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COMBINED SCOPING AND ASSESSMENT REPORT

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE NEW NAMPOWER POWER LINE FROM OBIB TO ZINCUM SUBSTATION FOR RPZC MINE

NOVEMBER 2013

(RESUBMISSION JULY 2021)

Compiled for:

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ACRONYMS

ASEC	A. Speiser Environmental Consultants
CV	Curriculum Vitae
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
IAPS	Interested and Affected Parties
MET	Ministry of Environment and Tourism
MHSS	Ministry of Health and Social Security
MSDS	Material Safety Data Sheet
my	million years
NACOMA	Namibian Coast Conservation and Management Project
NPC	National Planning Commission
OIS	Oxygen Isotope Stage
RPZC	Rosh Pinah Zinc Corporation
SEAT	Socio-economic Assessment Toolkit

EXECUTIVE SUMMARY

INTRODUCTION

The Rosh Pinah mine is situated in the Karas Region, 165 km south of Aus, which is 125km east of Lüderitz. At present Rosh Pinah Zinc Corporation (RPZC) (part of Trevali) produces zinc and lead concentrate. From 2015, RPZC plans to increase its annual production. The increase in production will require additional power supply provided by NamPower. NamPower has indicated that the existing 66 kV line would not be able to meet the mine's power requirements. As all power demands in the area are currently growing, these loads (including to the Sendelingsdrif Mine) would have a negative effect on the security of power supply to RPZC.

NamPower therefore recommends that a new 66 kV line be constructed from Obib to Zincum substation at Rosh Pinah with the specific purpose of supplying the mine with adequate power.

THE PROJECT

The new 66 kV line will be routed along the existing 66 kV line except for the parts from Obib substation to the Skorpion entrance gate and from Lorelei to Zincum Substation (South of Rosh Pinah). This new line will be approximately 26 km long and will be constructed with twin pelican conductors which will be able to carry considerably more than the existing line (in the order of 50 MVA) between Obib substation to Lorelei substation. From Lorelei to Zincum substation, single pelican conductors will be used. At this stage, there seems to be no need for any resettlement, even though the new substation and line will be routed in Rosh Pinah town and close to a few buildings.

RPZC hopes that construction can begin in early 2014. The line from Obib to Lorelei is expected to take 2.5 months and the line from Lorelei to ZinCum to take 1.5 months. Most of this work will be changes at the sub-stations. It is unlikely to require night working and it is proposed that the construction team will be accommodated in Rosh Pinah town. Laydown areas need yet to be located. At this stage, there seems to be no need for any resettlement, even though the new substation and line will be routed in Rosh Pinah town and close to a few buildings.

SCOPE AND OBJECTIVES

The scope and objectives for the EIA were discussed between Mr. M. Castelyn and Ms A. Speiser and the proposal was accepted in January 2013. The scope is a new 66 kV power line from the Obib substation to the Zincum Substation near RPZC mine. The final alignment of the power line needs to include the findings of the EIA.

The EIA will assess the new alignment of the proposed power line, its construction and operations and as far as possible its dismantling. The main objectives are to:

- describe the affected environment based on available documentation;
- identify and assess the potential positive and negative impacts of the new power line;
- liaise and consult with the relevant ministries to ensure that all legal requirements are met regarding the EIA;

- conduct public participation and focus group meetings at Rosh Pinah; and
- produce Environmental Management Plans for construction and operation of the new power line and the dismantling of the existing power line.

The assessment focused on third parties only and did not assess health and safety impacts on workers in detail because the assumption was made that these aspects are separately regulated by health and safety legislation, policies and standards.

EIA APPROACH AND METHODOLOGY

The approach and methodology, including stakeholder and public consultations for this combined scoping-environmental assessment followed the steps set out in the Environmental Impact Assessment Regulations, notably:

- Submitted Form 1 to MET (18/6/2013) (**Appendix A**)
- Notified stakeholders and IAPs through site notices and posters in Rosh Pinah, advertisements in national newspapers, and by distributing a background information document (BID) by email.
- Placed the BID for review by government authorities and IAPs at the Rosh Pinah library and on the website: www.asecnam.com from 24 June to 22 July 2013.
- Held a stakeholder and a public meeting on 4th July 2013
- Conducted specialist site visits just before the stakeholder meetings to enable verbal feedback and discussion at the meetings, prior to the completion of the studies
- Prepared draft Scoping-Assessment report. No conflicting impact assessment ratings or mitigation measures were identified so it was not felt necessary to have a joint specialist meeting
- Prepared draft Environmental Management Plan (EMP)
- Placed the Scoping/Assessment Report and EMP on the website: www.asecnam.com in December 2013.
- Submitting the Scoping-Assessment report and Environmental Management Plan (EMP) to MET.

At the end of the review period, the Scoping/Assessment Report and EMP was finalized and submitted to MET. Depending on the acceptance of the report by MET and the granting of environmental clearance, the EMP for construction and operational phase will be implemented.

During separate meetings with MET, NamPower and the client, it was discussed that the following specialist reports need to be conducted:

- Flora survey;
- Avifauna, and
- Archaeology.

Environmental Impact Assessment Findings

The potential negative and positive impacts associated with activities at the proposed new power line have been assessed using the methodology prescribed in Section 9.1. A list of the issues/threats associated with each aspect is provided in each sub-section.

Aspect / Impact	Phase C= Construction O = Operation D=Decommissioning	Significance Pre mitigation	Mitigation measures	Significance After mitigation
Flashfloods Runoff water from lay-down areas, might create downstream soil contamination. Erosion of tracks impacts.	**C, O, D**	**Minor (-ve)**	• Ensure that lay-down areas are not in washes • If applicable construct temporary protection bunds around lay-down areas	**Negligible**
Waste Management Hazardous spills and contaminants have the potential to contaminate soil and water, which in turn can harm plants and animals. Also general waste, e.g. plastic, cardboard, paper, needs to be managed properly to avoid any risk to animals.	**C, O, D**	**Minor (-ve)**	• Spillage-management and response procedures need to be developed for all hazardous substances used on site. All hazardous storage facilities should be bunded; the volume of the bunded area is to be at least 110% of the total volume of the tanks in which the hazardous material is stored. • Spills to be cleaned immediately and contaminated soils and water to be remediated or treated. • Hazardous waste and contaminated soil needs to be disposed of at the mine. • Implement a strong anti-litter and clean surroundings policy among all staff and contractors. • All domestic waste to be disposed of in waste bins. Temporary storage of collected waste should be within a fenced area to prevent scavenging and dispersal by wind. • All domestic waste bins to have lids so as to reduce the likelihood of windborne litter. • Regularly inspect and clean up litter at site and in the general proximity of the mine. • All waste to be disposed of in appropriate waste-disposal facilities (e.g. specific facilities designed for hazardous wastes). Wastes are to be stored on site but	**Minor (-ve) - Negligible**

Aspect / Impact	Phase C= Construction O = Operation D=Decommissioning	Significance Pre mitigation	Mitigation measures	Significance After mitigation
			removed from the lay-down areas for disposal at the Rosh Pinah waste disposal site. • Implement a strong occupational safety and clean surroundings policy among all staff and contractors.	
Flora **Physical destruction of habitat and vegetation, including species of high conservation concern during construction and operation**	**C, O**	**Moderate (-ve)**	• The no-go area should be avoided at all costs. • The final route should stay on the plains habitat as much as possible. Damage to the other sensitive areas should be avoided as far as possible, particularly to the succulent plain near the Obib substation. • Uncontrolled vehicle activity is of major concern. Outside the plains habitat vehicle movement should be controlled and restricted to the future service track as far as possible. Even in the plains habitat uncontrolled driving should not be permitted. Careful pre-planning of construction activities should be done to identify where tracks will be absolutely necessary for both construction and maintenance, overlapping these as far as possible. These should be clearly marked prior to construction activities beginning, together with designated turning points and construction laydown areas. Turning points for heavy vehicles should be designated and adhered to. *Ad lib* turns should not be permitted. The area used should be constrained as far as possible, and should be rehabilitated once construction is complete. • During the operational phase only the service track should be used. No new tracks should be created. • All construction laydown should be done in previously damaged areas, where construction camps should also be located unless crews could be accommodated in Rosh Pinah, which would be preferable. Several previously damaged areas that could be used are	**Moderate (-ve) - minor (-ve)**

Aspect / Impact	Phase C= Construction O = Operation D=Decommissioning	Significance Pre mitigation	Mitigation measures	Significance After mitigation
			indicated in Appendix 6 of the specialist report, see **Appendix G**. • In the undesirable event that the no-go area will be impacted, plant relocation should be considered. Previous work of this kind done in the Sperrgebiet has shown that relocation should take place as soon as possible (A. Burke, pers. comm.). Plant storage is a possibility, but will not work for many species unless the period of storage is very short (no more than 3 weeks). Plants should be relocated to areas damaged by the project. Undisturbed areas should generally not be disturbed in order to relocate plants, although possible exceptions might be species of very high conservation concern. • Fixed point photography, initiated prior to construction activities, should be extensively utilised to assess compliance by contractors. • Construction and maintenance staff should be educated and informed of their environmental obligations. Meaningful penalties for damages should be stipulated, and the main contractor should be held responsible for all transgressions. • Due to the very low and sparse nature of the plant growth in this area, it is unlikely that any vegetation clearing will be necessary for this route in the future. If any is necessary it should be done manually.	
Illegal plant or firewood harvesting for fuel or ornamental purposes during construction and operation		**Minor (-ve)**	• Collection of plants, or parts of plants (including seed and/or fuelwood) should be forbidden. Staff should be expressly forbidden to collect any plant material, dead or alive (including seed), for any purpose whatsoever and should be provided with fuel (preferably gas) for both heating and cooking. • Construction and maintenance staff should be	**Negligible**

Aspect / Impact	Phase C= Construction O = Operation D=Decommissioning	Significance Pre mitigation	Mitigation measures	Significance After mitigation
			educated and informed of their environmental obligations. Meaningful penalties for damages should be stipulated, and the main contractor should be held responsible for all transgressions.	
Reptiles / Mammals **Increased poaching and disturbance during construction**	**C**	**Minor (-ve)**	• Poaching and disturbance of animals is illegal in a National Park. Construction and maintenance staff should be educated and informed of their environmental obligations. Meaningful penalties for damages should be stipulated, and the main contractor should be held responsible for all transgressions.	**Negligible**
Social / Economic **Contractors entering private land and the National Park.**	**C, D**	**Moderate (-ve)**	• NamPower must notify the landowners in good time (minimum of 2 weeks) and the contractor should establish and foster good working relations and a clear system of communication with the landowners, ensuring adherence to NamPower's strict EMP guidelines (NamPower 2008. Section 3.1) • All members of the construction team coming into the area should be reminded of and should implement a solid HIV/AIDS prevention programme. This will assist in reducing the spread of HIV and other sexually transmitted diseases, to and from the areaspread of HIV and other sexually transmitted diseases, to and from the area.	**Minor (-ve)**
Limited employment opportunities during construction	**C, D**	**Moderate (+ve)**	• Recruit local labour from Rosh Pinah, Sendelingsdrif and other nearby settlements, to minimise migrants bringing social ills and to maximise employment benefits for the local communities.	**Moderate (+ve)**
Positive indirect economic impacts at local, regional and national level as the proposed power line will enable RPZC to increase its production.	**O**	**High (+ve)**	No specific mitigation measures are proposed.	**High (+ve)**

Aspect / Impact	Phase C= Construction O = Operation D=Decommissioning	Significance Pre mitigation	Mitigation measures	Significance After mitigation
Archaeology **Loss or disturbance of archaeological sites.**	**C, O**	**Negligible**	• Considering the assessment presented here, and the combination of low archaeological density and generally low archaeological significance within the area of development, no specific mitigation measures are proposed, other than that contractors and operating personnel should be made aware of the provisions of the National Heritage Act with regard to reporting of archaeological materials found in the course of development activities. • However, it is recommended that contractors working on the site are made aware that under the National Heritage Act any items protected under the definition of heritage found in the course of development should be reported to the National Heritage Council. The attention of the project proponent is therefore drawn to the “chance finds” procedure in Appendix 1 of the Archaeological report.	**Negligible**

CONCLUSION

No fatal flaw has been identified. However, the final design of the power line alignment needs to include the findings and recommendation of the specialist reports. The flora maps showing the 'No-Go' and sensitive areas should be consulted when the final alignment is put together and laydown areas are located. Laydown areas should utilise areas which have been impacted upon during previous power line construction process. All mitigation measures stated in **Section 9** pertinent to the design phase need to be adhered to.

Based on the findings of the environmental risk assessment, all the identified potential environmental impacts associated with the proposed construction, operations and dismantling can be managed and reduced if the proposed mitigation measures are implemented.

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ENVIRONMENTAL IMPACT ASSESSMENT FOR THE NEW NAMPOWER POWER LINE FROM OBIB TO ZINCUM SUBSTATION FOR RPZC MINE

1 INTRODUCTION

The Rosh Pinah mine is situated in the Karas Region, 165 km south of Aus, which is 125km east of Lüderitz. At present Rosh Pinah Zinc Corporation (RPZC) (part of Glencore group) produces 100,000t of zinc concentrate and 20,000t of lead concentrate per annum. From 2015 onwards the potential exists for production to increase to 150,000t and 25,000 per annum respectively.

The increase in production will require additional power supply provided by NamPower. NamPower has indicated that the existing 66 kV line would not be able to meet the mine's power requirements. As all power demands in the area are currently growing, these loads (including to the Sendelingsdrif Mine) would have a negative effect on the security of power supply to RPZC.

NamPower therefore recommends that a new 66 kV line be constructed from Obib to Zincum substation at Rosh Pinah with the specific purpose of supplying the mine with adequate power.

The 66 kV line feeding the RPZC substation goes via the Lorelei substation and then continues on to the Sendilingsdrif mine. The current line is only rated for 32 MVA thermally but voltage limits on the network will not allow the line to reach this limit. The 33 kV network feeds the town of Rosh Pinah as well as the Namwater loads (pumping stations) in the area. **Figure 1** shows the project area. At this stage, there seems to be no need for any resettlement, even though the new substation and line will be routed in Rosh Pinah town and close to a few buildings.

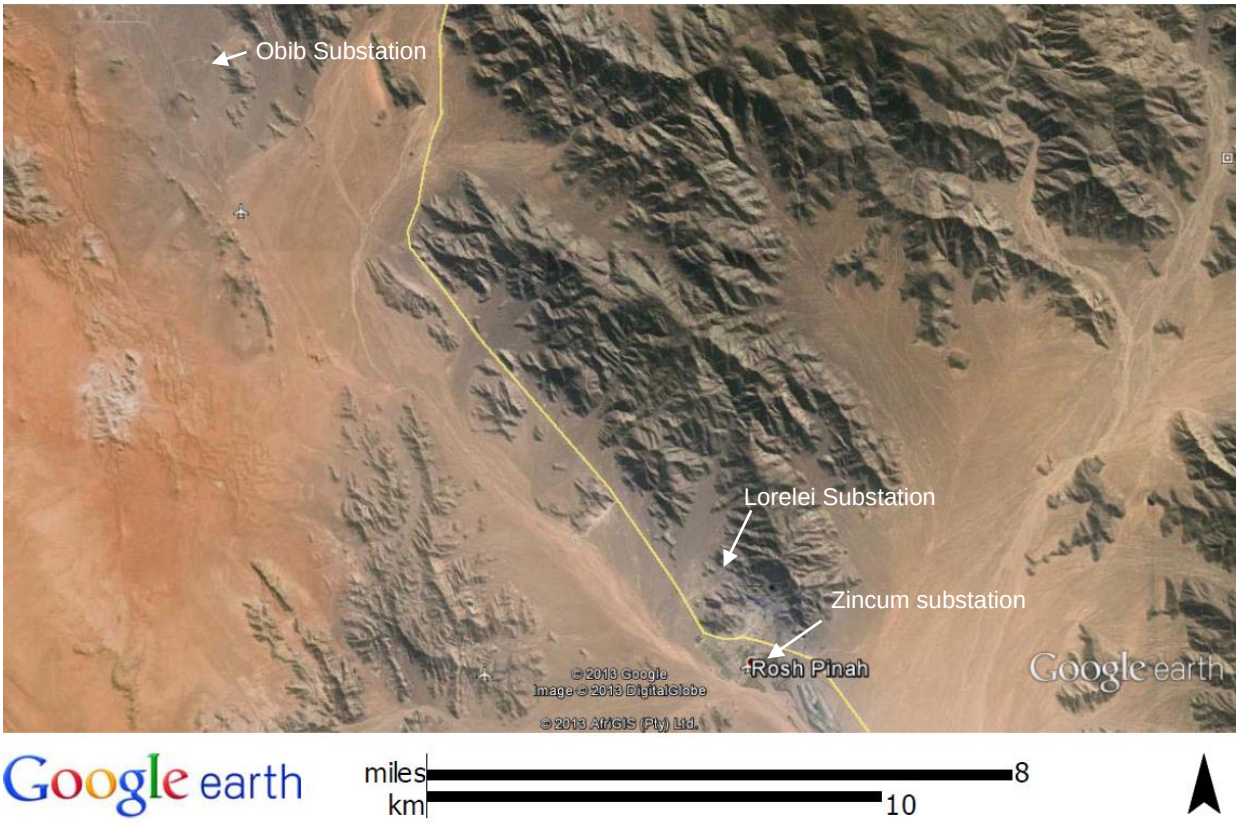

Figure 1: Proposed Project area and approximate position of substations.

2 SCOPE AND OBJECTIVES

The scope and objectives for the EIA were discussed between Mr. M. Castelyn and Ms A. Speiser and the proposal was accepted in January 2013. The scope is a new 66 kV power line from the Obib substation to the Zincum Substation near RPZC mine.

The EIA will assess the new alignment of the proposed power line, its construction and operations and as far as possible its dismantling, as well as the dismantling of the old line between Lorelei and the Aurus sub-station. The main objectives are to:

- describe the affected environment based on available documentation;
- identify and assess the potential positive and negative impacts of the new power line;
- liaise and consult with the relevant ministries to ensure that all legal requirements are met regarding the EIA;
- conduct public participation and focus group meetings at Rosh Pinah; and
- produce Environmental Management Plans for construction and operation and dismantling of the existing power line.

The assessment focused on third parties only and did not assess health and safety impacts on workers in detail because the assumption was made that these aspects are separately regulated by health and safety legislation, policies and standards.

2.1 Terms of reference

Table 1 provides the Terms of Reference (EIA requirements) as requested in the Environmental Management Act and the Regulations.

Table 1: Requirements for EIA reports

EIA Regulation requirement	Reference in the EIA report
Details of the environmental assessment practitioner (EAP) that compiled the report and the expertise of the EAP to carry out the EIA, including CVs.	Section 3.2 and Appendix B
Description of the proposed activity.	Section 6
Description of the environment that may be affected by the activity.	Section 8
Details of public participation process: List of persons, organisations and organs of state that were registered as interested and affected parties (IAPs). A summary of comments received from and a summary of issues raised by IAPs, the date of receipt of these comments and the response of the EAP to the comments. Copies of any representations, objections and comments received from IAPs.	Section 4 and Appendices C, D, E and F
Description of need and desirability of proposed activity and identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity.	Section 7
Indication of methodology used in determining the significance of potential impacts.	Section 9
A description and comparative assessment of all alternatives identified during the environmental impact assessment process.	Section 7, Section 9
A description of all environmental issues that were identified during the environmental impact assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures.	Section 8, Section 9
An assessment of each identified potentially significant impact.	Section 9
A description of any assumptions, uncertainties and gaps in knowledge.	Section 3.3
An opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	Section 10
An environmental impact statement which contains: • a summary of the key findings of the environmental impact assessment; and	Section: Executive Summary EMP – Appendix J

EIA Regulation requirement	Reference in the EIA report
• a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives; and • any specific information that may be required in terms of the Act.	
Management plan Monitoring programme Audit proposal.	EMP - Appendix J

3 APPROACH, METHODOLOGY AND LIMITATIONS

3.1 Namibian Environmental legislation

Namibia's environmental impact assessment (EIA) policy of 1995 promotes accountability and informed decision-making through the requirement of EIAs for listed programmes and projects.

The Environmental Management Act was gazetted on 27 December 2007 (Government Gazette No 3966) and the commencement of the Act, the list of activities that may not be undertaken without an environmental clearance certificate and the Environmental Impact Assessment regulations were promulgated on 6 February 2012 (Government Gazette No. 4878). The relevant activities listed in the regulations that require an environmental clearance certificate are provided in **Table 2** below, with comments next to each.

Table 2: Listed Activities in the EMA Regulations which might trigger an EIA.

Activity	Comment
1. ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES	
The construction of facilities for - (b) the transmission and supply of electricity;	The project deals with the construction and operation of a new 66 kV power line from Obib to Zincum Substation.

3.2 Approach and Methodology

With reference to the above mentioned legislation, environmental clearance and therefore an EIA will be required for the project. An EIA process typically involves a screening or initiating phase, a scoping phase and the assessment phase (including the development of an environmental management plan (EMP).

During separate meetings with MET, NamPower and the client, it was discussed that the following specialist reports need to be conducted:

- Flora survey;
- Avifauna, and
- Archaeology.

The new alignment was provided by NamPower (see **Section 5**). As far as technically possible, the new power line will be adjacent to the existing power line to minimise disturbance of undisturbed areas. Hence the scoping and assessment phases have been combined, which is

supported by the governing legislation and was discussed with the Ministry of Environment and Tourism (MET) on 24 October 2012. MET however can still decide after the combined scoping-assessment phase that further studies are required and that a more detailed EIA report needs to be developed.

The following process was followed to conduct the combined scoping - environmental assessment:

- Submitted Form 1 to MET (18/6/2013) (**Appendix A**)
- Notified stakeholders and IAPs through site notices and posters in Rosh Pinah, advertisements in national newspapers, and by distributing a background information document (BID) by email
- Placed the BID for review by government authorities and IAPs at the Rosh Pinah library and on the website: www.asecnam.com from 24 June to 22 July 2013
- Held a stakeholder and a public meeting on 4th July 2013
- Conducted specialist site visits just before the stakeholder meetings to enable verbal feedback and discussion at the meetings, prior to the completion of the studies
- Prepared draft Scoping-Assessment report. No conflicting impact assessment ratings or mitigation measures were identified so it was not felt necessary to have a joint specialist meeting.
- Prepared draft Environmental Management Plan (EMP)
- Placed the Scoping/Assessment Report and EMP on the website: www.asecnam.com in December 2013.
- Submitted the Scoping-Assessment report and Environmental Management Plan (EMP) to MET.

At the end of the review period, the Scoping/Assessment Report and EMP was finalized and subsequently submitted to MET. Depending on the acceptance of the report by MET and the granting of environmental clearance, the EMP for construction and operational phase will be implemented.

Alexandra Speiser of ASEC and Auriol Ashby of Ashby Associates cc compiled the scoping assessment report and their curricula vitae can be found in **Appendix B.**

Alex Speiser has 13 years of experience of EIA preparation in Namibia and is an Associated Member (AIEMA) of the Institute of Environmental Management & Assessment, UK and the Environmental Assessment Practitioners Association for Namibia (EAPAN). She is also a member of the Chamber of Mines (Namibia) and Greenspace Namibia.

Ms Auriol Ashby has had Namibian permanent residence since 1991 and has extensive experience in the socio-economic aspects of integrated development planning, mainly in Namibia. She focuses on the socio-economic and public participation components of EIAs, EMPs and Closure Plans for large scale mines and projects. She is a member of the South African Monitoring and Evaluation Association and the Environmental Assessment Practitioners Association for Namibia (EAPAN).

4. PUBLIC CONSULTATION

4.1 Objectives of public consultation

The public consultation process aimed to ensure that all persons or organisations that may be affected or interested in the project were informed of the issues and were able to register their views and concerns. Building from there, the process provided opportunities to influence the project design so that its benefits can be maximised and potential negative impacts be minimised.

4.2 Interested and Affected Parties

The stakeholder engagement process began with identifying interested and affected parties and stakeholders (IAPs) who have engaged with RPZC and RoshSkor recent years and updating and broadening this list. The current list, including all those who attended the meetings, is summarised in **Table 3** and is detailed in **Appendix C**.

Table 3: Summary of Interested and Affected Parties

Category	Stakeholders
Local and Regional Authorities	RoshSkorTown Council Karas Regional Council
Key Government Ministries and Parastatals	NamPower Ministry of Environment and Tourism Ministry of Mines and Energy Ministry of Agriculture, Water and Forestry Ministry of Works and Transport, Civil Aviation Ministry of Trade and Industry Ministry of Health and Social Services Ministry of Labour and Social Welfare Ministry of Safety and Security Ministry of Home Affairs NamWater Roads Authority Telecom
Farm owners along the route	Nick Kotze – FarmsSpitskop and Zebrafontein
Rosh Pinah Forum	Government departments and private sector listed separately and others e.g. community representatives Education providers
Environmental NGOs and Specialists	Namibian Coast Conservation and Management Project (NACOMA) National Botanical Research Institute (NBRI) EcoServe EnviroMEND Namibia Scientific Society Southern African Institute for Environmental Assessment (SAIEA) Namibia Environment and Wildlife Society (NEWS) Brown Hyena Research Project

Category	Stakeholders
Private Sector	Skorpion Zinc Chamber of Mines Namibia Chamber of Commerce and Industry, Rosh Pinah branch Rosh Pinah based safari and tour companies Accommodation and catering establishments
Unions	Mine Workers Union of Namibia
Individuals	General public attending the public meeting and responding to press announcements
Media	Newspapers: *The Namibian* *New Era* *Die Republikein* *Allgemeine Zeitung*

4.3 Public consultation process

The process adopted follows the 2012 regulations to theEnvironmental Management Act, No. 7 of 2007.

Stakeholders were notified about the EIA process through site notices and posters in Rosh Pinah, advertisements in two national newspapers, and by distributing the Background Information Document and introductory letter to known IAPs by email. Another 49 people were reached through Rosh Pinah's Community Notice Board, by email.

A copy of the Background Information Document was placed in the public library in Rosh Pinah and was available to download from the website: www.asecnam.com. The information sharing record is detailed in **Appendix D**.

All stakeholders and IAPs were invited to review and comment on the Background Information Document and attend a public meeting in Rosh Pinah. A focus group meeting was also held with the Rosh Pinah Town Council – RoshSkor. ASEC had a telephone conversation with Mr Kotze and also met his representative on site. Meetings were scheduled as follows:

Date	Time	Stakeholder	Venue
Monday 1st July 2013	09h30	Representative of N. Kotze	Farm Spitskop
Wednesday 3rd July	14h30	RoshSkor	RoshSkor Offices
Thursday 4th July	16h30	Public meeting	Rosh Pinah Community Hall

The public and IAPs were invited to raise issues and comment from the 24 June to 22 July 2013 by email, fax or SMS. Minutes of the meetings and all comments received are documented in **Appendix E** and summarised in the Summary Issues and Response Report in **Appendix F**. The draft Environmental Scoping-Assessment Report, with these appendices will be sent to all IAPs for comments for a 21 working day period.

4.4 Main Issues raised by IAPs

Table 4 summarises the main issues raised during the EIA Scoping Phase consultation process, which have been addressed in the EIA Scoping Report.

Table 4: Summary of issues raised during IAP consultations

	Issue
1.	Avoid the route passing close to buildings in Rosh Pinah by utilising open spaces, where possible.
2.	Potential bird fatalities along the route
3.	Instead of having an extra power line line, can one bigger line be built and then dismantle the old 66kV power line.
4.	Who monitors construction?
5.	Will the power line provide local employment?

LEGAL, POLICIES AND PLANS

5.1 Legal requirements

The following is a brief overview of all pertinent legal acts, bills, laws, policies, standards and international treaties regarding the environment which will be considered while conducting the EIA and EMP for the proposed new power line.

5.1.1 Constitution of the Republic of Namibia (1990)

Article 91 (c) describes the duty to investigate complaints concerning the over-utilisation of living natural resources, the irrational exploitation of non-renewable resources, the degradation and destruction of ecosystems, and the failure to protect the beauty and character of Namibia.

Article 95 (l) states that "*the State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at … maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of 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*".

Article 101 further states that the principles embodied within the Constitution "*shall not of and by themselves be legally enforceable by any court, but shall nevertheless guide the Government in making and applying laws. The courts are entitled to have regard to the said principles in interpreting any laws based on them*".

5.1.2 Water Act (Act 54 of 1956)

(Note: the Water Resource Management Act (2004) has been promulgated but not yet implemented as the guidelines are still in draft form. However, the described procedures and stipulations are much more stringent compared with the current Water Act.)

The Act stipulates, *inter alia*, only the most important procedures, steps and requirements to obtain:

- the purification of waste water and discharge (**Section 21 (1) (2) (3) (4) (5)**);
- the use of public water for industrial purposes (**Section 11 (1)** – **(7)**);
- a permit to use public water for industrial purposes (**Section 12 (1)** – **(9)**); and
- a water abstraction permit (**Section 13 (2)**).

5.1.3 Atmospheric Pollution Prevention Ordinance (1976)

A number of sections (**5 (1)**, **7**, **8 (1)**, **11 (1) (2) (3)**, **12 (1)**, **13 (1) (2) (4) (5) (6)**, **24 (1**) and **25 (1) (2)**) relate to "Air pollution control certification", dust control, closure certificate, etc. However, when ASEC approached the Ministry, the consultant was told that no certificates are currently being issued. The best practice would be to notify the Ministry of the anticipated emissions.

5.1.4 Labour Act, No. 11 of 2007

The Act aims to *"promote and maintain the welfare of the people and ..to further a policy of labour relations conducive to economic growth, stability and productivity"*. It details basic conditions of employment, and health, safety and welfare requirements of employers.

5.1.5 Environmental Management Act, No. 7 of 2007

The Act was gazetted on 27 December 2007 (Government Gazette No. 3966) and the Commencement of the Environmental Management Act, List of Activities that may not be undertaken without Environmental Clearance Certificate and Environmental Impact Assessment Regulations: Environmental Management Act, 2007 (Government Gazette No. 4878) were promulgated on 6 February 2012.

Section 10 (1) (General Obligations) states that: '*An Environmental Assessment Report shall contain, as a minimum:*

(I) where appropriate, an outline for monitoring and management programmes and any plans for post-project analysis;

(j) a description of measures to be employed for decommissioning and restoration.'

5.1.6 Forestry Act No. 72 of 1968, as amended in 2005

The Forestry Act No. 72 of 1968, as amended in 2005, prohibits interference with protected plants. Permits are required from the Directorate of Forestry to destroy protected plant species.

5.1.7 National Heritage Act (27 of 2004)

The National Heritage Act (27 of 2004) makes provision for archaeological impact assessment of large infrastructure projects.

5.2 Applicable Namibian policies and draft legislation

5.2.1 Environmental Assessment Policy (1994)

Namibia's Environmental Assessment Policy is legislated through the Environmental Management Act (see **Section 2.3.5**). Appendix B of Namibia's Environmental Assessment Policy contains a list of activities which might require an environmental clearance from the

Directorate of Environmental Affairs. It is up to the DEA to decide whether a project listed in the activities list requires an EIA.

The listed points **No. 14** ("Storage facilities for chemical products") and **No. 16** ("Bulk distribution facilities") are applicable to the proposed zinc and lead loading facility.

5.2.2 Parks and Wildlife Management Bill of 2001

The Parks and Wildlife Management Bill of 2001 governs the declaration and management of national protected areas, of which the /Ai-/Ais/Richtersveld Transfrontier Park forms a part.

5.3 International treaties and protocols

The following International treaties and protocols have been ratified by the Namibian Government:

- Convention on International Trade and Endangered Species of Wild Fauna and Flora (CITES) (1973)
- Vienna Convention for the Protection of the Ozone Layer (1985)
- Montreal Protocol on Substances that Deplete the Ozone Layer (1987)
- Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal (1989)
- Convention on Biological Diversity (1992)
- United Nations Framework Convention on Climate Change (1992)
- Kyoto Protocol on the Framework Convention on Climate Change (1998)
- World Heritage Convention (1972)
- Convention to Combat Desertification (1994)
- Stockholm Convention on Persistent Organic Pollutants (2001)

5.4 Permits

As stipulated in the Environmental Impact Assessment Regulations, No.30 of 2012, the Environmental Clearance Certificate needs to be obtained from the Ministry of Environment and Tourism (MET) before the commencement of the Project.

6. PROPOSED PROJECT

The new 66 kV line will be routed along the existing 66 kV line except for the parts from Obib substation to the Skorpion entrance gate and from Lorelei to Zincum Substation (South of Rosh Pinah). This new line will be approximately 26 km long and will be constructed with twin pelican conductors (**Plate 1**) which will be able to carry considerably more than the existing line (in the order of 50 MVA) between Obib substation to Lorelei substation. From Lorelei to Zincum substation single pelican conductors will be used (**Plate 1**). **Figure 2** and **Figure 3** show the existing power line and the proposed one. RoshSkor have recommended a change of alignment through the town, after Lorelei, to keep the line away from as many buildings as possible and they are satisfied that the routes fit into their town planning schemes. RPZC is aware that they will have to clear any building in the Ehafo area (possibly hostel and houses) which will fall in the servitude, in accordance with NamPower's guidelines.

RPZC hopes that construction can begin in early 2014. The line from Obib to Lorelei is expected to take 2.5 months and the line from Lorelei to ZinCum to take 1.5 months. Most of this work will be changes at the sub-stations. It is unlikely to require night working and it is proposed that the construction team will be accommodated in Rosh Pinah town. Laydown areas need yet to be located.

Mike anymore information.

Plate 1: Example of twin pelican conductors and single pelican conductors.

