Demolition works?	No		
1.7	Temporary sites used for construction works or housing of construction workers?	Yes	The construction site will be based in the urban areas of Walvis Bay or Swakopmund.	No.
1.8	Above ground buildings, structures or earthworks including linear structures cut and fill or excavations?	Yes	The above ground earthworks will be regarded as primarily for the road construction. Topography will be affected as well as soils.	Yes, the excavations will be prominent during the construction phase. This includes borrow pits.
1.9	Underground works including mining or tunnelling?	No		
1.10	Reclamation works?	No		
1.11	Dredging?	No		

1.12	Coastal structures egg seawalls, piers?	No		
1.13	Offshore structures?	No		
1.14	Production and manufacturing processes?	No		
1.15	Facilities for storage of goods or materials?	No	All materials and goods will be stored in urban areas.	No impact predicted.
1.16	Facilities for treatment or disposal of solid wastes or liquid effluents?	No		
1.17	Facilities for long term housing of operational workers?	No		
1.18	New road, rail or sea traffic during construction or operation?	Yes	Traffic increase due to movement of construction vehicles. Health and safety.	Medium significance due to safety concerns for regular road users as well as construction workers.
1.19	New road, rail, air, water body or other transport infrastructure including new or altered routes and stations, ports, airports etc.?	No	The use of the existing MR44 will serve as the service road for the new road.	No. Existing route.
1.20	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	Yes	Temporary limitations, deviations or routes will be constructed during the projects. Health and Safety.	Due to the high volumes of traffic MR44 and TR2/1 carries, these activities might have a significant impact. Mitigation measures will limit the significance.
1.21	New or diverted transmission lines or pipelines?	No		
1.22	Impoundment, damming, culverts, realignment or other changes to the hydrology of watercourses or aquifers?	Yes	New culverts will not impact on the surface runoff patterns or the Swakop River.	No significance.
1.23	Stream crossings?	Yes	Swakop River crossing.	No significance.
1.24	Abstraction or transfers of water from ground or surface waters?	No		
1.25	Changes in water bodies or the land surface affecting drainage or run-off?	No		
1.26	Transport of personnel or materials for construction, operation or commissioning?	Yes	Materials and personnel will be transported during construction and operation phases. Health and Safety.	Medium significance on the health and safety of the personnel as well as the public due to increased traffic volumes.
1.27	Long term dismantling or decommissioning or restoration works?	No		
1.28	On-going activity during decommissioning which could have an impact on the environment?	No		
1.29	Influx of people to an area in either temporarily or permanently?	Yes	Temporary influx of people during construction phase.	Low significance due to the small work force.
1.30	Introduction of alien species?	No		

1.31	Loss of native species or genetic diversity?	Yes	Surface disturbances always impact on the bio-diversity of an area. Soils, fauna and flora.	There might be low significant impact on the genetic diversity due to low endemism of the plains.
1.32	Any other actions?	No		

2. Will construction or operation of the Project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
2.1	Land especially undeveloped or agricultural land?	Yes	The biggest impact will be the borrow pits needed to be constructed to obtain the necessary materials for the construction of the road. This will impact on the natural materials excavated from the pits.	The significance will be medium but proper mitigation measures will result in a medium – low significance.
2.2	Water?	Yes	Water is used for domestic and construction purposes.	The available water will be used but the significance might be medium due to the volumes.

3. Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
3.1	Will the project involve use of substances or materials which are hazardous or toxic to human health or the environment (flora, fauna, and water supplies)?	Yes	Hydrocarbons, fuels and some chemicals such as battery acid, surface primer and possible pesticides.	The significance might be significant should mitigation measures not be implemented.
3.2	Will the project result in changes in occurrence of disease or affect disease vectors (eg insect or water borne diseases)?	No		
3.3	Will the project affect the welfare of people eg by changing living conditions?	Yes	Road user safety will increase due to better road conditions (operational phase).	Medium – high positive significance.
3.4	Are there especially vulnerable groups of people who could be affected by the project eg hospital patients, the elderly?	No		
3.5	Any other causes?	No		

4. Will the Project produce solid wastes during construction or operation or decommissioning?

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
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4.1	Spoil, overburden or mine wastes?	Yes	Soil and topography will be affected with the overburden produced during material excavations at the borrow pits.	Medium significance and can be mitigated successfully.
4.2	Municipal waste (household and or commercial wastes)?	Yes	Domestic waste will be generated at the construction site.	No. The domestic waste can be managed.
4.3	Hazardous or toxic wastes (including radioactive wastes)?	No		
4.4	Other industrial process wastes?	No		
4.5	Surplus product?	No		
4.6	Sewage sludge or other sludge from effluent treatment?	No		
4.7	Construction or demolition wastes?	No		
4.8	Redundant machinery or equipment?	No		
4.9	Contaminated soils or other material?	Yes	There is always a possibility that contamination of soils can occur during operation due to spillage of oils / diesel / bitumen.	No. The scale of contamination is very limited and can be mitigated.
4.10	Agricultural wastes?	No		
4.11	Any other solid wastes?	No		

5. Will the Project release pollutants or any hazardous, toxic or noxious substances to air?

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources?	Yes	Gasses such as Nox and Sox are deposited in the air from the machines.	No. The quantity of these gasses will not impact negatively on the environment.
5.2	Emissions from production processes?	No		
5.3	Emissions from materials handling including storage or transport?	Yes	Gasses such as Nox and Sox are deposited in the air from the machines.	No. The quantity of these gasses will not impact negatively on the
5.4	Emissions from construction activities including plant and equipment?	Yes	The movement from vehicles will generate dust and gaseous emissions.	The significance will be low and can further be mitigated.
5.5	Dust or odours from handling of materials including construction materials, sewage and waste?	Yes	Dust from mineral handling, crushing and transport.	Yes. Dust might be a nuisance to receptors.

