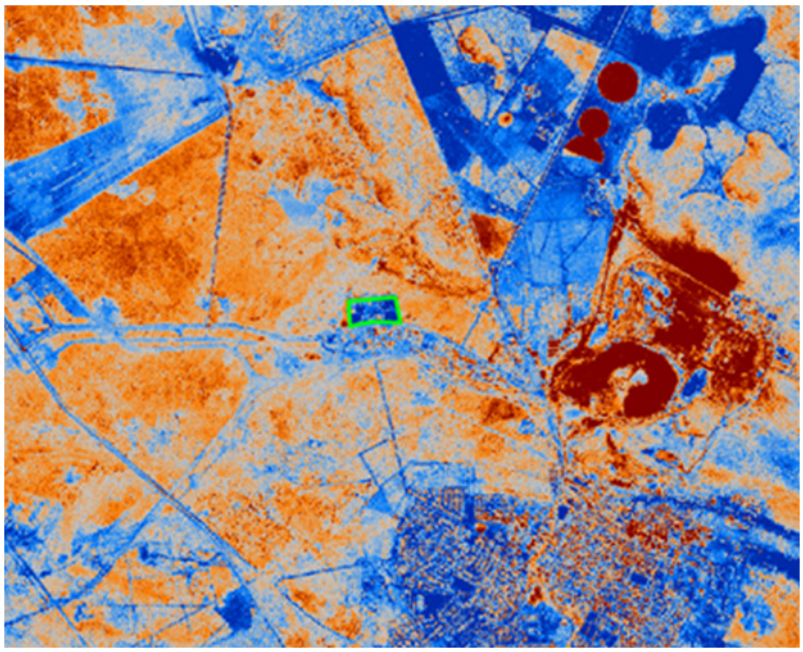
APP - 00994

HENNING CRUSHER BRICKFIELD, OSHIKOTO REGION ENVIRONMENTAL ASSESSMENT SCOPING REPORT



Assessed by:

GEO Pollution Technologies Namibia

Assessed for:

Henning Crusher (Pty) Ltd

May 2020

Project:	**HENNING CRUSHER BRICKFIELD, OSHIKOTO REGION: ENVIRONMENTAL ASSESSMENT SCOPING REPORT**	
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Report Version/Date	Final May 2020	
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Report Approval	 **Pierre Botha** Managing Director	

I Schalk Henning acting on behalf of Henning Crusher (Pty) Ltd hereby confirm that the project description contained in this report is a true reflection of the information which the Proponent provided to Geo Pollution Technologies. All material information in the possession of the proponent that reasonably has or may have the potential of influencing any decision or the objectivity of this assessment is fairly represented in this report and the report is hereby approved.

Signed at Tsumeb on the 22nd day of June 2020.

Henning Crusher (Pty) Ltd

EXECUTIVE SUMMARY

Geo Pollution Technologies (Pty) Ltd was appointed by Henning Crusher (Pty) Ltd to undertake an environmental assessment for their brickfield and associated activities on Portion 27 of Consolidated Farm Tsumore No. 761 (Figure 1-1). Henning Crusher has been operating the brickfield in Tsumeb for over 40 years. Material, as sourced from a nearby quarry, is used to manufacture a variety of products including bricks, pavers and tile grout. The site further accommodates fuel storage, a large maintenance yard and workshop with related offices.

The environmental assessment is conducted to determine environmental, safety, health and socio-economic impacts associated with the continued operations of the brickfield and associated activities of the facility. Relevant environmental data were compiled by making use of secondary data and from a reconnaissance site visit. Potential environmental impacts and associated social impacts were identified and are addressed in this report.

The operational area and its infrastructure are mainly surrounded by open farmland and industrial activities. Due to the nature and location of the facility, impacts are expected on the surrounding environment, see summary impacts table below. It is therefore recommended that environmental performance be monitored regularly to ensure regulatory compliance and that corrective measures be taken if necessary. The existing activities play a role in contributing to the construction industry.

Major concerns of the operations relate to potential groundwater, surface water and soil contamination and the possibility of a fire. This will however be limited by adherence to relevant South African National Standards and Material Safety Data Sheet instructions. Noise and air quality impacts may further negatively impact on neighbouring receptors. By appointing local residents and by implementing monitoring and training programs, the positive socio-economic impacts can be maximised while mitigating any negative impacts.

Implementing a safety, health, environment and quality (SHEQ) policy will contribute to effective management procedures, to prevent and mitigate impacts. All regulations relating to labour and health and safety legislation should be adhered to. Groundwater and soil pollution must be prevented at all times. All staff must be made aware of the importance of biodiversity and poaching or illegal harvesting of animal and plant products prohibited. Any waste produced must be removed from site and disposed of at an appropriate facility or re-used or recycled where possible. Hazardous waste must be disposed of at an approved hazardous waste disposal site.

The environmental management plan included in Section 10 of this document should be used as an on-site reference document during all phases (planning, construction, operations and decommissioning) of the project. All monitoring data and records kept should be included in a report to ensure compliance with the environmental management plan. Parties responsible for transgression of the environmental management plan should be held responsible for any rehabilitation that may need to be undertaken. The SHEQ policy should be used in conjunction with the environmental management plan. Operators and responsible personnel must be taught the contents of these documents. Local or national regulations and guidelines must be adhered to and monitored regularly as outlined in the environmental management plan.

Impact Category	Impact Type	Construction	Operations
	Positive Rating Scale: Maximum Value	5	5
	Negative Rating Scale: Maximum Value	-5	-5
EO	Developing Project Feasibility & Permitting (Planning Phase)		
EO	Plans and Aspirations for the Future		
EO	Skills, Technology and Development		
EO	Change in Land Use and Earning Potential		
SC	Revenue Generation and Employment		
EO	Building Material Supply		
EO	Demographic Profile and Community Health		
SC	Traffic		
SC	Health, Safety and Security		
PC	Fire		
PC	Air Quality		
SC	Noise		
PC	Waste Production		
BE	Ecosystem and Biodiversity Impact		
PC	Groundwater, Surface Water and Soil Contamination		
SC	Visual Impact		