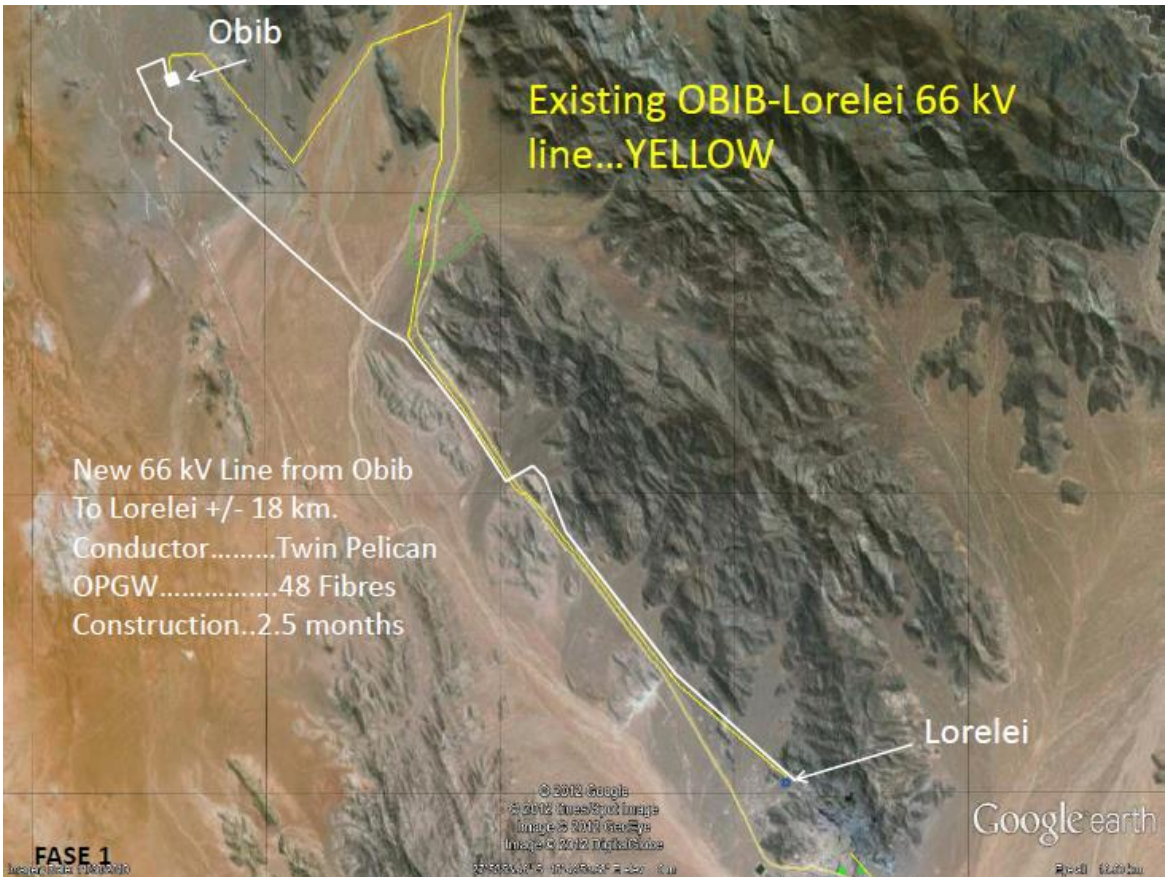

Figure 2: Alignment of proposed ne 66 kV power line from Obib to Lorelei substation.

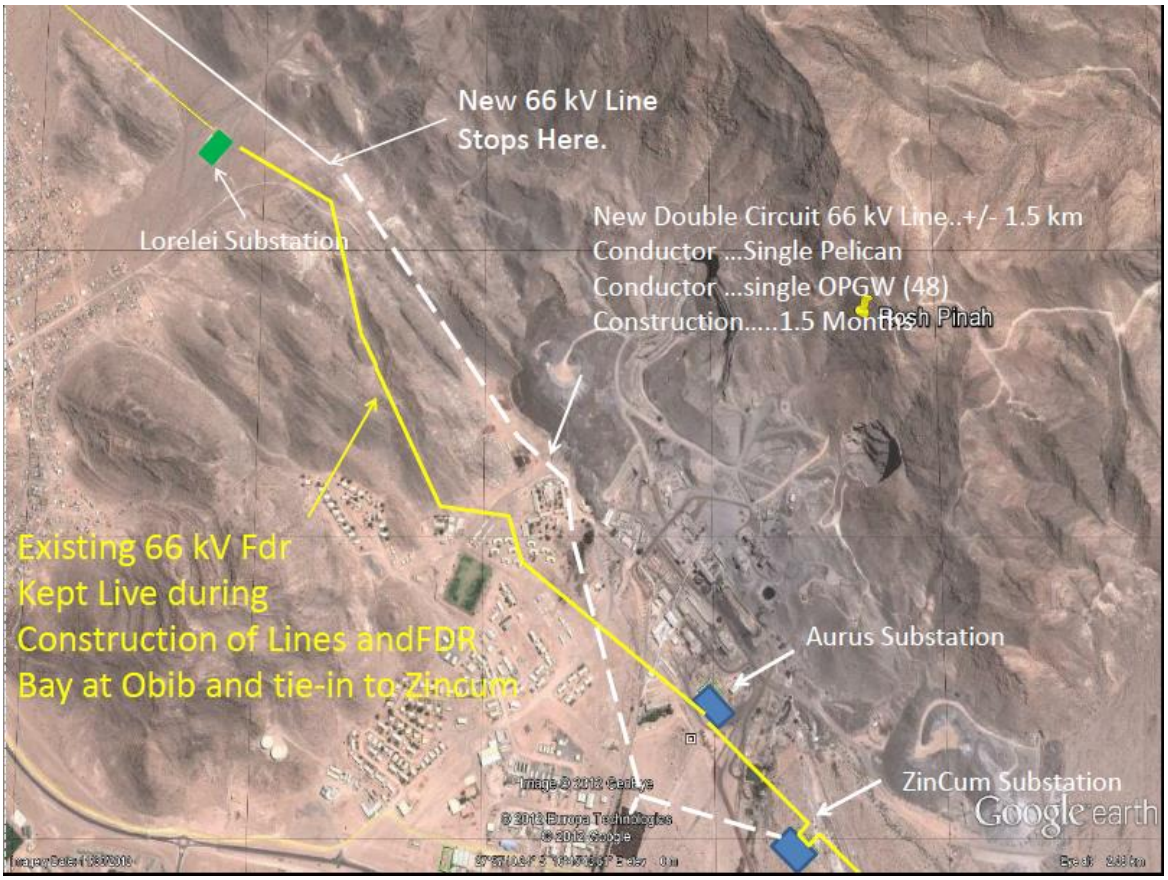

Figure 3: Alignment of the proposed 66 kV power line from Lorelei to Zincum substation.

7. PROJECT NEED, DESIRABILITY AND ALTERNATIVES

No alternatives have been assessed, as it is imperative that the new 66 kV power line needs to be built to ensure that the upgrades at RPZC mine can be implemented. NamPower has indicated that the existing 66 kV line would not be able to meet the mine's power requirements. As all power demands in the area are currently growing, these loads (including to the Sendelingsdrift Mine) would have a negative effect on the security of power supply to RPZC. However, environmental damage needs to be avoided and minimized at all costs. The EMP (separate report) will ensure that this will be met.

8. BIOPHYSICAL AND SOCIAL ENVIRONMENT

8.1 Aspects considered

The environmental regulations require both a scoping and an assessment report to include *"a description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity".*

In this section, information gathered at RPZC mine, existing literature and specialist reports are used to provide an overview of the biophysical and socio-economic situation at and in the surroundings of RPZC mine.

8.2 Climate

RPZC mine is situated in a predominately winter-rainfall region. The winds of the south Atlantic anticyclone system and cold Benguela current are the main elements influencing the area's climate.

The climate of the wider Rosh Pinah area is arid with low unpredictable rainfall, mainly occurring between April and August. Summers are hot and winters are mild. A large diurnal temperature range is exhibited in the winter months resulting in early morning mist and heavy dew.

8.1.1 Rainfall

The Rosh Pinah area has received an average of 55.5 mm of rain per year over the last 20 years. The highest average rainfall events during these years usually occur between March and July. However, as Rosh Pinah falls within the southern part of the winter-summer rainfall area, rain events can be expected throughout the year. The highest rainfall event – 106.1 mm – was recorded in April 2006. The rainfall data shows that run-off events are uncommon. The ephemeral channel west of Rosh Pinah flowed in January 2000 for the first time in 11 years and a storm in 2001 on the mountain east of the town resulted in a flash flood, which eroded the tarred main road and swept through several houses belonging to Skorpion Zinc. It was predicted that as the higher ground in the area has little vegetative cover, run-off could occur if more than 5 - 10 mm of rain fell during any single rainfall event (Carr, 1998). **Table 5** provides rainfall data recorded at the rain gauge at RPZC mine, while **Table 6** provides the rain figures recorded at the mine weather station between 2005 - 2007.

Table 5: The mean monthly rainfall at Rosh Pinah (in mm), 1983 – 2002

(Source: 1983 - 1989, Weather Bureau Windhoek; 1990 - 2002, RPZC)

Mm	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean	1.8	4.7	4.2	7.8	5.8	3.5	5.6	3.5	6.9	3.6	3.7	4.4
Max	12.0	23.0	19.1	36.0	16.9	13.0	18.0	17.0	28.7	28.8	23.0	75.1
No. of years with precipitation	9	10	14	13	13	12	15	11	15	11	11	8

Table 6: Monthly rainfall at RPZC mine weather station (in mm), 2005 – 2008

(Source: Weather Bureau Windhoek; 1994 - 2007, RPZC)

Year	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Year total
04/05	2	21.5	0	0	0	1.1	0.5	15.5	8.5	0	0	14	63.1
05/06	0	26	0	0	7	0	0	106.1	42.8	0	11.5	19.5	212.9
06/07	1.5	0	0	1	0	0	0	5.5	0	7.5	0	5.7	21.2
07/08	0	0	*	*	16.5	0	41.8	4	1.5	1.5	41.5	0	106.8

* no data

Potential negative impacts:

- Erosion of tracks and other structures caused by flash floods
- Soil contamination from contaminated run-off water from the lay-down areas.

8.1.2 Evaporation

The potential annual evaporation in the Rosh Pinah area is approximately 3,000 mm. The maximum is during the summer months and progressively declines during the autumn, winter and spring. The evaporation decreases slightly – to approximately 2,600 mm – towards the coast due to the presence of fog (Pallet, 1995). Comparing the average annual precipitation figures – between 54 and 64 mm – with the potential annual evaporation it becomes clear that overall there is a net loss of water within the Rosh Pinah area. **Table 7** provides the mean gross evaporation at Sendlingsdrif.

Table 7: The mean gross evaporation rate at Sendlingsdrif, 1975 to 1991

(Source: Department of Water Affairs purification works, Orange River. Period March 1975 - September 1991)

Mm	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean gross evaporation	329	274	285	215	170	147	145	182	211	269	312	336	2 875

Potential negative impacts

- none

8.1.3 Temperature

Rosh Pinah experiences hot to very hot summers, with temperatures averaging between 30°C and 40°C, and mild winters with maximum temperatures averaging between 20 and 25°C and with a minima range from 5-10°C. Snow has been recorded at Aus about 165 km north of the area and Witputs approximately 45 km to the north (pers. comm., Mr. G Hinders). Snow was also recorded on the mountains south-east of Rosh Pinah in July 2000 (pers. Comm. Ms. S Coleman).

The large diurnal and seasonal variations are caused by a number of factors, such as the high incidence of sunshine (>90% at Keetmanshoop), latitude and distance from the coast. There is rapid cooling of the ground surface at night due to high surface reflectance (rocky terrain, thin soils, and lack of vegetative cover) and clear skies, allowing for strong outgoing radiation.

Data collected at the Skorpion Zinc Project shows that the warmest period of the year is between October and April (Walmsley, EMS for Skoprion Mine, 2000). Maximum monthly averages range between 30-33°C, dropping overnight to minima ranging between 11-15°C.

Exceptionally high temperatures may occur during Berg wind conditions with maxima of over 40°C being recorded, but these conditions seldom last for more than a day (Walmsley, EMS for Skorpion Mine, 2000). The months from May to September are cooler, with maximum daytime average temperatures ranging between 21-25°C, while night-time temperatures range between 6-9°C.

Potential negative impacts

- Dehydration of workforce
- Sunburn risk
- Exposure in extreme cold events

(Please note that these issues will not be assessed in this EIA.)

8.1.4 Fog

Namdeb has recorded an average of 100 days of fog per annum at Oranjemund. Along the coastal areas of the Sperrgebiet, fog occurs most often in February and March. Often the fog also moves many kilometres inland along the Orange River and calculations conducted for the Rosh Pinah Landfill Study (WSP Walmsley, 2001) suggested that fog occurs about five or more times per month during February and March at Rosh Pinah.

Potential negative impact

- Safety of drivers/trucks on roads

(Please note that these issues will not be assessed in this EIA).

8.1.5 Wind Direction and Velocity

Table 8 shows data recorded on site over a period of 12 months (Crowther, 1999). It shows that the prevailing wind direction for moderate winds occurs from ESE to SSE (highlighted rows). Higher wind events above 8.0 ms^{-1} occur mainly from WNW. The northerly and north-easterly winds are the strong Berg winds which occur during the winter due to the persistence of strong

high pressure over the interior and depressions along the coast. Wind data measured between 2005 and 2007 at the Rosh Pinah Mine weather station confirm this trend.

Table 8: Wind direction and speed measured at Rosh Pinah over a period of 12 months, recorded 1999)

Direction	1,2-3,4 ms^{-1} (%)	3,5-7,9 ms^{-1} (%)	8,0-13,9 ms^{-1} (%)	>14,0 ms^{-1} (%)	Total (%)
	0	0.14	0.07	0	0.21
NNE	0	0	0	0	0
NE	0	0.07	0.07	0	0.14
ENE	0	0.07	0	0	0.07
E	3.96	1.22	0	0	5.18
ESE	8.78	2.95	0.14	0	11.87
SE	5.04	7.27	0.14	0	12.45
SSE	6.12	9.86	1.22	0	17.20
S	0.58	2.66	0	0	3.24
SSW	0.14	0	0	0	0.14
SW	0.43	0.65	0.22	0	1.30
WSW	0.36	1.73	0	0	2.09
W	1.73	3.6	0.29	0	5.62
WNW	1.51	4.03	1.80	0.07	7.41
NW	1.44	1.37	0.07	0	2.88
NNW	0.58	0.14	0.07	0	0.79

Potential negative impacts

- High wind speed will affect a poorly managed waste disposal system.

8.2 Topography / Soils

Due to the arid and semi-arid climatic conditions mechanical weathering predominates. This results in residual soils above the rock which are usually thin. Transported soils are predominantly aeolian sands during strong wind events or coarse colluvial talus from the surrounding mountain ranges. The soils are mainly developed on the gravel plains and in depressions/valleys, which provide some geomorphological stability (Pallett, 1995).

Desert soils are often stabilised by an organic or inorganic layer, which protects the underlying soils from erosion in areas devoid of macro-vegetation (Daneel, 1992). Soil algae and/or the inorganic surface gravel layer, usually a small pebble layer or desert pavement, protects the underlying soil from erosion. Disturbance to this fragile protective layer will result in erosion, by wind, of the soil fines, which are important for moisture retention and nutrient adherence. Recovery from structural damage by disruption to surface micro-topography and compaction may take as long as soil formation – several thousand years (Daneel, 1992).

The soils in the Rosh Pinah area are predominately surface alluvial sediments that support mainly sparse grassland and have a low agricultural value (Rosh Pinah Landfill Study, Walmsley, 2001). Typically the soils have a pH of ±9, high salinity and sodicity and low clay and organic-matter content (RPZC, 1999). The soils have no agricultural potential.

In the mountainous rock outcrop areas, no soil development usually occurs and all weathered particles are eroded to the sandy and gravely desert floor and flood plain areas. Soils consist mostly of medium-to-coarse sand or gravel, with thickness varying from zero to approximately 40 m in the valley bottoms (Steenekamp, 2003).

Although thin, the soil layer must be protected, for it is presumed to contain the valuable seedbed for the Succulent Karoo and Nama Karoo Biomes, especially since soil formation takes such a long time. Some of the plant species that are found within the Rosh Pinah Mining Licence are endemic to the area. Disturbance of the organic and inorganic protective layers can lead to increased wind and water erosion; reduced infiltration rates; reduced soil moisture content; and the inhibition of plant germination.

Potential negative impacts

- Flash floods during rain events, especially on the sandy plains
- Disturbance of soil cover leads to increased dust though wind erosion

8.3 Flora

A specialist vegetation study (**Appendix G**) was done to identify potential impacts on the Namibian flora of the proposed power line alignment by Ms C. Mannheimer in July 2013. The study included a site visit between the 01 – 05 July 2013.

The rationale to commission a specialist studies lies with the location of the area within the Namib Desert and escarpment, which harbour numerous endemic and near endemic plant species, of which many are of restricted distribution or habitat and/or are protected. This makes them extremely vulnerable to disturbance, particularly because many occur in small patches of suitable substrate where quite restricted damage may cause the loss of the whole or a large proportion of a population.

The project area does not impinge on a protected area, but does lie very close to the border of the Sperrgebiet National Park.

8.3.1 Botanical sensitivity of the project area

Although it has some floral affinities with the Nama-Karoo, the project area falls within the Succulent Karoo Biome, which is regarded as a global hotspot of biological diversity (Myers et al. 2000), including both plants and animals, and is extremely sensitive in terms of near-endemic, endemic and protected plant and animal species. It is important in global as well as regional and national terms. This makes only absolutely unavoidable damage acceptable.

Approximately 17% of the Namibian flora as a whole is thought to consist of endemic species (Barnard 1998), and over 30% of plants that occur in the Namibian section of the Desert Biome are believed to be endemic to that area. This is a remarkably high figure, and the areas of highest plant endemicity in the Namib are the Kaokoveld and the southern Namib, both regarded as major centres of endemicity in Namibia (Maggs et al. 1998). Furthermore, recent assessment by Burke and Mannheimer (2004) indicated that the Sperrgebiet (which excludes Aus) carries nearly 25% of the plant species known to occur in Namibia, making it a national biodiversity hotspot. Elevated areas such as mountains and koppies are known to harbour many species of conservation concern, making them sensitive to environmental disturbance, some more than others. In addition to on-site damage the creation of obvious access roads promotes illegal

access and plant removal by criminal collectors, and is of particular concern as it perpetuates and aggravates existing damage ad infinitum. An additional concern of great importance is the negative visual impact of roads and other infrastructure. This factor is of particular importance in an area such as the southern Namib, where open and relatively unspoilt vistas may be regarded as a major tourist attraction that will provide long-term income to the country. Although the proposed route lies outside the Sperrgebiet it still harbours many of the same species of conservation concern.

The section of this particular area that falls into the Sperrgebiet (i.e. just to the east of Skorpion) has been categorised by Burke (2006) as of High to Very High conservation importance. Flora studies for the Environmental Impact Assessment for the Skorpion Zinc Project found a high plant diversity in the area (over 220 species), with approximately 12 per cent of those being Namibian endemic species, some of very restricted distribution.

8.3.2 Description of habitats along proposed power line route

The study area consists of plains interrupted by koppies, rocky outcrops, mountain slopes and foothills. Four habitats were identified during this study, and they have been assessed for vegetation sensitivity based on occurrence of species of conservation concern and recovery potential. The habitats are mapped in **Figure 4** and **Figure 5**.

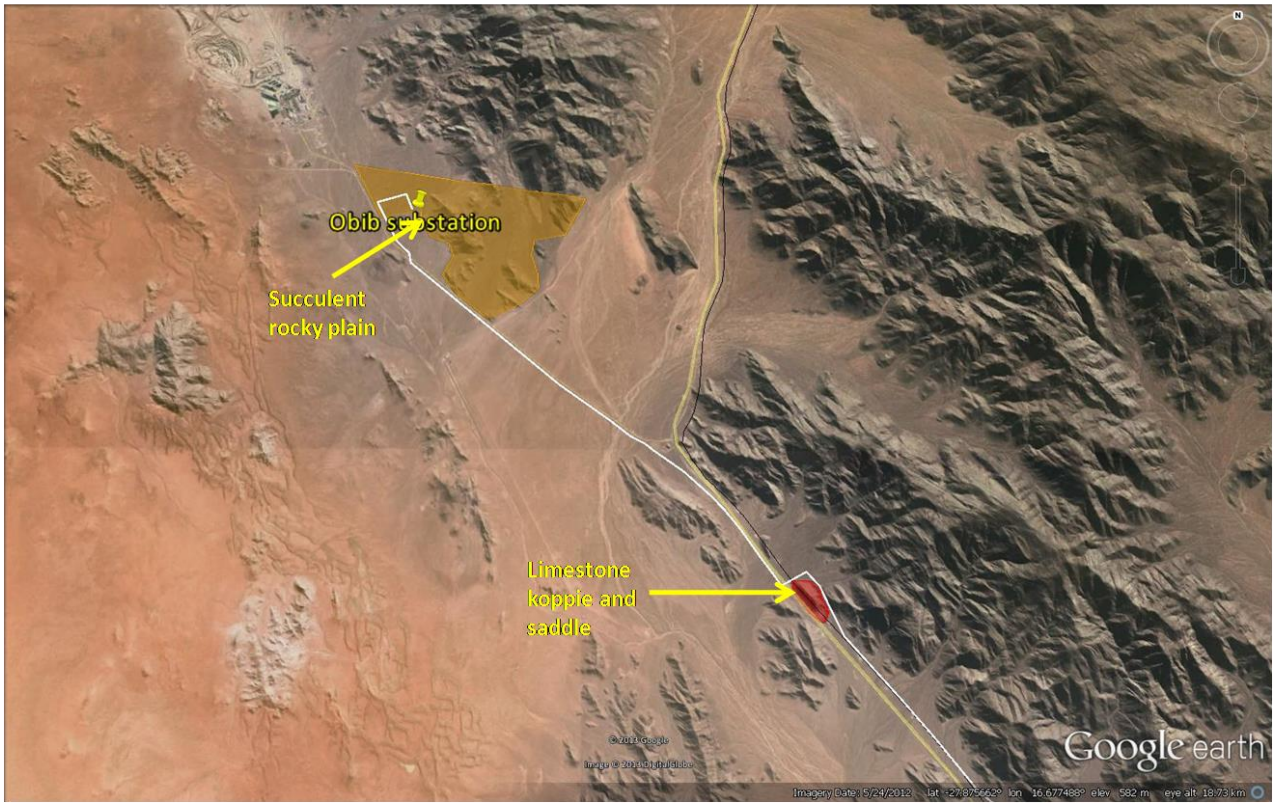

Figure 4: The map is showing the northern habitats.

The power line route runs roughly NW-SE from Obib substation (Point A). Initially it travels to the north and west of the substation, crossing a succulent plain of medium sensitivity before turning south-eastwards and traversing a sandy plain, running parallel to the C13 road before crossing it just to the NW of a limestone-quartz koppie situated at approximately 27.903859°S/16.705029°E

(Point B: this koppie is the no-go zone). To the north of the koppie it turns SE, going over one of two saddles between the koppie and the mountain slope to the east. Thence it traverses a sandy plain, crossing two rocky ridges, one on either side of the Tutungeni settlement area, before entering Rosh Pinah and meeting the Nampower substation in the town itself (Aurus and Zincum). At approximately 27.938871°S/16.741188°E at passes over the quartz footslope of a rocky ridge (Point C) and, after passing the Lorelei substation, at approximately 27.949133°S/16.757192°E (Point D) it crosses or curves around a rocky ridge and drops into a narrow sandy valley bordered in the NE and SW by mountainous and rocky ridges. It runs down this valley and crosses a built-up area of Rosh Pinah before meeting proposed new Rosh Pinah substation (Point D). **Figure 6** shows the proposed power line route and conducted transects.

Broadly speaking, four habitats are traversed:

1. Succulent rocky plain
2. Sandy plains and washes
3. Limestone koppie and saddle
4. Low rocky outcrops and quartz foothills

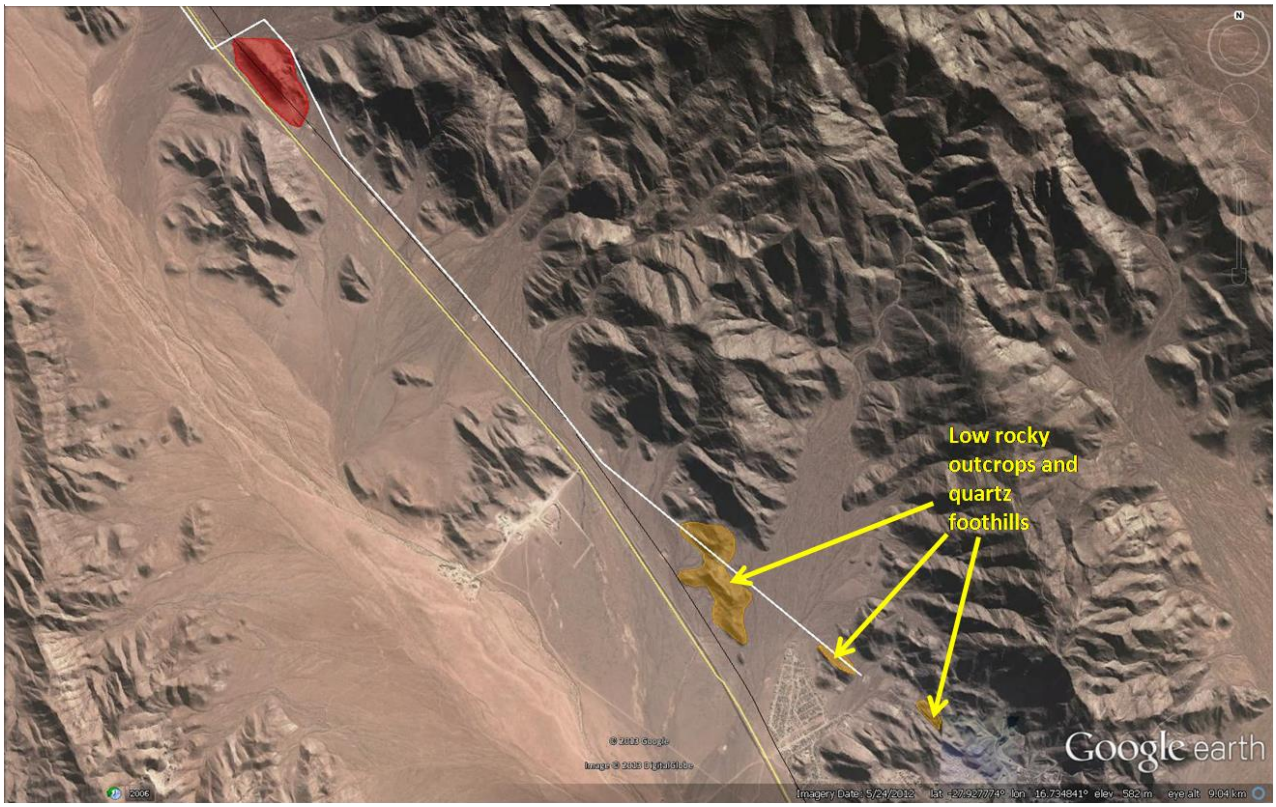

Figure 5: The map is showing the southern habitats.

Figure 6: Proposed power line route and transects conducted.

8.3.2.1 Succulent rocky plain

As shown in **Figure 4**, in the vicinity of the Obib substation the plain habitat is characterised by a dense cover of succulent and/or perennial species, many of which are of some conservation concern, including *Pelargonium paniculatum, Sarcocaulon patersonii, S. inerme, Zygophyllum pterocaule, Z. longicapsulare, Z. schreiberianum, Cheiridopsis robusta, Cephalophyllum ebracteatum, Jordaaniella cuprea* and others. **Table 9** is an annotated list of species of conservation concern that were found during this study.

Table 9: Annotated list of species of highest concern found along the proposed route.

Species	Endemism	Protected	Red Data Status	Comments
Aloe gariepensis	NE	X	LC	Restricted distribution
Antimima quarzitica	E	X	LC	Restricted distribution and habitat
Astridia longifolia		X	R	
Cephalophyllum ebracteatum	NE	X	LC	Reasonably widespread
Cheiridopsis robusta		X	LC	Reasonably common and widespread
Dracophilus dealbatus	NE		DD	Reasonably common and widespread, but already has been impacted by mining here and on the Orange River

Species	Endemism	Protected	Red Data Status	Comments
Eberlanzia schneideriana	NE	X		Reasonably widespread, restricted habitat
Hartmanthus hallii	E	X	LC	Highly restricted occurrence and habitat
Jordaaniella cuprea		X	LC	Restricted distribution
Mesembryanthemum pellitum	E			Limited distribution but weedy species that readily recolonises disturbed areas
Boscia albitrunca		X		Widespread but subject to collection for wood in the Rosh Pinah area
Adromischus filicaulis		X		
Crassula atropurpurea		X	R	
Crassula brevifolia		X		
Crassula cotyledonis		X		
Crassula fusca		X		
Crassula macowaniana		X		
Crassula subaphylla subsp. *subaphylla*		X		
Tylecodon hallii	E	X	LC	Restricted distribution and habitat
Tylecodon paniculatus subsp. *glauca*	E	X		Subject to illegal collecting
Pelargonium paniculatum	NE			Restricted habitat
Sarcocaulon inerme	E		LC	Restricted habitat
Sarcocaulon patersonii	NE		LC	Reasonably widespread
Zygophyllum longicapsulare	NE		LC	Reasonably widespread
Zygophyllum pterocaule	NE		LC	Restricted distribution
Zygophyllum schreiberianum	NE			Restricted distribution
Larryleachia marlothii	NE			Reasonably widespread

CR = critically endangered; VU = vulnerable; R = rare; LC = least concern; DD = data deficient.

This habitat is of MEDIUM sensitivity due to high diversity of perennial species, some of conservation concern, relatively restricted size, and quite low restoration potential, as shown in **Plate 2**.

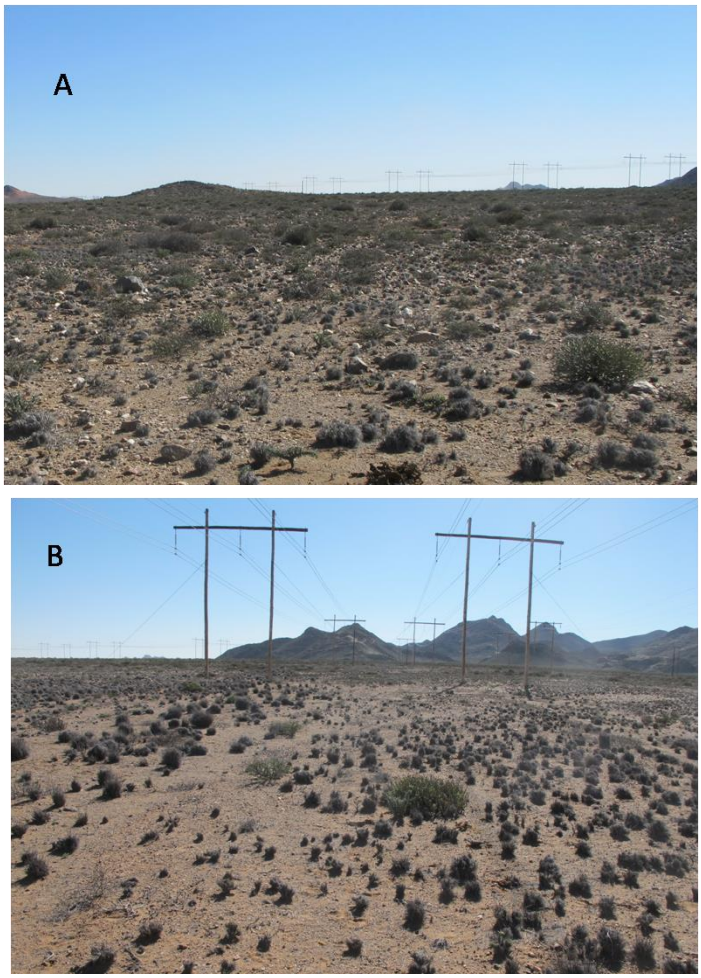

Plate 2: The corridor of damage along the existing power line north of the Obib substation, showing very low re-establishment of succulent and perennial plant diversity. A = undamaged; B = damaged.

8.3.2.2 Sandy plains and washes

These red sand plains (**Plate 3**) are characterised by dominance of *Stipagrostis ciliata* and *Brownanthus arenosus*, with *Stipagrostis geminifolia* and *Othonna cylindrica* also common and *Zygophyllum prismatocarpum, Sisyndite spartea, Searsia populifolia* and *Euphorbia dregeana* defining the many shallow washes that cut through them. These plains harbour a relatively high plant diversity, more obvious after rains, with a number of range-restricted, endemic and near-endemic species occurring, including *Euphorbia melanohydrata, Dracophilus dealbatus, Cheiridopsis robusta, Mesembryanthemum pellitum, Zygophyllum pterocaule, Sarcocaulon patersonii, Gazania schenckii* and *Ruschia* spp.. *Euphorbia melanohydrata* has a restricted distribution in Namibia, a portion of which was affected by the development of Skorpion mine and the associated airstrip.

Nevertheless, in the context of this narrow, linear impact the sensitivity of this habitat is rated as LOW to MEDIUM because it covers a large area and has a medium recovery potential.

Plate 3: Sandy plain habitat.

8.3.2.3 Limestone koppie and saddle

The limestone/granite koppie (**Plate 4**) where the power line crosses the road provides high niche diversity by virtue of substrate, moisture and aspect variability, including a large SW-facing slope that collects moisture from fog. As a result it exhibits an extremely high species diversity, and harbours a high number of endemic, near-endemic, range-restricted and protected species, both on the slopes and on the footslopes. These include numerous protected species of high conservation concern and/or very restricted distribution including *Antimima quarzitica, Hartmanthus hallii*, *Conophytum taylorianum* subsp. *ernianum, Astridia longifolia, Tylecodon hallii, Tylecodon paniculatus* subsp. *glauca, Aloe gariepensis,* and *Crassula atropurpurea* (**Table 9**). In addition, many more protected species occur, such as *Cheiridopsis robusta, Crassula brevifolia, C. cotyledonis, C. fusca, C. macowaniana, C. subaphylla* subsp. *subaphylla, Adromischus filicaulis, Larryleachia marlothii* and *Boscia albitrunca.* Numerous other endemic or near-endemic species are also found, some of restricted habitat. A number of these species show a tendency to congregate in small patches of suitable habitat (pers. obs.), making the impact on them higher than on those species that are more randomly distributed. In this respect *Hartmanthus hallii* is of very high concern on this site. There is a very dense, hitherto unknown, population in the first saddle behind the koppie (**Plate 5**; **Figure 7**) centred at 27.90384°S/16.70686°E. Because this is such a localised population it should be easy to avoid by routing the power line over the next saddle (27.90312°S/16.70808°E) which is, by far, less sensitive. It is also indicated in **Figure 7** and shown in **Plate 6**. Note that it might be that the route is already intended to use the second saddle, but it was not possible to see for certain on the route information provided by Nampower for this study. All three saddles are shown in **Plate 7**.