5.6	Emissions from incineration of waste?	No		
5.7	Emissions from burning of waste in open air (eg slash material, construction debris)?	No		
5.8	Emissions from any other sources?	No		

6. Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
6.1	From operation of equipment eg engines, ventilation plant, crushers?	Yes	The mining of borrow pits and production equipment produces noise and vibrations as well as the crunching and screening.	Depending on the receptors in close proximity of the plant. The significance might be low.
6.2	From industrial or similar processes?	No		
6.3	From construction or demolition?	Yes	Construction might produce noise.	Low significance.
6.4	From blasting or piling?	Yes	If blasting will occur, there will be negative impacts on the environment.	Significance depends on the receptors in the area. If the blasting is going to take place at the Swakop River crossing – medium significance.
6.5	From construction or operational traffic?	Yes	The hauling trucks will produce noise and vibration.	No. The impact is very local and is not significant.
6.6	From lighting or cooling systems?	No		
6.7	From sources of electromagnetic radiation (consider effects on nearby sensitive equipment as well as people)?	No		
6.8	From any other sources?	No		

7. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into sewers, surface waters groundwater, coastal waters or the sea?

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
7.1	From handling, storage, use or spillage of hazardous or toxic materials?	Yes	Impact on soil and surface water quality due to spillage of oils and hydrocarbon liquids (diesel, oil and bitumen).	Low significance due to proper mitigation measures.

7.2	From discharge of sewage or other effluents (whether treated or untreated) to water or the land?	No		
7.3	By deposition of pollutants emitted to air, onto the land or into water?	Yes	Gasses from the machines.	Low significance. If not properly mitigated or managed.
7.4	From any other sources?	Yes	From blasting. Nitrates and other chemical compounds will be present after blasting.	Low significance due to the scale and possibility of occurrence.
7.5	Is there a risk of long term build-up of pollutants in the environment from these sources?	No		

8. Will there be any risk of accidents during construction or operation of the Project which could affect human health or the environment?

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous or toxic substances?	Yes	Blasting might take place.	Low significance due to the scale and mitigation measures.
8.2	From events beyond the limits of normal environmental protection eg failure of pollution controls systems?	No		
8.3	From any other causes?	No		
8.4	Could the project be affected by natural disasters causing environmental damage (eg floods, earthquakes, landslip, etc)?	No		

9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
9.1	Changes in population size, age, structure, social groups etc?	No		
9.2	By resettlement of people or Demolition of homes or communities or community facilities eg schools, hospitals, social facilities?	No		
9.3	Through in-migration of new residents or creation of new communities?	No		
9.4	By placing increased demands on local facilities or services eg housing, education, health?	No		

9.5	By creating jobs during construction or operation or causing the loss of jobs with effects on unemployment and the economy?	Yes	The local community will benefit from the construction phase.	The significance might be positive medium due to lack of work in the area.
9.6	Any other causes?	No		

10. Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
10.1	Will the project lead to pressure for consequential development which could have significant impact on the environment eg more housing, new roads, new supporting industries or utilities, etc?	No		
10.2	Will the project lead to development of supporting facilities, ancillary development or development stimulated by the project which could have impact on the environment eg: <ul style="list-style-type: none"> • supporting infrastructure (roads, power supply, waste or waste water treatment, etc) • housing development • extractive industries • supply industries • other? 	Yes	Increased transport efficiency and safety will have positive impacts on the socio-economic environment of the area.	Unknown – Please refer to the Socio-economic Impact Assessment document.
10.3	Will the project lead to after-use of the site which could have an impact on the environment?	No		
10.4	Will the project set a precedent for later developments?	?		Unknown – Please refer to the Socio-economic Impact Assessment document.
10.5	Will the project have cumulative effects due to proximity to other existing or planned projects with similar effects?	?		Unknown – Please refer to the Socio-economic Impact Assessment document.

PART TWO OF THE SCOPING CHECKLIST: CHARACTERISTICS OF THE PROJECT ENVIRONMENT

For each project characteristic identified in Part consider whether any of the following environmental components could be affected.

<p>Question - Are there features of the local environment on or around the Project location which could be affected by the Project?</p> <ul style="list-style-type: none"> • The Dorob National Park surrounds the proposed area and might be affected by the borrow pit operations, but not the construction activities of the new road. • The breeding grounds for the Damara Tern are not affected by this project. • There is a very low possibility of features of high historic or cultural importance. • Surface drainage patterns will be addressed through proper engineering design.
<p>Question - Is the Project in a location where it is likely to be highly visible to many people?</p> <p>The topographical characteristics of the area are such that the visual impact will be minimal due to the high dunes to the west and limited receptors to the east.</p>
<p>Question - Is the Project located in a previously undeveloped area where there will be loss of Greenfield land?</p> <p>The roads will be constructed in the current road reserve between the MR44 and the railway line. Small areas will be affected that can be regarded as Greenfields (for the borrow pits), but the significance is low due to the small areas affected and the sensitivity of the vegetation in the areas.</p>
<p>Question - Are there existing land uses on or around the Project location which could be affected or altered?</p> <p>The land use for the current transport corridor will not be altered.</p>
<p>Question - Are there any plans for future land uses on or around the location which could be affected by the Project?</p> <p>No. The adjacent land uses will probably remain protected areas and recreational.</p>
<p>Question - Are there any areas on or around the location which are densely populated or built-up, which could be affected by the Project?</p> <p>There are no densely populated areas around the project.</p>
<p>Question - Are there any areas on or around the location which are occupied by sensitive land uses which could be affected by the Project?</p> <p>The only areas of importance are the conservation areas of the Dorob National Park and the conservation areas with special reference to bird breeding grounds to the east. The borrow pits might have an impact on the Dorob National Park.</p>
<p>Question - Are there any areas on or around the location which contain important, high quality or scarce resources which could be affected by the Project?</p> <p>There are no scarce resources found around the project that could be influenced by the construction or operational phases of these projects. The only concern is Damara Tern breeding grounds that falls outside the project area.</p>
<p>Question - Are there any areas on or around the location of the Project which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?</p> <p>No. Even though levels of pollution have not been tested it is unlikely that legal levels of pollution has been or will be exceeded.</p>
<p>Question - Is the Project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?</p> <p>Winds and fog plays a part in the safety of drivers on the salt road – contributing to the motivation for the upgrade of the current MR44 road.</p>