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ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BID	Background Information Document
CBD	Convention on Biological Diversity
CENORED	Central North Regional Electricity Distributor
CITES	Convention on International Trade of Endangered Species
DEA	Directorate of Environmental Affairs
DWA	Department of Water Affairs
EA	Environmental Assessment
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act, 2007 (Act no. 7 of 2007)
EMP	Environmental Management Plan
EMS	Environmental Management System
GIS	Geographic Information System
GPT	Geo Pollution Technologies (Pty) Ltd
HIV	Human Immunodeficiency Virus
HMV	Heavy Motor Vehicle
HSE	Health, Safety and Environment
IAP	Interested and Affected Party
IUCN	International Union for Conservation of Nature
m/s	Meter per second
MAWF	Ministry of Agriculture, Water and Forestry
mbs	Meters below surface
MET	Ministry of Environment and Tourism
mm/a	Millimetres per annum
MME	Ministry of Mines and Energy
MSDS	Material Safety Data Sheet
NGO	Non-Government Organisation
PC	Physical/Chemical
PPE	Personal Protective Equipment
ppm	Parts per million
SANS	South African National Standards
SC	Sociological/Cultural
SHEQ	Safety, Health, Environment and Quality
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization

GLOSSARY OF TERMS

Alternatives - A possible course of action, in place of another, that would meet the same purpose and need but which would avoid or minimize negative impacts or enhance project benefits. These can include alternative locations/sites, routes, layouts, processes, designs, schedules and/or inputs. The "no-go" alternative constitutes the 'without project' option and provides a benchmark against which to evaluate changes; development should result in net benefit to society and should avoid undesirable negative impacts.

Assessment - The process of collecting, organising, analysing, interpreting and communicating information relevant to decision making.

Biodiversity - The variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part.

Competent Authority - means a body or person empowered under the local authorities act or Environmental Management Act to enforce the rule of law.

Construction - means the building, erection or modification of a facility, structure or infrastructure that is necessary for the undertaking of an activity, including the modification, alteration, upgrading or decommissioning of such facility, structure or infrastructure.

Cumulative Impacts - in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Environment - As defined in the Environmental Assessment Policy and Environmental Management Act - "land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, palaeontological or social values".

Environmental Impact Assessment (EIA) - process of assessment of the effects of a development on the environment.

Environmental Management Plan (EMP) - A working document on environmental and socio-economic mitigation measures, which must be implemented by several responsible parties during all the phases of the proposed project.

Environmental Management System (EMS) - An Environment Management System, or EMS, is a comprehensive approach to managing environmental issues, integrating environment-oriented thinking into every aspect of business management. An EMS ensures environmental considerations are a priority, along with other concerns such as costs, product quality, investments, PR productivity and strategic planning. An EMS generally makes a positive impact on a company's bottom line. It increases efficiency and focuses on customer needs and marketplace conditions, improving both the company's financial and environmental performance. By using an EMS to convert environmental problems into commercial opportunities, companies usually become more competitive.

Evaluation – means the process of ascertaining the relative importance or significance of information, the light of people's values, preference and judgements in order to make a decision.

Hazard - Anything that has the potential to cause damage to life, property and/or the environment. The hazard of a particular material or installation is constant; that is, it would present the same hazard wherever it was present.

Interested and Affected Party (IAP) - any person, group of persons or organisation interested in, or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.

Mitigate - The implementation of practical measures to reduce adverse impacts.

Proponent (Applicant) - Any person who has submitted or intends to submit an application for an authorisation, as legislated by the Environmental Management Act no. 7 of 2007, to undertake an

activity or activities identified as a listed activity or listed activities; or in any other notice published by the Minister or Ministry of Environment & Tourism.

Public - Citizens who have diverse cultural, educational, political and socio-economic characteristics. The public is not a homogeneous and unified group of people with a set of agreed common interests and aims. There is no single public. There are a number of publics, some of whom may emerge at any time during the process depending on their particular concerns and the issues involved.

Quarrying – A Quarry is an open surface excavation for the extraction of building stone, slate, marble, etc., by drilling, blasting, or cutting. Quarries principally produce sand and gravel and crushed rock for construction and these materials are usually described as' aggregates'.

Scoping Process - process of identifying: issues that will be relevant for consideration of the application; the potential environmental impacts of the proposed activity; and alternatives to the proposed activity that are feasible and reasonable.

Significant Effect/Impact - means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Stakeholder Engagement - The process of engagement between stakeholders (the proponent, authorities and IAPs) during the planning, assessment, implementation and/or management of proposals or activities. The level of stakeholder engagement varies depending on the nature of the proposal or activity as well as the level of commitment by stakeholders to the process. Stakeholder engagement can therefore be described by a spectrum or continuum of increasing levels of engagement in the decision-making process. The term is considered to be more appropriate than the term "public participation".

Stakeholders - A sub-group of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term therefore includes the proponent, authorities (both the lead authority and other authorities) and all interested and affected parties (IAPs). The principle that environmental consultants and stakeholder engagement practitioners should be independent and unbiased excludes these groups from being considered stakeholders.

Sustainable Development - "Development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs and aspirations" – the definition of the World Commission on Environment and Development (1987). "Improving the quality of human life while living within the carrying capacity of supporting ecosystems" – the definition given in a publication called "Caring for the Earth: A Strategy for Sustainable Living" by the International Union for Conservation of Nature (IUCN), the United Nations Environment Programme and the World Wide Fund for Nature (1991).

1 BACKGROUND & INTRODUCTION

Geo Pollution Technologies (Pty) Ltd was appointed by Henning Crusher (Pty) Ltd to undertake an environmental assessment for their brickfield and associated activities on Portion 27 of consolidated Farm Tsumore No. 761 (Figure 1-1). Henning Crusher has been operating the brickfield in Tsumeb for over 40 years. Material, as sourced from a nearby quarry, is used to manufacture a variety of products including bricks, pavers and tile grout. The site further accommodates fuel storage, a large maintenance yard and workshop with related offices. The environmental assessment include all activities associated with the construction and operational activities performed on site.

The main operational activities include:

- Receipt and temporary storage of raw material,
- Manufacturing of building products including bricks, pavers and tiling grout and tiling adhesive;
- Repairs of machines and vehicles,
- Receipt of bulk fuel,
- Refuelling of heavy motor vehicles,
- Burning of fuel in a dryer, and
- Storage and shipment of products.

A risk assessment was undertaken to determine the potential impact of the operations, maintenance / construction, and possible decommissioning phases of the facility, on the environment. The environment being defined in the Environmental Assessment Policy and Environmental Management Act as "land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values". The environmental assessment was conducted to apply for an environmental clearance certificate in compliance with Namibia's Environmental Management Act (Act No 7 of 2007) (EMA).

Project Justification – As per Vision 2030 and all the related National Development Plans, it is the intention of the Namibian Government to sustainably develop natural resources. Through value addition of natural resources, various sectors within the economy may be positively affected. Henning Crusher, as the Oshikoto Region's largest crusher stone supplier, has brought local investment into the Oshikoto Region. Value addition activities of their mined material include crusher activities and the brickfield of this assessment, which is provided with the quarried material. The brickfield is therefore instrumental in the value chain of natural resources development.