The sensitivity of this koppie and its direct surrounds, as mapped in Appendices 3 and 4, is VERY HIGH, and it should be regarded as a 'NO-GO' area.

Plate 4: The limestone/granite koppie carries a very high plant diversity.

Plate 5: The western saddle (shown here from the north) is rated as HIGHLY SENSITIVE. It carries a dense population of *Hartmanthus halii* as well as other species of concern.

Plate 6: The eastern saddle is far less sensitive than the western saddle.

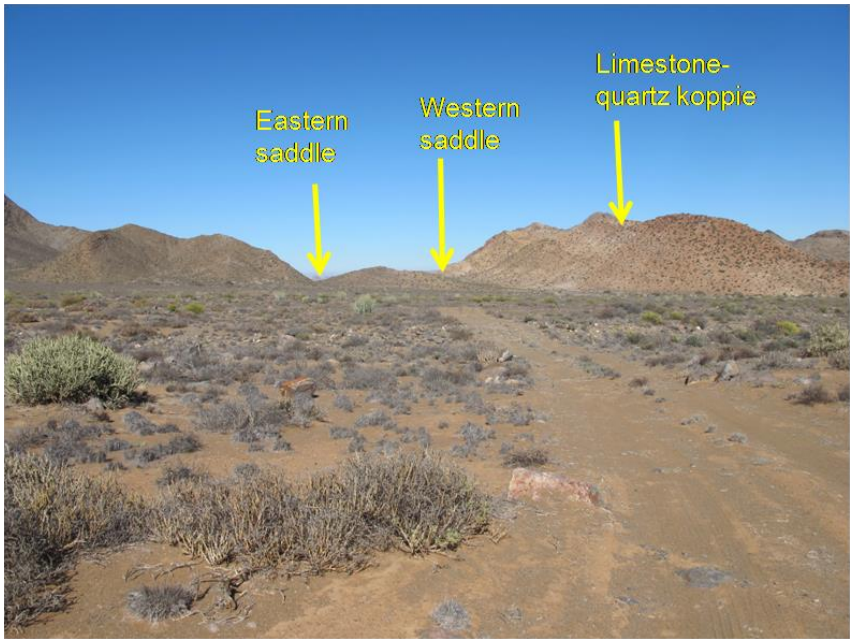

Plate 7: View of the two saddles from the north.

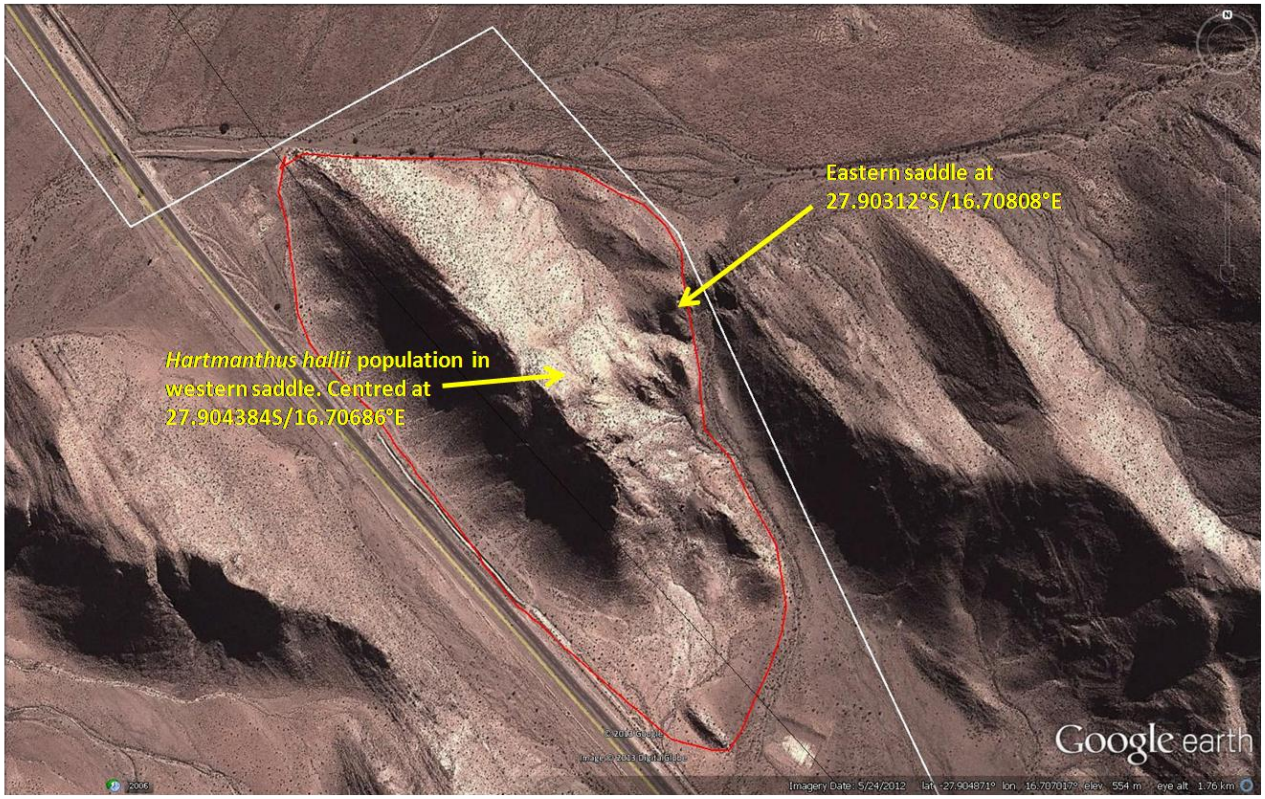

Figure 7: No-go areas with *Hartmanthus hallii* locality and showing saddle.

8.3.2.4 Low rocky outcrops and quartz foothills

This habitat, found on either side and north of the Tutungeni settlement (**Figure 4**), is characterised by the presence of many succulent perennials, including species of some conservation concern such as *Tylecodon hallii, Crassula brevifolia, C. macowaniana,* and *Sarcocaulon inerme* on the outcrops and *Cephalophyllum ebracteatum* and *Eberlanzia schneideriana* on the quartz foothills, which characteristically carry a dense layer of white quartz pebbles on the surface (**Plate 8**). The species of highest concern seen here was *Aloe pillansii*

(giant quiver tree), but only very high on the slopes in the gulley approaching the mine. It should not really be affected by the route, which is unlikely to run high along the slope. However, it should be pointed out that this species has already experienced an very high impact from the Rosh Pinah mine and further losses of this protected, endangered, CITES I, near-endemic, iconic species should be prevented at all costs.

Plate 8: Typical quartz-covered footslope in the southern section of the route.

The sensitivity of this habitat is rated as MEDIUM because it has a low to very low recovery potential. It should be regarded as an area to be avoided if at all practical, and any unavoidable damage, especially collateral damage, should be restricted as far as possible.

Potential negative impacts

- damage to protected, endemic and near-endemic plants and restricted habitats due to uncontrolled vehicle and human activity during construction and maintenance of infrastructure
- removal of or damage to plants for firewood or other (e.g. ornamental) purposes

8.4 Fauna

8.4.1 Avifauna

A specialist avifauna study was carried out to identify potential impacts of the new powerline on avifauna. The survey was conducted by Dr. Chris Borwn in July 2013. The study included a site visit between 01 – 05 July 2013.

The survey focused along the existing powerline, as the new powerline will be erected close to it. No fatalities were reported.

Unfortunately the specialist report was not available at the time of printing. Since October 2008 NamPower and the Namibian Nature Foundation (NNF) joined forces in a strategic partnership. The partnership focuses on the management of powerline impacts on the natural environment, especially birds. Guideline documents on high risk factors for birds and a bird risk factor matrix have been compiled for use by NamPower and other electricity providers of new powerline

routes. The information provided in these documents should be used when designing the new powerline.

8.4.2 Reptiles and Mammals

No specialist study focusing on the power line route specifically was conducted. Associated with the unique vegetation habitats around the power line route, there are a large number of animal species which are of conservation importance or endemic to the region (**Appendix H**). The Nama Karoo Biome supports 131 desert vertebrates. Of this total, 16 species (nine reptiles, five mammals, two birds) are endemic to the biome (Lovegrove, 1993). The Succulent Karoo Biome has 88 desert vertebrates, of which 25 occur nowhere else. There are nine endemic reptiles in the Nama Karoo Biome.

Common wild mammals, such as kudu, zebra, baboons, gemsbok and springbok occur on the farms and the state land. However, mammals and reptiles will move away during construction activities. Information provided in **Appendix H** has been collected from various studies conducted in the close vicinity and has been confirmed in discussions held with Mr. M. Griffin (previous MET, Windhoek).

Potential negative impacts

- Loss of habitat
- Disturbance of migration routes during construction

8.5 Social / Economic

8.5.1 Directly Affected Parties

Mr. Nick Kotze owns both Farm Spitskop and Zebrafontein, which are crossed by existing lines and will be crossed by the proposed power line. Mr Kotze was faxed a covering letter, the BID and the Comments Sheet (**Appendix D**), and ASEC phoned him to ensure he had received it. He made arrangements for the EIA team to meet his farm worker, Mr Peter Jacobs, and to allow the team access for the specialist studies. No comments have been received.

8.5.2 The Karas Region

Rosh Pinah is situated 376 kilometres south west of Keetmanshoop in the Karas Region, which is the largest of Namibia's regions (161,086 km^2), the most arid and has a density of 0.5 people per square km. 60% of the region is private property, mainly used for farming and the remaining 40% of the land is controlled by the government (NPC 2007).According to the 2011 Census results, 77 421 people live in the region (about 3.5% of the national population). While the number of households in the region has increased from 16,839 in 2001 to 21,283 in the 2011, the average size of household in the region has decreased from 4.7 to 4.2. The population is fairly balanced regarding gender, with only 1,400 more men than women (39,400 male compared to 38,000 females) (NPC 2012).

In-migration to the Karas Region has been greatly influenced by mining, irrigation, fishing and industrial type developments. Only 60% of the people living in the Karas Region were born there (NPC 2007) often resulting in higher unemployment for the local people. Employment is dominated by men (two-thirds versus one-third for women) in almost all kinds of work. About 61%

of all employed persons work in the private sector while the government employs about 27%, and a small proportion work in other sectors (PLANUNG+UMWELT / SAIEA. 2011).

8.5.3 Rosh Pinah

The town of Rosh Pinah came into being in 1968 when the first major mining operation, Rosh Pinah Zinc Corporation (RPZC) was set up in the area. When Skorpion Zinc opened in 2000, Rosh Pinah's population continued to increase rapidly. If one or both mines for whatever reason have to decrease their activity or close altogether, Rosh Pinah is likely to shrink considerably.

In 2011, the population census registered 2,835 people in Rosh Pinah whereas RoshSkor, the town's management body, is confident that approximately 7,000 people live there (split about 50:50 between the main town and the informal settlement of Tutengeni (Pers. comm. RoshSkor, July and October 2013)[1]. RoshSkor is in the process of conducting a full population count in October 2013.

Figure 8: Aerial view of Rosh Pinah, showing some suburbs; 2008.

The town's economy is driven by the two mines, with tourism and business providing further opportunities. In Tutengeni, the town's informal settlement, approximately 40% of the adult population is employed by the two mines and their contractors whilst 54% are unemployed[2]; the rest of town has almost a zero rate of unemployment (UTN 2009).

8.5.4 Rosh Pinah Town Management

Rosh Pinah is not a proclaimed town and does not have a municipality. The town falls under the control of the two mines, RPZC and Skorpion Zinc, who manage the town via RoshSkor Township (Pty) Ltd.

[1] The author notes that there have been a lot of complaints from across the country with the 2011 census data, especially in towns and this may be because the census was close to a public holiday so many people had left the towns for the rural areas.

The land on which Rosh Pinah is situated falls within the two mines' accessory works area – land made available by Government for a mine to develop accommodation and other facilities in an attempt to improve the quality of life of their employees.

One of the main challenges faced by the town is access to freehold land. Currently private individuals have the opportunity to acquire right of lease for a piece of land and some have done so to build their homes. Apart from the right to freehold land, Rosh Pinah offers all other benefits and drawbacks of a small town.

8.5.5 Tutungeni

In 2006, after consultations with the informal settlement of Sands Hotel, RoshSkor invested approximately N$1.6 million in town planning and roads to move the settlement away from the proximity of the enlarging waste rock dumps. The resulting township, Tutungeni, has 1350 plots and RoshSkor estimates it is home to approximately 3,000 people.

The 2009 SEAT survey, which reached 428 individuals in 319 households, found clear socio-economic differences between Tutungeni and the rest of Rosh Pinah. The majority of the town residents consulted earned an income between N$5,001 and N$10,000/month. In Tutungeni, however, virtually nobody earned an income above N$5,000. Almost 80% of the respondents staying in Tutungeni stated that they earn a monthly income of N$2,000 or less, compared to 30% of the respondents staying in town (UTN 2009).

Priorities for future social investment also reflected significant requirements. People living in Tutungeni wanted investment to meet their basic needs - electricity, increased accessibility to water, flushing toilets and more/improved housing. Residents in town wanted a secondary school, more opportunities for gaining entrepreneurial skills such as through skills training projects, entertainment and housing.

8.5.6 Housing

RPZC has built 140 houses over the past 12 years, purchased 17 dwellings and built 29 houses as part of the OBIB project, totaling 186 houses. These dwellings include 1 bedroom, 2 bedroom and 3 bedroom houses in all areas of the town. RPZC also upgraded 8 3 bedroom houses in Kokerboom street into 4 bedroom houses. Examples of RPZC's housing stock are shown in the **Plates** below.

Plate 9: RPZC's Affordable housing

Plate 10:RPZC Artisan housing

Plate 11: RPZC housing

Plate 12: RPZC's Affordable housing

Skorpion Zinc has built six types of housing at Rosh Pinah for employees of different levels who work full-time at the mine. The operators work one week shifts and stay at the "shift village" which are 100 purpose-built, hotel-like rooms in Rosh Pinah (**Plate 13**). As the lifespan of the mine was originally thought to be finite to 2015, the houses are prefabricated and are built on shallow foundations so all can be easily removed on mine closure.

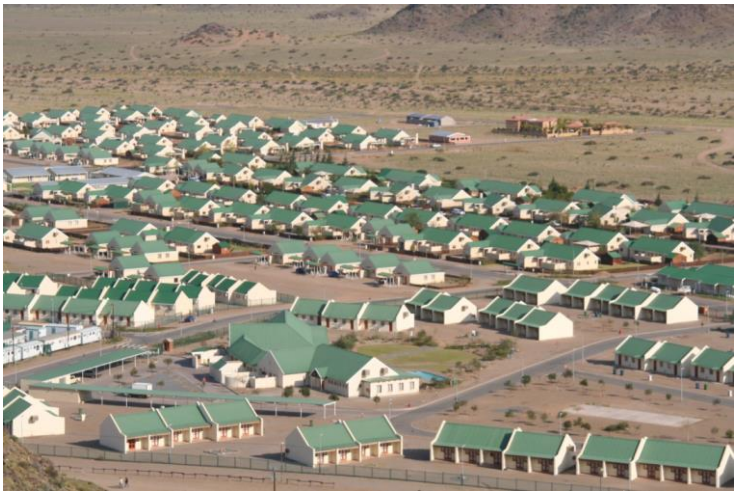

Plate 13: Skorpion Zinc housing, showing the shift village units in the foreground

8.5.7 Education and Health

Rosh Pinah has a government school, Hoeksteen Primary, which provides Grade 1 – 7 and a Tsau Khaeb Secondary School which provides grade 8 - 12. There is also a private primary and two pre-primary schools. Both mines offer hostel and transport costs for family members to travel to secondary schools within a 1,000km radius. They also offer bursaries for Namibian students and also offer opportunities for employees to gain further skills training. Other social responsibility contributions in the region include support to Namibian Institution of Mining and Technology, (NIMT) Keetmanshoop, the OBIB Training Centre in Rosh Pinah and various Karas schools such as Bethanie.

Rosh Pinah has a state clinic staffed by two nurses and two community counsellors which provides health care to approximately 80-90 people per day; a doctor visits twice monthly. The Ministry of Health has listed the upgrading of this clinic to a Health Centre, as a high priority. There is also a private healthcare company which runs Sidadi clinic in town, staffed by 2 doctors,

6 nurses and other para-medics which provides health care to mine employees and the general public.

8.5.8 Security

As in all informal settlements, crime incidents are much higher in Tutungeni than in Rosh Pinah, and the Tutungeni Committee (a resident's committee) recommended installing street lighting, more police patrols and a faster police response time. The Rosh Pinah police station is staffed by 20 full time NamPol police officers and provides police services twenty-four hours a day. Private security activities are carried out by G4S, which employs 142 persons (pers. comm. Mr Movirongo, CAM, Skorpion Zinc, Oct 2011).

8.5.9 Mining

The Rosh Pinah Zinc Corporation is an underground mine and employs approximately 610 people, plus a further 300 contractors who provide services such as security, catering, cleaning, waste management, construction, machine servicing and transport. Thus over 900 individuals and their families depended directly upon RPZC for their livelihoods.

Skorpion Zinc is based approximately 25km from Rosh Pinah. The mine and zinc extraction/ production plant has approximately 750 employees of whom 400 are operators, and an additional ~750 contractors. The average age of the workforce is 32. RPZC employs more general workers, many of whom have schooling below Grade 10. Skorpion Zinc has a higher percentage of graduates and all their staff - administrative, managerial and operators and most contractors stay in Rosh Pinah.

Both mines have a huge impact at the local level but also at regional level with the import of chemicals for ore processing and the export of zinc and lead through the expanded Port of Lüderitz. At national level, the export oriented production of the mines contributes significantly to the country's foreign currency earnings, as well as direct and indirect taxes by the mines and their employees.

The current information indicates that the Life of Mine of the RPZC mine can go up to 12 years at an annual production of 700 000t, however on-going exploration can extend this further if favourable exploration results are realised. A revision on the annual production rate would also change the life of mine.

Both mines have discovered new resources and are optimistic about their future.

8.5.10 Tourism

The Rosh Pinah area is nestled between the Ai-Ais / Richtersveld Transfrontier Park in the East, and the Sperrgebiet National Park in the West. This places Rosh Pinah right on the meeting edge of two amazingly contrasting geological areas and the landscape that surrounds the town, all the way along the road from Sendelingsdrif to Aus, is phenomenally beautiful.

The Sperrgebiet is currently still closed to the public, although it is a nature reserve. Hopefully negotiations will succeed in opening it up as concession areas in the not too distant future, which will change the allure of the town to tourism radically. Through concession holders, the southernmost dunes of the Namib, as well as the historical site of the Roter Kamm Meteorite Crater will be available.

8.5.11 Business and Development

A number of businesses cater for most of the community's needs. However, all infrastructure and most of the buildings and recreational facilities belong to the mines. Small and medium enterprises are dependent on the support of the residents and tourism is still limited. Services delivered by institutions like Telecom, Namibian Police, Immigration, NamWater, NamPower, Namcol and NamPost are available.

RoshSkor is constantly involved with the implementation and support of SMEs through both mine's social investment programmes. A primary asset is water from the Orange River, approximately 30km away from the town, but increased electricity prices and long distances from potential markets, jeopardize agriculture projects. In an attempt to compensate for limited industrial potential, a lot of effort is put into skills development.

Training programs include welding, sewing, weaving, gardening, catering and brick-making. Partnerships with Namcol and the Ministry of Education help to extend formal education.

Potential negative impact

- Contractors entering land belonging to a private landowner and the Ministry of Environment and Tourism

Potential positive impacts

- Limited employment opportunities during construction of the proposed power line and dismantling of old one.
- Unlikely to be employment opportunities during operations, related to maintenance.
- Positive economic impacts at local, regional and national level.

8.6 Archaeology

A specialist archaeological study (**Appendix I**) was conducted by Dr. J. Kinahan (QRS). The study comprises a desktop study and a site visit carried out between 01 to 05 July 2013.

Archaeological remains in Namibia are protected under the National Heritage Act (27 of 2004) which makes provision for archaeological impact assessment of large infrastructure projects. The archaeology of the Rosh Pinah area has been studied in some detail for previous mining and related projects, and the present assessment required only a site inspection as the basis of impact assessment.

The field survey involved direct observation (field walking, transects), with archaeological site positions determined in the field by hand-held GPS and plotted on aerial photographs or large scale topographic maps. The sites themselves are documented according to conventional criteria of type, physical setting, spatial extent, degree of preservation, and likely age and affinity. In the field, all archaeological sites are assessed as to their significance and vulnerability, using two independent parallel scales devised for archaeological assessment in Namibia:

SIGNIFICANCE RANKING

0 no archaeological significance
1 disturbed or secondary context, without diagnostic material
2 isolated minor find in undisturbed primary context, with diagnostic material
3 archaeological site forming part of an identifiable local distribution or group
4 multi-component site, or central site with high research potential
5 major archaeological site containing unique evidence of high regional significance

VULNERABILITY RANKING

0 not vulnerable
1 no threat posed by current or proposed development activities
2 low or indirect threat from possible consequences of development (e.g. soil erosion)
3 probable threat from inadvertent disturbance due to proximity of development
4 high likelihood of partial disturbance or destruction due to close proximity of development
5 direct and certain threat of major disturbance or total destruction

8.6.1 Existing field data

The local archaeological sequence as determined by previous surveys and excavations in the Rosh Pinah area comprises the following four main elements:

a) Early to mid-Pleistocene (ca. 2my to 0.128my; OIS 6, 7, 19 &c): represented by surface scatters of stone tools and artefact debris, usually transported from original context by fluvial action, and seldom occurring in sealed stratigraphic context.
b) Mid- to upper Pleistocene (ca. 0.128my to 0.040my; OIS 3, 4 & 5a-e): represented by dense surface scatters and rare occupation evidence in sealed stratigraphic context, with occasional associated evidence of food remains.
c) Late Pleistocene to late Holocene (ca. 0.040my to recent; OIS 1 & 2): represented by increasingly dense and highly diverse evidence of settlement, subsistence practices and ritual art, as well as grave sites and other remains.
d) Historical (the last ca. 250 years): represented by remains of crude buildings, livestock enclosures, wagon routes and watering points. Some evidence of trade with indigenous communities, including metals, ceramics and glass beads.

Archaeological sites in the Rosh Pinah area are strongly associated with low rocky ridges and isolated outcrops where rock overhangs provide a degree of shelter from the prevailing winds. Evidence of small-scale activities such as artefact raw material quarrying, the use of hunting blinds in strategic locations and the positioning of burial sites on outwash fans, combines with the rock shelter sites to present a relatively high local site concentration. Within this terrain approximately 80% of archaeological sites are associated with low rocky hills and outcrops, and about 12% with sandy gravel outwash fans. **Figure 9**, below shows the distribution of existing archaeological site locations, as well as additional site locations noted in the course of the present survey, in relation to the proposed RPZC infrastructure developments.

8.6.2 New archaeological sites

Table 10 lists the newly encountered archaeological sites during the field survey (see **Figure 9** for illustration).

Table 10: Newly encountered archaeological sites during the site visit.

Site No.	Co-ordinates	Significance / Vulnerability	Description
QRS 187/1	S27.87943 E16.68567	2/3	Schist hill spur with dispersed scatter ¬20 pieces/m^2 hydrothermal vein quartz artefact flaking debris.
QRS 187/2	S27.90844 E16.70812	2/3	Schist outcrop with localized scatter of fine-grained quartzite flaking debris. Distance from centerline 116m.
QRS 187/3	S27.90224 E16.70531	1/3	Valley-fill sediments with hydrothermal vein quartz artefact flaking debris on streambank. Distance from centerline 95m.
QRS 12/34	S27.85349 E16.635232	2/2	Isolated schist outcrop, rock shelter, facing 160° mag, talus has flaked quartz Distance from centreline 127m.
QRS 12/37	S27.88245 E16.68288	2/2	Isolated schist outcrop, rock shelter, talus has flaked quartz Distance from centreline 193m.
QRS 177/14	S27.88245 E16.68288	2/2	Isolated schist outcrop, rock shelter, facing 160° mag, talus has flaked quartz Distance from centreline 209m.

In summary, the intended linear infrastructure is largely confined to:

- Colluvial outwash sediments
- Areas of low archaeological site density
- Existing linear infrastructure corridors
- Previously disturbed ground

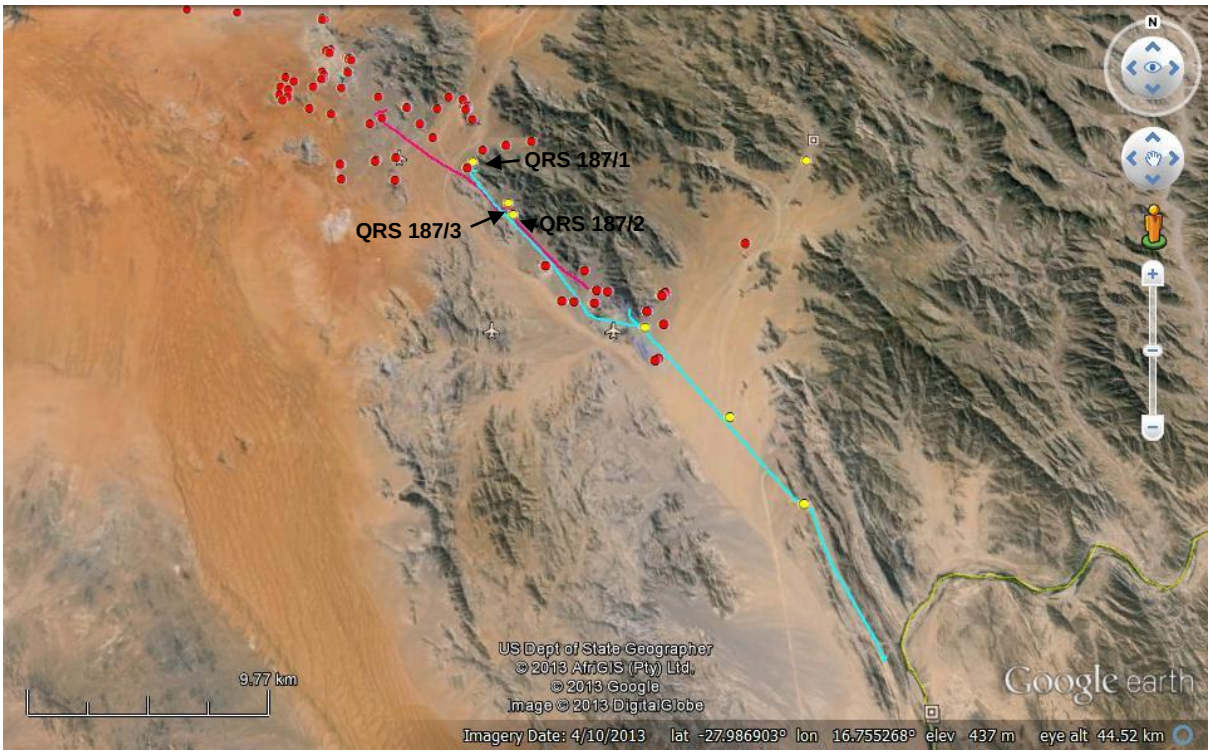

Figure 9: Existing archaeological site locations (red) and additional site locations noted in the course of the present survey (yellow), shown in relation to the proposed water supply power line to Rosh Pinah from Sendelingsdrif (blue). Note: the position of the RPZC linear infrastructure elements is shown here for illustrative purposes; no final design or spatial data were available at the time of this study.

Potential negative impacts

- Damage or loss of archaeological site

9. ASSESSMENT OF IMPACTS RELATING TO THE BIOPHYSICAL AND HUMAN ENVIRONMENT

The potential negative and positive impacts associated with activities relating to the proposed new power line have been assessed using the methodology prescribed in **Section 9.1**. A list of the issues/threats associated with each aspect is provided in each sub-section.

9.1 Impact Assessment Methodology

The adequate assessment and evaluation of the potential impacts and benefits that will be associated with the proposed project necessitates the development of a scientific methodology that will reduce the subjectivity involved in making such evaluations. A clearly defined methodology is used in order to accurately determine the significance of the predicted impact on, or benefit to, the surrounding natural and/or social environment. For this, the proposed project must be considered in the context of the area and the people that will be affected.

Nonetheless, an impact assessment will always contain a degree of subjectivity, as it is based on the value judgment of various specialists and EIA practitioners. The evaluation of significance is thus contingent upon values, professional judgement, and dependent upon the environmental and community context. Ultimately, impact significance involves a process of determining the acceptability of a predicted impact to society.

The purpose of impact assessment is to identify and evaluate the likely significance of the potential impacts on identified receptors and resources according to defined assessment criteria, to develop and describe measures that will be taken to avoid, minimize, reduce or compensate for any potential adverse environmental effects, and to report the significance of the residual impacts that remain following mitigation.

There are a number of ways that impacts may be described and quantified. An impact is essentially any change to a resource or receptor brought about by the presence of the proposed project component or by the execution of a proposed project related activity.

The nature of the project may determine whether one needs to assess both routine and non-routine impacts. Non-routine impacts generally relate to accidents and could include oil/chemical/fuel spills, emergency venting of noxious gases, etc. In most cases, it would be sensible to have separate chapters for the assessment of routine and non-routine impacts.

The types of impacts and terminology to be used in the assessment are outlined in **Table 11**.

Table 11: Defining the Nature of the Impact

Term	Definition
Impact nature	
Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change.
Negative	An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor.
Direct impact	Impacts that result from a direct interaction between a planned project activity and the receiving environment/receptors (eg. between occupation of a site and the pre-existing habitats or between an effluent discharge and receiving water quality).

Term	Definition
Indirect impact	Impacts that result from other activities that are encouraged to happen as a consequence of the Project (eg. in-migration for employment placing a demand on resources).
Cumulative impact	Impacts that act together with other impacts (including those from concurrent or planned future third party activities) to affect the same resources and/or receptors as the Project.

9.1.1 Assessing Significance

There is no single accepted definition of 'significance' and its determination is, therefore, somewhat subjective. However, it is generally accepted that significance is a function of the magnitude of the impact and the probability of the impact occurring. It is widely accepted that Impact Magnitude (or Severity) is a function of the extent, duration and intensity of the impact.

The criteria used to determine significance are summarised in **Table 12**.

Table 12: Significance Criteria

Impact magnitude – the degree of change brought about in the environment	
Extent (Scale)	On-site – impacts that are limited to the power line line itself and any other related infrastructure. Local – impacts that affect an area of 1km to 500m from the power line. (Local social impacts can be within 20km area of the powerline). Regional – impacts that affect regionally important environmental resources or are experienced at a regional scale as determined by administrative boundaries, habitat type/ecosystem. National – impacts that affect nationally important environmental resources or affect an area that is nationally important/ or have macro-economic consequences. Transboundary/International – impacts that affect internationally important resources such as areas protected by international conventions.
Duration	Temporary – impacts are predicted to be of short duration and intermittent/occasional. Short-term – impacts that are predicted to last only for the duration of the construction period. Long-term – impacts that will continue for the life of the Project, but cease when the Project stops operating. Permanent – impacts that cause a permanent change in the affected receptor or resource (e.g. removal or destruction of ecological habitat) that endures substantially beyond the Project lifetime.
Intensity ([3])	BIOPHYSICAL ENVIRONMENT: Intensity can be considered in terms of the sensitivity of the biodiversity receptor (i.e. habitats, species or communities). Negligible – the impact on the environment is not detectable. Low – the impact affects the environment in such a way that natural functions and processes are not affected. Medium – where the affected environment is altered but natural functions and processes continue, albeit in a modified way.

(3) The frequency of the activity causing the impact also has a bearing on the intensity of the impact, i.e. the more frequent the activity, the higher the intensity.

	High – where natural functions or processes are altered to the extent that it will temporarily or permanently cease. Where appropriate, national and/or international standards are to be used as a measure of the impact. Specialist studies should attempt to quantify the magnitude of impacts and outline the rationale used.
	SOCIO-ECONOMIC ENVIRONMENT: Intensity can be considered in terms of the ability of project affected people/communities to adapt to changes brought about by the Project. Negligible – there is no perceptible change to people's livelihood Low - People/communities are able to adapt with relative ease and maintain pre-impact livelihoods. Medium - Able to adapt with some difficulty and maintain pre-impact livelihoods but only with a degree of support. High - Those affected will not be able to adapt to changes and continue to maintain-pre impact livelihoods.
Impact probability – the probability that an impact will occur	
Unlikely	The impact is unlikely to occur.
Likely	The impact is likely to occur under most conditions.
Definite	The impact will occur.

Once a rating is determined for magnitude and probability, the matrix in **Table 13** can be used to determine the impact significance.

Table 13: Example of Significance Rating Matrix for Positive and Negative Impacts

SIGNIFICANCE RATING				
	PROBABILITY	**Unlikely**	**Likely**	**Definite**
INTENSITY	**Negligible**	Negligible	Negligible	Minor
	Low	Negligible	Minor	Minor
	Medium	Minor	Moderate	Moderate
	High	Moderate	Major	Major

A colour scale for negative and positive ratings is given in **Table 14**.

Table 14: Colour Scale for Ratings

Negative ratings	**Positive ratings**
Negligible	Negligible
Minor	Minor
Moderate	Moderate
Major	Major

Table 15 outlines the various definitions for significance of an impact and is based on the significance rating matrix.

Table 15: Significance Definitions

Significance definitions	
Negligible significance	An impact of negligible significance is where the magnitude is negligible, low or medium and the likelihood of the impact occurring is unlikely or likely. An impact of negligible significance is where a resource or receptor will not be affected in any way by a particular activity, or the predicted effect is deemed to be imperceptible or is indistinguishable from natural background levels.
Minor significance	An impact of minor significance is where the magnitude of the impact is low but the likelihood is high or where the magnitude is high but the likelihood of occurrence is unlikely or likely. An impact of minor significance is one where an effect will be experienced, but the impact magnitude is sufficiently small and well within accepted standards, and/or the receptor is of low sensitivity/value.
Moderate significance	An impact of moderate significance is where the magnitude is medium to high and the likelihood of the impact occurring is likely or definite. An impact of moderate significance is one within accepted limits and standards. The emphasis for moderate impacts is on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that "moderate" impacts have to be reduced to "minor" impacts, but that moderate impacts are being managed effectively and efficiently.
Major significance	An impact of major significance is where the magnitude of the impact is medium to high and the likelihood of the impact occurring is also likely or definite. An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. A goal of the EIA process is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might be the visual impact of a development. It is then the function of regulators and stakeholders to weigh such negative factors against the positive factors, such as employment, in coming to a decision on the Project.