Question - Is the Project likely to affect the physical condition of any environmental media?

Yes, the project has got an impact on the environmental media which includes the atmosphere (local), surface water run-off drainage patterns, soils (compaction, crusting, and erosion) and natural ground conditions due to quarrying and construction.

The physical condition of the environment will be changed – some permanently and other during the construction phase of the project.

Question - Are releases from the Project likely to have effects on the quality of any environmental media?

- The air quality might improve due to the upgrading of the road.
- The quality of soil might deteriorate without proper management.
- Acidification of soils or waters will probably not occur.
- There will be some noise generated during the construction and operational phase of the road, but will be limited to the site.
- Impact on vegetation will be evident for some time but will re-generate after some time. The sensitivity of the vegetation is regarded to be low – medium (Flora Specialist Investigation Report)

Question - Is the Project likely to affect the availability or scarcity of any resources either locally or globally?

- The project will use fossil fuels in liquid (diesel).
- Water will also be used for dust suppression, construction and domestic use.
- The quarrying activity extracts minerals on a non-renewable basis.

Question - Is the Project likely to affect human or community health or welfare?

- The quality of air will be affected due to construction activities and hauling. Even though this is the case, human health will not be affected.
- No mortality or morbidity might be experienced by human receptors.
- The project will have a positive impact on the social economic welfare of the region.
- Better access between Swakopmund and Walvis Bay will improve road safety, decrease traffic on the coastal routes (especially heavy vehicle traffic) and will be economical viable for transporters to move good from Walvis Bay Port alongside the this route to the rest of Africa.

In the Scoping checklist, the significance must be indicated. To facilitate this procedure, the following questions were considered during the rating:

Questions that were considered to determine significance:

1. Will there be a large change in environmental conditions?
2. Will new features be out-of-scale with the existing environment?
3. Will the effect be unusual in the area or particularly complex?
4. Will the effect extend over a large area?
5. Will there be any potential for Trans frontier impact?
6. Will many people be affected?
7. Will many receptors of other types (fauna and flora, businesses, facilities) be affected?
8. Will valuable or scarce features or resources be affected?
9. Is there a risk that environmental standards will be breached?
10. Is there a risk that protected sites, areas, features will be affected?
11. Is there a high probability of the effect occurring?
12. Will the effect continue for a long time?
13. Will the effect be permanent rather than temporary?
14. Will the impact be continuous rather than intermittent?
15. If it is intermittent will it be frequent rather than rare?
16. Will the impact be irreversible?
17. Will it be difficult to avoid, or reduce or repair or compensate for the effect?

6.1 Environmental Impact Assessment Summary

The following environmental impacts were identified during the assessment procedure as described above. The impacts are classified as either positive or negative and the significance ratings as low, medium and high. Mitigation measures are not reckoned for the significance classification.

Ref.	Activity	Aspect / Impact	Positive / Negative	Significance
1.1	Land use / topography, and land use cover.	The quarry operations will permanently alter the land use, land cover and, for the borrow pits - topography of the area.	Negative	Medium
		Cutting and filling along the road will impact on the topography, soils and vegetation.	Negative	Low
1.2	Clearance of existing land, vegetation and buildings.	Clearing of vegetation for construction operations influencing the vegetation, soils and topography.	Negative	Low
1.4	Pre-construction investigators egg boreholes, soil testing?	Material testing was conducted prior to borrow pit identification and material allocation for construction. The topography is altered.	Negative	Low
1.5	Construction works.	Construction involves not only the road but also the construction camp. Temporary land use changes will occur.	Negative	Low
1.8	Above ground buildings, structures or earthworks including linear structures cut and fill or excavations?	The above ground earthworks will be regarded as primarily for the road construction. Topography will be affected as well as soils.	Negative	Medium
1.18	New road, rail or sea traffic during construction or operation?	Traffic increase due to movement of construction vehicles. Health and safety.	Negative	Medium
1.20	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	Temporary limitations, deviations or routes will be constructed during the projects. Health and Safety.	Negative	Medium
1.26	Transport of personnel or materials for construction, operation or commissioning?	Materials and personnel will be transported during construction and operation phases. Health and Safety.	Negative	Medium
1.29	Influx of people to an area in either temporarily or permanently?	Temporary influx of people during construction phase.	Negative	Low
1.31	Loss of native species or genetic diversity?	Surface disturbances always impact on the bio-diversity of an area. Soils, fauna and flora.	Negative	Low
2.1	Land especially undeveloped or agricultural land?	The biggest impact will be the borrow pits needed to be constructed to obtain the necessary materials for the construction of the road. This will impact on the natural materials excavated	Negative	Medium