The brickfield has been providing construction material for the construction industry in Tsumeb for over 40 years. Bricks, pavers and tile grout is supplied to the construction industry in and around the region.

Potential direct benefits:

- Reliable and secure supply of construction material for the local and regional construction industry,
- Skills development of the employees,
- Employment,
- Increased economic resilience of direct employees,
- Economic resilience in the area through diversification of business activities,
- Economic growth and development of Tsumeb and surrounding areas,
- Sustaining employment in secondary industries.

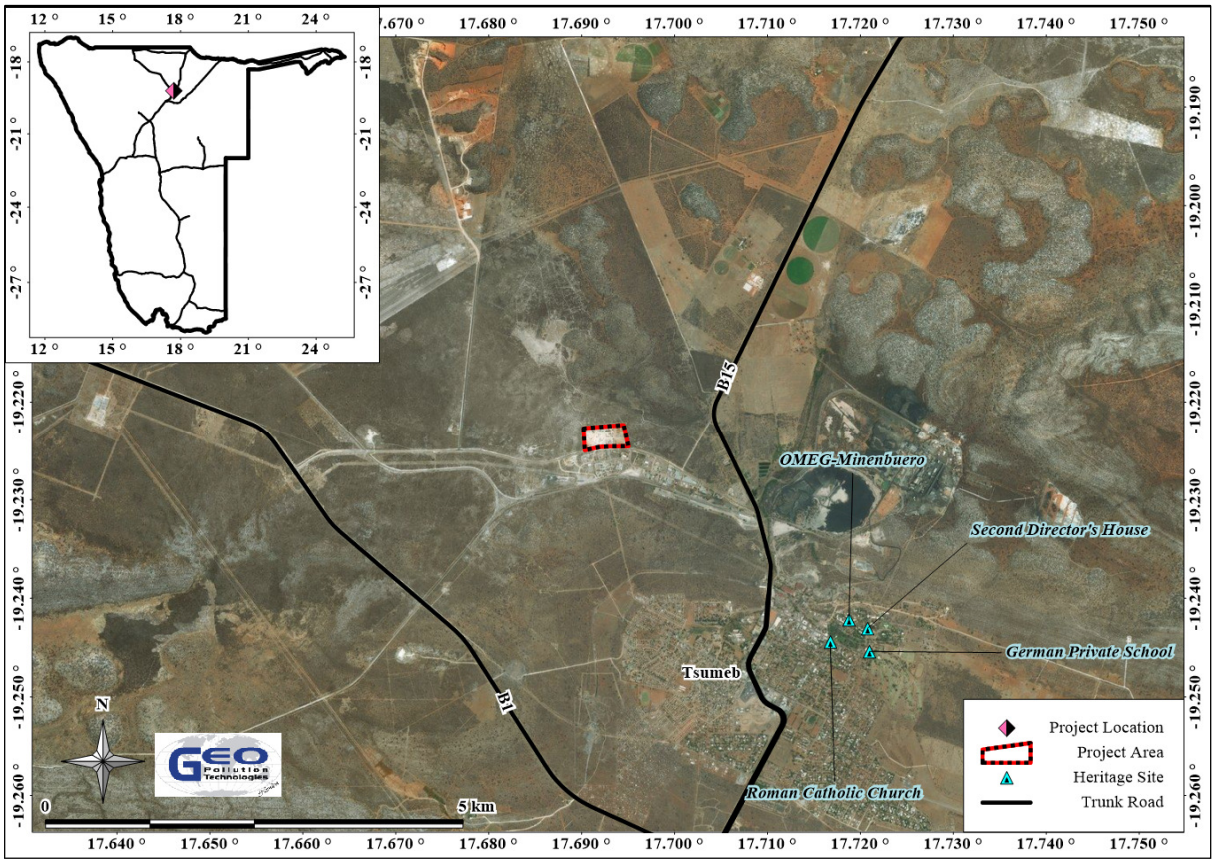


Figure 1-1. Location map

2 SCOPE

The aims and objectives of the environmental assessment and the associated EIA and EMP report are to:

1. Determine the potential environmental impacts emanating from the operational, maintenance / construction and possible decommissioning activities of Henning Crusher.
2. Identify a range of management actions which could mitigate the potential adverse impacts to acceptable levels.
3. Comply with the requirements of EMA.
4. Provide sufficient information to the relevant competent authority and MET to make an informed decision regarding the activities of Henning Crusher.

3 METHODOLOGY

The following methods were used to investigate the potential impacts on the social and natural environment due to the brickfield and related activities on, as well as possible decommissioning of the facility:

1. Baseline information about the site and its surroundings was obtained from primary information, existing secondary information as well as from a reconnaissance site visit.
2. As part of the scoping process to determine potential environmental impacts, interested and affected parties (IAPs) were consulted about their views, comments and opinions all of which are presented in this report.
3. Based on all information, the development was briefly explained and an environmental description was prepared. Potential environmental impacts were identified and preventative and mitigating methods proposed.

4 PROJECT DESCRIPTION

Henning Crusher, a registered private company, operates a sand and dolomite quarry on a property north of the brickfield, which may also be referred to as a brickyard. Material from the quarry is crushed and supplied to the brickfield. Apart from the raw materials supplied by the quarry, dust from the crusher operations is contained and also supplied to the brickfield. The brickfield manufactures a variety of products for the building and construction industry including tile grout manufactured from the crusher dust. The following section provides a description of the main activities and related support infrastructure of the Henning Crusher Brickfield.

4.1 PRODUCT MANUFACTURING

Dolomitic crusher rock, washed sand and crusher dust is transported to the brickfield as raw material. Materials are stored on site and used continually in the manufacturing process. Operations are supported through various permanent infrastructure components on site. Manufacturing of the two main commodities is detailed below.

4.1.1 Bricks and Pavers

Raw materials including sand and stone are mixed with concrete and water. The concrete mixture is then pressed into a mould which has several individual brick forms. The blocks are then moved by conveyor belt to a curing chamber for curing. After 24 hours, the bricks are removed from the curing chambers when desired strength has been reached, packed and transport to the outside yard. A similar process is followed for paving material with the variation of adding a dye to the concrete mix to obtain a specific colour. Finished products are packed in transportable bulk units and stored on site.