Once the significance of the impact has been determined, it is important to qualify the degree of confidence in the assessment. Confidence in the prediction is associated with any uncertainties, for example, where information is insufficient to assess the impact. Degree of confidence can be expressed as low, medium or high.

9.1.2 Potential for cumulative impacts

As defined in the Environmental Regulations Feb 2012) – "cumulative effect", in relation to an activity, means the effect of an activity that in itself may not be significant but may become significant when added to the existing and potential effects eventuating from similar or diverse activities or undertakings in the area.'

A brief description will be provided for each impact.

9.1.3 Potential for non-compliance with legislative and regulatory requirements

All applicable legislations and regulatory requirements have been stated in Section 5 and Section 8 where applicable. They will also be mentioned in the Environmental Management Plan against which the impact will be audited and monitored.

It is important that all legal and regulatory requirements are met prior to the commencement of the project.

9.1.4 Mitigation Potential and final risk categorisation of Impacts

It is expected that for the identified significant impacts, the project team will work with the client in identifying suitable and practical mitigation measures that are implementable. Mitigation that can be incorporated into the Project design in order to avoid or reduce the negative impacts or enhance the positive impacts will be developed. A description of these mitigation measures should also be included within the EMP.

Final risks of impacts are those impacts which remain once the mitigation measures have been designed and applied. Once the mitigation is applied, each impact is re-evaluated (assuming that the mitigation measure is effectively applied) and any remaining impact is rated once again using the process outlined above. The result is a significance rating for the final risk of the impact.

The approach taken to defining mitigation measures is based on a typical hierarchy of decisions and measures, as described in **Figure 10**.

THE MITIGATION HIERARCHY FOR PLANNED PROJECT ACTIVITIES
Avoid at Source; Reduce at Source
Avoiding or reducing at source is essentially 'designing' the project so that a feature causing an impact is designed out (e.g. a waste stream is eliminated) or altered (e.g. reduced waste volume). Often called minimisation.
Abate on Site
This involves adding something to the basic design to abate the impact - pollution controls fall within this category. Often called 'end-of-pipe'.
Abate at Receptor
If an impact cannot be abated on-site then measures can be implemented off-site - an example of this would be to use the stand-by vessel to help control the level of interference with fishing activity.
Repair or Remedy
Some impacts involve unavoidable damage to a resource, eg land disturbance. Repair essentially involves restoration and reinstatement type measures, such as base camp closure.
Compensate in Kind
Where other mitigation approaches are not possible or fully effective, then compensation, in some measure, for loss, damage and general intrusion might be appropriate.

Figure 10: Mitigation Hierarchy

9.2 Flash Floods

Impact description

High rain events might result in flash floods, especially on the flat sandy plain areas, as the water cannot seep into the ground. Evidence of previous storm water events is visible in the area. This might result in erosion of access tracks during construction and maintenance of the new power line. In addition the run-off water can be contaminated by material, e.g. grease, oil, etc., at the lay down areas.

	Construction	Operational	Closure
Project Aspect/ Activity	General building activities Management of dirty water Storage and handling of new and used materials and chemicals (including hydrocarbons). Waste management (non-mineralised and mineralised) Use of vehicles and equipment that may leak lubricants and fuel. Dust fallout.	Erosion of maintenance track	General decommissioning activities

Impact assessment

Nature - it is expected that a **negative** and **direct** impact will result from unmanaged flash floods.

Impact Magnitude

- **Extent**: The scale would be primarily confined to site, but should the subsurface water in drainage lines and washes become contaminated off-site, the extent of the impact will be **local.**
- **Duration**: Should water become contaminated off-site, the duration of this impact will be **short term**.
- **Frequency**: The **frequency** of this impact occurring is deemed to be **low**.

Intensity: Rainfall runoff may be significant, albeit that the frequency of such events in the area may be low. As a result of typically short duration, high intensity rainfall events, coupled with shallow soils with low infiltration potential, the intensity of rainfall runoff, when it occurs is high, resulting in a high likelihood of flow, which if contaminated by lay-down areas, might create downstream soil contamination and erosion of tracks impacts. This will result in an impact of a **low** intensity.

Probability: The impact is **likely**, significant rainfall events have occurred in the past three years.

IMPACT SIGNIFICANCE (PRE-MITIGATION) FOR CONSTRUCTION & OPERATIONS: MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **high**.

Mitigation

Mitigation measures to reduce the impacts of storm water runoff include the following:

Avoid:

- Ensure that lay-down areas are not in washes.

Mitigation:

- Where applicable construct temporary protection bunds around lay-down areas.

Final risk categorisation

The implementation of mitigation measures will result in a reduction in the risks posed by flash floods. The mitigation measures implemented will result in a negligible residual impact.

Pre- and Post- Mitigation Significance: Impacts as a result of storm water runoff on water quality

Phase	Significance (Pre-mitigation)	Final risk Impact Significance
Construction	**MINOR (-ve)**	Negligible
Operation	**MINOR (-ve)**	Negligible
Decommissioning and Closure	**MINOR (-ve)**	Negligible

9.3 Impacts from Waste management

Impact description

During the construction, operational and decommissioning phases, fuels and hazardous substances will be used at the lay-down areas. These pose a risk of accidents, but it is very difficult to predict the impact of such accidents when their magnitude or severity is not known. Hazardous spills and contaminants have the potential to contaminate soil and water, which in turn can harm plants and animals. Also general waste, e.g. plastic, cardboard, paper, needs to be managed properly to avoid any risk to animals. The frequent strong winds can disperse this rubbish over long distances, where it can collect in the surroundings on and around bushes and rocks. This is messy and detracts from the wilderness value of the surroundings. More pertinent to terrestrial ecology, it can harm animals if it is ingested, and can attract scavenging animals such as jackals so that their numbers increase beyond the normal capacity of the ecosystem. Indirectly, this can have negative consequences for jackals' other prey species.

	Construction	Operational	Closure
Project Aspect/ Activity	Use of fuels and hazardous substances General waste	Use of fuels and hazardous substances General waste	Use of fuels and hazardous substances General waste

Impact assessment

Nature - Accidental spills of polluting substances and badly managed general waste could have a **negative direct** impact on various animals and on the functioning of the ecosystem.

Impact Magnitude

- **Extent**: The extent of the impact depends on the type of accident, but is unlikely to be greater than **local**.
- **Duration**: Accidents are possible during any of the phases. The duration could vary from **short term** to **temporary**.
- **Frequency**: The impact would probably be felt only at the time of the accident.

Intensity: Depending on the scale of the accident, the intensity could be **low** to **medium**.

Probability: The impact is **likely** to **unlikely** to occur as human errors need to be taken into account.

IMPACT SIGNIFICANCE (PRE-MITIGATION) FOR CONSTRUCTION & OPERATIONS: MINOR NEGATIVE

Degree of Confidence: The degree of confidence is **high**.

Mitigation

Accidents can be prevented by safety and management procedures, which contractors usually do well as it is in their interest to maintain high occupational safety standards and to minimise time losses caused by accidents. Some of the measures which should be implemented include:

- Spillage-management and response procedures need to be developed for all hazardous substances used on site. All hazardous storage facilities should be bunded; the volume of the bunded area is to be at least 110% of the total volume of the tanks in which the hazardous material is stored.
- Spills to be cleaned immediately and contaminated soils and water to be remediated or treated.
- Hazardous waste and contaminated soil needs to be disposed of at the mine.
- Implement a strong anti-litter and clean surroundings policy among all staff and contractors.
- All domestic waste to be disposed of in waste bins. Temporary storage of collected waste should be within a fenced area to prevent scavenging and dispersal by wind.
- All domestic waste bins to have lids so as to reduce the likelihood of windborne litter.
- Regularly inspect and clean up litter at site and in the general proximity of the mine.
- All waste to be disposed of in appropriate waste-disposal facilities (e.g. specific facilities designed for hazardous wastes). Wastes are to be stored on site but removed from the lay-down areas for disposal at the Rosh Pinah waste disposal site.
- Implement a strong occupational safety and clean surroundings policy among all staff and contractors.

Final risk categorisation

The success of the above mitigation measures will determine the risk of accidents and their severity. However, most accidents are caused by human error or negligence, which can never be 100% prevented. Thus, the likelihood of accidents might be decreased, but the potential impacts they pose remain unchanged.

The mitigation measures implemented will result in a negligible to minor residual impact.

Pre- and Post- Mitigation Significance: Impacts as a result from pollution from accidental spills of hazardous substances and general waste management

Phase	Significance (Pre-mitigation)	Final risk Impact Significance
Construction	**Minor (-ve)**	**Minor (-ve) - Negligible**
Operation	**Minor (-ve)**	**Minor (-ve) - Negligible**
Decommissioning and Closure	**Minor (-ve)**	**Minor (-ve) - Negligible**

9.4 Impacts on Flora

Impact description

Mainly during the construction phase, damage to protected plants and restricted habitats due to uncontrolled vehicle and human activity may occur. Additional removal of or damage to plants for firewood or other (e.g. ornamental) purposes could happen.

	Construction	Operational	Closure
Project Aspect/ Activity	Loss of species of concern resulting from physical destruction due to vehicle activity along the service track, laydown areas and assembly areas. Unauthorised firewood or ornamental collection.	Widening or modification of the existing service route to avoid uneven terrain, resulting in additional plants being damaged or destroyed. Unauthorised firewood or ornamental collection.	Decommissioning activities. Unauthorised firewood or ornamental collection.

Impact assessment

Nature: Physical destruction of habitat and vegetation, including species of high conservation concern during construction and operation resulting in **negative direct** impacts

Impact Magnitude:

- **Extent**: The extent of the direct impact is limited to the site but, due to the limited area of occurrence of the species of concern **the extent may be considered to be regional, national and even international** because Southern Namib endemics and near-endemics of extremely limited extent of occurrence, and their habitats, will be affected, and species will be lost.
- **Duration**: The duration would be **long-term** to **permanent** as the ecology of the area would be altered beyond the completion of the project.
- **Intensity**: The impact will be **medium** because no species or habitat would be totally lost.

Probability: Habitat and vegetation, including species of conservation concern will **definitely** be lost.

IMPACT SIGNIFICANCE (PRE-MITIGATION): MODERATE

Degree of Confidence: The degree of confidence is **high**.

Nature: Illegal plant or firewood harvesting for fuel or ornamental purposes during construction and operation resulting in **negative direct** impacts

Impact Magnitude:

- **Extent**: The extent is limited to the site but, due to the limited area of occurrence of the species of concern **the extent may be considered to be regional, national and even international** because Southern Namib endemics and near-endemics of extremely limited extent of occurrence, and their habitats, will be affected, and species will be lost.
- **Duration**: The duration would be **long-term** to **permanent**.
- **Intensity**: The impact will be **medium**.

Probability: The impact is **likely** to occur.

IMPACT SIGNIFICANCE (PRE-MITIGATION): MODERATE

Degree of Confidence: The degree of confidence is **high**.

Many species of conservation concern have already been impacted by mining activities and associated linear infrastructure around Rosh Pinah, as well as facilities such as the Rosh Pinah Waste Site and the Tutungeni township, so cumulative impacts are of concern particularly in the case of *Hartmanthus hallii.*

Mitigation

The following measures to avoid or reduce damage to sensitive areas and vegetation are recommended:

- The no-go area should be avoided at all costs.

- The final route should stay on the plains habitat as much as possible. Damage to the other sensitive areas should be avoided as far as possible, particularly to the succulent plain near the Obib substation.

- Uncontrolled vehicle activity is of major concern. Outside the plains habitat vehicle movement should be controlled and restricted to the future service track as far as possible. Even in the plains habitat uncontrolled driving should not be permitted. Careful pre-planning of construction activities should be done to identify where tracks will be absolutely necessary for both construction and maintenance, overlapping these as far as possible. These should be clearly marked prior to construction activities beginning, together with designated turning points and construction laydown areas. Turning points for heavy vehicles should be designated and adhered to. *Ad lib* turns should not be permitted. The area used should be constrained as far as possible, and should be rehabilitated once construction is complete.

- During the operational phase only the service track should be used. No new tracks should be created.

- All construction laydown should be done in previously damaged areas, where construction camps should also be located unless crews could be accommodated in Rosh Pinah, which would be preferable. Several previously damaged areas that could be used are indicated in Appendix 6 of the specialist report, see **Appendix G**.

- In the undesirable event that the no-go area will be impacted, plant relocation should be considered. Previous work of this kind done in the Sperrgebiet has shown that relocation should take place as soon as possible (A. Burke, pers. comm.). Plant storage is a possibility, but will not work for many species unless the period of storage is very short (no more than 3 weeks). Plants should be relocated to areas damaged by the project. Undisturbed areas should generally not be disturbed in order to relocate plants, although possible exceptions might be species of very high conservation concern.

- Fixed point photography, initiated prior to construction activities, should be extensively utilised to assess compliance by contractors.

- Construction and maintenance staff should be educated and informed of their environmental obligations. Meaningful penalties for damages should be stipulated, and the main contractor should be held responsible for all transgressions.

- Due to the very low and sparse nature of the plant growth in this area, it is unlikely that any vegetation clearing will be necessary for this route in the future. If any is necessary it should be done manually.

- Collection of plants, or parts of plants (including seed and/or fuelwood) should be forbidden. Staff should be expressly forbidden to collect any plant material, dead or alive

(including seed), for any purpose whatsoever and should be provided with fuel (preferably gas) for both heating and cooking.

- Construction and maintenance staff should be educated and informed of their environmental obligations. Meaningful penalties for damages should be stipulated, and the main contractor should be held responsible for all transgressions.

Final risk categorisation

The mitigation measures implemented will result in a moderate to minor negative residual impact.

Pre- and Post- Mitigation Significance: Impacts as a result from physical destruction to vegetation, including species of high conservation concern

Phase	Significance (Pre-mitigation)	Final risk Impact Significance
Construction	**Moderate (-ve)**	**Moderate (-ve) - minor (-ve)**
Operation	**Moderate (-ve)**	**Moderate (-ve) - minor (-ve)**
Decommissioning and Closure	**Minor (-ve)**	**Negligible**

If the route is planned to avoid the areas of high sensitivity then very few plants of conservation concern will be destroyed.

Pre- and Post- Mitigation Significance: Impacts as a result from illegal plant or firewood harvesting for fuel or ornamental purposes

Phase	Significance (Pre-mitigation)	Final risk Impact Significance
Construction	**Minor (-ve)**	**Negligible**
Operation	**Minor (-ve)**	**Negligible**
Decommissioning and Closure	**Minor (-ve)**	**Negligible**

9.6 Impacts on reptiles and mammals

Impact description

The loss of habitat will be minimal, as the power line will affect a very small corridor.
The only negative impact could be poaching during the construction phase.

	Construction	Operational	Closure
Project Aspect/ Activity	Increase in human activities	none	Increase inhuman activities

Impact assessment

Nature: Increased poaching and disturbance during construction might have a **negative direct** impact on terrestrial vertebrates.

Impact Magnitude:

- **Extent**: The extent of the impact is **local**.
- **Duration**: The duration would be **temporary**.
- **Intensity**: The impact will be **negligible** to **low**.

Probability: Vegetation and habitat will **likely** be lost.

IMPACT SIGNIFICANCE (PRE-MITIGATION): MINOR

Degree of Confidence: The degree of confidence is **high**.

Mitigation

- Construction and maintenance staff should be educated and informed of their environmental obligations. Meaningful penalties for damages should be stipulated, and the main contractor should be held responsible for all transgressions.

Final risk categorisation

The mitigation measures implemented will result in a negligible residual impact.

Pre- and Post- Mitigation Significance: Impacts as a result from physical destruction to vegetation, including species of high conservation concern

Phase	Significance (Pre-mitigation)	Final risk Impact Significance
Construction	**Minor (-ve)**	**Negligible**
Operation	**Minor (-ve)**	**Negligible**
Decommissioning and Closure	**Minor (-ve)**	**Negligible**

9.7 Social / Economic

Impact Description

- Contractors entering land belonging to private landowner and the Ministry of Environment and Tourism.
- Limited employment opportunities during construction of the proposed power line and dismantling of old one. The line from Obib to Lorelei is expected to take 2.5 months and the line from Lorelei to ZinCum to take 1.5 months. The small construction team will be accommodated in Rosh Pinah, bringing further economic benefits for a few months. The few additional visitors are unlikely to make any significant impact to the town's HIV risk as the majority of workers are migrants.
- Unlikely to be employment opportunities during operations, related to maintenance. The power line will form part of NamPower's asset base and will be maintained and operated by them.
- Positive indirect economic impacts at local, regional and national level as the proposed power line will enable RPZC to increase its production

	Construction	Operational	Decommissioning
Project Aspect/ Activity	A few short term employment opportunities	Entering and working on landowners' property. Very limited employment opportunities Indirect economic benefit of increased production at RPZC.	A few employment opportunities when the power line is dismantled.

Impact assessment

Nature: Contractors entering land belonging to private landowner and the Ministry of Environment and Tourism, and staying in Rosh Pinah could have **direct negative impacts.**

Impact Magnitude:

- **Extent**: The extent of the impact should be **local**.
- **Duration**: The duration would be **short-term during construction and again during decommissioning.**
- **Intensity**: The impact will be **medium**
- Probability: **Definite**

IMPACT SIGNIFICANCE (PRE-MITIGATION): MODERATEDegree of Confidence: The degree of confidence is **high**.

Mitigation

The following management objective has been identified in terms of mitigating social impacts:

- Minimise incidents involving contractor employees

Actions

- NamPower must notify the landowners in good time (minimum of 2 weeks) and the contractor should establish and foster good working relations and a clear system of communication with the landowners, ensuring adherence to NamPower's strict EMP guidelines (NamPower 2008. Section 3.1)
- All members of the construction team coming into the area should be reminded of and should implement a solid HIV/AIDS prevention programme. This will assist in reducing the spread of HIV and other sexually transmitted diseases, to and from the area.

Final risk categorisation

The mitigation measures implemented will result in a minor residual impact.

Pre- and Post- Mitigation Significance: Impacts as a result of Contractors entering land belonging to landowners

Phase	Significance (Pre-mitigation)	Final risk Impact Significance
Construction	**Moderate (-ve)**	**Minor (-ve)**
Operation	**Negligible**	**Negligible**
Decommissioning and Closure	**Moderate (-ve)**	**Moderate (-ve)**

Nature: Creation of a few short-term employment opportunities during construction and decommissioning will have **positive direct impacts.**

Impact Magnitude:

- **Extent**: The extent of the impact is mostly **local and possibly regional**.
- **Duration**: The duration would be **short-term during construction and again during decommissioning.**
- **Intensity**: The impact will be **medium**
- Probability: **Definite**

IMPACT SIGNIFICANCE (PRE-MITIGATION): MODERATE

Degree of Confidence: The degree of confidence is **high**.

Nature: The new power line, once operating will enable RPZC to increase production. This will have **positive indirect social and economic impacts.**

Impact Magnitude:

- **Extent**: The extent of the impact is **local, regional and national**.
- **Duration**: The duration would be **long term** for the life of mine.
- **Intensity**: The impact will be **high for the power line operations phase, while the mine remains in existence.**

Probability: The impact is **likely** to occur

IMPACT SIGNIFICANCE (PRE-MITIGATION): HIGH

Degree of Confidence: The degree of confidence is **high**.

Mitigation

The management objective should be to maximise socio-economic benefits to the local community through the following action:

- Recruit local labour from Rosh Pinah, Sendelingsdrif and other nearby settlements, to minimise migrants bringing social ills and to maximise employment benefits for the local communities.

Final risk categorisation

The mitigation measures implemented will result in a moderate to high positive residual impact.

Pre- and Post- Mitigation Significance: Impacts as a result of creating a few employment, short-term opportunities and enabling RPZC to increase production.

Phase	Significance (Pre-mitigation)	Final risk Impact Significance
Construction	**Moderate (+ve)**	**Moderate (+ve)**
Operation	**Major (+ve)**	**Major (+ve)**
Decommissioning and Closure	**Moderate (+ve)**	**Moderate (+ve)**

9.8 Archaeology

Impact description

Expected **negative impacts** on archaeological sites would be either **direct** (in the form of disturbance of destruction in the course of construction), or **indirect** (in the form of deterioration caused by soil erosion resulting from construction). It is possible that these would take the form of **cumulative impacts** during the operational phase of the development.

	Construction	Operational	Closure
Project Aspect/ Activity	Loss or disturbance of archaeological sites	Loss or disturbance of archaeological sites	Loss or disturbance of archaeological sites

Impact assessment

Nature: Loss or disturbance of archaeological sites might be a **negative direct** impact.

Impact Magnitude:

- **Extent**: The extent of the impact is **on-site** or **local**.
- **Duration**: The duration would be **permanent**.
- **Intensity**: The impact will be **low** to **negligible**.

Probability: **Unlikely**.

IMPACT SIGNIFICANCE (PRE-MITIGATION): NEGLIGIBLE

Degree of Confidence: The degree of confidence is **high**.

Mitigation

Considering the assessment presented here, and the combination of low archaeological density and generally low archaeological significance within the area of development, no specific mitigation measures are proposed, other than that contractors and operating personnel should be made aware of the provisions of the National Heritage Act with regard to reporting of archaeological materials found in the course of development activities.

However, it is recommended that contractors working on the site are made aware that under the National Heritage Act any items protected under the definition of heritage found in the course of development should be reported to the National Heritage Council. The attention of the project proponent is therefore drawn to the “chance finds” procedure in Appendix 1 of the Archaeological report.

Final risk categorisation

In view of these observations, the archaeological impact **risk categorization** for all phases of the project (Construction, Operation and Closure) are estimated as **minor**.

Pre- and Post- Mitigation Significance: Impacts as a result from physical destruction to vegetation, including species of high conservation concern

Phase	Significance (Pre-mitigation)	Final risk Impact Significance
Construction	**Negligible**	**Negligible**
Operation	**Negligible**	**Negligible**

Phase	Significance (Pre-mitigation)	Final risk Impact Significance
Decommissioning and Closure	**Negligible**	**Negligible**

10. CONCLUSION

No fatal flaw has been identified. However, the final design of the power line alignment needs to include the findings and recommendation of the specialist reports. The flora maps showing the 'No-Go' and sensitive areas should be consulted when the final alignment is put together and laydown areas are located. Laydown areas should utilise areas which have been impacted upon during previous power line construction process. All mitigation measures stated in **Section 9** pertinent to the design phase need to be adhered to.

Based on the findings of the environmental risk assessment, all the identified potential environmental impacts associated with the proposed construction and operations can be managed and reduced if the proposed mitigation measures are implemented.

A. Speiser

A. Speiser Environmental Consultants cc

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COMBINED SCOPING AND ASSESSMENT REPORT

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE NEW NAMPOWER POWER LINE FROM OBIB TO ZINCUM SUBSTATION FOR RPZC MINE

VOLUME 2: APPENDICES

NOVEMBER 2013

Compiled for:
Rosh Pinah Zinc Corporation (Pty) Ltd
Private Bag 2001
Rosh Pinah
Namibia

Compiled by:
A. Speiser Environmental Consultants cc
PO Box 40386
Windhoek
Namibia

CONTENTS

APPENDIX A

SUBMISSION OF FORM 1 TO THE MINISTRY OF ENVIRONMENT AND TOURISM

Form 1

REPUBLIC OF NAMIBIA

ENVIRONMENTAL MANAGEMENT ACT, 2007

(Section 32)

APPLICATION FOR ENVIRONMENTAL CLEARANCE CERTIFICATE

machine impression

PART A: DETAILS OF APPLICANT

1. Name: (person or business):
   Rosh Pinah Zinc Corporation Pty Ltd
2. Business Registration / Identity No.
   380 SWA
3. Correspondence Address:
   Rosh Pinah Zinc Corporation
   Private Bag 2001
   Rosh Pinah
   Namibia
4. Name of Contact Person:
   Mr. M. Castelyn
5. Position of Contact Person:
   Manager: Engineering
6. Telephone No.:
   +264-63-274200
7. Fax No.:
   +264-63-274209
8. E-mail Address: (if any)
   Mike.castelyn@rpzc.com.na

☐Tick (☐) the appropriate box

MINISTRY OF ENVIRONMENT AND TOURISM
DEPARTMENT OF ENVIRONMENTAL AFFAIRS
2013 -06- 18
RECEIVED
Ester Hatutale

PART B: SCOPE OF THE ENVIRONMENTAL CLEARANCE CERTIFICATE

1. The environmental clearance certificate is for the following listed activity

ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES

The construction of facilities for -

(b) the transmission and supply of electricity;

2. Details of the activity(s) covered by the environmental clearance certificate:

Title of Activity:

Construction of a 66kV transmission line from Obib substation (near Skorpion) to Lorelei (~18km) and then to Zincum substation south of Rosh Pinah (RPN) mine.

Nature of Activity:

Construction and supply of electricity for RPZC mine. The power line will be build by NamPower.

Location of Activity:

Area between Obib substation (near Skorpion) to Lorelei (~18km) and then Zincum substation south of Rosh Pinah (RPN) mine. The extent of the proposed alignment is illustrated in Appendix A.

Scale and Scope of Activity:

The new 66 kV line will be routed along the existing 66 kV line except for the part from Lorelei to Zincum Substation (South of Rosh Pinah). This new line will be approximately 26 km long and will be constructed with twin pelican conductor which will be able to carry considerably more than the existing line (in the order of 50 MVA). At this stage, there seems to be no need for any resettlement, even though the new substation and line will be routed in Rosh Pinah town and close to a few buildings.

The EIA will assess the new route and construction activity of the proposed 66 kV power line. The main objectives are to:

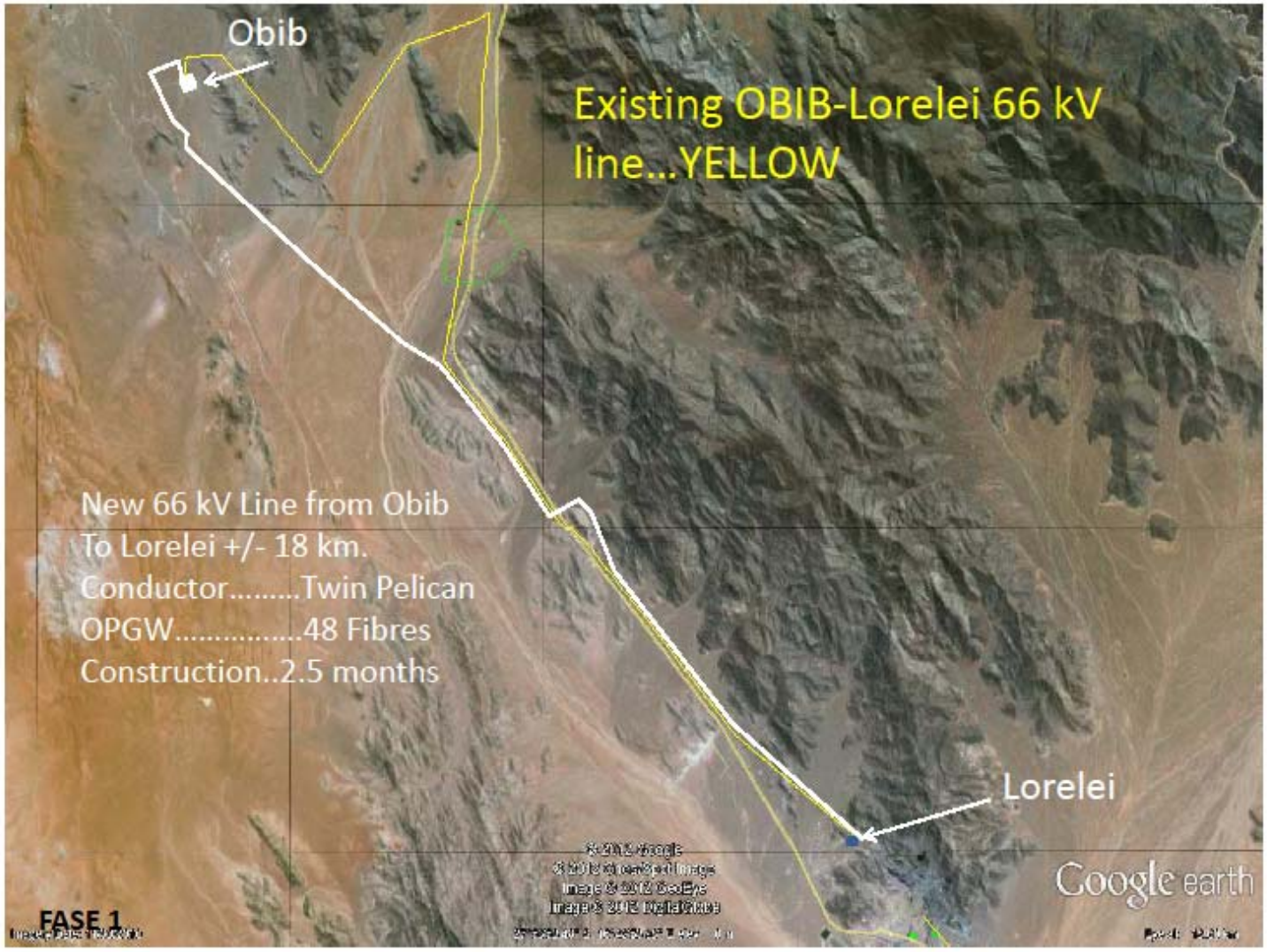
- identify and assess the potential impacts of the alignment and the construction of the proposed 66 kV power line;
- liaise and consult with the relevant ministries and other stakeholders to ensure that all legal requirements are met regarding the EIA;
- meet key stakeholders and conduct a public participation meeting at Rosh Pinah
- produce Environmental Management Plans for construction and operation.

PART C: DECLARATION BY APPLICANT I hereby certify that the particulars given above are correct and true to the best of my knowledge and belief. I understand the environmental clearance certificate may be suspended, amended or cancelled if any information given above is false, misleading, wrong or incomplete.

Signature of Applicant	MIKE CASTELYN Full name in Block Letters	Manager Engineering Position

On behalf of Rosh Pinah Zinc Corporation Date: 18/6/2013

FORM 1 APPENDIX A: MAPS SHOWING THE PROPOSED PROJECT




New 66 kV Line
Stops Here.
Lorelei Substation
New Double Circuit 66 kV Line..+/- 1.5 km
Conductor ...Single Pelican
Conductor ...single OPGW (48)
Construction.....1.5 Months
Bosh Pinah
Existing 66 kV Fdr
Kept Live during
Construction of Lines andFDR
Bay at Obib and tie-in to Zincum
Aurus Substation
ZinCum Substation
Google earth

APPENDIX B

CURRICULUM VITAE OF THE EAP

A. Speiser Environmental Consultants cc

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Tel. 061 244 782, cell 081 1245655

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SHORTENED CURRICULUM VITAE:

ALEXANDRA SPEISER

A. PROFESSIONAL INFORMATION

First Names: Marie Alexandra Angelika
Surname: Speiser
Nationality: German (Permanent Residence in Namibia 1999)
Date of Birth: 19 October 1968
Language: German and English (fluent), Afrikaans (fair),
Profession: Environmental Scientists (MPhil), Geologist (MSc)

B. EDUCATION

2000 **Master of Philosophy** in Environmental Science, University of Cape Town, RSA
Group Thesis Title: *Environmental Situation Analysis of the Orange and Fish River Catchments*
Individual Paper Title: *Small Scale Mining in Namibia*

1994 **Master of Science** in Geology and Paleontology, Georg-August University Göttingen/Germany.

C. PROFESSIONAL ACTIVITIES

Professional Institutes & Membership:

- Approved Inspection Authority with the Ministry of Labour and Social Welfare (A.I.A. 08/12)
- Institute of Environmental Management & Assessment, UK (Associated Member, AIEMA, October 2010)
- Chamber of Mines of Namibia (member)
- Geological Society of Namibia (Executive Committee)

D. RELEVANT COURSES

November 2004

Environmental Auditor Trainings Course, Institute of Environmental Impact Assessment (IEMA) approved, Crystal Clear Consulting & Merchants (Pty) Ltd, RSA

E. EMPLOYMENT HISTORY

2012 – to date Associated Environmental Consultant to SLR Namibia

2003 - to date A. Speiser – Environmental Consultants cc, Director

Main work conducted and ongoing:

- **Environmental Consultant** to RPZC (Glencore): EIA/EMP for the proposed zinc concentrate Storage shed at Lüderitz Harbour.
- **Environmental Consultant** to Metals Namibia. EO and EMP for exploration activities
- **Environmental Consultant** for the bulk chemical store of Crest Chemical Pty Ltd at Walvis Bay harbour.
- **Environmental Coordinator** for the Kassinga (Angola) North and South Iron Ore Project – Area 1 (SMP / AEMR). JV between ASEC and Environmental Resource Management
- **Environmental Coordinator** for the exploration phase at Lofdal, Namibian Rare Earth (Pty) Limited

- **ESIACoordinator** Scoping & final ESIA for the proposed U-mine at Etango (Bannerman Mining Resources Namibia (Pty) Ltd); Amendment 1 to the approved ESIA & ESMP.
- **External Environmental Consultant** to Rössing Uranium (Rio Tinto) – SEMP: exploration drilling in the ML area within the Namib Naukluft Park
- **Reviewer** of Swakop Uranium SEIA conducted by Metago
- **Environmental Consultant** to Exxaro – Rosh Pinah Mine – mine audits
- **Environmental Consultant**&**Mine Closure Plan** for Okorusu Fluorspar Pty Ltd
- **ESIACoordinator** for the proposed Au-mine at Otjikoto, Central Namibia (B2Gold)
- **Environmental Consultant –** updating the EA & EMS for infrastructure changes at Navachab Mine, Anglogold Namibia (Pty) Ltd.
- **Bi-annual monitoring reports** auditing environmental performance of exploration activities (Kumba Resources, Ambase Namibia, Avdale Namibia) – ongoing.

SHORTENED CURRICULUM VITAE: MS AURIOL ASHBY

Ashby Associates CC
PO Box 11513
Windhoek, Namibia

Email: aaplm@mweb.com.na
Tel/Fax: +264 61 233 679
Cell: 081 240 9678

DATE OF BIRTH: 1956

NATIONALITY: British (Namibian Permanent Residence)

COUNTRIES WORKED: Namibia, Angola, South Africa, Botswana and UK

QUALIFICATIONS: B.SC (Hons), Environmental Sciences,

University of East Anglia, Norwich, UK, 1974 – 1977

Certificate in Education: Teacher Training for Further and Higher Education - Science, Garnett College, ILEA, London, UK. 1983-84

Ms Auriol Ashby has had Namibian permanent residence since 1991 and extensive experience in the socio-economic aspects of integrated development planning. She has conducted more than a hundred consultancies in Namibia, Botswana, South Africa and Angola. Her clients are from the private sector, various government ministries, NGOs, UN Agencies, SADC and Yale University in USA. She focuses in four broad areas:

Environmental Management: Socio-economic and public participation components of EIAs, EMPs and Closure Plans of large scale projects, such as mines.