		from the pits.		
2.2	Water?	Water is used for domestic and construction purposes.	Negative	Medium
3.1	Will the project involve use of substances or materials which are hazardous or toxic to human health or the environment (flora, fauna, and water supplies)?	Hydrocarbons, fuels and some chemicals such as battery acid, surface primer and pesticides may impact on the soil, water and air (pollution).	Negative	Medium
3.3	Will the project affect the welfare of people eg by changing living conditions?	Road user safety will increase due to better road conditions (operational phase).	Positive	High
4.1	Spoil, overburden or mine wastes?	Soil, vegetation and topography will be affected with the overburden produced during material excavations at the borrow pits.	Negative	Low
5.4	Emissions from construction activities including plant and equipment?	The movement from vehicles will generate dust and gaseous emissions. Impact on air quality as well as health and safety.	Negative	Low
5.5	Dust or odours from handling of materials including construction materials, sewage and waste?	Dust from mineral handling, crushing and transport. Might impact on the air quality and health and safety.	Negative	Low
6.1	From operation of equipment eg engines, ventilation plant, crushers?	The mining of borrow pits and production equipment produces noise and vibrations as well as the crunching and screening.	Negative	Low
6.4	From blasting or piling?	If blasting will occur, there will be negative impacts on the environment.	Negative	Low
7.1	From handling, storage, use or spillage of hazardous or toxic materials?	Impact on soil and surface water quality due to spillage of oils and hydrocarbon liquids (diesel, oil and bitumen).	Negative	Low
7.3	By deposition of pollutants emitted to air, onto the land or into water?	Gasses from the machine will impact on the air quality.	Negative	Low
7.4	From any other sources?	From blasting. Nitrates and other chemical compounds will be present after blasting.	Negative	Low
9.5	By creating jobs during construction or operation or causing the loss of jobs with effects on unemployment and the economy?	The local community will benefit from the construction phase. Socio- economic conditions.	Positive	Medium

7. ANALYSIS OF ALTERNATIVES

The following alternatives were considered during the feasibility study of the proposed project:

7.1 Horizontal alignment of the roads:

The first alternative was to use the existing alignment of the MR44 for upgrading to bitumen standard. This alternative is not being executed due to the base layering work quality that is uncertain. It was decided to use the existing MR44 as the temporary route while the new road will be constructed. This way the impact is also lessened. The new alignment will then be between the existing MR44 road and the railway line.

7.2 Construction Method

The use of large machines will be the most effective way of construction. Any other alternative will impact negatively on construction time resulting in higher cost and risks for road user safety.

7.3 Construction Materials

The exploration and testing of materials suitable for the project still needs to be done. Local knowledge of various existing sources of materials is known (used for the construction of existing roads). These existing sources will be used and there will also be a few more areas tested for suitable construction material.

The G2/3 materials will be sourced from a commercial quarry that can supply quality materials for the construction of the road.

7.4 The “No-Go” Option

If this option is selected the status quo of the environment will prevail. The existing road will deteriorate to such an extent that the road surface quality will become unsafe to commuters and other road users and the use thereof will increase vehicle operating costs. Severe fatal accidents will increase and use of the road will become intolerable.

8. MITIGATION PLAN

The Environmental and Social Management Program (ESMP) will be implemented during construction. The ESMP is intended to bridge the gap between the Environmental Impact Assessment (EIA) and the implementation of the project, particularly with regard to implementing the mitigation measures recommended in the Environmental Impact Assessment (EIA). Monitoring, auditing and taking corrective actions during implementation are crucial interventions to successfully implement the ESMP.

The ESMP detail actions to ensure compliance with regulatory bodies and that environmental performance is verified through information on impacts as they occur.

ESMP implementation is a cyclical process that converts mitigation measures into actions and through cyclical monitoring, auditing, review and corrective action, ensures conformance with stated ESMP aims and objectives. Through monitoring and auditing, feedback for continual improvement in environmental performance must be provided and corrective action taken to ensure that the ESMP remains effective.

8.1 ESMP Administration

Copies of the ESMP shall be kept at the site office and will be distributed to all senior contract personnel. All senior personnel shall be required to familiarize themselves with the contents of this document.

8.2 Roles and Responsibilities

The implementation of the ESMP requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during each phase.

A) Engineer's Representative (ER)

The Engineer will delegate powers to the Engineer's Representative (ER) on site who would act as the Employer's implementing agent and has the responsibility to ensure that the Employer's responsibilities are executed in compliance with relevant legislation and the ESMP. The Engineer also has the responsibility to approve the appointment of the Environmental Control Officer (ECO).

Any on-site decisions regarding environmental management are ultimately the responsibility of the ER. The ER will have the following responsibilities in terms of the implementation of this ESMP:

- Controlling that the necessary environmental authorizations and permits have been obtained by the Contractor.
- Assisting the Contractor in finding environmentally responsible solutions to problems with input from the ECO (Environmental Control Officer) where necessary.
- Taking appropriate action if the specifications are not followed.
- Ordering the removal of person(s) and/or equipment not complying with the EMP specifications.

- Recommending and issuing fines for transgressions of site rules and penalties for contravention of the ESMP.
- Advising on the removal of person(s) and/or equipment not complying with the specifications.
- Receive and record any complaints (concerning environmental matters) from landowners or the public.
- Auditing the implementation of the ESMP and compliance with authorization on a monthly basis.
- Undertaking a continual review of the ESMP and recommending additions and/or changes to the document after completion of the contract.

B) Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) will be a competent person from the staff of the Contractor to implement the on-site environmental management of this ESMP by the Contractor. The ECO shall be on site daily and the ECO's duties will include the following:

- Assisting the ER in ensuring that the necessary environmental authorizations and permits have been obtained.
- Maintaining open and direct lines of communication between the ER, Contractor and interested and effected parties (I&APs) with regard to environmental matters.
- Convening and facilitating public meetings.
- Regular site inspections of all construction areas with regard to compliance with the ESMP.
- Monitoring and verifying adherence to the ESMP, monitoring and verifying that environmental impacts are kept to a minimum.
- Assisting the Contractor in finding environmentally responsible solutions to problems.
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel coming onto site.

C) The Contractor

The duties of the Contractor are as follows:

- The Contractor shall be familiar with the contents of the ESMP in order to understand the mitigation measures and the reasons for the measures.
- The Contractor's site agent and his Safety Health and Environmental Offices shall at all times be in possession of this ESMP.
- Attend lectures / training that deals with environmental issues and the content of the ESMP.
- The Contractor shall ensure that he complies fully with the Environmental Specifications. This includes all plant operators, transport vehicles, and sub-contractors.
- The Contractor should also notify the ER of any activity that could or did impact negatively on the environment.

- The Contractor is responsible for any rectification measures needed to rectify, mitigate or avoid environmental degradation or impact during the construction phase of the project.

8.3 Environmental Awareness Training

Before any work is commenced on the Site, the Contractor shall ensure that adequate environmental awareness training of senior site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the ESMP. The Contractor shall liaise with the Engineer during the establishment phase to fix a date and venue for the training and to agree on the training content.

The Contractor shall provide a suitable venue and ensure that the specified employees attend the course. The Contractor shall ensure that all attendees sign an attendance register, and shall provide the ER with a copy of the attendance register. The presentation shall be conducted, as far as is possible, in the employees' language of choice.

As a minimum, training should include:

- Explanation of the importance of complying with the ESMP.
- Discussion of the potential environmental impacts of construction activities.
- The benefits of improved personal performance.
- Employees' roles and responsibilities, including emergency preparedness.
- Explanation of the mitigation measures that must be implemented when carrying out their activities.
- Explanation of the specifics of this ESMP and its specification (no-go areas, etc.)
- Explanation of the management structure of individuals responsible for matters pertaining to the ESMP.
- A HIV/AIDS awareness programme as part of Health and Safety issues.
- The contractor shall keep records of all environmental training sessions, including names, dates and the information presented.

8.4 Public Participation

An on-going process of public participation shall be maintained during construction to ensure the continued involvement of interested and affected parties (I&APs) in a meaningful way. Public meetings to discuss progress and any construction issues that may arise shall be held at least every three months and more regularly if deemed necessary by the ER. These meetings shall be arranged by the ECO but shall be facilitated by the ER. The Contractor shall present a progress report at each public meeting. All I&APs that participated in or were informed during the EIA shall be invited to each of the public meetings.

8.5 Environmental Mitigation Measures

COMPONENT	OBJECTIVE	MANAGEMENT MEASURES	RESPONSIBILITY/ PARTNERSHIPS
8.5.1 MANAGEMENT AND MONITORING	To ensure that the provisions of the ESMP are implemented during construction.	<ul style="list-style-type: none"> a. The environmental and social consultant shall ensure that all aspects of the ESMP are implemented during construction. b. The environmental and social consultants shall attend regular site inspections and meetings and minutes shall make provision for reporting on every aspect of the ESMP. 	Environmental and social consultant together with the ECO.
8.5.2 COMMUNICATION AND STAKEHOLDER CONSULTATION	To ensure that all stakeholders are adequately informed throughout construction and that there is effective communication with and feedback to the consultant and client.	<ul style="list-style-type: none"> a. The Contractor shall appoint an ECO from the construction team to take responsibility for the implementation for all provisions of this ESMP and to liaise between the contractor, community, client and consultants. The ECO must be appointed at least 14 days after the site-handover. b. The Contractor shall at every site meeting report on the status of the implementation of all provisions of the ESMP. c. The contractor shall implement the environmental awareness training as stipulated in Section 8.3 above. d. The Contractor shall liaise with the social and environmental consultants regarding all issues related to community consultation and negotiation as soon as possible after construction commences. 	Contractor/ Environmental and Social Consultant to monitor.
8.5.3 HEALTH AND SAFETY	To ensure health and safety of workers and the public at all times during construction	<ul style="list-style-type: none"> a. The Contractor shall submit a strategy to ensure the least possible disruption to traffic and potential safety hazards during construction. b. The strategy should include a schedule of work indicating when and how road crossings (construction at existing intersections) will be made. The schedule will be updated and distributed to all stakeholders. c. The Contractor shall also liaise with the Traffic Authorities in this regard. d. Proper traffic and safety warning signs will be placed at the construction site to the satisfaction of the Engineer and the Roads Authority. e. The Contractor will adhere to the regulations pertaining to Health and Safety, including the provision of protective clothing, failing which the Contract may be temporarily suspended until corrective actions were taken. f. Dust protection masks shall be provided to task workers if they complain about dust. 	Contractor will ensure the mitigation measures are enforced at his own expense. The ECO will monitor.