Photo 1. Raw material storage on site

Photo 2. Brick manufacturing building

Photo 3. Product movement and storage

Photo 4. Storage of various brick products

4.1.2 Tile Grout and Tile Adhesive

Tile grout and tile adhesive is manufactured through the process of blending various chemical materials with raw material such as sand. Sand is supplied to the manufacturing plant through bins. Prior to blending, the sand is put through a drying process to ensure that no moisture enters the mixing tank. Heat for the drying process is provided by a dryer which runs on diesel fuel. Once dried, the sand is added to cement, starch, calcium and CTA-Gelatine in the main blender. The ratios for tile grout and adhesive are different. The blender mixes the various additives for a period of time. Once fully blended, the mixture is conveyed to the final product silo from where it is packed in suitably sized containers for shipment. The entire process, from drying to packaging is conducted within one building.

The dryer used for heat and drying processes, is located in the building with the stack protruding out of the roofing structure, Photo 6.

Photo 5. Tile grout factory next to raw material storage

Photo 6. Tile grout factory and dryer stack

4.2 SUPPORT INFRASTRUCTURE

Operations are enabled through support infrastructure and services. These include power supply, water, waste, transport and administrative infrastructure.

Electricity Supply is provided by NamPower through the Central North Regional Electricity Distributor (CENORED). The facility also has a back-up generator. The site is further equipped with a consumer *fuel* installation, consisting of one 46 m^3 aboveground diesel storage tank. The tank is located in a bund wall and equipped with two pumps. Fuel is dispensed to delivery and plant vehicles.

Water Supply is provided through a combination of three boreholes on the property. All three boreholes were test pumped and have safe yields of at least 100 m^3/h. Water is primarily used for brick manufacturing and dust suppression. Each borehole has four storage tanks with a combined capacity of 40 m^3, for easy dissemination. The combined water storage capacity of the tanks on site is 120 m^3.

Waste removal comprise various components. All hazardous waste is transported from the site by a contractor, while domestic waste is sent to the municipal landfill site. No hazardous waste is stored on site. *Sewage Infrastructure* is provided in the form of a French drain which is connected to the ablution facilities and offices on site.

Photo 7. North-western borehole

Photo 8. North-eastern borehole

Photo 9. Back-up generator

Photo 10. Fuel storage, pumps and spill control

Photo 11. Water truck being filled

Photo 12. Water storage and oil/water separator

Photo 13. French drain

Photo 14. Office complex on site

Photo 15. Maintenance storage yard and workshop

Photo 16. Workshop and vehicle parking

Transport infrastructure comprise a road and access onto Namutoni Road. Trucks enter the site at the southern gate at the administrative complex. Trucks deliver raw materials and fuel to site while also transporting product and waste from the site. Trucks are weighed on a weighbridge when entering and again when exiting the site. Thereby determining the load to ensure that over loading is avoided.

Maintenance and administration are divided into two areas. General maintenance of equipment is conducted on a spill proof surface with appropriate grease traps on the northern portion of the site. Washing of heavy motor vehicles and equipment is conducted on the north-eastern corner of the property. Administrative buildings to accommodate daily tasks related to the site operations are located on the eastern portion of the site close to the entrance of the property. A weighbridge is located at the offices.

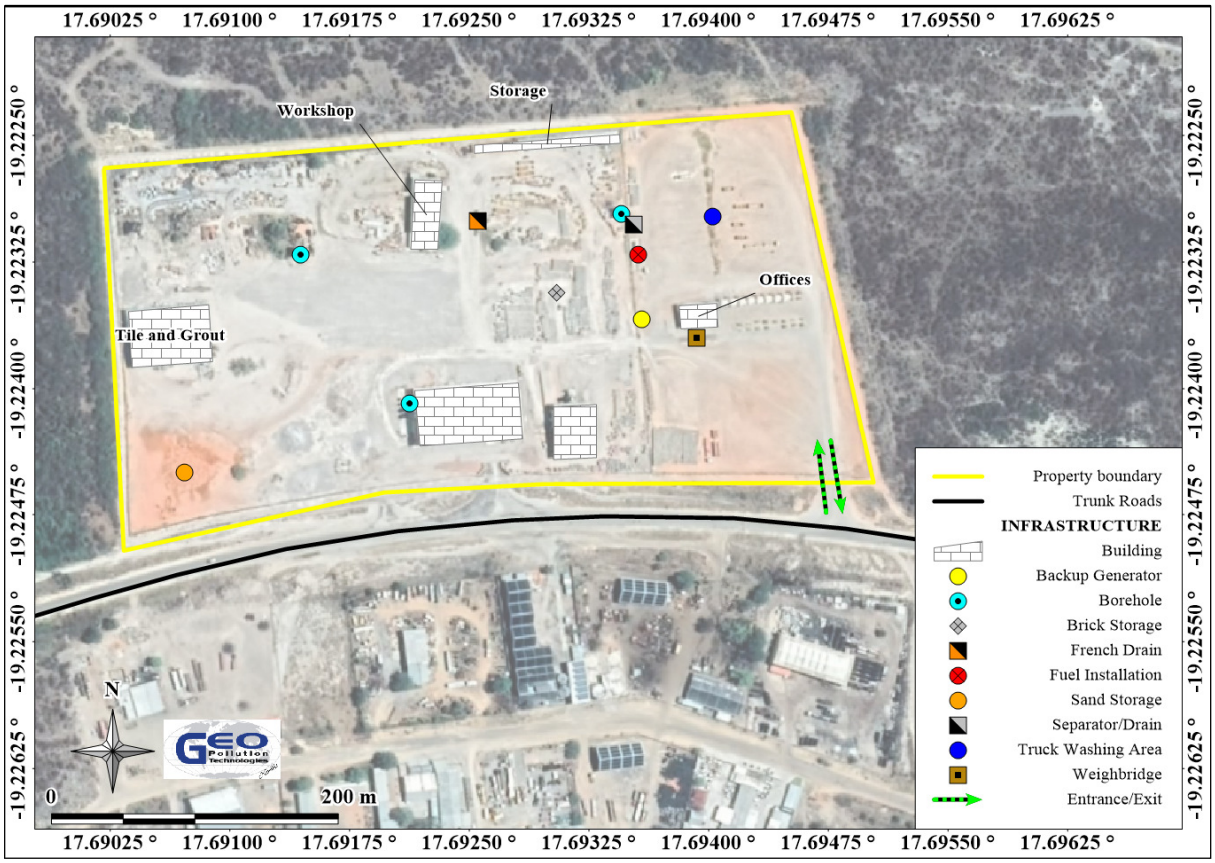


Figure 4-1. Operational layout of the brickfield

5 ALTERNATIVES

Project location alternatives is limited to where a suitable site is present. Industrial properties within Tsumeb are limited, especially sites close to the quarry. The location of the property is advantageous due to its proximity to the quarry which supplies the raw material. Available properties closer to the quarry have not been subdivided or zoned suitably. These properties are neither for sale. In addition, contamination of surface soils from the nearby smelter, renders the surrounding properties largely unsuitable for agriculture. Surface soil contaminated around the site, is presented in Figure 5-1. Alternatives considered by the proponent relate to the technologies on site and support infrastructure.