Programme Planning and Evaluation: Strategic planning, research, needs assessments, design and implementation of programmes, evaluation studies and funding proposals; works with Logical Framework Analysis, Results Based Management, M&E systems and SPSS.

HIV/AIDS and community health care: Policy formulation, programme planning, Monitoring and Evaluation (M&E) for prevention, treatment, care and support services.

Integrated Development (Rural and Urban): Corporate Social Responsibility programmes,Programme planning, management and M&E for vocational training, school-building, agricultural development, early childhood development, gender issues and natural resource management.

EMPLOYMENT HISTORY

2003 -	Freelance development consultant; Established Ashby Associates cc in 2005
1996 - 2003	Partner at Namibia Resource Consultants cc
1993 - 1994	Business Training Consultant, Private Sector Foundation, Namibia
1984 - 1987	Secondary school teacher, Science subjects, Langley Park Girls School, UK
1980 - 1983	Co-ordinator, Tshwaragano Development Brigade Centre, Botswana

RECENT RELEVANT CONSULTANCIES

- ESIA & ESMP for the Otjikoto gold mine, south of Otavi; ASEC/SLR/AuryxGold/B2Gold Namibia
- ESIA & ESMP for the Omitiomire copper mine, near Hochfeld; ASEC/Synergistics/SLR Consulting/Craton Mining
- EIA and EMP for the proposed sulphur storage facility at Walvis Bay harbour for Walvis Bay Cargo Terminal; SLR Consulting/WBCT
- EIA for the proposed Arandis Thermal Power Generation and Waste Oil Recycling Plants; SLR Consulting/Arandis Power

- EIA & EMP for the zinc / lead concentrate storage and loading facility in Lüderitz harbour; ASEC / Rosh Pinah Zinc Corporation
- Socio-economist & public consultation facilitator for Environmental and Social Impact Assessment (ESIA) &ESMP for Bannerman Resources' proposed Etango Project uranium mine and its associated linear infrastructure; ASEC and ERM.
- Sociologist and public consultation to develop and implement the Corporate Social Investment Strategy for the proposed Otjikoto gold mine for AuyrxGold/B2Gold;
- Socio-economic baseline study and ESIA for the Proposed Kassinga Iron Ore Mine Complex, Southern Angola; for AEMR & ERM
- Socio-Economic and PPP components: Scoping Phase of the EA for the proposed Desert Star South
- Ohlthaver and List Wellness Research; O&L Group (with 4,300 employees)

APPENDIX C

LIST OF INTERESTED AND AFFECTED PARTIES

Approximately 100 IAPs were reached directly by email and fax.
(allowing for those which are registered on different IAP lists in Rosh Pinah).

Landowners - Directly Affected Parties

Nick Kotze	Owner, Farms Spitskop and Zebrafontein (crossed by powerline)
Peter Jacobs	Farmworker of Mr Kotze

Ministry of Environment and Tourism

Erica Akuenje	Acting PS
Jonas Heita	NAMPLACE project, MET
K. Shilongo	Chief Warden for Sperrgebiet (Oranjemund)

RoshSkorTown Council

Stefan Saayman	Manager
Ms Nailenge	Community Development Manager
Callie van Heeden	Manager: Technical Services RoshSkor
Ansie Cornelissen	(Finance Manager - RoshSkor

Karas Regional Council

Hon. Bernadus Swartbooi	Governor
Ms. Wilma Isaaks	Secretary to Chief Regional Officer
Cecily Hanse	Karas Regional Council

Key Government Ministries and Parastatals

Nampower

Paulinus Shilamba	Managing Director
Horst Mutschler	Environmental Manager
Gert Fourie	Engineer: Transmission System Planning

Namwater

Nicolaas du Plessis	Environmental Manager

Ministry of Agriculture, Water and Forestry

Mr A. Nehemia	Under Secretary: Water

Ministry of Works and Transport

Ms. Angelina Simana - Pauloa	Director of Civil Aviation

Ministry of Health and Social Services

Elizabeth McKay	Rosh Pinah clinic

Ministry of Safety and Security

Inspector Hamunyela	Rosh Pinah

Roads Authority

Anna Marie Bosman	Keetmanshoop office

Telecom

Valerie Garises	Manager Infrastructure, Network Provisioning and Assurance Support Systems

Rosh Pinah Forum (* included above)

Kondja Kaulinge	RPZC
Eliphas Iita	Karas Regional Council
Stefan Saayman*	RoshSkor Township
Inspector Hamunyela *	Ministry of Safety & Security
W Tibinyane	Ministry of Home Affairs
Alta De Beer	Namibia Chamber of Commerce & Industry
Nicolene Brandt	Stepping stones Pre-Primary
Maria Aludhilu	Informal settlement representative
Connie Willemse	Rosh Pinah Academy
Rickey van Rooyen	Hoeksteen Combined School
Jacky Karumbo	Mine Workers Union
Elizabeth McKay *	Ministry of Health & Social Security
Anton Meintjes	Sidadi Clinic

Environmental NGOs and Specialists

Dr. Ingrid Wiesel	Brown Hyena Research Project
Cunningham, Peter	Namibia Environment and Wildlife Society (NEWS)
John Pallett	SAIEA
Shitilifa, Selma	Namibian Coast Conservation and Management Project (NACOMA)
The manager	Namibia Scientific Society
Sonja Loots	National Botanical Research Institute (NBRI)
Mike and Ann Scott	Ecoserve
Jo Henschel	EnviroMEND
Chris Brown	Sustainable Solutions Trust
Kinahan, John	Quaternary Research Services cc
Coleen Manheimer	Flora specialist

Private Sector

Christo Aspeling	Mine manager, RPZC
Mike Castelyn	Engineering Manager, RPZC
Satish Kumar	General Manager, Skorpion Zinc

Dawid deBruin	Farm Namuskluft (Restcamps)
Mrs. Alta de Beer	National Chamber of Commerce and Industry (NCCI)
Wayne Handley	Nama Padloper Route Tour
Tarryn Julie	Felix Unite
Lufie Druker	Coastway Tours
Evalastus Kaaronda	National Union of Namibian Workers
Alfred Angula	National Union of Namibian Workers
Mr J. Karumbo	Mine Workers Union of Namibia
Jonas Lumbu	Mine Workers Union of Namibia
Ebben Zarondo	Mine Workers Union of Namibia
Amica Guesthouse	Accommodation (Rosh Pinah)
Rentia Louw	McMillan's Rus Guesthouse
Suzie's Cabins	
Brukarosh Bush Lodge	
Four Seasons Lodge	
Mr. G Schluter	Contract and Catering Management (CCM)
R. Cook	Anglo American Namibia Foundation

Media

Jo-Mare Duddy	The Namibian
News Editor	New Era
Francoise Steynberg	Die Republikein
Dirk Heinrich	Algemeine Zeitung

Rosh Pinah's Community Notice Board, by email

greytown@iway.na);	Debbie Schutte (tokkie@iway.na);	Krizette van Vuuren;
Adri;	Dr Lucy vd Walt;	'Louis Dry';
Aletta v Schalkwyk;	Du Preez, Maggy;	Marsileen Kruger;
Alta de Beer;	Ensa; Estelle Aspeling;	Mia Engelbrecht;
Amanda Bothma;	Eureka Meyer;	Nita Maritz;
Amica Guesthouse;	ewalters@trentyrenam.com;	resterhuyzen@iway.na;
Andries Blaauw;	Four Seasons Lodge;	Riene vd Walt; Ronel;
Angeline Maritz;	Francois van Vuuren;	Rosh Pinah Academy;
Belinda;	Gerty Coetzee;	Sarika Engelbrecht;
Berend Louw;	Gillian Visser;	Stefan Saayman;
Bruce Steenkamp;	Glenn Schluter;	Stepping Stones Administrator;
Celeste van Aarde;	hoeksteen;	Stepping Stones Principal;
Charmaine Smith;	Jeanine & Fourie;	Tannie Rentia Louw; Warman;
Claudine Mouton;	Jeannette Mostert;	Wayne Handley;
Danelle Coleman;	Joet Handley;	Wayne Schablinski
Danny Meyer;	Johan Maritz;	
Davies, Dolly;	Kasava Trading;	

APPENDIX D

INFORMATION SHARING RECORD

BACKGROUND INFORMATION DOCUMENT

FOR THENEW POWER-LINE FROM OBIB TO ZINCUMSUBSTATION TO RPZC MINE

INTRODUCTION

Rosh Pinah Zinc Corporation (Pty) Ltd (RPZC) is proposing to expand its zinc/lead mine at Rosh Pinah, Karas Region in 2015.

NamPower has indicated that the existing 66 kV line would not be able to meet the mine's power requirements. As all power demands in the area are currently growing, these loads (including to the Sendelingsdrift Mine) would have a negative effect on the security of power supply to RPZC.

NamPowertherefore recommends that a new 66 kV line be constructed from Obib to Rosh Pinah with the specific purpose of supplying the mine with adequate power.

The existing 66 kV line runs from Obibsubstation (near Skorpion mine) to the RPZC substation via Loreleisubstation (located just north of the mine).

The 66 kV line feeding the RPZC substation goes via the Loreleisubstation and then continues on to the Sendelingsdrift mine. The current line is only rated for 32 MVA thermally but voltage limits on the network will not allow the line to reach this limit.The 33 kV network feeds the town of Rosh Pinah as well as the NamWater loads (pumping stations) in the area.

ENVIRONMENTAL APPROVAL

In terms of the Environmental Management Act,7 of 2007, a project of this nature requires an environmental impact assessment (EIA) process to apply for Environmental Clearance from the Ministry of Environmental and Tourism (MET).

A. Speiser Environmental Consultants cc (associated with SLR Environmental Consulting (Namibia) (Pty) Ltd), is an independent firm of environmental consultants based in Namibia and has been appointed to manage the EIA process.

PURPOSE OF THIS DOCUMENT

This document has been prepared to inform you:

* about the proposed project;
* about the EIA process to be followed;
* of possible environmental impacts; and
* how you can have input into the EIA process.

YOUR ROLE

Public involvement is an essential part of the EIA process.

You have been identified as an interested and affected party (IAP) who may want to know about the proposed project and have input into the EIA process.

All comments received will be recorded and addressed in the EIA process.

ATTEND THE PUBLIC MEETING

at the Community Hall, Rosh Pinah on 4th July at 16h30

HOW TO RESPOND

Please send comments using the attached comments sheet to the contact person below.

If you would like your comments to be addressed in the draft scoping report please submit them by **22 July 2013.**

WHO TO CONTACT

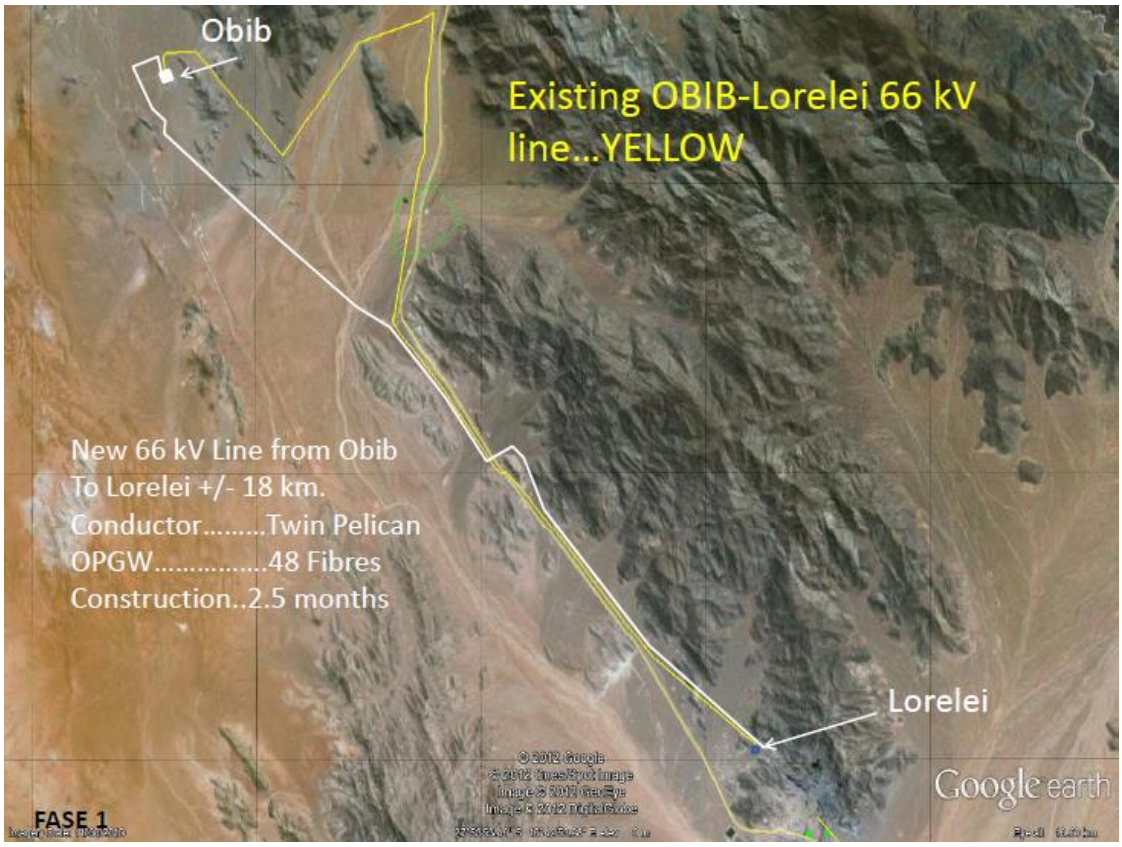
Auriol Ashby:

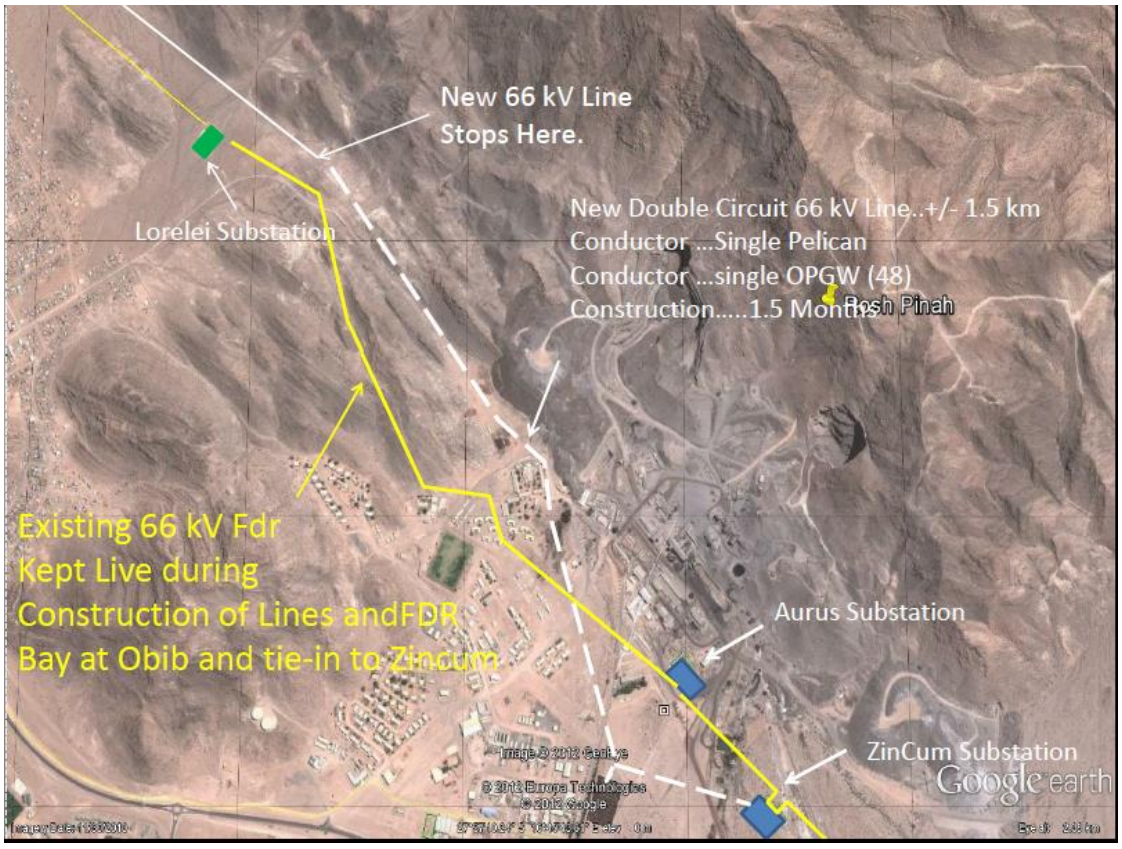
Email: aaplm@mweb.com.na,

Fax: +264 88637016 or

SMS to 081 865 0846

The new 66 kV line will be routed along the existing 66 kV line except for the part from Lorelei to Zincum Substation (South of Rosh Pinah). This new line will be approximately 26 km long and will be constructed with twin pelican conductors which will be able to carry considerably more than the existing line (in the order of 50 MVA). The Figures below show the existing powerline and the newly proposed one. RPZC hopes that construction can begin in early 2014.





POTENTIAL ENVIRONMENTAL ISSUES

The following table provides a preliminary list of potential environmental issues associated with the proposed project.

ENVIRONMENTAL ASPECT	POTENTIAL ISSUES
SOILS	▪ Contamination of soils at laydown areas ▪ Disturbance of soil along the proposed new powerline during construction
SURFACE WATER	▪ Possible pollution of surface water and run-off during construction
BIODIVERSITY	▪ Potential avifauna conflicts ▪ Removal / disturbance to plants and animals ▪ General waste emissions during construction
ARCHAEOLOGY	▪ Potential damage if any archaeological sites are found along the route.
WASTE MANAGEMENT	▪ General waste emissions during construction
TRAFFIC	▪ Increase in traffic during construction
AIR QUALITY	▪ Emissions from vehicles
NOISE	▪ Noise emission increase during construction
VISUAL	▪ Eyesore: Two stretches of the new powerline are along new routes. The middle section will be erected next to the existing powerlines so impact will be less.
SOCIO-ECONOMIC	▪ Employment opportunities during construction – approximately 4 months.

THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The EIA scoping process provides information on the proposed project and the environment in which it is situated. It identifies, in consultation with IAPs, the potential negative and positive impacts of the proposed project and reports on management measures required to mitigate such impacts to an acceptable level. The likely process steps and time frames are provided below. Parties to be involved in the environmental assessment process are identified in the table below. **Please let us know if there are any additional interested and affected parties that should be involved.**

STEPS IN THE EIA PROCESS

PHASE 1 – Screening, Specialist Site Surveys & PPP
(June 2013 – August 2013)

- Meeting with the MET and application submission
- Notify other regulatory authorities and IAPs of the proposed project *(via newspaper advertisements, this document, emails, site notices)*
- Site visit and conduct specialist studies (flora, archaeology & avifauna)
- Identify key stakeholders and IAPs
- Hold meeting with RoshKor and a public meeting atthe Community Hall, Rosh Pinah on 4th July at 16h30

PHASE II – Scoping Phase and EMP
(August – November 2013)

- Compile scoping report, including assessment of potential impacts, and environmental management plan (EMP) and make it available for comment by regulatory authorities and other IAPs
- Notify other regulatory authorities and IAPs of the proposed project *(via newspaper advertisements, this document, emails, site notices)*
- Submit a final Scoping Report, Issues and Response Report and EMP to MET
- Record of decision from MET

PARTIES INVOLVED IN THE ASSESSMENT PROCESS

PROJECT PROPONENT

- Rosh Pinah Zinc Corporation (Pty) Ltd

PROJECT TEAM

- ASEC, Ashby Associates cc

IAPS

- Local farmers
- Residents of Rosh Pinah
- Non-government organisations and associations
- Media

REGULATORY AUTHORITIES

- Ministry of Environment and Tourism (MET)
  - Directorate Environmental Affairs
  - Directorate Parks and Wildlife
- Ministry of Agriculture, Water and Forestry
- NamPower
- Relevant regional and local authorities

Rosh Pinah Zinc Corporation (Pty) Ltd (RPZC)

FOR THE NEW POWERLINE FROM OBIB SUBSTATION TO ZINCUM SUBSTATION SOUTH OF RPZC MINE

REGISTRATION AND RESPONSE FORM FOR INTERESTED AND AFFECTED PARTIES

DATE		**TIME**	
PARTICULARS OF THE INTERESTED AND AFFECTED PARTY			
NAME			
POSTAL ADDRESS			
		POSTAL CODE	
STREET ADDRESS			
		POSTAL CODE	
WORK/ DAY TELEPHONE NUMBER		**WORK/ DAY FAX NUMBER**	
CELL PHONE NUMBER		**E-MAIL ADDRESS**	

PLEASE IDENTIFY YOUR INTEREST IN THE PROPOSED PROJECT
PLEASE WRITE YOUR COMMENTS AND QUESTIONS HERE

Please return completed forms by **22 of July 2013** for inclusion in the draft scoping report to:

Auriol Ashby
Ashby Associates cc for ASEC cc
Fax: +264 88637016
Email: aaplm@mweb.com.na or SMS to 081 865 0846

A. Speiser Environmental Consultants cc
VAT Reg. No.: 3452708015 Reg. No.: cc 2003/0606
Alexandra Speiser
MSc MPhil
P.O. Box 40386 Windhoek Namibia Tel:+264 61 244 782 Cell: 081 124 5655 e-mail:amspeiser@yahoo.com

Tel/Fax: +264 88637016
Cell: 081 240 9678
Email: aaplm@mweb.com.na

URGENT FAX COVER PAGE

To: Mr N. Kotze, Neighbouring Farm to RPZC **From:** MsAuriol Ashby

Fax:+27 851 8650 **Page:** 2 + 4

Date: 29 June 2013

Re: Request for permission for environmental specialists to access your farm

Dear Mr Kotze,

Rosh Pinah Zinc Corporation mine is intending to expand its zinc and lead. The increased electricity and water demand cannot be met with the existing facilities. An Environmental Impact Assessment (EIA) process will be conducted as an environmental clearance is required from the Ministry of Environment and Tourism.**The two EIAs are for:**

- For a proposed new 66 kV powerline from Obib Substation to RPZC Mine.
- For a new water pipeline (approximately 500m^3/hour) from the existing water treatment plant located at the Orange River to the Rosh Pinah Mine.

I am also faxing you the Background Information Document (BID) on the powerline as I understand that the proposed route will cross your farm. I emailed you both BIDs yesterday.

We apologise for the late notice but we request permission for our three specialists to have access to your farm on either Monday, Tuesday or Wednesday, 1st – 3rd July. The specialists are thoroughly trustworthy:

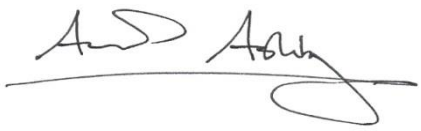
- Ms Colleen Mannheimer: Flora
- Mr Chris Brown: Ornithology
- Mr John Kinnahan: Archaeology

They need to examine the proposed route of the powerline. They will need to enter your farm and we can assure you that they will only use existing tracks on your land and where there are none, they will go on foot.

In addition, we would very much like to meet you when we are in the area next week at a time that is least inconvenient to yourself. You are also invited to the public meeting to be held on Thursday 04th July at 16h30 at the Rosh Pinah Community Hall, No. 160 Betel.

We hope that we can work together, best wishes,

Yours sincerely,



Ms Auriol Ashby

Attachment: Background Information Document for a proposed new 66 kV powerline from Obib to Zincum Substation to RPZC Mine.

Advertisements

Placed in The Republikein and The Namibian, two national newspapers on the 24 June and 1 July 2013.

THE NAMIBIAN SPORT MONDAY 24 JUNE 2013 37

Hernandez saves face for Mexico

• ROB HARRIS

BELO HORIZONTE - Javier 'Chicharito' Hernandez cemented his status as Mexico's leading striker Saturday, sending his team home from the Confederations Cup on a high by scoring twice to clinch a 2-1 victory over Japan in their final Group A match.

With seven goals in his last eight games for Mexico, the 25-year-old Manchester United striker has now climbed up his country's all-time scoring leaderboard to third spot, which he shares with retired forward Luis Hernandez.

"He's always been a very insistent, determined player," said Mexico coach Jose Manuel De la Torre, who also managed Hernandez at Guadalajara.

"He's highly competitive, and has a huge dynamic and sense of timing in order to score ... and that is what has taken him to be at these very high levels with Manchester United. Now he's simply responding with these goals for the national team."

After struggling to threaten in the first half at the Mineirao Stadium, Hernandez met Andres Guardado's cross in the 54th minute and headed in again in the 66th from Giovani Dos Santos' corner.

Shinji Okazaki pulled one back for Japan in the 86th and Hernandez won a penalty in stoppage time, but his weak effort was saved and he then sent the follow-up against the crossbar.

Both Mexico and Japan were playing only for pride, having been eliminated from the Confederations Cup by losing their first two matches at the 2014 World Cup test event.

"We have an unpleasant taste in our mouths - we don't like seeing our team being eliminated early from a tournament," Hernandez said through a translator.

"But Mexico at least made it to the (Confederation Cup) finals ... and this victory helps us in building the confidence back."

Although Japan leaves Brazil having finished bottom of its group without a point, the team's return trip to Brazil is already guaranteed.

The Asian champions were the first World Cup qualifiers while Mexico is still slugging it out for a spot from the Concacaf confederation.

Japan was the speedier and hungrier initially, picking up where it left off in Wednesday's slender 4-3 loss to Italy.

For all the creativity and slick passing, the Japanese had nothing to show for its domination.

"You could say there was little petrol in our tank," Japan coach Alberto Zaccheroni said through a translator.

-Nampa-AP

Nampa-Reuters

GOOD ONE ESE ... Mexico's Javier Hernandez (right) celebrates a goal with teammate Giovani dos Santos.

ASEC

ROSH PINAH ZINC CORPORATION

part of the Glencore Group

Invitation to public meeting for Environmental Impact Assessments for Proposed new powerline & water pipeline for RPZC's expansion

The Rosh Pinah Zinc Corporation (RPZC) has commissioned A. Speiser Environmental Consultants cc to undertake two Environmental Impact Assessments (EIAs):

- For a proposed new 66 kV powerline from Obib Substation to RPZC Mine, Rosh Pinah
- For a new water pipeline (approximately 500m3/hour) from the existing water treatment plant located at the Orange River to the Rosh Pinah Mine

The overall aim is to apply for environmental clearance certificates from the Environmental Commissioner in terms of the Environmental Management Act, 7 of 2007 and its 2012 Regulations.

RPZC mine is intending to expand its zinc and lead production (which may later also include a new mine at Gergarub). The increased electricity and water demand cannot be met with the existing facilities and the current water pipeline is over 43 years old and is reaching its end of life.

RPZC hopes that construction of this new power and water infrastructure can begin in early 2014.

The public is invited to comment on the Background Information Documents (BID) for the pipeline and powerline EIA projects and to attend one **Public Meeting to be held on Thursday 04th July at 16h30 at the Rosh Pinah Community Hall, No. 160 Betel.**

The Background Information Document are available on request from ASEC (see below), at the Rosh Pinah Public Library, Unit 10 Former Sentra Building, Kokerboom Street and on *www.asecnam.com*.

Interested and Affected Parties should register and send your comments to A. Ashby: aaplm@mweb.com.na, Fax: +264 88637016 or SMS to 081 865 0846 **before 22 July 2013.**

Republic of Namibia

MINISTRY OF HEALTH AND SOCIAL SERVICES

The Ministry of Health & Social Services (MoHSS) is looking for suitable qualified and experienced candidate to fill the following position:

Position: Short-term consultancy position for a Medical Officer
Duty Station: Windhoek
Requirements / qualifications:
- Medical Degree from a recognized institution
- Registered with the Namibia Medical board
- At least 5 years public health experience preferably in HIV and TB programs

TORs for the position:
- Act as focal person for facilitating the 2013 National ART guidelines review
- Provide coordination between the TAC and stakeholders
- Develop a plan for national roll-out of the implementation of the new updated guidelines
- Support the development of a National Strategy for HIV Drug Resistance Monitoring

Duration: July - December 2013
To obtain more details on TORs please contact:
Ms Francina Tjituka:
tjituka@nacop.net or
Tel: +264 61203 2868.
Closing date: 28 June 2013

Konrad Adenauer Stiftung

The Konrad Adenauer Stiftung in partnership with the Forum For the Future cordially invites you to a Public Lecture on

REDISCOVERING AND RENAMING THE NAMIBIAN DREAM

Speaker: Prof. Joseph Diescho

Wednesday, 26th June 2013 – 18H00
Moringa Room – Kalahari Sands Hotel

Thursday, 27th June 2013 – 18H00
UN-Plaza, Penning Str. Soweto Katutura

LOSING CONTROL?

AA

ALCOHOLICS ANONYMOUS NAMIBIA

If you want to drink, that's your business. If you want to stop, that's ours.

+264 61 222 477
+264 81 325 6144

TROUBLED? ANXIOUS? PROBLEMS? LONELY?

LifeLine/ChildLine cares
Adult Crisis Line: 061 – 23 22 21
SMS: 081 140 0222
Prevent/Report Abuse
Child Helpline: 116 Toll free
supported by all networks
There is someone to talk to from
08:00 – 22:00 every day

City of Windhoek

Vision: To enhance the quality of life of all our people

PUBLIC NOTICE

BANKING DETAILS FOR ELECTRONIC PAYMENTS AND BANK DEPOSITS

The City of Windhoek strives to ensure efficient and effective service delivery. The City of Windhoek therefore informs our valued clients that as from 1 July 2013 all clients must use the banking details stated below to honour their monthly municipal bills as well as sundry payments.

Bank Name:	First National Bank
Account Number:	5550 003 3613
Branch Name:	Windhoek Corporate Suite
Branch Code:	281872

All clients should take note that a full validation check will be implemented as from the 1st July 2013, therefore the City of Windhoek request their clients to ensure that their reference (account number) is correct otherwise their transactions will not be successful and their accounts will remain unpaid, that will result in the disconnection of their services.

	Reference should be as follows:
Monthly municipal services (water, electricity & rates and taxes)	The eight numerical digit new account number (refer to your monthly statement).
Sundry services (any other service)	The thirteen, numerical digit vote number (refer to your monthly invoice).

The clients may also visit any of our Cash Halls to sign up for our debit order facility currently available.

The City of Windhoek remain committed to deliver effective and efficient services, thereby enhancing the quality of life of all our people.

Issued by:
Office of the Chief Executive Officer
Corporate Communications, Marketing, Tourism and Customer Care
Tel: +264 61 290 2366 / 2044
Fax: +264 61 290 2344
E-mail: communication@windhoekcc.org.na

Enquiries:
Department of Finance
Revenue Management Division
Tel: +264 61 290 2335/5645
Fax: +264 61 290 2199
E-mail: payments@windhoekcc.org.na

ASEC

ROSH PINAH ZINC CORPORATION

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The overall aim is to apply for environmental clearance certificates from the Environmental Commissioner in terms of the Environmental Management Act, 7 of 2007 and its 2012 Regulations.

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The public is invited to comment on the Background Information Documents (BID) for the pipeline and powerline EIA projects and to attend one **Public Meeting to be held on Thursday 04th July at 16h30 at the Rosh Pinah Community Hall, No. 160 Betel.**

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ASEC

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The overall aim is to apply for environmental clearance certificates from the Environmental Commissioner in terms of the Environmental Management Act, 7 of 2007 and its 2012 Regulations.

RPZC mine is intending to expand its zinc and lead production (which may later also include a new mine at Gergarub). The increased electricity and water demand cannot be met with the existing facilities and the current water pipeline is over 43 years old and is reaching its end of life.

RPZC hopes that construction of this new power and water infrastructure can begin in early 2014.