COMPONENT	OBJECTIVE	MANAGEMENT MEASURES	RESPONSIBILITY/ PARTNERSHIPS
		<ul style="list-style-type: none"> g. Surface dust will be contained by wetting dry surfaces periodically with a water bowser, sprinkler system or any suitable method. This applies for the construction site as well as all the roads. h. Potable water shall be available to workers to avoid dehydration. This water shall be of acceptable standards to avoid any illness. At least 5 liters of drinking water per person per day shall be made available during construction. i. The contractor shall enforce relevant Health and Safety Regulations for these specific activities. j. The contractor shall also comply with relevant Labour Laws as stipulated by the Labour Act. k. The Contractor shall implement a HIV/AIDS awareness programme as part of Health and Safety. l. Blasting may only be conducted by a qualified person and all laws and regulations will be enforced before and during blasting. 	
8.5.4 CONSERVATION OF THE NATURAL AND HISTORICAL ENVIRONMENT	<p>To minimise damage to soil, vegetation and historical resources during the construction phase. This includes soil crusting, soil erosion and unnecessary vegetation destruction.</p> <p>Management of water (domestic and construction).</p> <p>Management of other sensitive areas.</p>	<ul style="list-style-type: none"> a. At the outset of construction (or during construction as may be applicable), the ECO and the contractor shall visit all proposed borrow-pits, haul roads, access roads, camp sites, and other areas to be disturbed outside the road reserve. Areas to be disturbed shall be clearly demarcated, and no land outside these areas shall be disturbed or used for construction activities. Detailed instructions and final arrangements for protection of sensitive areas, keeping of topsoil and rehabilitation of disturbed areas shall be made, in line with the guidelines in this document. The ECO shall be consulted before any new areas are disturbed which have not yet been visited. b. No off-road driving shall be allowed, except on the agreed haul and access roads. Special attention will be given to lichen areas. c. Vegetation shall be cleared within the road reserve as necessary for the construction of the road. The reserves on either sides of this corridor may not be cleared of vegetation, unless permission is given to do so for detours or access roads. This measure is subjected to the Roads Authority of Namibia specifications with regards to the road reserve. d. A prescribed penalty will be deducted from the Contractors payment certificate for every mature tree removed without approval. 	<p>Contractor will ensure the mitigation measures are enforced at his own expense. The ECO will monitor.</p>

COMPONENT	OBJECTIVE	MANAGEMENT MEASURES	RESPONSIBILITY/ PARTNERSHIPS
		<ul style="list-style-type: none"> e. Where compaction has taken place in disturbed areas, these areas will be ripped and covered with topsoil separately kept for this purpose. f. Poaching or collecting of wild animals is prohibited. g. The killing of any animal (reptile, bird or mammal) is prohibited. h. A prescribed penalty will be deducted from the contractor's payment certificate if it is shown that any of his staff or sub-contractors are involved in trapping, hunting or any kind of collecting of wild animals in the vicinity of the work sites. Offenders will be handed to the authorities for prosecution. i. Pipelines for the pumping of construction water shall as far possible run within the road reserve and along existing tracks and other roads. j. Water will not be allowed to be wasted. This includes water required for construction and domestic purposes. k. Special attention shall be given to sensitive sites when it comes to the identification of Damara Tern breeding grounds. Even though no sites are predicted in the area, if some of these sites are identified it should be reported to the RE for relocation measures. l. Collection of plants or parts of plants (including fuel wood of any size or description) is forbidden. m. As far as possible existing tracks alongside the existing salt road and within the present servitudes should be utilised for both construction and maintenance. These should be clearly indicated, together with designated turning points and construction laydown areas. The area used should be constrained as far as possible. Even in areas where tracks seem obvious, and are many, specific tracks should be selected and used. The choice should not be left to the individual. If necessary, dust suppression measures shall be taken. n. A map will be drafted to indicate the lichen areas to enforce a "limited access" area for the construction vehicles. This map will be drafted in cooperation with the RE, ECO and Environmental Specialist. 	

COMPONENT	OBJECTIVE	MANAGEMENT MEASURES	RESPONSIBILITY/ PARTNERSHIPS
8.5.5 BORROW PIT MANAGEMENT AND REHABILITATION	<p>To ensure proper soil management (combat soil erosion and promote biological activities).</p> <p>Preserve and manage natural vegetation.</p> <p>To ensure health and safety around the borrow pits (decommissioning phase).</p> <p>To stimulate ecological processes after decommissioning (to stimulate vegetation and other biological activities).</p> <p>To establish borrow pits which is aesthetically pleasing after decommissioning.</p>	<ol style="list-style-type: none"> a. The removal of material at borrow-pit sites shall be focused where the least significant vegetation exists and where suitable materials are available. b. The Engineers and surveyors must draft a plan for approval before commencement of a borrow pit. This plan must indicate the required resources and sensitive areas that may not be mined (indication of the lichen fields or other new sensitive areas). c. All borrow-pits must be rehabilitated. d. The borrow pits shall be rehabilitated by trimming the sides to a slope not steeper than 18° (1:3) and evenly spreading the top soil over the slopes to allow for the growth of new vegetation. e. All spoil material at the borrow pits shall be neatly shaped and no loose material (oversized) will be left inside the borrow pits. f. Access to borrow pits shall be controlled (using gates or manned positions). g. The borrow pit floor shall be leveled evenly as part of rehabilitation. h. The disturbed areas shall be raked by hand after sloping rehabilitation. This will limit the possible visual impacts. i. A Borrow Pit Rehabilitation Plan will be compiled indicating the rehabilitation schedule (time-frames) for the various borrow pits to be rehabilitated. 	<p>Contractor will ensure the mitigation measures are enforced at his own expense. The ECO will monitor.</p>