5.1 DESIGN AND TECHNOLOGY

The design layout of operations has been adapted to support the most practical execution of tasks. Different product manufacturing activities are located on different portions of the site. The layout has been adopted to separate raw material and product storage. The main product storage is close to the offices and weigh bridge while the truck washing facilities are located at the furthest point from the raw material storage. Thereby possible contamination and wetting of the resources are avoided. Other layout-options may be considered by the proponent but would have cost implications if such plans require the relocation of any building, which may not be economically feasible.

Similarly additional technologies may be employed at the brickfield and tile grout manufacturing plant. These have not been proposed for the short to medium term. Should additional technologies or infrastructure components change, the environmental management plan should be updated to accommodate measures preventing pollution.

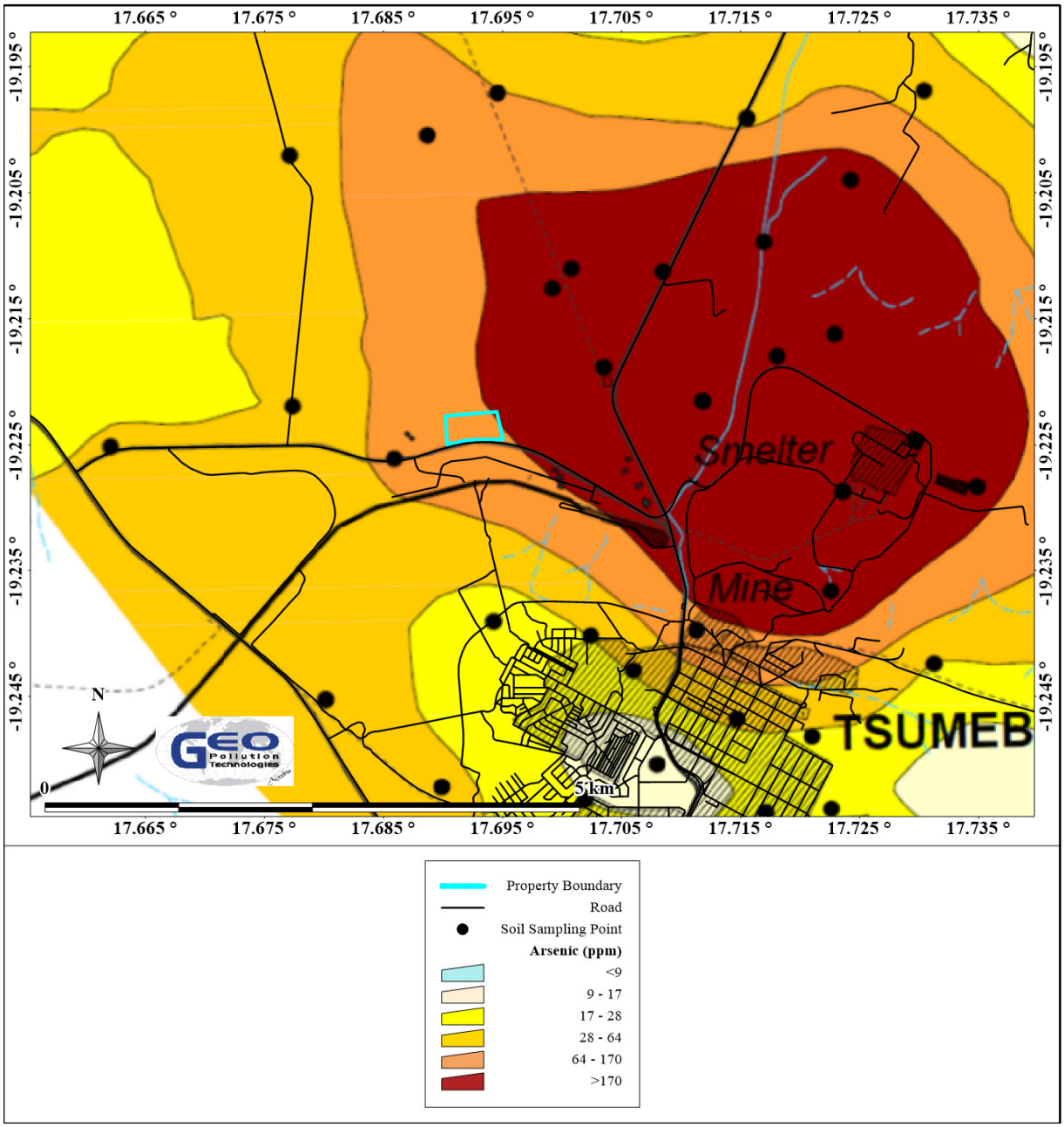


Figure 5-1. Arsenic pollution of the surface soils in and around the project area (Adapted from Kríbek, B et all, 2005)

5.2 SUPPORT INFRASTRUCTURE

Current operations are supported through electricity, water and waste removal. An alternative to the electricity provided by CENORED would be renewable energy resources such as solar panels. However, challenges in the stability/reliability of power provision and costs involved in producing the electricity deems it less feasible than the current electricity source. Existing infrastructure and growth capacity within the supply line deems it the most practicable approach. However, Henning Crusher are continually investigating alternatives to augment electricity provision.

Water is provided by the on-site boreholes. Costs associated with installation of the required infrastructure for municipal water, will render municipal water a less favourable option. Operations utilise only a fraction of the available groundwater resource.

No municipal sewer line is located in close proximity to the project area. To provide such a connection will require unnecessary funding while also increasing pressure on the already heavily

burdened municipal system. All surrounding farming properties utilise similar sewerage systems. Also, current employment does not warrant any larger system as the existing system has sufficient capacity to accommodate the current load.

5.3 THE NO-GO OPTION

Operations by Henning Crusher have been ongoing for almost 40 years. In this time Henning Crusher has steadily increased its production of construction material and increased their number of permanent staff thereby contributing to the sustainable employment of direct and related industries. Should operations be stopped, as part of the no-go option, several job-losses will be experienced in the area, while no value addition to natural resources will be conducted. All revenue generation in the involved sectors will be stopped. Thus, the no-go option will not contribute to sustainable development and the national goals of Vision 2030.

6 ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

To protect the environment and achieve sustainable development, all projects, plans, programmes and policies deemed to have adverse impacts on the environment require an environmental assessment, as per the Namibian legislation. The legislation and standards provided in Table 6-1 to Table 6-3 govern the environmental assessment process in Namibia and/or are relevant to the development.