The public is invited to comment on the Background Information Documents (BID) for the pipeline and powerline EIA projects and to attend one **Public Meeting to be held on Thursday 04th July at 16h30 at the Rosh Pinah Community Hall, No. 160 Betel.**

The Background Information Document are available on request from ASEC (see below), at the Rosh Pinah Public Library, Unit 10 Former Sentra Building, Kokerboom Street and on *www.asecnam.com.*

Interested and Affected Parties should register and send your comments to A. Ashby: aaplm@mweb.com.na, Fax: +264 88637016 or SMS to 081 865 0846 **before 22 July 2013.**

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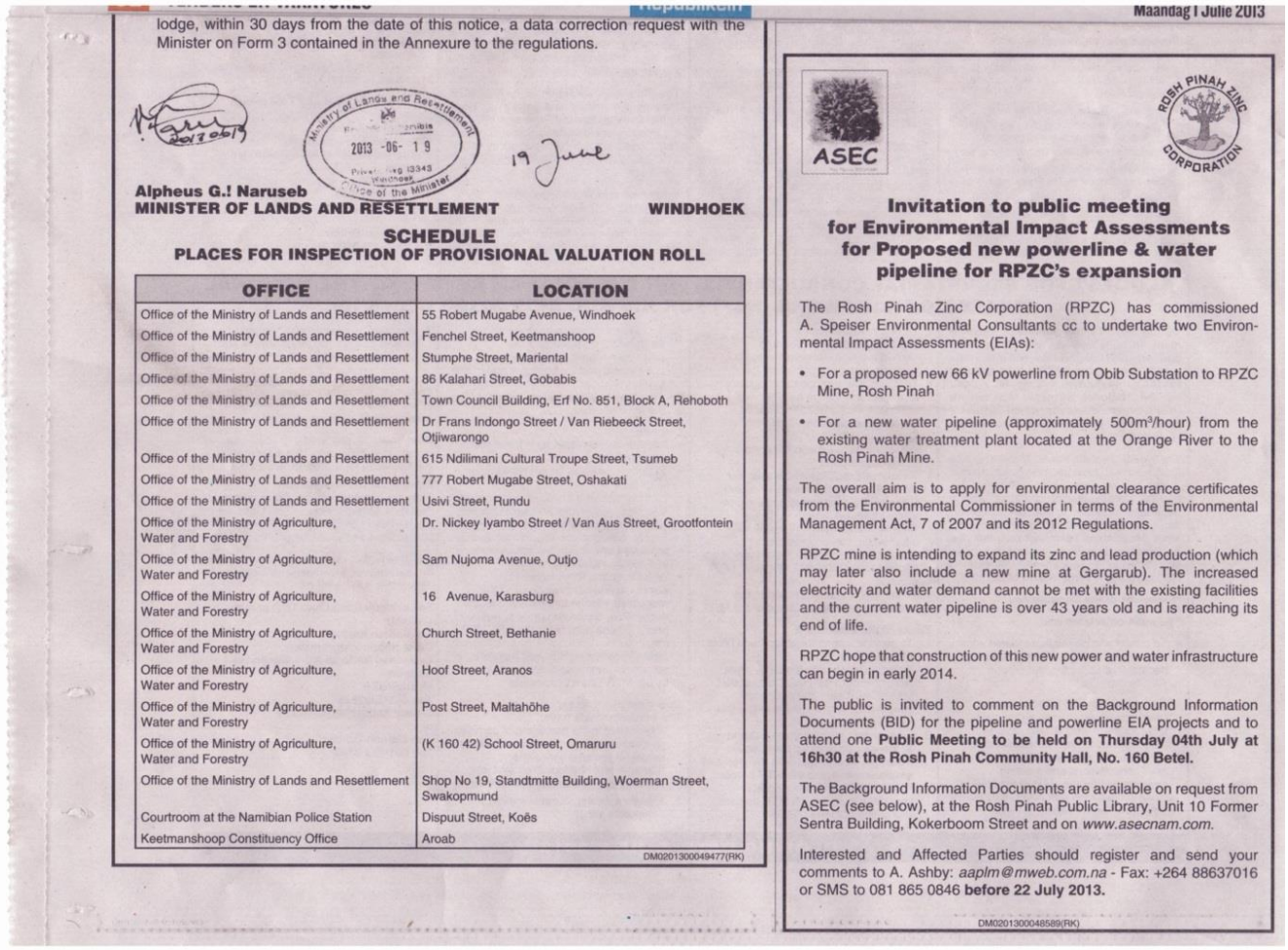
E-mail: campbellcherille@yahoo.com
Paulinda Olivier
216, Halifax Island, Rocky Crest, Windhoek, Ph. +264 81 210 5848
E-mail: olivierpaula11@gmail.com
Contact address: BrB Building
Corner of Bernard May & Garten Street, Ausspanplatz, Windhoek



lodge, within 30 days from the date of this notice, a data correction request with the Minister on Form 3 contained in the Annexure to the regulations.

Ministry of Lands and Resettlement
2013 -06- 19
Private Bag 13343 Windhoek
Office of the Minister

19 June

Alpheus G.! Naruseb
MINISTER OF LANDS AND RESETTLEMENT **WINDHOEK**

SCHEDULE
PLACES FOR INSPECTION OF PROVISIONAL VALUATION ROLL

OFFICE	LOCATION
Office of the Ministry of Lands and Resettlement	55 Robert Mugabe Avenue, Windhoek
Office of the Ministry of Lands and Resettlement	Fenchel Street, Keetmanshoop
Office of the Ministry of Lands and Resettlement	Stumphe Street, Mariental
Office of the Ministry of Lands and Resettlement	86 Kalahari Street, Gobabis
Office of the Ministry of Lands and Resettlement	Town Council Building, Erf No. 851, Block A, Rehoboth
Office of the Ministry of Lands and Resettlement	Dr Frans Indongo Street / Van Riebeeck Street, Otjiwarongo
Office of the Ministry of Lands and Resettlement	615 Ndilimani Cultural Troupe Street, Tsumeb
Office of the Ministry of Lands and Resettlement	777 Robert Mugabe Street, Oshakati
Office of the Ministry of Lands and Resettlement	Usivi Street, Rundu
Office of the Ministry of Agriculture, Water and Forestry	Dr. Nickey Iyambo Street / Van Aus Street, Grootfontein
Office of the Ministry of Agriculture, Water and Forestry	Sam Nujoma Avenue, Outjo
Office of the Ministry of Agriculture, Water and Forestry	16 Avenue, Karasburg
Office of the Ministry of Agriculture, Water and Forestry	Church Street, Bethanie
Office of the Ministry of Agriculture, Water and Forestry	Hoof Street, Aranos
Office of the Ministry of Agriculture, Water and Forestry	Post Street, Maltahöhe
Office of the Ministry of Agriculture, Water and Forestry	(K 160 42) School Street, Omaruru
Office of the Ministry of Lands and Resettlement	Shop No 19, Standtmitte Building, Woerman Street, Swakopmund
Courtroom at the Namibian Police Station	Dispuut Street, Koës
Keetmanshoop Constituency Office	Aroab

DM0201300049477(RK)

Maandag 1 Julie 2013

ASEC

ROSH PINAH ZINC CORPORATION

Invitation to public meeting for Environmental Impact Assessments for Proposed new powerline & water pipeline for RPZC's expansion

The Rosh Pinah Zinc Corporation (RPZC) has commissioned A. Speiser Environmental Consultants cc to undertake two Environmental Impact Assessments (EIAs):

- For a proposed new 66 kV powerline from Obib Substation to RPZC Mine, Rosh Pinah
- For a new water pipeline (approximately 500m³/hour) from the existing water treatment plant located at the Orange River to the Rosh Pinah Mine.

The overall aim is to apply for environmental clearance certificates from the Environmental Commissioner in terms of the Environmental Management Act, 7 of 2007 and its 2012 Regulations.

RPZC mine is intending to expand its zinc and lead production (which may later also include a new mine at Gergarub). The increased electricity and water demand cannot be met with the existing facilities and the current water pipeline is over 43 years old and is reaching its end of life.

RPZC hope that construction of this new power and water infrastructure can begin in early 2014.

The public is invited to comment on the Background Information Documents (BID) for the pipeline and powerline EIA projects and to attend one **Public Meeting to be held on Thursday 04th July at 16h30 at the Rosh Pinah Community Hall, No. 160 Betel.**

The Background Information Documents are available on request from ASEC (see below), at the Rosh Pinah Public Library, Unit 10 Former Sentra Building, Kokerboom Street and on *www.asecnam.com.*

Interested and Affected Parties should register and send your comments to A. Ashby: *aaplm@mweb.com.na* - Fax: +264 88637016 or SMS to 081 865 0846 **before 22 July 2013.**

DM0201300048589(RK)

Site Notice, also displayed prominently at public places in the town.

ASEC

Invitation to public meeting for Environmental Impact Assessments for Proposed new powerline RPZC's expansion

ROSH PINAH ZINC CORPORATION

The Rosh Pinah Zinc Corporation (RPZC) has commissioned A. Speiser Environmental Consultants cc to undertake an Environmental Impact Assessment (EIA) for a proposed new 66kV powerline from Obib Substation to RPZC Mine, Rosh Pinah.

In terms of the Environmental Management Act, 7 of 2007, a project of this nature requires an environmental impact assessment (EIA) process to apply for Environmental Clearance from the Ministry of Environmental and Tourism (MET).

The new 66 kV line will be routed along the existing 66 kV line and may look like the picture to the left.

The section from Lorelei to Zincum Substation (South of Rosh Pinah) is a new route and may be a single pole concrete structure, similar to the pole to the right.

The new line will be approximately 26 km long and will be constructed with twin pelican conductors which will be able to carry considerably more than the existing line (in the order of 50 MVA).

The public is invited to comment on the Background Information Document (BID) powerline EIA. It is available on request from ASEC (see below), at the Rosh Pinah Public Library, unit 10 former Sentra Building Kokerboom Street and on **www.asecnam.com**

Interested and Affected Parties are invited to attend the public meeting to be held on:

Public Meeting for EIA for the proposed new powerline			
Date	**Time**	**Stakeholder**	**Venue**
04th July 2013	16h30	Public meeting	Rosh Pinah Community Hall, No. 160 Betel

Kindly register as a Interested and Affected Party with A. Ashby: aaplm@mweb.com.na Fax +264 88637016 or SMS to 081 085 0846 and submit your comments before 22 July 2013.

Site poster photo: Engen Service Station, Rosh Pinah

EIA Notices also put up at:

Namibian Police
Rosh Pinah Spar
Rosh Pinah Mall
Sidadi Clinic
State Library
Tutungeni Office

EIA notice: Ministry of Environment and Tourism Office

EIA notice at state clinic

APPENDIX E
ALL COMMENTS RECEIVED

MINUTES held with RoshSkor on 3rd July 2013 at 13h30 for the EIAs for proposed new powerline & water pipeline for RPZC's expansion

Venue: RoshSkor Board Room
Purpose:

- To provide an overview of the proposed projects
- To explain the EIA process being followed
- To discuss potential environmental impacts
- To allow RoshSkor the opportunity to provide input into the EIA process

Present:

Name	Organisation
S.N. Saayman	RoshSkor
E. Nailenge	RoshSkor
C.P. Aspeling	Glencore Exstrata
M. Castelyn	Glencore Exstrata
A. Speiser	ASEC cc
A. Ashby	Ashby Associates cc

Mr Saayman welcomed Rosh Pinah Zinc Corporation's (RPZC) managers and the consultants.Ms Alex Speiser gave a presentation which is attached.
Most comments related to suggested improvements to the presentation for the public meeting scheduled for the following day, to clarify understanding. For example, changing "Obib" on the site map to Obib Substation as there is an Obib Training Centre in the town.

Relevant input to the Powerline EIA are detailed below:

Q, A, C	Name	**Issues**(Q=Question, A = Answer, C = Comment)
Q	A. Speiser	What is the construction period?
A	M. Castelyn	The line from Obib to Lorelei is expected to take 2.5 months and the line from Lorelei to ZinCum to take 1.5 months. Most of this work will be changes at the sub-stations. It is unlikely to require night working.
Q	S. Saayman	When we had a previous discussion and site visit with the design consultants for the powerline, we recommended a change of alignment through the town, after Lorelei, to keep the line away from as many buildings as possible.
A	A. Ashby	Yes, I am concerned about powerline being close to the Ehafo Hostel, one of .RPZC's buildings.
A	M. Castelyn	We will have to clear all the buildings (hostel and houses) in the servitude, in accordance with NamPower's guidelines, which I think is 1 ½ times the height of the pole. The route has not been finalised; we will ask for an updated route from our consultants.
C	S. Saayman	As far as RoshSkor is concerned, the routes fit into our town planning schemes.

The meeting closed at about 14h30.

ATTENDANCE LIST: Environmental Impact Assessment for Proposed Proposed new powerline & water pipeline for RPZC's expansion

Venue: RoshSkor Board Room Date: Wednesday 3rd July Time: 13h30

	Name	Organisation/position	Email	Telephone/cell
1	C.P. ASPELING	GLENCORE EXSTRATA	christo.aspeling@rpzc.com.na	0811495652
2	M CASTELYN	— " —	mike.castelyn@rpzc.com.na	0811246114
3	A Speiss			
4	E Nailenge	RoshSkor	eva-liza.nailenge@roshskor.com.na	0825368444
5	SN SAAYMAN	RoshSkor	snsaayman@iway.na	0812391208
6	A. ASHBY	ASEC - Ashby Associates	aaplm@mweb.com.na	
7				
8				

MINUTES OF PUBLIC MEETING held at Rosh Pinah Community Hall on 4th July 2013 at 16h30 for the EIAs for proposed new powerline & water pipeline for RPZC's expansion

Venue: Rosh Pinah Community Hall

Purpose:

- To provide an overview of the proposed
- To explain the EIA process being followed
- To discuss potential environmental impacts
- To allow stakeholders the opportunity to provide input into the EIA process

Present:

Name	Organisation	Email
Kondja Kaulinge	RPZC, Manager Engagement	Kondja.kaulinge@rpzc.com.na
Mike Castelyn	RPZC, Manager Engineering	Mike.castelyn@rpzc.com.na
O. Steenkamp	Namib Irrigation	
Elliot Mutyambizi	RPZC, Chief Mine Surveyor	elliotmutyambizi@rpzc.com.na
E. Nailenge	RoshSkor	Eva-liza.nailenge@roshskor.com.na
M. Nashandi	RPZC	Martin-nashandi
H.S. Basson	RoshSkor	drogba.basson@roshskor.com.na
S. Kasirye	RPZC-Geology	solomankasirye@gmail.com
Piet Kooper	RPZC	Piet-kooper@gmail.com
Rose Mtuleni	RPZC	rosetufi@gmail.com
Auriol Ashby	Ashby Associates cc	aaplm@mweb.com.na
Alexandra Speiser	A. Speiser Environmental Consultants cc	alex@biwac.com

Ms Auriol Ashby welcomed the participants and gave a presentation which is attached.
The following discussions, relevant to the NamPower EIA, took place.

Q/A/C	Name	Issues
Q	K. Kaulinge	Is it a good or bad sign that the avifauna specialist didn't find any bird fatalities under the 3 existing powerlines between Obib and RPZC Mine? Maybe all the birds are gone.
A	A. Speiser	The specialist thought it was more an issue of very little food to attract birds to the area. We will report what he writes in his report.
Q	E. Nailenge	On your map which one is the old powerline and which one is the proposed one? Instead of having an extra line, can we build a bigger one and dismantle the old 66kV powerline?
A	M. Castelyn	The existing 66kV powerline has to be kept in use during construction and also as a future back-up. There will be separate powerlines which will feed RPZC Mine, Rosh Pinah Town and NamWater at Sendelingsdrif. NamPower plans to upgrade the power supply to the Rosh Pinah Town, but this is not part of this EIA.
C	M. Castelyn	He explained the revised powerline alignment through the townafter Lorelei, which willbe more towards the mine in the open space, to avoid existing houses.

The meeting closed at about 17h30.

ASEC

ATTENDANCE LIST
Environmental Impact Assessment for Proposed
Proposed new powerline & water pipeline for RPZC's expansion

ROSH PINAH ZINC CORPORATION

Venue: Rosh Pinah Community Hall   Date: Thursday 4th July   Time: 14h30

	Name	Organisation/position	Email	Telephone/cell
1	Kondja Kaulinge	RPZC Manager Engagement	kondja.kaulinge@rpzc.com.na	0811475965
2	Mike Cantley	RPZC Man Eng	mike.cantley@rpzc.com.na	0812461[illegible]
3	[illegible]	Water Irrigation	Namibirrigation waffeki@iafrica.net	081 7466510
4	ELLIOT KAMTYA KABIZI	RPZC - CHIEF MINE SURVEYOR	[illegible]@rpzc.com.na	0811224961
5	E. Nailenge	Roshskor	eva-liza.nailenge@roshskor.com.na	0812536844
6	M. NASHANDI	RPZC	martin-nashandi@gmail.com	0812551135
7	H. S. Basson	Rosh Skor	[illegible].basson@roshskor.com	0811475737
8	S. Kasirye	RPZC - Geology	solomonkasirye@gmail.com	081-2566620
9	Rose Mhuleni	RPZC	rosetufi@gmail.com	0813103691
10	Piet Kooper	RPZC -	Piet.kooper@.com	0812101485
11				
12				
13				
14				
15				

All comments received by email; none were received by fax or SMS

From: John Pallett, SAIEA

From: John Pallett [mailto:john.pallett@saiea.com]
Sent: 04 July 2013 09:38
To: 'Auriol Ashby'
Cc: 'Mike & Ann Scott'
Subject: RE: Invitation to public meeting on 4th July in Rosh Pinah for EIAs for proposed new powerline & water pipeline for RPZC

Hi Auriol, is there a bird specialist on this EIA team?
J

John Pallett
Southern African Institute for Environmental Assessment
Windhoek, Namibia
www.saiea.com

Tel +264 61 220579
Fax +264 61 259183
Cell +264 81 240 25 28

From: Auriol Ashby [mailto:aaplm@mweb.com.na]
Sent: 04 July 2013 10:44 AM
To:john.pallett@saiea.com
Cc: 'Mike & Ann Scott'
Subject: RE: Invitation to public meeting on 4th July in Rosh Pinah for EIAs for proposed new powerline & water pipeline for RPZC

Yes Chris Brown. He has just completed his field work and is driving home.
He travelled under about 25km of different types of powerline and only found one set of bones about 5 yrs old.
Please contact him.
A

Auriol Ashby
Ashby Associates cc
Tel/Fax: +264 61 233679
P.O. Box 11513
Windhoek, Namibia

From: John Pallett [mailto:john.pallett@saiea.com]
Sent: 04 July 2013 11:24
To: 'Auriol Ashby'
Cc: 'Mike & Ann Scott'
Subject: RE: Invitation to public meeting on 4th July in Rosh Pinah for EIAs for proposed new powerline & water pipeline for RPZC

Hi Auriol - thanks for this feedback, I'll definitely contact Chris
J

John Pallett
Southern African Institute for Environmental Assessment
Windhoek, Namibia
www.saiea.com

Tel +264 61 220579
Fax +264 61 259183

From: Peter Cunningham [mailto:pckkwrc@yahoo.co.uk]
Sent: 26 June 2013 08:11
To: Auriol Ashby
Subject: Re: Invitation to public meeting on 4th July in Rosh Pinah for EIAs for proposed new powerline & water pipeline for RPZC

Dear Auriol
Power line: Main concern would be the bird mortalities - e.g. bustards & raptors - would have to determine the most NB stretches and mitigate appropriately.
Regards
Peter Cunningham

Peter Cunningham
Environment & Wildlife Consulting Namibia
Windhoek
POBox 90717
Namibia
Tel: +264 61 254550
Fax: +264 61 254550
Mobile: +264 81 3004080

APPENDIX F
ISSUES AND RESPONSE REPORT

ISSUES AND RESPONSE REPORT			
Name and how raised	**Issue Raised / Comment**	**Response**	**Report Section**
Bird Fatalities			
J. Pallett, by email, 4 July 2013	Is there a bird specialist on this EIA team?	Yes, Chris Brown. He has just completed his field work and is driving home. He travelled under about 25km of different types of power line and only found one set of bones about 5 yrs old.Please contact him.	
P.Cunningham Environment & Wildlife Consulting Namibia, by email 24/7/2013	Main concern would be the bird mortalities - e.g. bustards & raptors - would have to determine the most NB stretches and mitigate appropriately.		
K. Kaulinge, RPZC, Manager Engagement; Public meeting 3/7/13	Is it a good or bad sign that the avifauna specialist didn't find any bird fatalities under the 3 existing powerlines between Obib and RPZC Mine? Maybe all the birds are gone.	The specialist thought it was more an issue of very little food to attract birds to the area. See Main EIA and Specialist report.	
Powerline Route and quantity of lines			
S. Saayman, RoshSkor meeting, 3/7/13	When we had a previous discussion and site visit with the design consultants for the powerline, we recommended a change of alignment through the town, after Lorelei, to keep the line away from as many buildings as possible.	We will have to clear all the buildings (hostel and houses) in the servitude, in accordance with NamPower's guidelines, which I think is 1 ½ times the height of the pole. The route has not been finalised; we will ask for an updated route from our consultants. As far as RoshSkor is concerned, the routes fit into our town planning schemes.	
A. Ashby, RoshSkor meeting, 3/7/13	Yes, I am concerned about powerline being close to the Ehafo Hostel, one of RPZC's buildings.		
E. Nailenge, RoshSkor meeting, 3/7/13	On your map which one is the old powerline and which one is the proposed one? Instead of having an extra line, can we build a bigger one and dismantle the old 66kV powerline?	The existing 66kV powerline has to be kept in use during construction and also as a future back-up. There will be separate powerlines which will feed RPZC Mine, Rosh Pinah Town and NamWater at Sendelingsdrif. NamPower plans to upgrade the power supply to the Rosh Pinah Town, but it is not part of this EIA.	
Construction			
A.Speiser, RoshSkor meeting, 3/7/13	What is the construction period?	The line from Obib to Lorelei is expected to take 2.5 months and the line from Lorelei to ZinCum to take 1.5 months. Most of this work will be changes at the sub-stations. It is unlikely to require night working.	
Public meeting; 3/7/2013	Do the potential issues listed already cover the construction period as well? Who monitors construction?	Yes, all activities associated with the project will be covered in the Environmental Management Plan. The public is welcome to notify the mine if they see anything which doesn't seem to correct. We will take it up with the relevant person. NamPower will go out on tender and appoint the construction company. NamPower will also do the construction supervision.	
K. Kaulinge, Public meeting 3/7/13	So we are looking at construction next year in 2014.	If there are any major changes, we will have to submit an amendment EIA.	

ISSUES AND RESPONSE REPORT			
Name and how raised	**Issue Raised / Comment**	**Response**	**Report Section**
EIA Process			
K. Kaulinge, Public meeting 3/7/13	How long does MET take?	The EIA can be conducted within a few months. However, some technical aspects, e.g. final alignment, need to be addressed with NamPower before the final report can be submitted to MET.	
S. Kasirye, Public meeting 3/7/13	Will you have more public meetings?	No, there are other ways to consult with the public. The Environmental Regulation states that the public has to be consulted, but it doesn't specify that public meetings have to be held. All registered stakeholders will receive any further information and reports regarding this project via email and we will place the information in the library and on ASEC webpage.	

APPENDIX G
FLORA SPECIALIST REPORT

Environmental Impact Assessment for a new power line from the existing Obib substation to Rosh Pinah, in the vicinity of the existing servitude line.

Specialist Vegetation Study

July 2013

Prepared by: Coleen Mannheimer
manfam@iafrica.com.na

For: A. Speiser Environmental Consulting

Contents

List of Appendices

List of Tables

Executive Summary

The route for a proposed new power pipeline between the existing Obib substation SE of Skorpion Mine and Rosh Pinah was assessed for potential impacts on the Namibian flora. In part the route shadows an existing power line, but they diverge in places where there is insufficient space to accommodate both.

Four habitats were identified, one of which is very sensitive, of concern and at risk due to three factors:

Limited extent.

Many species/individuals of protected plants.

Low to no recovery potential.

It is, thus, essentially a no-go area.

Of the other three, two are of medium sensitivity and require some care to do as little damage as possible and the last, the sandy plains, is of less concern for reasons discussed in the body of this report.

It was found that recovery along the existing power line, which is largely confined to sandy plains habitat, has been good.

The sensitive areas were mapped. It was found that with very little change to the route the no-go area could be avoided.

The following recommendations were made on mitigation of potential damage:

Careful route planning to avoid the no-go area completely and the other sensitive areas as far as possible.

Careful planning and marking of access routes for construction and maintenance.

Placement of laydown areas and temporary staff accommodation in previously damaged areas, which have been indicated in this report.

1. Background

Due to potential development of a new mining resource about 10 km north of Rosh Pinah it may be necessary to increase electricity supply for the proposed new facility. About two thirds of the new line lies in close proximity to an existing line, as indicated in Appendix 1.

A specialist vegetation study was done to identify potential impacts on the Namibian flora of the proposed power line.

The Namib Desert and escarpment harbour numerous endemic and near endemic plant species, of which many are of restricted distribution or habitat and/or are protected. This makes them extremely vulnerable to disturbance, particularly because many occur in small patches of suitable substrate where quite restricted damage may cause the loss of the whole or a large proportion of a population.

Rosh Pinah Zinc Corporation has commissioned an EIA for the new power line. This specialist vegetation study forms a part of that EIA.

1.1 Location and climate

The proposed route runs from the Obib substation, just SW of Skorpion Zinc Mine, past the Lorelei substation near the Tutungeni settlement, and on into Rosh Pinah. It lies within the Desert and Succulent Steppe as defined by Giess (1971).

Winter and summer rains are possible, with an average annual rainfall of less than 100 mm, and coastal fog moving up the Orange River valley playing an important role in the moisture regime of many organisms. Due to oceanic influences temperatures are moderate compared with much of Namibia, with average annual temperature around 17°C, although temperatures may reach as high as 30°C or more in summer, particularly in the river valley. Winds, which are often strong, occur throughout the year, mainly from the south, although warm north-easterly winds occur sporadically during winter (Mendelsohn et al 2002, pers. obs.).

1.2 Area status

The project area does not impinge on a protected area, but does lie very close to the border of the Sperrgebiet National Park.

1.3 Botanical sensitivity

Although it has some floral affinities with the Nama-Karoo, the project area falls within the Succulent Karoo Biome, which is regarded as a global hotspot of biological diversity (Myers et al. 2000), including both plants and animals, and is extremely sensitive in terms of near-endemic, endemic and protected plant and animal species. It is important in global as well as regional and national terms. This makes only absolutely unavoidable damage acceptable.

Approximately 17% of the Namibian flora as a whole is thought to consist of endemic species (Barnard 1998), and over 30% of plants that occur in the Namibian section of the Desert Biome are believed to be endemic to that area. This is a remarkably high figure, and the areas of highest plant endemicity in the Namib are the Kaokoveld and the southern Namib, both regarded as major centres of endemicity in Namibia (Maggs et al. 1998). Furthermore, recent assessment by Burke and Mannheimer (2004) indicated that the Sperrgebiet (which excludes Aus) carries nearly 25% of the plant species known to occur in Namibia, making it a national biodiversity hotspot. Elevated areas such as mountains and koppies are known to harbour many species of conservation concern, making them sensitive to environmental disturbance, some more than others. In addition to on-site damage the creation of obvious access roads promotes illegal access and plant removal by criminal collectors, and is of particular concern as it perpetuates and aggravates existing damage ad infinitum. An additional concern of great importance is the negative visual impact of roads and other infrastructure. This factor is of particular importance in an area such as the southern Namib, where open and relatively unspoilt vistas may be regarded as a major tourist attraction that will provide long-term income to the country. Although the proposed route lies outside the Sperrgebiet it still harbours many of the same species of conservation concern.

The section of this particular area that falls into the Sperrgebiet (i.e. just to the east of Skorpion) has been categorised by Burke (2006) as of High to Very High conservation importance. Flora studies for the Environmental Impact Assessment for the Skorpion Zinc Project found a high plant diversity in the area (over 220 species), with approximately 12 per cent of those being Namibian endemic species, some of very restricted distribution.

2. Terms of Reference and Objectives

The consultant was requested to:

- Review existing relevant information to identify the plant species that occur or are thought to occur along the proposed pipeline route, with emphasis on those that are

protected by legislation, are Red Data species or are otherwise particularly valuable from a biodiversity and/or ecological point of view.

- Divide the area into broad sensitivity zones according to plant species vulnerability, ecological and scientific value as well as scenic value. Identify particularly sensitive areas or habitats, if any, within each of those zones.
- Consider the potential impacts on the flora that might result from construction and operation of the proposed pipeline.
- Identify and suggest mitigation measures and methods that could be considered to minimise impacts during the construction and operational phases of the project.

3. Approach and Methodology

- Review of existing specialist vegetation and ecological studies done for this area, i.e.: Burke 2006; Burke & Mannheimer 2004; Giess 1971; Pallett 1995; Williamson 1997.
- Review known species occurrence in the general area of the proposed route, i.e.: Specimen Database National Botanical Research Institute (SPMNDB); unpublished data C. Mannheimer. Tree Atlas of Namibia Database.
- Inspection of route on Google Earth to identify preliminary habitats/zones and areas of potential concern such as marble ridges, which are known to harbour species of conservation concern in Namibia.
- Fieldwork done 1 to 4 July 2013. Ground-truthing of preliminary zones that had been identified. Assessment of zones by traversing the route by vehicle. Walked transects were done in all habitats (Appendix 2), and the very sensitive koppie at 27.903859°S/16.705029°E was extensively traversed on foot for several hours.
- Preparation of report and mapping of zones.

4. Legal and Policy Requirements

4.1 Acts and ordinances

Namibia's Constitution provides for the protection of the environment in Article 95, which says: "The State is obliged to ensure maintenance of ecosystems, essential ecological processes and

biological diversity and utilisation of living natural resources on a sustainable basis for the benefit of Namibians both present and future".

Plant species are protected by various mechanisms in Namibia, including Nature Conservation Ordinance No. 4 of 1975 and amendments, which provide for the declaration of protected areas and for the specific protection of scheduled species where they occur and Forestry Act No. 72 of 1968, as amended in 2005. Environmental assessment and other activities are governed by the Environmental Management and Assessment Act of 2007.

The Parks and Wildlife Management Bill of 2001 governs the declaration and management of national protected areas, of which the /Ai-/Ais/Richtersveld Transfrontier Park forms a part.

4.2 Namibian commitment to international standards and/or guidelines

Namibia is a signatory to the Convention on Biodiversity, committing it to the preservation of species, particularly rare and endemic species, within its boundaries. As a signatory also to the Convention to Combat Desertification it is also bound to prevent excessive land degradation that may threaten livelihoods.

4.3 National policies and guidelines

No protected areas are involved.

5. Description of habitats along proposed route

The study area consists of plains interrupted by koppies, rocky outcrops, mountain slopes and foothills. Four habitats were identified during this study, and they have been assessed for vegetation sensitivity based on occurrence of species of conservation concern and recovery potential. The habitats are mapped in Appendix 3 and 4.

The power line route runs roughly NW-SE from Obib substation (Point A). Initially it travels to the north and west of the substation, crossing a succulent plain of medium sensitivity before turning south-eastwards and traversing a sandy plain, running parallel to the C13 road before crossing it just to the NW of a limestone-quartz koppie situated at approximately 27.903859°S/16.705029°E (Point B: this koppie is the no-go zone). To the north of the koppie it turns SE, going over one of two saddles between the koppie and the mountain slope to the east. Thence it traverses a sandy plain, crossing two rocky ridges, one on either side of the Tutungeni settlement area, before entering Rosh Pinah and meeting the Nampower substation in the town itself (Aurus and Zincum). At approximately 27.938871°S/16.741188°E at passes over the quartz footslope of a rocky ridge (Point C) and, after passing the Lorelei substation, at approximately 27.949133°S/16.757192°E (Point D) it crosses or curves around a rocky ridge and drops into a narrow sandy valley bordered in the NE and SW by mountainous and rocky ridges. It runs down this valley and crosses a built-up area of Rosh Pinah before meeting proposed new Rosh Pinah substation (Point D).

Broadly speaking, four habitats are traversed:

1. Succulent rocky plain
2. Sandy plains and washes
3. Limestone koppie and saddle
4. Low rocky outcrops and quartz foothills

5.1 Succulent rocky plain

As shown in Appendix 3, in the vicinity of the Obib substation the plain habitat is characterised by a dense cover of succulent and/or perennial species, many of which are of some conservation concern, including *Pelargonium paniculatum, Sarcocaulon patersonii, S. inerme, Zygophyllum pterocaule, Z. longicapsulare, Z. schreiberianum, Cheiridopsis robusta, Cephalophyllum ebracteatum, Jordaaniella cuprea* and others. Table 1 is an annotated list of species of conservation concern that were found during this study.

This habitat is of MEDIUM sensitivity due to high diversity of perennial species, some of conservation concern, relatively restricted size, and quite low restoration potential, as shown in Figure 1.

Figure 1: The corridor of damage along the existing power line north of the Obib substation, showing very low re-establishment of succulent and perennial plant diversity. A = undamaged; B = damaged.

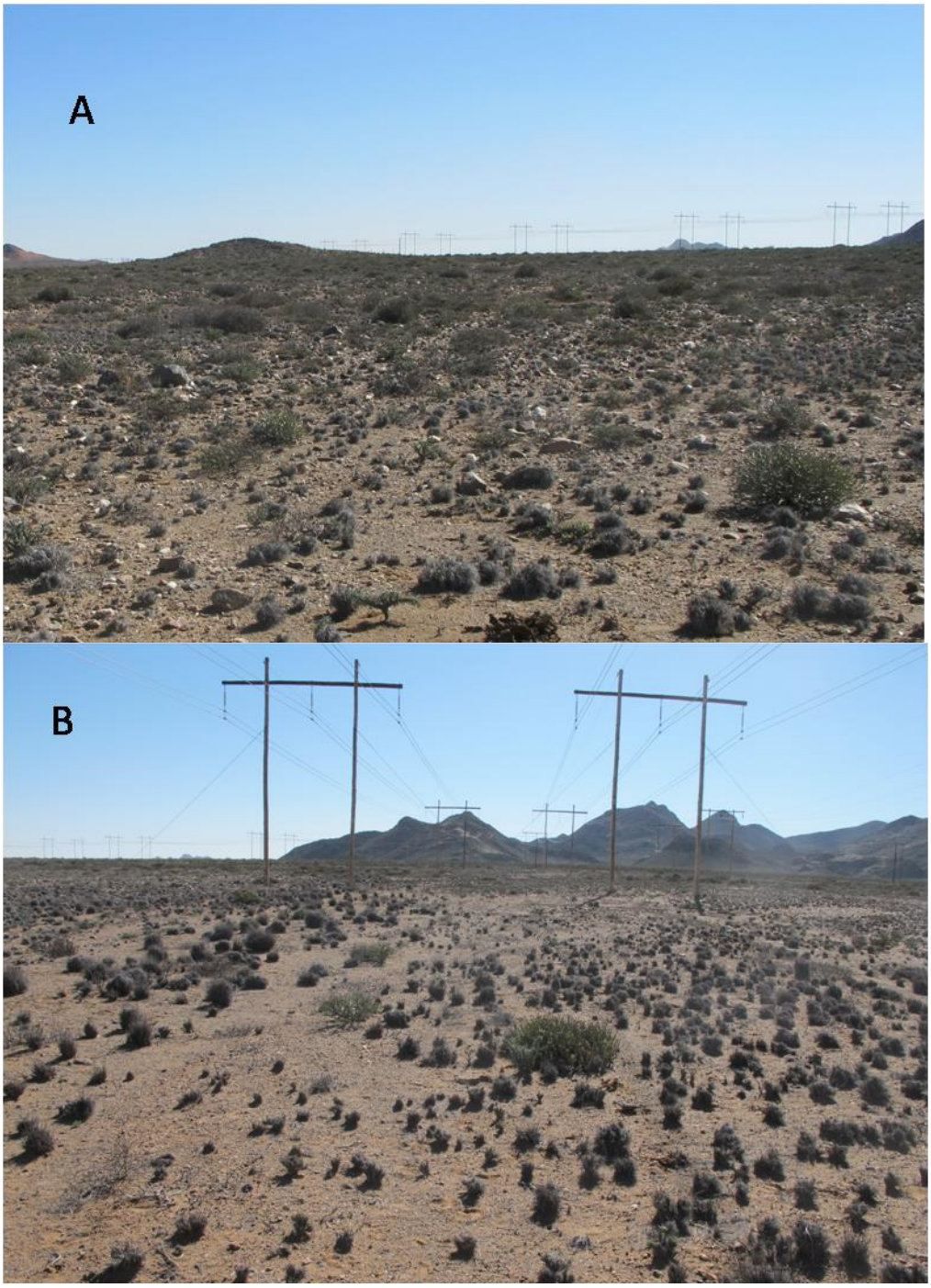


Table 5.1: Annotated list of species of highest concern found along the proposed route.