COMPONENT	OBJECTIVE	MANAGEMENT MEASURES	RESPONSIBILITY/ PARTNERSHIPS
<p>8.5.6 WASTE AND POLLUTION MANAGEMENT</p>	<p>To avoid contribution to potential surface and groundwater pollution.</p> <p>To avoid contribution to potential soil pollution.</p> <p>To ensure that sound waste management practices are adhered to during construction.</p>	<ol style="list-style-type: none"> a. Construction rubble and other waste generated during construction will be disposed of on a regular basis at an approved waste disposal site, which could be mined out borrow pits deep enough to properly bury construction waste such as concrete and oversize gravel and cover it with at least 1m of overburden material. A temporary waste site may be demarcated for temporary storage of waste, but this area will be identified and clearly marked. b. The temporary domestic waste site will be fenced off with access control to the area. c. Adequate separate containers for hazardous and domestic waste will be provided on site and at the construction camp. d. The workforce will be sensitized to dispose of waste in a responsible manner and not to litter. e. Waste bins will be placed in and around the construction site to facilitate proper waste management. f. No waste may remain on site after completion of the project. g. Toilet facilities will be available in the following ratio: 2 toilets for every 50 females and one toilet for every 50 males. The toilets should be such that it can be transported for various site selections and to be emptied at an approved sewage site. No person should have to walk more than 1km for the use of a toilet. h. A demarcated vehicle service area will be provided. This area will have an impermeable floor (lining or concrete), oil trap and dedicated wash bay area. All used water will first run through the oil trap before the effluent is allowed to exit. The oil trap will be cleaned on a regular basis to ensure its efficiency. i. Servicing of vehicles is only permitted in the demarcated vehicle service area, except for large immobile vehicles which may be serviced on site, on condition that oils and lubricants are prevented from spilling through the use of drip trays or other suitable containers. j. Drip trays will be available for all vehicles that are intended to be used during construction. These trays will be placed underneath each vehicle while the vehicles are parked. The drip trays will be cleaned every morning and the spillage handled as hazardous waste. k. Machines operating during the day that shows signs of excess leaking (verified by ECO or ER) should be withdrawn from the task and repaired by the 	<p>Contractor will ensure the mitigation measures are enforced at his own expense. The ECO will monitor.</p>

COMPONENT	OBJECTIVE	MANAGEMENT MEASURES	RESPONSIBILITY/ PARTNERSHIPS
		contractor. l. Accidental spills will be cleaned immediately. The contaminated soil will be suitably disposed of in a container suitable for hazardous waste.	
		m. Oil, lubricants, and other hazardous materials will be stored in separate containers (concrete liner, container, or metal or plastic drip tray) and stored for transport and disposal at an approved waste disposal site or for collection by an oil recycling company such as WESCO Salvage (this company collects significant quantities of oil from central locations throughout the country). n. Fuel tanks on site will be properly bunded. The volume of the bunded area will be sufficient to hold 1.5 times the capacity of the storage tanks. The floor of the bunded area will be impermeable (either lining or concrete) and the sides high enough to achieve the 1.5 times holding capacity. There will be a valve installed in the bunded area to allow rain water drainage. o. Foam fire extinguishers will be in close proximity to fuel kept on site. There will be trained personnel to handle this equipment. At least two extinguishers will be placed at every fuel storage area.	
8.5.7 REHABILITATION OF CONSTRUCTION SITE, SERVITUDES AND CLEARED AREAS (WHICH INCLUDES STOCKPILES)	To rehabilitate the site office, work sites, servitude areas, tracks and other areas disturbed during construction as close to their original state as reasonably possible.	a. All bunded areas, equipment, waste, temporary structures, stockpiles etc. must be removed from the camp and work sites. b. All disturbed areas shall be reshaped to their original contours; as close as possible to the natural conditions before construction commenced, including the road reserve, detours, construction camps, and temporary access routes. c. All cuttings must be shaped with a slope to provide a natural appearance, without having to destroy significant vegetation on top of the slope. d. Existing borrow pits adjacent to main roads need also be rehabilitated during rehabilitation phase.	Contractor will ensure the mitigation measures are enforced at his own expense. The ECO will monitor.

8.6 Non-Compliance

A) Procedures

The Contractor shall comply with the environmental specifications and requirements on an on-going basis and any failure on his part to do so will entitle the ER to impose a penalty. In the event of non-compliance the following recommended process shall be followed:

- The ER shall issue a notice of non-compliance to the Contractor through the ECO, stating the nature and magnitude of the contravention.
- The Contractor shall act to correct the non-conformance within 24 hours of receipt of the notice, or within a period that may be specified within the notice.
- The Contractor, through the ECO, shall provide the ER with a written statement describing the actions to be taken to discontinue the non-conformance, the actions taken to mitigate its effects and the expected results of the actions.
- In the case of the Contractor failing to remedy the situation within the predetermined time frame, the Engineer shall impose a monetary penalty based on the conditions of contract.
- In the case of non-compliance giving rise to physical environmental damage or destruction, the Engineer shall be entitled to undertake or to cause to be undertaken such remedial works as may be required to make good such damage and to recover from the Contractor the full costs incurred in doing so.
- In the event of a dispute, difference of opinion, etc. between any parties with regard to or arising from interpretation of the conditions of the ESMP, disagreement regarding the implementation or method of implementation of conditions of the ESMP, etc. any party shall be entitled to require that the issue be referred to specialists for determination.
- The Engineer shall at all times have the right to stop work and/or certain activities on site in the case of non-compliance or failure to implement remedial measures.

B) Offences and Penalties

Where the Contractor inflicts non-repairable damage upon the environment or fails to comply with any of the environmental specifications, he shall be liable to pay a penalty fine over and above any other contractual consequence.