Table 6-1. Namibian law applicable to the facility

Law	Key Aspects
The Namibian Constitution	♦ Promote the welfare of people ♦ Incorporates a high level of environmental protection ♦ Incorporates international agreements as part of Namibian law
Environmental Management Act Act No. 7 of 2007, Government Notice No. 232 of 2007	♦ Defines the environment ♦ Promote sustainable management of the environment and the use of natural resources ♦ Provide a process of assessment and control of activities with possible significant effects on the environment
Environmental Management Act Regulations Government Notice No. 28-30 of 2012	♦ Commencement of the Environmental Management Act ♦ List activities that requires an environmental clearance certificate ♦ Provide Environmental Impact Assessment Regulations
Soil Conservation Act Act No. 76 of 1969	♦ Provides for combating and prevention of soil erosion, the conservation, improvement and manner of use of the soil and vegetation and the protection of the water sources
Petroleum Products and Energy Act Act No. 13 of 1990, Government Notice No. 45 of 1990	♦ Regulates petroleum industry ♦ Makes provision for impact assessment ♦ Petroleum Products Regulations (Government Notice No. 155 of 2000) o Prescribes South African National Standards (SANS) or equivalents for construction, operation and decommissioning of petroleum facilities (refer to Government Notice No. 21 of 2002)

Law	Key Aspects
The Water Act Act No. 54 of 1956	♦ Remains in force until the new Water Resources Management Act comes into force ♦ Defines the interests of the state in protecting water resources ♦ Controls water abstraction and the disposal of effluent ♦ Numerous amendments
Water Resources Management Act Act No. 11 of 2013	♦ Provide for management, protection, development, use and conservation of water resources ♦ Prevention of water pollution and assignment of liability ♦ Not in force yet
Local Authorities Act Act No. 23 of 1992, Government Notice No. 116 of 1992	♦ Define the powers, duties and functions of local authority councils ♦ Regulates discharges into sewers
Public Health Act Act No. 36 of 1919	♦ Provides for the protection of health of all people
Public and Environmental Health Act Act No. 1 of 2015, Government Notice No. 86 of 2015	♦ Provides a framework for a structured more uniform public and environmental health system, and for incidental matters ♦ Deals with Integrated Waste Management including waste collection disposal and recycling; waste generation and storage; and sanitation.
Labour Act Act No 11 of 2007, Government Notice No. 236 of 2007	♦ Provides for Labour Law and the protection and safety of employees ♦ Labour Act, 1992: Regulations relating to the health and safety of employees at work (Government Notice No. 156 of 1997)
Atmospheric Pollution Prevention Ordinance Ordinance No. 11 of 1976	♦ Governs the control of noxious or offensive gases ♦ Prohibits scheduled process without a registration certificate in a controlled area ♦ Requires best practical means for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process
Hazardous Substances Ordinance Ordinance No. 14 of 1974	♦ Applies to the manufacture, sale, use, disposal and dumping of hazardous substances as well as their import and export ♦ Aims to prevent hazardous substances from causing injury, ill-health or the death of human beings
Pollution Control and Waste Management Bill (draft document)	♦ Not in force yet ♦ Provides for prevention and control of pollution and waste ♦ Provides for procedures to be followed for licence applications

Table 6-2. Relevant multilateral environmental agreements for Namibia and the development

Agreement	Key Aspects
Stockholm Declaration on the Human Environment, Stockholm 1972.	♦ Recognizes the need for a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment
United Nations Framework Convention on Climate Change (UNFCCC)	♦ The Convention recognises that developing countries should be accorded appropriate assistance to enable them to fulfil the terms of the Convention
Convention on Biological Diversity, Rio de Janeiro, 1992	♦ Under article 14 of The Convention, EIAs must be conducted for projects that may negatively affect biological diversity
International Treaty on Plant Genetic Resources for Food and Agriculture, 2001	♦ Promote conservation, exploration, collection, characterization, evaluation and documentation of plant genetic resources for food and agriculture ♦ Promote the sustainable use of plant genetic resources for food and agriculture

Table 6-3. Standards or codes of practise

Standard or Code	Key Aspects
South African National Standards (SANS)*	♦ The Petroleum Products and Energy Act prescribes SANS standards for the construction, operations and demolition of petroleum facilities ♦ SANS 10089-3:2010 is specifically aimed at storage and distribution of petroleum products at fuel retail facilities and consumer installations ♦ SANS 10131: 2004 aimed at above-ground storage tanks for petroleum products ♦ Provide requirements for spill control infrastructure

The brickfield and related operations which are listed as activities requiring an environmental clearance certificate are (Government Notice No. 29 of 2012):

Water Resource Development

- 8.1 The abstraction of ground water for industrial or commercial purposes - Ground water is abstracted for the use in product manufacturing as well as for ancillary works in terms of dust suppression.
- 8.6 Construction of industrial and domestic wastewater treatment plants and related pipeline systems. - French drain system is employed on site.

Hazardous Substance Treatment. Handling and Storage.

- 9.1. The manufacturing, storage, handing or processing of a hazardous substance defined in the Hazardous Substances Ordinance 1974 - Diesel and petrol are defined as hazardous substances in the Labour Act. There are no definitions as per the Hazardous Substances Ordinance. Diesel is stored in an above ground storage facility on site.
- 9.4. The storage and handling of a dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic metres at any location – Diesel is stored on site in an above ground storage facility.

The property is zoned for industrial purposes and no additional rezoning will be conducted.

Additional national planning legislation considered include:

- 5th National Development Plan (NDP5),
- Harambee Prosperity Plan.

The Harambee Prosperity Plan (HPP) is a targeted action plan to accelerate development in clearly defined priority areas, which lay the basis for attaining prosperity in Namibia. The Plan does not replace, but complements the long-term goal of the National Development Plans (NDPs) and Vision 2030. The rationale behind the HPP is to introduce an element of flexibility in the Namibian planning system by fast tracking development in areas where progress is insufficient. It also incorporates new development opportunities and aims to address challenges that have emerged after the formulation of NDPs. It is the purpose of NDP5 to set out a roadmap for achieving envisioned rapid industrialization while adhering to the four integrated pillars of sustainable development as identified in the plan.

The first goal of the economic progression pillar of NDP5 is to achieve sustainable and equitable economic growth. NDP5 further aims at intensifying value addition as part of its mining strategies and to promote industries that will produce mining inputs and services. Operations of Henning Crusher are in line with all of these strategies as identified in the NDP5.