Species	Endemism	Protected	Red Data Status	Comments
Aloe gariepensis	NE	X	LC	Restricted distribution
Antimima quarzitica	E	X	LC	Restricted distribution and habitat
Astridia longifolia		X	R	
Cephalophyllum ebracteatum	NE	X	LC	Reasonably widespread
Cheiridopsis robusta		X	LC	Reasonably common and widespread
Dracophilus dealbatus	NE		DD	Reasonably common and widespread, but already has been impacted by mining here and on the Orange River
Eberlanzia schneideriana	NE	X		Reasonably widespread, restricted habitat
Hartmanthus hallii	E	X	LC	Highly restricted occurrence and habitat
Jordaaniella cuprea		X	LC	Restricted distribution
Mesembryanthemum pellitum	E			Limited distribution but weedy species that readily recolonises disturbed areas
Boscia albitrunca		X		Widespread but subject to collection for wood in the Rosh Pinah area

Adromischus filicaulis		X		
Crassula atropurpurea		X	R	
Crassula brevifolia		X		
Crassula cotyledonis		X		
Crassula fusca		X		
Crassula macowaniana		X		
Crassula subaphylla subsp. *subaphylla*		X		
Tylecodon hallii	E	X	LC	Restricted distribution and habitat
Tylecodon paniculatus subsp. *glauca*	E	X		Subject to illegal collecting
Pelargonium paniculatum	NE			Restricted habitat
Sarcocaulon inerme	E		LC	Restricted habitat
Sarcocaulon patersonii	NE		LC	Reasonably widespread
Zygophyllum longicapsulare	NE		LC	Reasonably widespread
Zygophyllum pterocaule	NE		LC	Restricted distribution
Zygophyllum schreiberianum	NE			Restricted distribution
Larryleachia marlothii	NE			Reasonably widespread

CR = critically endangered; VU = vulnerable; R = rare; LC = least concern; DD = data deficient.

5.2 Sandy plains and washes

These red sand plains (Figure 2) are characterised by dominance of *Stipagrostis ciliata* and *Brownanthus arenosus*, with *Stipagrostis geminifolia* and *Othonna cylindrica* also common and

Zygophyllum prismatocarpum, Sisyndite spartea, Searsia populifolia and *Euphorbia dregeana* defining the many shallow washes that cut through them. These plains harbour a relatively high plant diversity, more obvious after rains, with a number of range-restricted, endemic and near-endemic species occurring, including *Euphorbia melanohydrata, Dracophilus dealbatus, Cheiridopsis robusta, Mesembryanthemum pellitum, Zygophyllum pterocaule, Sarcocaulon patersonii, Gazania schenckii* and *Ruschia* spp.. *Euphorbia melanohydrata* has a restricted distribution in Namibia, a portion of which was affected by the development of Skorpion mine and the associated airstrip.

Nevertheless, in the context of this narrow, linear impact the sensitivity of this habitat is rated as LOW to MEDIUM because it covers a large area and has a medium recovery potential.

Figure 2: Sandy plain habitat.

5.3 Limestone koppie and saddle

The limestone/granite koppie (Figure 3) where the power line crosses the road provides high niche diversity by virtue of substrate, moisture and aspect variability, including a large SW-facing slope that collects moisture from fog. As a result it exhibits an extremely high species

diversity, and harbours a high number of endemic, near-endemic, range-restricted and protected species, both on the slopes and on the footslopes. These include numerous protected species of high conservation concern and/or very restricted distribution including *Antimima quarzitica, Hartmanthus hallii*, *Conophytum taylorianum* subsp. *ernianum, Astridia longifolia, Tylecodon hallii, Tylecodon paniculatus* subsp. *glauca, Aloe gariepensis,* and *Crassula atropurpurea* (Table 1). In addition, many more protected species occur, such as *Cheiridopsis robusta, Crassula brevifolia, C. cotyledonis, C. fusca, C. macowaniana, C. subaphylla* subsp. *subaphylla, Adromischus filicaulis, Larryleachia marlothii* and *Boscia albitrunca.* Numerous other endemic or near-endemic species are also found, some of restricted habitat. A number of these species show a tendency to congregate in small patches of suitable habitat (pers. obs.), making the impact on them higher than on those species that are more randomly distributed. In this respect *Hartmanthus hallii* is of very high concern on this site. There is a very dense, hitherto unknown, population in the first saddle behind the koppie (Figure 4; Appendix 5) centred at 27.90384°S/16.70686°E. Because this is such a localised population it should be easy to avoid by routing the power line over the next saddle (27.90312°S/16.70808°E) which is, by far, less sensitive. It is also indicated in Appendix 5 and shown in Figure 5. Note that it might be that the route is already intended to use the second saddle, but it was not possible to see for certain on the route information provided by Nampower for this study.

The sensitivity of this koppie and its direct surrounds, as mapped in Appendices 3 and 4, is VERY HIGH, and it should be regarded as a 'NO-GO' area.

Figure 3: The limestone/granite koppie carries a very high plant diversity.

Figure 4: The western saddle (shown here from the north) is rated as HIGHLY SENSITIVE. It carries a dense population of *Hartmanthus halii* as well as other species of concern.

Figure 5: The eastern saddle is far less sensitive than the western saddle.

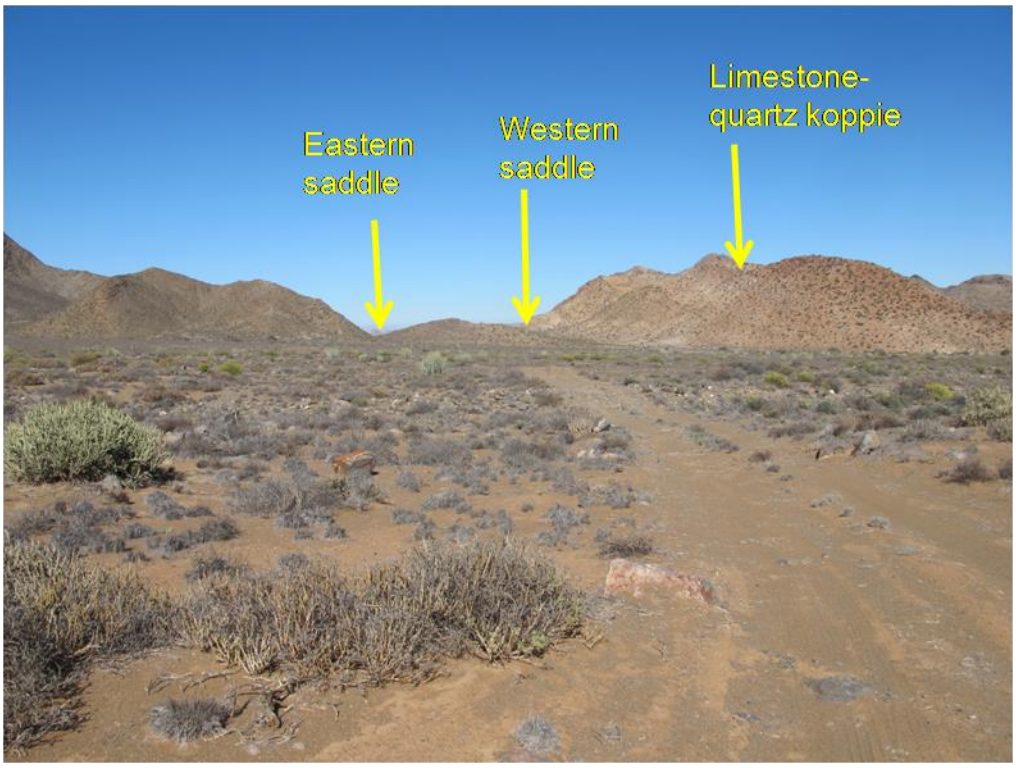


Figure 6: View of the two saddles from the north.

5.4 Low rocky outcrops and quartz foothills

This habitat, found on either side and north of the Tutungeni settlement (Appendix 3), is characterised by the presence of many succulent perennials, including species of some conservation concern such as *Tylecodon hallii, Crassula brevifolia, C. macowaniana,* and *Sarcocaulon inerme* on the outcrops and *Cephalophyllum ebracteatum* and *Eberlanzia schneideriana* on the quartz foothills, which characteristically carry a dense layer of white quartz pebbles on the surface (Figure 7). The species of highest concern seen here was *Aloe pillansii* (giant quiver tree), but only very high on the slopes in the gulley approaching the mine. It should not really be affected by the route, which is unlikely to run high along the slope. However, it should be pointed out that this species has already experienced an very high impact from the Rosh Pinah mine and further losses of this protected, endangered, CITES I, near-endemic, iconic species should be prevented at all costs.

The sensitivity of this habitat is rated as MEDIUM because it has a low to very low recovery potential. It should be regarded as an area to be avoided if at all practical, and any unavoidable damage, especially collateral damage, should be restricted as far as possible.

Figure 7: Typical quartz-covered footslope in the southern section of the route.

6. Potential Impacts

The project will have a negative impact on vegetation, and will affect populations of protected, endemic and near-endemic species. There will be contraventions of Nature Conservation Ordinance No. 4 of 1975, including amendments. Strictly speaking permits would be required to destroy protected species, but this would be very complicated given that exact numbers and species involved would be required and thus far this requirement has not been enforced by the Ministry of Environment and Tourism once an environmental clearance has been granted.

Potential impacts include damage to protected plants and restricted habitats due to uncontrolled vehicle and human activity during construction and maintenance of infrastructure as well as

removal of or damage to plants for firewood or other (e.g. ornamental) purposes. Additional damage could be caused by construction laydown areas and temporary staff housing facilities.

7. Mitigation and Management

Impact on sensitive areas will be greatly influenced by mitigation measures taken to control collateral damage, such as that caused by vehicles and construction laydown. It will also be affected by the exact route of the power line.

If the route is designed to avoid the no-go area (Appendix 3 & 4), damage to the succulent plain, ridges and quartz foothills is minimised as far as possible, collateral damage is controlled throughout and infrastructure is sited in previously damaged areas or along existing roads and servitudes damage will probably be slight.

8. Assessment of Impacts

8.1 Physical destruction to vegetation, including species of high conservation concern

Table 8.1.1 Impact Characteristics: Vegetation

Summary	Construction	Operation
Project Aspect/ activity	Loss of species of concern resulting from physical destruction due to vehicle activity along the service track, laydown areas and assembly areas.	Widening or modification of the existing service route to avoid uneven terrain, resulting in additional plants being damaged or destroyed.
Impact Type	Direct	Direct
Stakeholders/ Receptors Affected	Flora along the route.	Flora along the route.

Box 8.1.1 Construction Impact: Vegetation

Nature: Construction activities would result in a **negative direct** impact on flora along the route.

Impact Magnitude – **High**

- **Extent**: The extent of the direct impact is limited to the site but, due to the limited area of occurrence of the species of concern **the extent may be considered to be regional, national and even international because if they are lost in the only area that they occur then the extent is huge, in that context.**
- **Duration**: The duration would be **long-term**.
- **Intensity**: The intensity of the impact will be **medium** because some of the plants will most probably survive.

Likelihood – vegetation, including species of conservation concern will **definitely** be lost.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – HIGH

Degree of Confidence: The degree of confidence is **high**.

Box 8.1.2 Operational Impact: Vegetation

Nature: The operations phase could result in further **negative direct** impacts on vegetation.

Impact Magnitude – **Medium**

- **Extent**: The extent is limited to the site but, due to the limited area of occurrence of the species of concern **the extent may be considered to be regional, national and even international because if they are lost in the only area that they occur then the extent is huge, in that context.**.
- **Duration**: The duration would be **long-term** as the service route will continually be disturbed, thus beyond the completion of the project.
- **Intensity**: The intensity of the impact will be **medium** because some of the plants will most probably survive.

Likelihood – ongoing impacts on vegetation will **definitely** occur during operational activities.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MAJOR

Degree of Confidence: The degree of confidence is **high.**

8.1.1 Mitigation and Management

The following measures to avoid or reduce damage to vegetation/species of concern are recommended:

- The no-go area should be avoided at all costs.
- The final route should stay on the plains habitat as much as possible. Damage to the other sensitive areas should be avoided as far as possible, particularly to the succulent plain near the Obib substation.
- Uncontrolled vehicle activity is of major concern. Outside the plains habitat vehicle movement should be controlled and restricted to the future service track as far as possible. Even in the plains habitat uncontrolled driving should not be permitted. Careful pre-planning of construction activities should be done to identify where tracks will be absolutely necessary for both construction and maintenance, overlapping these as far as possible. These should be clearly marked prior to construction activities beginning, together with designated turning points and construction laydown areas. Turning points for heavy vehicles should be designated and adhered to. *Ad lib* turns should not be permitted. The area used should be constrained as far as possible, and should be rehabilitated once construction is complete.

- During the operational phase only the service track should be used. No new tracks should be created.
- All construction laydown should be done in previously damaged areas, where construction camps should also be located unless crews could be accommodated in Rosh Pinah, which would be preferable. Several previously damaged areas that could be used are indicated in Appendix 6.
- In the undesirable event that the no-go area will be impacted, plant relocation should be considered. Previous work of this kind done in the Sperrgebiet has shown that relocation should take place as soon as possible (A. Burke, pers. comm.). Plant storage is a possibility, but will not work for many species unless the period of storage is very short (no more than 3 weeks). Plants should be relocated to areas damaged by the project. Undisturbed areas should generally not be disturbed in order to relocate plants, although possible exceptions might be species of very high conservation concern.
- Fixed point photography, initiated prior to construction activities, should be extensively utilised to assess compliance by contractors.
- Construction and maintenance staff should be educated and informed of their environmental obligations. Meaningful penalties for damages should be stipulated, and the main contractor should be held responsible for all transgressions.
- Due to the very low and sparse nature of the plant growth in this area, it is unlikely that any vegetation clearing will be necessary for this route in the future. If any is necessary it should be done manually.

8.1.2 Potential for cumulative impact

Many species of conservation concern have already been impacted by mining activities and associated linear infrastructure around Rosh Pinah and along the Orange River, as well as facilities such as the Rosh Pinah Waste Site and the Tutungeni township, so cumulative impacts are of concern particularly in the case of *Hartmanthus hallii.*

8.1.3 Potential for non-compliance with legislative and regulatory requirements

Destruction and removal of protected plant species is illegal.

8.1.4 Final risk categorisation

Table 8.1.2 Pre- and Post- Mitigation Significance: Vegetation

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction	**MAJOR (-ve)**	**MINOR (-ve)**
Operation	**MAJOR (-ve)**	**MINOR (-ve)**

If the route is planned to avoid the areas of high sensitivity then very few plants of conservation concern will be destroyed.

8.2 Loss of limited habitats due to direct disturbance

Table 8.2.1 Impact Characteristics: Limited plant habitat along the route

Summary	Construction	Operation
Project Aspect/ activity	Loss of suitable habitat for species of concern resulting from vehicle activity along the service track, laydown areas and assembly areas.	Widening or modification of the existing service route to avoid uneven terrain, resulting in additional areas being damaged.
Impact Type	Direct	Direct
Stakeholders/ Receptors Affected	Limited habitat along the route.	Limited habitat along the route.

Box 8.2.1 Construction Impact: Limited plant habitat along the route

Nature: Construction activities would result in a **negative direct** impact on limited habitat along the route.

Impact Magnitude – **Medium**

- **Extent**: The extent of the direct impact is limited to the site but, due to the limited area of occurrence of the habitat of concern **the extent may be considered to be regional, national and even international.**
- **Duration**: The duration would be **long-term**.
- **Intensity**: The intensity of the impact will be **medium** because some of the habitat will most probably remain intact.

Likelihood –Limited habitat will **definitely** be lost.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – HIGH

Degree of Confidence: The degree of confidence is **high**.

Box 8.2.2 Operational Impact: Limited plant habitat along the route

Nature: The operations phase could result in further **negative direct** impacts on limited habitat along the route.

Impact Magnitude – **Medium**

- **Extent**: The extent of the direct impact is limited to the site but, due to the limited area of occurrence of the habitat of concern **the extent may be considered to be regional, national and even international.**
- **Duration**: The duration would be **long-term**.
- **Intensity**: The intensity of the impact will be **medium** because some of the habitat will most probably remain intact.

Likelihood – ongoing impacts on habitat will **definitely** occur during operational activities.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MAJOR

Degree of Confidence: The degree of confidence is **high.**

8.2.1 Mitigation and Management

The following measures to avoid or reduce damage to limited habitats are recommended:

- The no-go area should be avoided at all costs.
- The final route should stay on the plains habitat as much as possible. Damage to the other sensitive areas should be avoided as far as possible, particularly to the succulent plain near the Obib substation.
- Uncontrolled vehicle activity is of major concern. Outside the plains habitat vehicle movement should be controlled and restricted to the future service track as far as possible. Even in the plains habitat uncontrolled driving should not be permitted. Careful pre-planning of construction activities should be done to identify where tracks will be absolutely necessary for both construction and maintenance, overlapping these as far as possible. These should be clearly marked prior to construction activities beginning, together with designated turning points and construction laydown areas. Turning points for heavy vehicles should be designated and adhered to. *Ad lib* turns should not be permitted. The area used should be constrained as far as possible, and should be rehabilitated once construction is complete.
- During the operational phase only the service track should be used. No new tracks should be created.

- All construction laydown should be done in previously damaged areas, where construction camps should also be located unless crews could be accommodated in Rosh Pinah, which would be preferable. Several previously damaged areas that could be used are indicated in Appendix 6.
- Fixed point photography, initiated prior to construction activities, should be extensively utilised to assess compliance by contractors.
- Construction and maintenance staff should be educated and informed of their environmental obligations. Meaningful penalties for damages should be stipulated, and the main contractor should be held responsible for all transgressions.

8.2.2 Potential for cumulative impact

Hartmanthus hallii occurs in very small areas of suitable habitat, and is known from only a few populations. At least one population has already been impacted, at the Rosh Pinah Waste Site, so all attempts should be made to avoid further destruction of areas where it occurs.

8.2.3 Final risk categorisation

Table 8.2.2 Pre- and Post- Mitigation Significance: Limited plant habitat along the route

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction	**MAJOR (-ve)**	**MINOR (-ve)**
Operation	**MAJOR (-ve)**	**MINOR (-ve)**

If the route is planned to avoid the areas of high sensitivity then very little habitat of limited extent and high concern will be destroyed.

8.3 Illegal plant or wood harvesting for fuel or ornamental purposes

Table 8.3.1 Impact Characteristics: Illegal collection of plants/wood

Summary	**Construction**	**Operation**
Project Aspect/ activity	Loss of species of concern resulting from physical destruction due to vehicle activity along the service track, laydown areas and assembly areas.	Widening or modification of the existing service route to avoid uneven terrain, resulting in additional plants being damaged or destroyed.
Impact Type	Direct	Direct
Stakeholders/ Receptors Affected	Flora along the route.	Flora along the route.

Box 8.3.1 Construction Impact: Illegal collection of plants/wood

Nature: Construction activities would result in a **negative direct** impact on flora along the route.

Impact Magnitude – **Medium**

- **Extent**: The extent of the direct impact is limited to the site but, due to the limited area of occurrence of the species of concern **the extent may be considered to be regional, national and even international because if they are lost in the only area that they occur then the extent is huge, in that context.**
- **Duration**: The duration would be **long-term**.
- **Intensity**: The intensity of the impact will be **medium** because some of the plants will most probably survive.

Likelihood – vegetation, including species of conservation concern will **definitely** be lost.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MODERATE

Degree of Confidence: The degree of confidence is **high**.

Box 8.3.2 Operational Impact: Illegal collection of plants/wood

Nature: The operations phase could result in further **negative direct** impacts on vegetation.

Impact Magnitude – **Medium**

- **Extent**: The extent is limited to the site but, due to the limited area of occurrence of the species of concern **the extent may be considered to be regional, national and even international because if they are lost in the only area that they occur then the extent is huge, in that context.**.
- **Duration**: The duration would be **long-term** as the service route will continually be disturbed, thus beyond the completion of the project.
- **Intensity**: The intensity of the impact will be **medium** because some of the plants will most probably survive.

Likelihood – ongoing impacts on vegetation will **definitely** occur during operational activities.

IMPACT SIGNIFICANCE (PRE-MITIGATION) – MODERATE

Degree of Confidence: The degree of confidence is **high.**

8.3.1 Mitigation and Management

The following measures to avoid or reduce damage to sensitive areas and vegetation are recommended:

- Collection of plants, or parts of plants (including seed and/or fuelwood) should be forbidden. Staff should be expressly forbidden to collect any plant material, dead or alive (including seed), for any purpose whatsoever and should be provided with fuel (preferably gas) for both heating and cooking.
- Construction and maintenance staff should be educated and informed of their environmental obligations. Meaningful penalties for damages should be stipulated, and the main contractor should be held responsible for all transgressions.

8.3.2 Final risk categorisation

Table 8.3.2 Pre- and Post- Mitigation Significance: Illegal collection of plants/wood

Phase	Significance (Pre-mitigation)	Residual Impact Significance
Construction	**MODERATE (-ve)**	**MINOR (-ve)**
Operation	**MODERATE (-ve)**	**MINOR (-ve)**

Illegal harvesting of wood in for fuel or heating in this area can have a devastating effect on plant communities and should be strictly forbidden, as should collecting of plants for any other purpose whatsoever.

9. Assumptions

The precautionary principle was applied in these assessments in that, lacking the exact route, it was assumed that the route as proposed WOULD threaten the no-go area.

10. Summary and discussion

Habitat recovery along the existing alignment has generally been good, indicating that the plains have a high recovery potential. Recovery potential in the other habitats will be extremely slow to non-existent.

If the route is planned to completely avoid the one no-go area and the other sensitive areas to a large extent or (preferably) entirely then the impact of this project on plants and habitats of conservation concern will be low.

11. References

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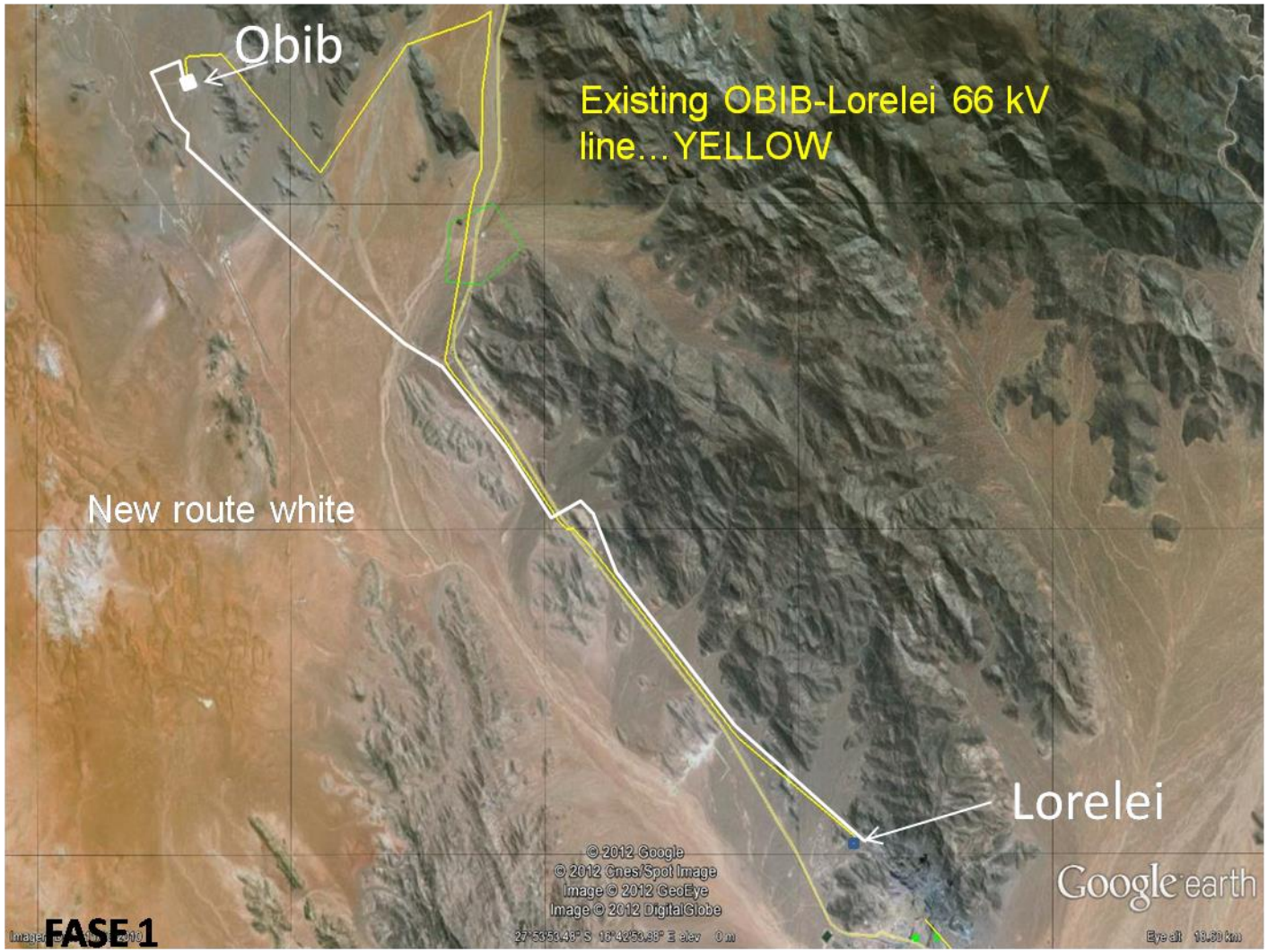
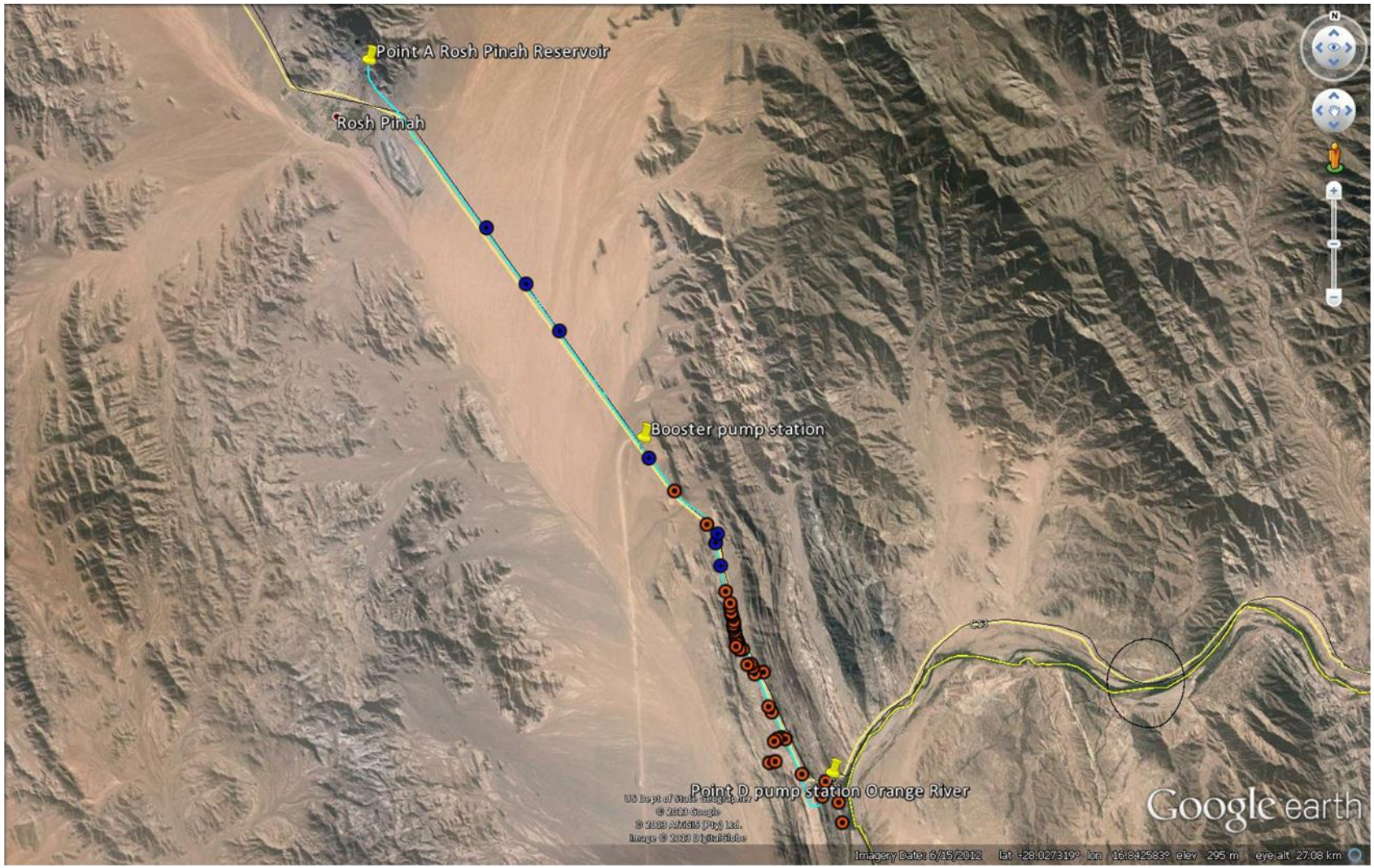
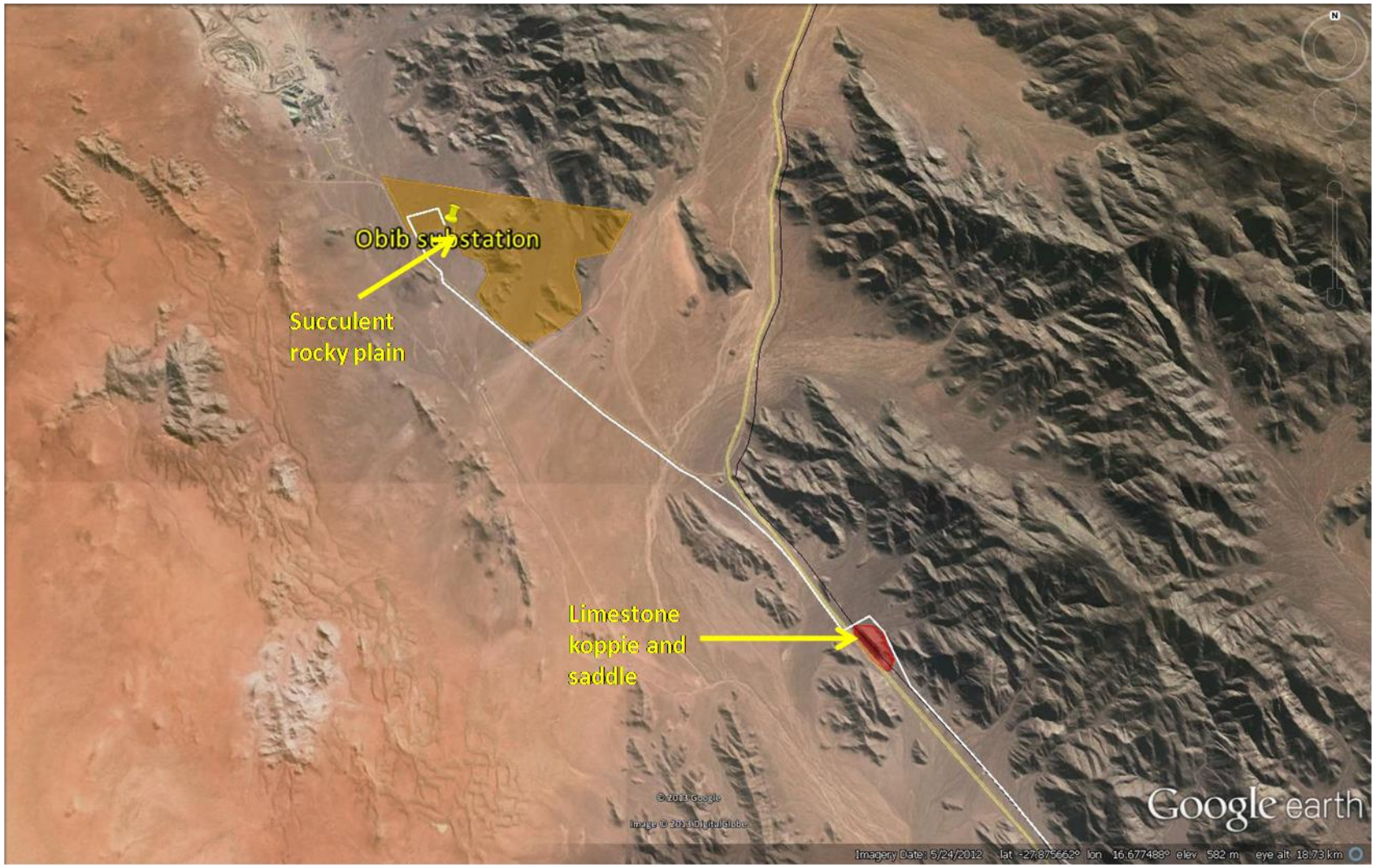
Appendix 1: Proposed route for new power line.