The Contractor is deemed NOT to have complied with this Specification if:

- a. within the boundaries of the site, site extensions and haul/access roads there is evidence of contravention of the Specification;
- b. environmental damage due to negligence;

- c. the Contractor fails to comply with corrective or other instructions issued by the ER within a specific time;
- d. the Contractor fails to respond adequately to complaints from the public.

Penalties for the activities detailed below, might be imposed on discretion of the ER should the Contractor and/or his Subcontractors are found to be Non-Compliant (Section 8.6):

- | | |
|---|--|
| a. Actions leading to major erosion | A penalty equivalent in value to the cost of rehabilitation plus 20%. |
| b. Oil spills due to negligence and/or reluctance towards mitigation measures mentioned in the ESMP. | A penalty equivalent in value to the cost of clean-up operation plus N\$ 3000. |
| c. Damage to indigenous vegetation due to reluctance towards the ESMP. | A penalty equivalent in value to the cost of restoration plus N\$ 5 000. |
| d. Damage to demarcated sensitive environments | A penalty equivalent in value to the cost of restoration plus N\$ 5 000. |
| e. Damage to demarcated cultural sites | A penalty to a maximum of N\$100 000 shall be paid for any damage to any cultural/ historical sites. |
| f. Damage to trees | A penalty to a maximum of N\$5 000 shall be paid for each tree removed without prior permission, or a maximum of N\$5 000 for damage to any tree, which is to be retained on site. |
| g. Damage to natural fauna (due to negligence and/or reluctance towards the mitigation measures mentioned in the ESMP). | A penalty to a maximum of N\$5 000 for damages to any natural occurring animal. |
| h. Any persons, vehicles, plant, or thing related to the Contractors operations within the designated boundaries of a "no-go" area. | N\$4,000 |
| j. Litter on site. | N\$ 1,000 |
| k. Deliberate lighting of illegal fires on site. | N\$ 1,000 |

- Penalties may be issued per incident at the discretion of the Engineer. The Engineer will inform the Contractor of the contravention and the amount of the fine, and will deduct the amount from monies due under the Contract.
- For each subsequent similar offence the fine may, at the discretion of the ER, be doubled in value to a maximum value of N\$10, 000.
- Payment of any fines in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.
- In the case of a dispute in terms of this section, the Engineer shall determine as to what constitutes a transgression in terms of this document.

8.7 Environmental Monitoring and Auditing

Environmental monitoring should be conducted at least once every six months during construction. Benefits derived from the monitoring and final audit process might include:

- identification of environmental risk;
- development or improvement of the environmental management system;
- avoidance of financial loss;
- avoidance of legal sanctions;
- increase in staff awareness;
- identify potential cost savings;
- improve dealings with employees, environmental groups, the community, regulators, media, shareholders, or insurance & finance institutions; and
- establish a history of environmentally responsible operations, e.g. through environmental incident reports, environmental monitoring & recording, & reporting to committees or Authorities.

Commonly, the environmental monitoring or audit of a site will cover all management procedures, operational activities & systems, and environmental issues. The environmental monitoring and final audit will be compiled objectively and be conducted by an independent, competent entity.

8.8 Documentation, Record Keeping and Reporting Procedures

It is vital that an appropriate document handling and retrieval system be developed for all EMP documentation. This will ensure that there is adequate EMP documentation control and will facilitate easy document access and evaluation. EMP documentation should include:

- EMP implementation activity specifications;
- training records;

- site inspection reports;
- monitoring reports; and
- Performance Assessment reports.

Responsibilities must be assigned to relevant personnel for ensuring that the EMP documentation system is maintained and that document control is ensured through access by and distribution to, identified personnel.

Document control is important for the effective functioning of an EMP. A document handling system must be established to ensure adequate control of updating and availability of all documents required for the effective functioning of the EMP. This procedure applies to the EMP as well as procedures and policies relating to the EMP, which must be controlled (i.e. identified, registered and changes recorded).

The Environmental Officer is responsible for ensuring that the registration and updating of all relevant EMP documentation is carried out. It is the responsibility of the Project Manager to ensure that all personnel are performing according to the requirements of this procedure and to initiate the revision of controlled documents, when required by changes in process, operating procedures, legislation, specifications, monitoring or audit findings or any other circumstances, by informing the Environmental Officer of the changes. A controlled document is official only if the issue/revision has been approved. The Environmental Officer and Project Manager are responsible for ensuring that the latest versions of documents are used to conduct tasks which may impact on the project environment.

9. CONCLUSION AND RECOMMENDATIONS

This proposed upgrading of the MR44 and Coastal Route has been identified as an important section of road to be upgraded. Road safety has been deteriorating due to contributing factors such as increased traffic volumes (both commuter and heavy loads), periods of heavy fog limiting visibility and negatively affecting the road surface quality, and then the change of motorist driving behaviours where motorists get impatient due to the high traffic volumes and limited passing lanes and limited alternative routes between Swakopmund and Walvis Bay.

Limiting environmental factors were investigated and except for the vegetation and fauna, there are no significant impacts on the natural environment. Furthermore the ESMP will address these negative impacts and will mitigate successfully.

Improvements to the bio-physical and social environment will take place during operation of the project therefore concluding that the project will have a greater positive benefit to the environment (more especially the socio-economic environment) than negative.

We recommend environmental clearance for the project, subject to the strict implementation of the ESMP.

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APPENDIX A

SOCIAL IMPACT ASSESSMENT – URBAN DYNAMICS

APPENDIX B

CODE OF CONDUCT LIST

APPENDIX C

BORROW PIT REHABILITATION CHECKLIST

APPENDIX D

SPECIALIST ASSESSMENT: VEGETATION STUDY