7 ENVIRONMENTAL CHARACTERISTICS

This section lists pertinent environmental characteristics of the study area and provides a statement on the potential environmental impacts on each. It also lists environmental features which may impact operations.

7.1 LOCALITY AND SURROUNDING LAND USE

The site (19.223579°S; 17.692324°E) is located adjacent to the industrial extension of Tsumeb along Namutoni Road. The property falls outside of the town boundaries, but is zoned for industrial purposes. Adjacent properties are farms largely associated with agriculture. Properties south of the site are all used for industrial purposes and zoned accordingly.

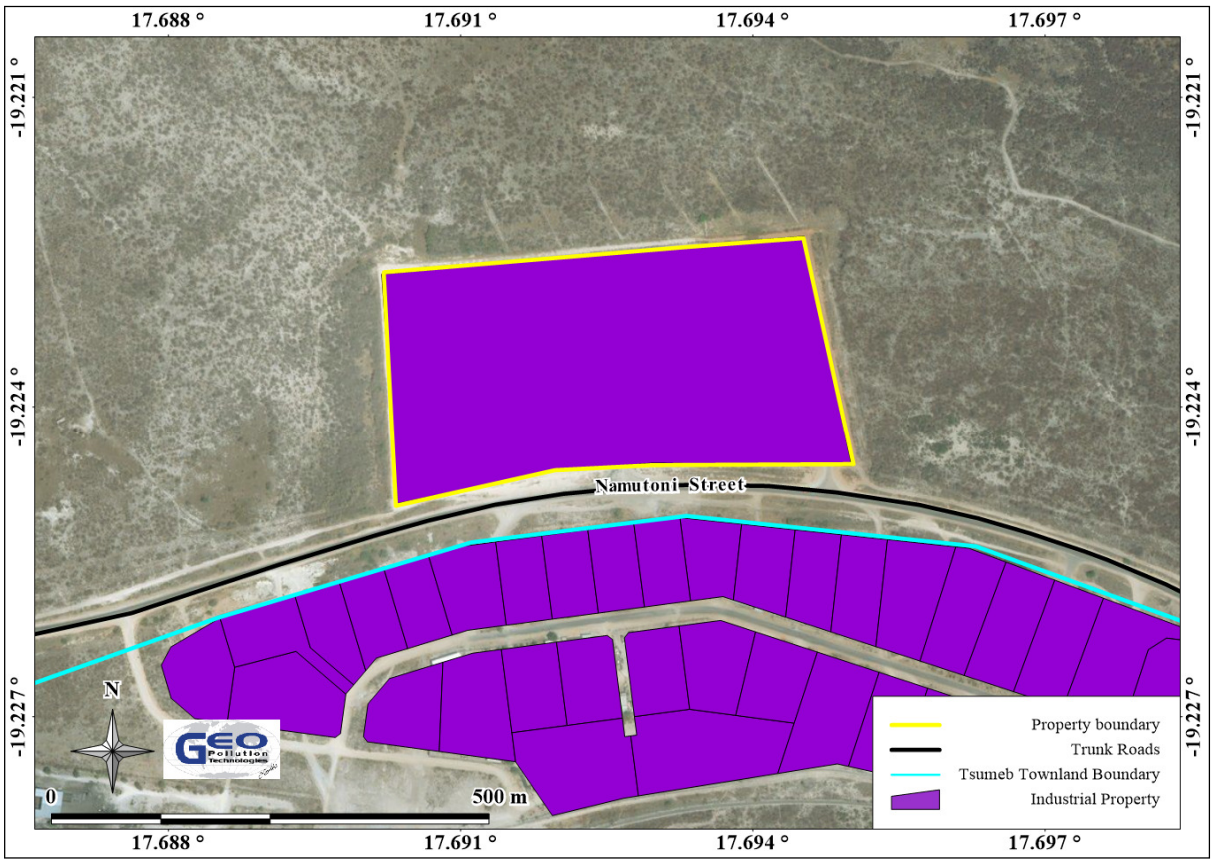


Figure 7-1. Industrial property zoning.

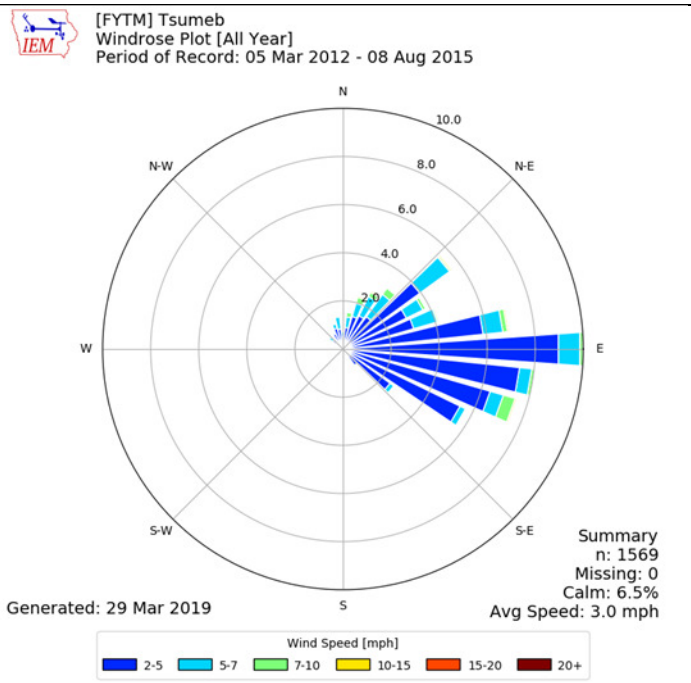
Implications and Impacts

Adjacent properties may be affected by dust and noise which may be associated with operations on site. Transport trucks may impact the road surface which is also used by neighbouring properties. No residential properties, schools, medical facilities or areas of cultural importance are located in close proximity to the site.

7.2 CLIMATE

The Tsumeb area is situated in a semi-arid climatic region. Days are mostly warm with very hot days during the summer months, while nights are generally cool. Rainfall occurs from October to April. The highest rainfall is normally received during the months of January, February and March. Average annual rainfall received in Tsumeb is high when compared to the rest of Namibia. Rainfall ranges between 500 and 550 mm/a, with a rainfall variability of <30%. Rainfall events are typically thunderstorms with heavy rainfall that can occur in short periods of time (cloud bursts). The average annual evaporation exceeds 2,800 mm/a. Table 7-1 below contain a summary of climate conditions for the area.