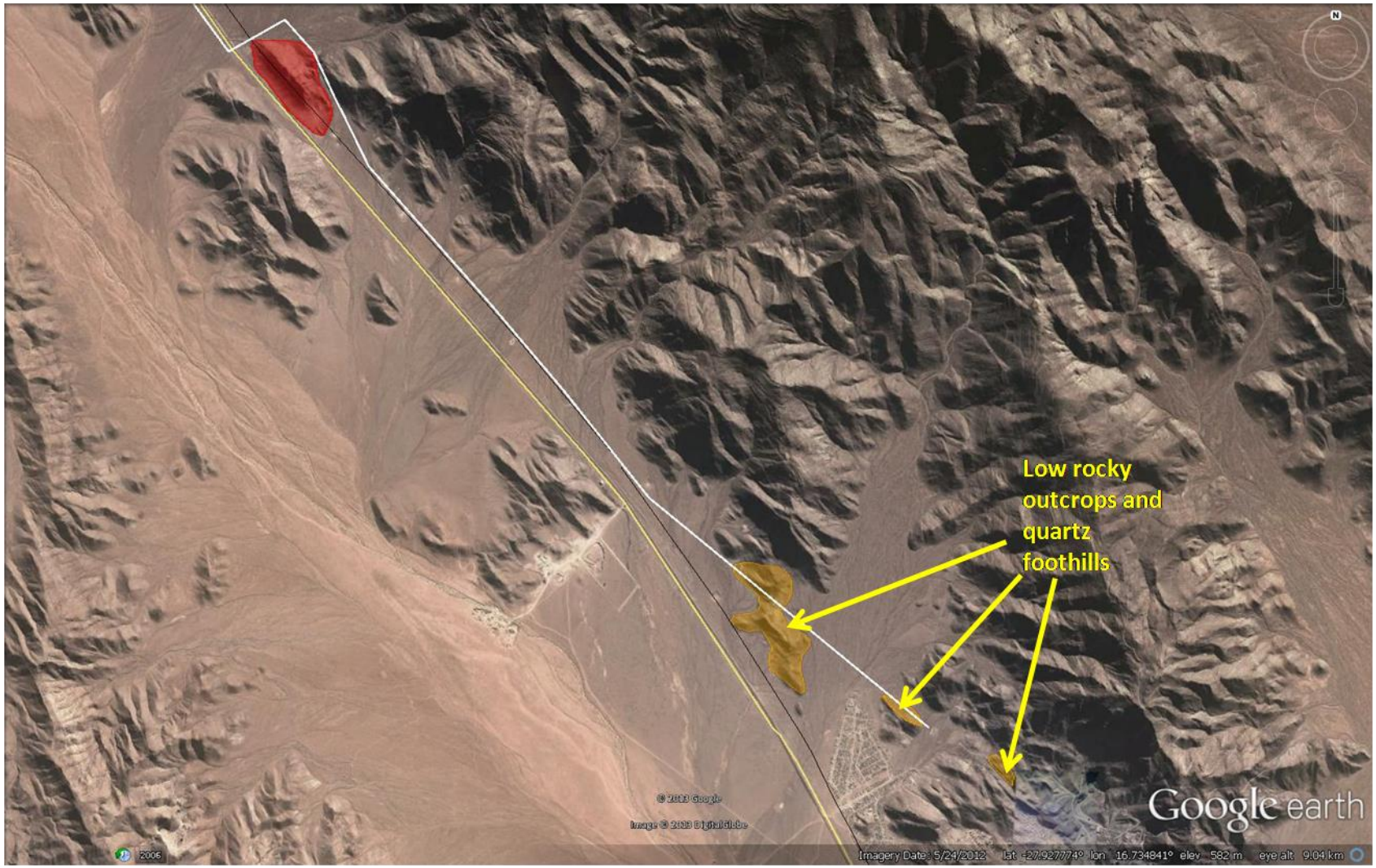
Appendix 2: Blue circles indicate transects done.



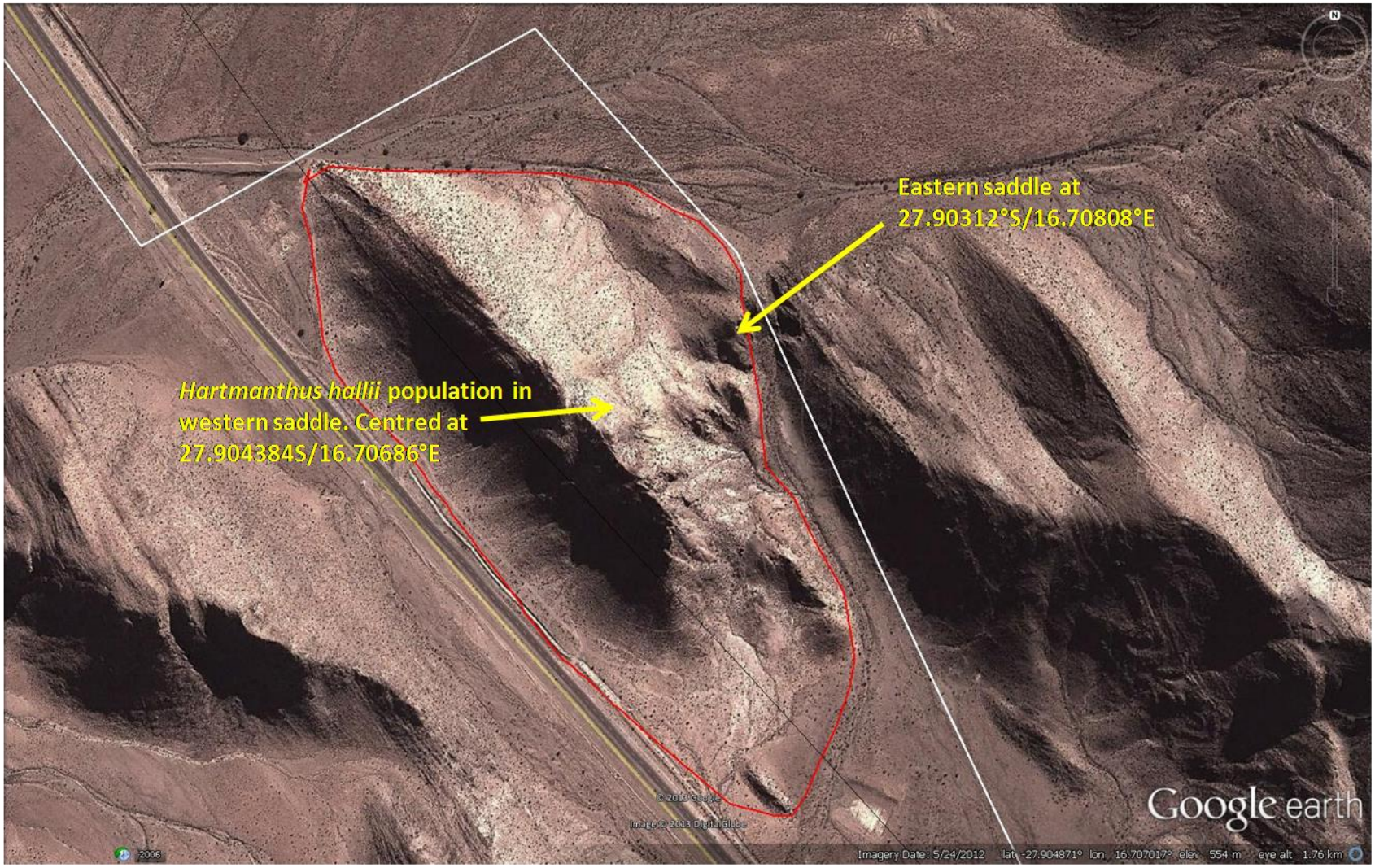
Appendix 3: Northern habitats



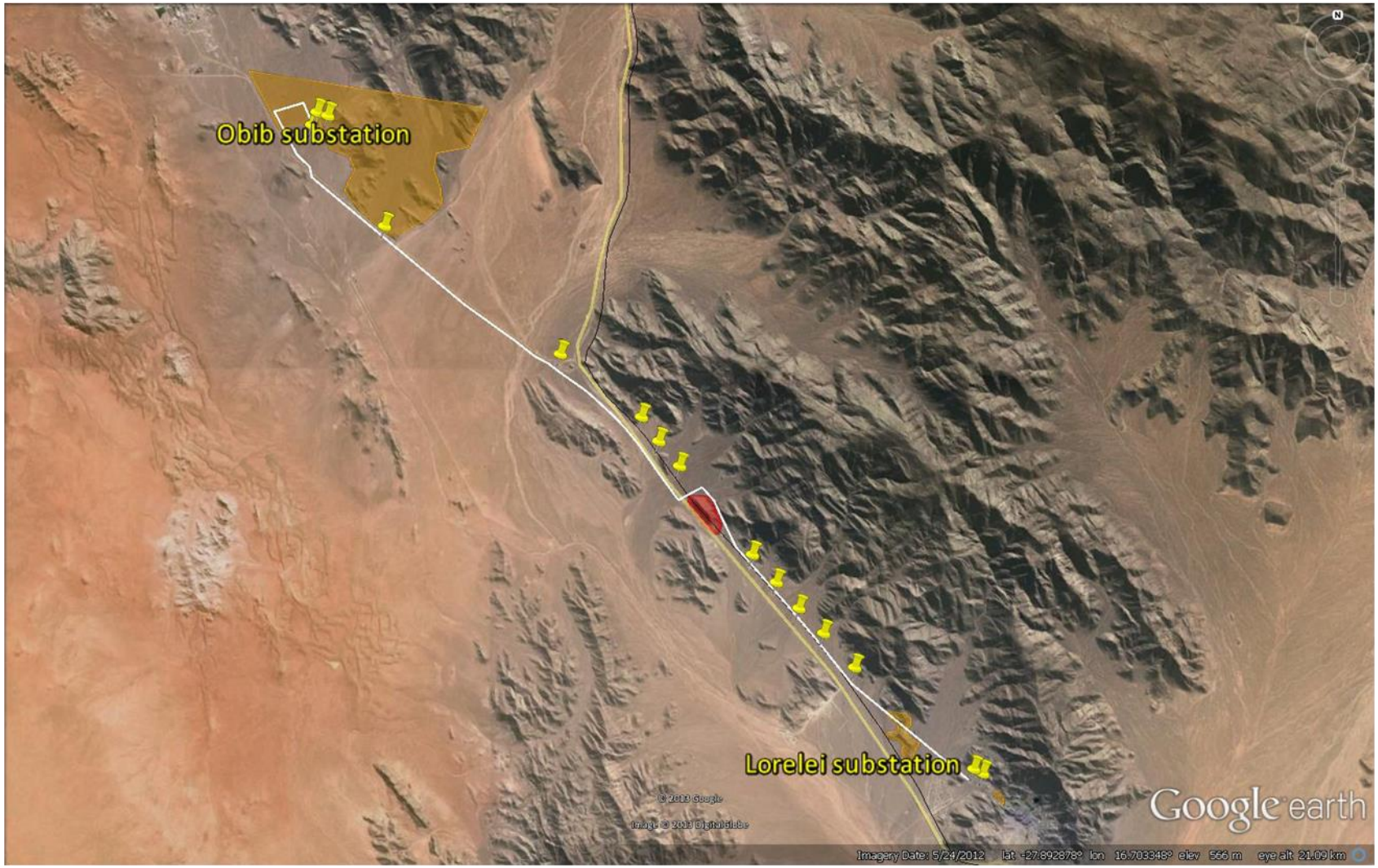
Appendix 4: Southern habitats



Appendix 5: No-go area with *Hartmanthus hallii* locality and showing saddles.



Appendix 6: Previously damaged areas.



APPENDIX H

ENDEMIC AND RED DATA SPECIES KNOWN IN THE ROSH PINAH AREA

Endemic or Red Data species known in the Rosh Pinah area

(Adapted from Griffin, 1997 and information provided in RPZC EA & EMP, Crowther, 1999)

Common name	Species	Provisional conservation status	Species habitat / occurrence / expected to occur
Class Reptilia			
Order Chelonia (Tortoises)			
Angulate Tortoise	*Chersina angulata*	Peripheral	Common throughout
Leopard Tortoise	*Geochelone pardalis*	Vulnerable & peripheral	May occur as a vagrant in area
Nama Padloper	*Homopus sp.nov.*	Endemic & indeterminate	Mountainous areas
Tent Tortoise	*Psammobates tentorius*	Vulnerable	Common throughout
Order Rana (Frogs)			
Marbled Rubber Frog		Endemic & secure	85% of the population occurs within the Rosh Pinah/ Orange River area
Order Sauria (Lizards)			
Namaqua Flat Gecko	*Afrodedura namaquensis*	Rare	May occur in the Rosh Pinah Area – mainly observed in the Hunsberge
Festive Gecko	*Narudasia festiva*	Endemic & secure	Common in Rosh Pinah area
Tropical Button-scaled Gecko	*Pachydactylus turneri*	Endemic & secure	Widespread and common
Smooth Button-scaled Gecko	*Pachydactylus laevigatus*	Endemic & secure	Present except on mobile sand
Rough-scaled Gecko	*Pachydactylus rugosa*	Endemic & secure	Widespread and probably uncommon
Striped Leaf-toed Gecko	*Goggia lineata*	Rare	
Richtersveld Leaf-toed Gecko	*Goggia gemmulus*	Rare	
Namibian Dwarf Burrowing Skink	*Sccelotes capensis*	Endemic & secure	Occurs in area
Wedge-snouted Skink	*Mabuya acutilabris*	Endemic & secure	Widespread and common
Namibian Tree Skink	*Mabuya spilogaster*	Endemic & secure	Present on trees
Namibian Sand Lizard	*Pedioplanis inornata*	Endemic & secure	Widespread and common
Dwarf-plated Lizard	*Cordylosaurus subtessellatus*	Endemic & secure	
Namaqua Dwarf Chameleon	*Bradypodion ventrale*	Rare	May occur in the area, not recorded – observed in the Lorelei area
Namaqua Chameleon	*Chamaeleo namaquensis*	Common	Widespread and common
Order Serpentes (Snakes)			

Common name	Species	Provisional conservation status	Species habitat / occurrence / expected to occur
Western Worm Snake	*Leptotyphlops occidentalis*	Endemic & secure	Widespread and secure
Beaked Blind Snake	*Typhlops schinzi*	Endemic & secure	Expected on hard substrates
Spotted House Snake	*Lamprophis guttatus*	Status unknown	
Namibian Shovel Snout	*Prosymna frontalis*	Endemic & secure	Expected to occur in area
Western Spitting Cobra	*Naja nigricincta*	Endemic & secure	Occurs in study area
Namaqua Dwarf Adder	*Bitis schneideri*	Status not known	Widespread & common
Desert Mountain Adder	*Bitis xeropaga*	Endemic & not well known	Rocky hillsides
Class Mammalia			
Order Chiroptera (Bats)			
Angola Hairy Bat	*Myotis seabrai*	Endemic & possibly rare	Expected to occur in area
Lesuer's Hairy Bat	*Myotis lesueri*	Endemic	Possibly occurs in the area
Namib Long-eared Bat	*Laephotis namibensis*	Endemic. Status unknown	Expected to occur in area
Order Carnivora			
Aardwolf	*Proteles cristatus*	Vulnerable & peripheral	Widespread and seen in area
Brown Hyaena	*Parahyaena brunnea*	Vulnerable & peripheral	Present in study area
Wilde Cat	*Felis lybica*	Vulnerable & peripheral	
Small Spotted Cat	*Felis nigripes*	Rare & peripheral	Reported from area but rare
Bat Eared Fox	*Otocyon megalotis*	Vulnerable & peripheral	May be found in study area
Cape Fox	*Vulpes chama*	Vulnerable	Occurs throughout
Small Grey Mongoose	*Galerella sanguineus*	Rare	Common in the area
Brukkaros Mongoose	*Galerella swalis*	Endemic & rare	Expected to occur in the area
Order Perissodactyla (Odd-toed ungulates)			
Mountain Zebra	*Equus zebra*	Endemic & not well known	Possibly occurs in the area
Order Rodentia (Rodents)			
Visagie's Golden Mole	*Chrysochloris visagiei*	Indeterminate	Possibly occurs in the area
Namibian Rock Dormouse	*Graphiurus rupicola*	Endemic & secure	
Cape Ground Squirrel	*Xerus inaurus*	Secure	
Mountain Ground Squirrel	*Xerus princeps*	Endemic & secure	
Dassie Rat	*Petromus typicus*	Endemic & secure	
Tree Rat	*Thallomys paedulcus*	Peripheral	Expected in trees in

Common name	Species	Provisional conservation status	Species habitat / occurrence / expected to occur
			area
Namaqua Brush-tailed Gerbil	*Gerbillurus vallinus*	Endemic & secure	Abundant in study area
Grant's Rock Mouse	*Aethomyn granti*	Endemic	Expected to occur in the area
Brukkaros Rock Mouse	*Petromyscus monticularis*	Endemic	Possibly occurs in the area
Berseba Rock Mouse	*Petromyscus monticularis*	Endemic & secure	Expected to occur in rocky habitats
Tiny Fat Mouse	*Stearomys parvus*	Peripheral	Expected to occur in area

ENDANGERED: Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating

***VULNERABLE*:** Taxa believed likely to move into the ENDANGERED category in the future if present causes continue operating

RARE: Taxa with small populations which are not (thought to be) presently ENDANGERED or VULNERABLE, but are potentially at risk

***INDETERMINATE*:** Taxa that are known to be ENDANGERED, VULNERABLE, or RARE, but for which insufficient information is currently available to assign them to the appropriate category

***INSUFFICIENTLY KNOWN*:** Taxa that are suspected but not definitely known to belong to any of the above categories because of insufficient information

SECURE: No special threat status

ENDEMIC: Restricted to, or found almost exclusively in, Namibia

***PERIPHERAL*:** Taxa with a limited proportion of their distribution in Namibia (25% or less) and whose main distribution falls outside the political boundaries of the country

RD: Protected

APPENDIX I
ARCHAEOLOGY SPECIALIST STUDY

QRS

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12 July 2013

ASEC
Windhoek

For attention: Alexandra Speiser

Job No QRS 187

Archaeological assessment of linear infrastructure for RPZC

Introduction:
RPZC intends to develop linear infrastructure for the provision of water and electricity to support mining operations at Rosh Pinah, in the Karas Region. RPZC has appointed ASEC to carry out an environmental impact assessment of the proposed development, and ASEC has commissioned QRS to carry out an archaeological assessment of the potential impacts on archaeological sites.

Archaeological remains in Namibia are protected under the National Heritage Act (27 of 2004) which makes provision for archaeological impact assessment of large infrastructure projects. The archaeology of the Rosh Pinah area has been studied in some detail for previous mining and related projects, and the present assessment required only a site inspection as the basis of impact assessment.

Background:
Namibia has an archaeological sequence spanning most of the last one million years. This evidence is of both regional and global significance as it is crucial to our understanding of several key developments in human history, including the early spread of ancestral humans and their adaptation to extremely arid climatic conditions.

Intensive field survey and excavation has yielded several thousand archaeological sites in Namibia, although the country remains incompletely explored. Field surveys are routinely carried out for large projects and these contribute to the documented archaeological record. As this knowledge increases it becomes possible to predict impacts and target field surveys.

Although each new field survey improves the quality of baseline data, extrapolation to previously unsurveyed areas is unreliable. Extrapolation is justified at the regional level only, to provide a basic indication of impact risks which will single out those areas that require detailed field assessment before ground disturbance commences.

The following section of the report sets out the approach and methodology used here, as well as the assumptions and limitations of the study.

Approach & methodology:

Archaeological assessment in Namibia follows the conventional three phase process of evaluation (Phase 1 evaluation; Phase 2 assessment; Phase 3 mitigation).

The present report represents Phase 1 and 2 combined. The Phase 1 (desktop) component of this study is set out below under Existing Field Data, while the Phase 2 (field survey) component is set out under Additional Field Data. Geospatial data supplied by RPZC consisted of unscaled satellite image files showing the general alignment of the proposed infrastructure. This included the route of a proposed powerline from Obib s/s to Rosh Pinah at ZinCum s/s; and the alignment of a water supply pipeline from Sendelingsdrif pump-station to Rosh Pinah.

Desktop assessment is in this case based on previous studies in the Rosh Pinah area, including:

QRS 20. *Archaeological mitigation of the Skorpion Zinc Project.* Commissioned by Bateman Engineering Limited on behalf of Reunion Mining Namibia (Pty) Ltd. (2000). John and Jill Kinahan.

QRS 26. *Archaeological assessment of proposed landfill sites at Rosh Pinah.* Commissioned by WSP Walmsley (Pty) Ltd. (2001). John Kinahan.

QRS 35. *Report on the excavation of a late Holocene cave deposit in the southern Namib Desert.* Commissioned by WSP Walmsley (South Africa) for the Skorpion Zinc Project (2002). John and Jill Kinahan.

QRS 37. *Supplementary Archaeological Mitigation of the Skorpion Zinc Project.* Commissioned by Namzinc (Pty) Ltd. (South Africa) (2002). John Kinahan.

QRS 177. *Archaeological baseline survey of the Gergarub zinc project.* Commissioned by EnviroDynamics cc (2013). John Kinahan.

Additional field survey involves direct observation (field walking, transects), with archaeological site positions determined in the field by hand-held GPS and plotted on aerial photographs or large scale topographic maps. The sites themselves are documented according to conventional criteria of type, physical setting, spatial extent, degree of preservation, and likely age and affinity. In the field, all archaeological sites are assessed as to their significance and vulnerability, using two independent parallel scales devised for archaeological assessment in Namibia:

SIGNIFICANCE RANKING

0 no archaeological significance
1 disturbed or secondary context, without diagnostic material
2 isolated minor find in undisturbed primary context, with diagnostic material
3 archaeological site forming part of an identifiable local distribution or group
4 multi-component site, or central site with high research potential
5 major archaeological site containing unique evidence of high regional significance

VULNERABILITY RANKING

0 not vulnerable
1 no threat posed by current or proposed development activities
2 low or indirect threat from possible consequences of development (e.g. soil erosion)
3 probable threat from inadvertent disturbance due to proximity of development
4 high likelihood of partial disturbance or destruction due to close proximity of development
5 direct and certain threat of major disturbance or total destruction

Existing field data:

The local archaeological sequence as determined by previous surveys and excavations in the Rosh Pinah area comprises the following four main elements:

a. Early to mid-Pleistocene (ca. 2my[1] to 0.128my; OIS[2] 6, 7, 19 &c): represented by surface scatters of stone tools and artefact debris, usually transported from original context by fluvial action, and seldom occurring in sealed stratigraphic context.
b. Mid- to upper Pleistocene (ca. 0.128my to 0.040my; OIS 3, 4 & 5a-e): represented by dense surface scatters and rare occupation evidence in sealed stratigraphic context, with occasional associated evidence of food remains.
c. Late Pleistocene to late Holocene (ca. 0.040my to recent; OIS 1 & 2): represented by increasingly dense and highly diverse evidence of settlement, subsistence practices and ritual art, as well as grave sites and other remains.
d. Historical (the last ca. 250 years): represented by remains of crude buildings, livestock enclosures, wagon routes and watering points. Some evidence of trade with indigenous communities, including metals, ceramics and glass beads.

Archaeological sites in the Rosh Pinah area are strongly associated with low rocky ridges and isolated outcrops where rock overhangs provide a degree of shelter from the prevailing winds. Evidence of small-scale activities such as artefact raw material quarrying, the use of hunting blinds in strategic locations and the positioning of burial sites on outwash fans, combines with the rock shelter sites to present a relatively high local site concentration. Within this terrain approximately 80% of archaeological sites are associated with low rocky hills and outcrops, and about 12% with sandy gravel outwash fans.

Additional field data:

QRS 187/1 S27.87943 E16.68567 2/3
Schist hill spur with dispersed scatter ¬20 pieces/m^2 hydrothermal vein quartz artefact flaking debris.

QRS 187/2 S27.90844 E16.70812 2/3
Schist outcrop with localized scatter of fine-grained quartzite flaking debris.

QRS 187/3 S27.90224 E16.70531 1/3
Valley-fill sediments with hydrothermal vein quartz artefact flaking debris on streambank.

QRS 187/4 S28.04556 E16.84509 1/3
Top of alluvial fan with highly dispersed hydrothermal vein quartz artefact flaking debris scatter.

QRS 187/5 S28.00807 E16.81369 2/3
Outwash fan with remnants of stone features possibly indicating ancient livestock enclosure.

QRS 187/6 S27.87910 E16.86128 3/1
Outwash fan with slightly dispersed stone cairn 3m diameter, suspected burial

QRS 187/7 S27.96608 E16.77470 1/3
Isolated kopje with SW-facing rock shelter, very disturbed.

Assessment:

In summary, the intended linear infrastructure is largely confined to:

a. Colluvial outwash sediments
b. Areas of low archaeological site density
c. Existing linear infrastructure corridors
d. Previously disturbed ground

Expected **negative impacts** on archaeological sites would be either **direct** (in the form of disturbance of destruction in the course of construction), or **indirect** (in the form of deterioration caused by soil erosion resulting from construction). It is possible that these would take the form of **cumulative impacts** during the operational phase of the development.

The **significance** of the impacts will in the case of this development be **local** or **on-site** in extent, but **permanent** in duration, due to the fact that damage to archaeological sites cannot be reversed or repaired. The **intensity** the impacts will, however, be **low** or **negligible**, due to the generally low archaeological significance of the sites and their terrain setting. The **impact probability** cannot be determined at this stage because no final design for the development was available at the time of the study.

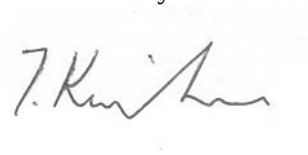
In terms of its **Significance Rating**, the proposed development is expected to have a **low** magnitude and an **unlikely** likelihood, with a resulting Significance Rating of: **negligible.** It is thus expected that the archaeological impact of the linear infrastructure development will be of **negligible** significance.

Considering the assessment presented here, and the combination of low archaeological density and generally low archaeological significance within the area of development, no specific mitigation measures are proposed, other than that contractors and operating personnel should be made aware of the provisions of the National Heritage Act with regard to reporting of archaeological materials found in the course of development activities.

In view of these observations, the archaeological impact **risk categorization** for all phases of the project (Construction, Operation and Closure) are estimated as **minor**.

Recommendations:
It is recommended that contractors working on the site are made aware that under the National Heritage Act any items protected under the definition of heritage found in the course of development should be reported to the National Heritage Council. The attention of the project proponent is therefore drawn to the "chance finds" procedure in Appendix 1.

Yours sincerely



J. Kinahan PhD MSAIE &ES
Partner

Appendix 1: CHANCE FINDS PROCEDURE

The "chance finds" procedure covers the actions to be taken from the discovery of a heritage site or item, to its investigation and assessment by a trained archaeologist or other appropriately qualified person. The "chance finds" procedure is intended to ensure compliance with the relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): *" a person who discovers any archaeological …. object ……must as soon as practicable report the discovery to the Council"*. The procedure of reporting set out below must be observed so that heritage remains reported to the NHC are correctly identified in the field.

RESPONSIBILITIES

Operator	To exercise due caution if archaeological remains are found
Foreman	To secure site and advise management timeously
Superintendent	To determine safe working boundary and request inspection
Archaeologist	To inspect, identify, advise management, and recover remains

PROCEDURE

5.1 Action by person identifying archaeological or heritage material
a) If operating machinery or equipment stop work
b) Identify the site with flag tape
c) Determine GPS position if possible
d) Report findings to foreman

5.2 Action by foreman
a) Report findings, site location and actions taken to superintendent
b) Cease any works in immediate vicinity

5.3 Action by superintendent
a) Visit site and determine whether work can proceed without damage to findings
b) Determine and mark exclusion boundary
c) Site location and details to be added to GIS for field confirmation by archaeologist

5.4 Action by archaeologist
a) Inspect site and confirm addition to GIS
b) Advise NHC and request written permission to remove findings from work area
c) Recovery, packaging and labelling of findings for transfer to National Museum

5.5 In the event of discovering human remains
a) Actions as for 5.1 to 5.3 above
b) Field inspection by archaeologist to confirm that remains are human
c) Advise and liaise with NHC and Police
d) Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed.

[1] my = million years
[2] OIS = Oxygen Isotope Stage

APPENDIX J
ENVIRONMENTAL MANAGMENT PLAN

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THE ENVIRONMENTAL MANAGEMENT PLAN
FOR THE

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE NEW NAMPOWER POWERLINE FROM OBIB TO ZINCUM SUBSTATION FOR RPZC MINE

November 2013

Compiled for:

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1. INTRODUCTION

From the Environmental Impact Assessment (EIA) covered in the main report, the following different facets of the powerline construction and operation that should be considered in the Environmental Management Plan (EMP) are listed below.

This Environmental Management Plan (EMP) aims to ensure environmental protection, meet legal requirements, and maintain good community relations. NamPower developed a 'General Environmental Management Plan for the Construction of Powerlines and Substations' (NamPower EMP), which was approved by the Ministry of Environment and Tourism in 2006. This EMP will address the site specific mitigation measures and should be read in conjunction with the NamPower EMP.

This EMP will form in addition to NamPower's EMP part of the Contractor's contractual agreement with NamPower and will be legally binding. Contractors are to use also this section of the report to calculate and allocate an adequate sum of money to ensure that the environmental requirements stipulated in the EMP can be implemented. Mitigation measures applicable for the final design need to be incorporated by the technical team of NamPower.

The project activities are grouped according to the NamPower EMP and reference is given where applicable. Essentially, many of the potential impacts can be avoided through good housekeeping.

A list of the applicable legislation is provided in the EIA. Where applicable the required permits or procedures to be followed are stated in the EMP.

For each section, the person(s) who should be held responsible for ensuring that the specific elements of the plan should be implemented is given. The following abbreviations have been used: -

- PO = NamPower as the Project Owner
- PE = NamPower Project Engineer
- SHE = Contractor Safety Health and Environmental Officer
- CONT = Contractor and any of the contractor's senior staff (e.g. foremen)
- ECO = NamPower Environmental Officer / External Environmental Consultant
- WF = Workforce

2. RESPONSIBILITIES OF IMPLEMENTATION OF THE EMP

In Section '2. Introduction' of NamPower's EMP already stipulates the different responsibilities to implement and monitor the EMP.

The monitoring, auditing and project handover is described in Section 6 of the NamPower EMP. In addition, as it is stipulated in the Environmental Management Regulations, bi-annual environmental audit reports need to be submitted to the Department of Environmental Affairs.

Aspect / reference NamPower EMP	Potential impacts	Mitigation measures
Archaeology / 3.3	Loss or disturbance of archaeological sites.	• However, it is recommended that contractors working on the site are made aware that under the National Heritage Act any items protected under the definition of heritage found in the course of development should be reported to the National Heritage Council. The attention of the project proponent is therefore drawn to the "chance finds" procedure in Appendix 1 of the Archaeological report (**Appendix I**).
Social / 3.4	Influx of job seekers, few employment opportunities during construction and decommissioning of the pipeline.	• Recruit local labour from Rosh Pinah, Senderlingsdrif and other nearby settlements, to minimise migrants. • Any specialist members of the construction team coming into the area should be reminded of and implement relevant parts of NamPower's HIV/AIDS prevention programme. This will assist in reducing the spread of HIV and other sexually transmitted diseases, to and from the area.
Waste Management including hazardous material/ 4.1 & 4.2	Hazardous spills and contaminants have the potential to contaminate soil and water, which in turn can harm plants and animals. Also general waste, e.g. plastic, cardboard, paper, needs to be managed properly to avoid any risk to animals.	• Spillage-management and response procedures need to be developed for all hazardous substances used on site. All hazardous storage facilities should be bunded; the volume of the bunded area is to be at least 110% of the total volume of the tanks in which the hazardous material is stored. • Spills to be cleaned immediately and contaminated soils and water to be remediated or treated. • Hazardous waste and contaminated soil needs to be disposed of at the mine. • Implement a strong anti-litter and clean surroundings policy among all staff and contractors. • All domestic waste to be disposed of in waste bins. Temporary storage of collected waste should be within a fenced area to prevent scavenging and dispersal by wind. • All domestic waste bins to have lids so as to reduce the likelihood of windborne litter. • Regularly inspect and clean up litter at site and in the general proximity of the mine. • All waste to be disposed of in appropriate waste-disposal facilities (e.g. specific facilities designed for hazardous wastes). Wastes are to be stored on site but removed from the lay-down areas for disposal at the Rosh Pinah waste disposal site. • Implement a strong occupational safety and clean surroundings policy among all staff and contractors.
Temporary camp site / 4.3	Disturbance of previously undisturbed areas	• Consult flora map in Appendix 6 of the Flora Specialist report (**Appendix G**).
Fauna / 5.3	Increased poaching and disturbance during	• Poaching and disturbance of animals is illegal in a National Park. Construction and maintenance staff should be educated and informed of their environmental obligations. Meaningful penalties for

Aspect / reference NamPower EMP	Potential impacts	Mitigation measures
	construction	damages should be stipulated, and the main contractor should be held responsible for all transgressions.
Flora / 5.4	**Physical destruction of habitat and vegetation, including species of high conservation concern during construction and operation**	• The no-go area should be avoided at all costs. (See Appendix 5 of the Flora Specialist report in (**Appendix G**). • The final route should stay on the plains habitat as much as possible. Damage to the other sensitive areas should be avoided as far as possible, particularly to the succulent plain near the Obib substation. Consult flora map in Appendix 6 of the Flora Specialist report (**Appendix G**). • Uncontrolled vehicle activity is of major concern. Outside the plains habitat vehicle movement should be controlled and restricted to the future service track as far as possible. Even in the plains habitat uncontrolled driving should not be permitted. Careful pre-planning of construction activities should be done to identify where tracks will be absolutely necessary for both construction and maintenance, overlapping these as far as possible. These should be clearly marked prior to construction activities beginning, together with designated turning points and construction laydown areas. Turning points for heavy vehicles should be designated and adhered to. *Ad lib* turns should not be permitted. The area used should be constrained as far as possible, and should be rehabilitated once construction is complete. • During the operational phase only the service track should be used. No new tracks should be created. • All construction laydown should be done in previously damaged areas, where construction camps should also be located unless crews could be accommodated in Rosh Pinah, which would be preferable. Several previously damaged areas that could be used are indicated in Appendix 6 of the specialist report, see **Appendix G**. • In the undesirable event that the no-go area will be impacted, plant relocation should be considered. Previous work of this kind done in the Sperrgebiet has shown that relocation should take place as soon as possible (A. Burke, pers. comm.). Plant storage is a possibility, but will not work for many species unless the period of storage is very short (no more than 3 weeks). Plants should be relocated to areas damaged by the project. Undisturbed areas should generally not be disturbed in order to relocate plants, although possible exceptions might be species of very high conservation concern. • Fixed point photography, initiated prior to construction activities, should be extensively utilised to assess compliance by contractors. • Construction and maintenance staff should be educated and informed of their environmental obligations. Meaningful penalties for damages should be stipulated, and the main contractor

Aspect / reference NamPower EMP	Potential impacts	Mitigation measures
		should be held responsible for all transgressions. • Due to the very low and sparse nature of the plant growth in this area, it is unlikely that any vegetation clearing will be necessary for this route in the future. If any is necessary it should be done manually.
	Illegal plant or firewood harvesting for fuel or ornamental purposes during construction and operation	• Collection of plants, or parts of plants (including seed and/or fuelwood) should be forbidden. Staff should be expressly forbidden to collect any plant material, dead or alive (including seed), for any purpose whatsoever and should be provided with fuel (preferably gas) for both heating and cooking. • Construction and maintenance staff should be educated and informed of their environmental obligations. Meaningful penalties for damages should be stipulated, and the main contractor should be held responsible for all transgressions.