Table 7-1. Summary climate data (Atlas of Namibia)

Precipitation	500-550
Variation in annual rainfall (%)	< 30
Average annual evaporation (mm/a)	2800-3000
Water deficit (mm/a)	1501-1700
Temperature (°C)	20-21
Tsumeb Windrose (Mesonet, 2019)	

Average Monthly Rainfall (mm)											
Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0.0	0.5	3.2	16.7	53.1	62.4	127.8	120.2	84.9	35.2	2.8	1.1

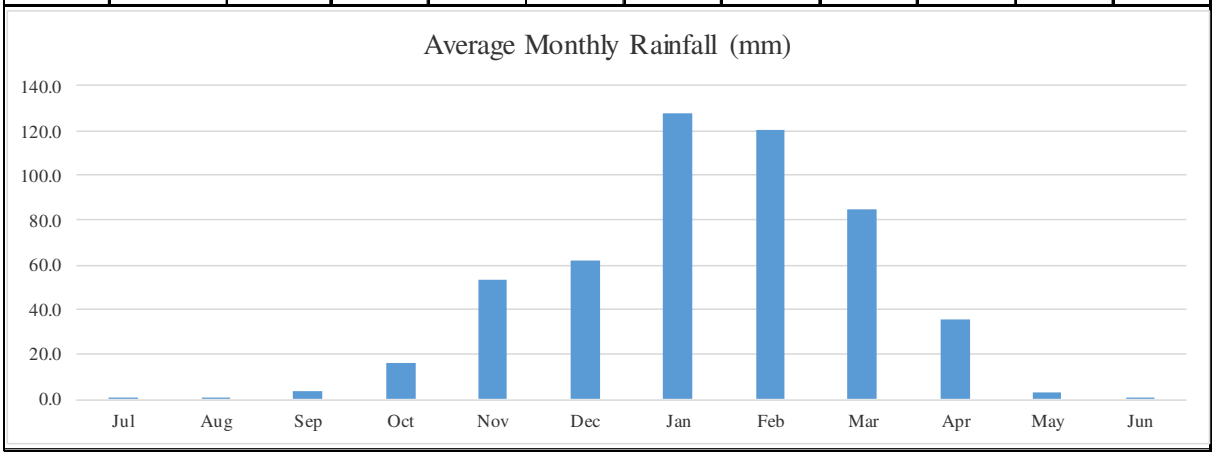


Figure 7-2. Rainfall information for the area (Atlas of Namibia)

Implications and Impacts

Rainfall events may result in the leaching of pollutants or hazardous substances to the groundwater. Wind may carry dust, emissions and noise to nearby receptors. Air emissions from the site will be mainly spread in a westerly direction.

7.3 TOPOGRAPHY AND SURFACE WATER

The project area forms part of the Karstveld Landscape, with Kalahari surface deposits in the form of pan deposits. The site forms part of the Otavi Mountain Land which is dominated by hills rising up to 500 m above the surrounding plains, with major east-west trending valleys with relatively flat valley bases. The slope of the project area is mainly less than 5°.

Drainage is poorly developed in the area. The site falls within the catchment of the Etosha Pan. The development of sinkholes, dolines and caves are common in the region. The sinkhole, Lake Otjikoto, occurs approximately 15 km west-northwest of the farm. A map showing slope and surface drainage directions, as generated from SRTM 30 m data, can be seen in Figure 7-3. It should be noted that drainage lines are not as well developed as what the figure might present due to high infiltration rates. Surface runoff from the site is expected to be in a northwestern direction (Figure 7-4).

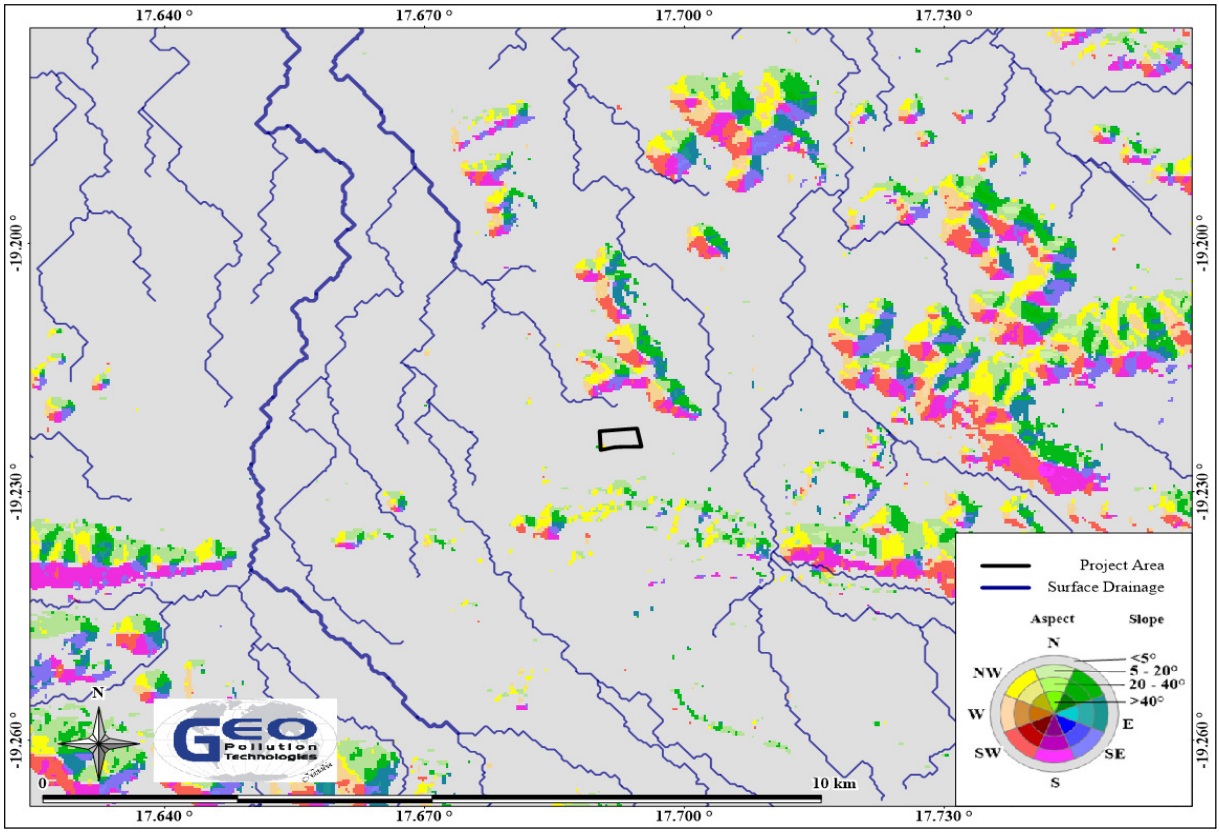


Figure 7-3. Slope Aspect of the project area

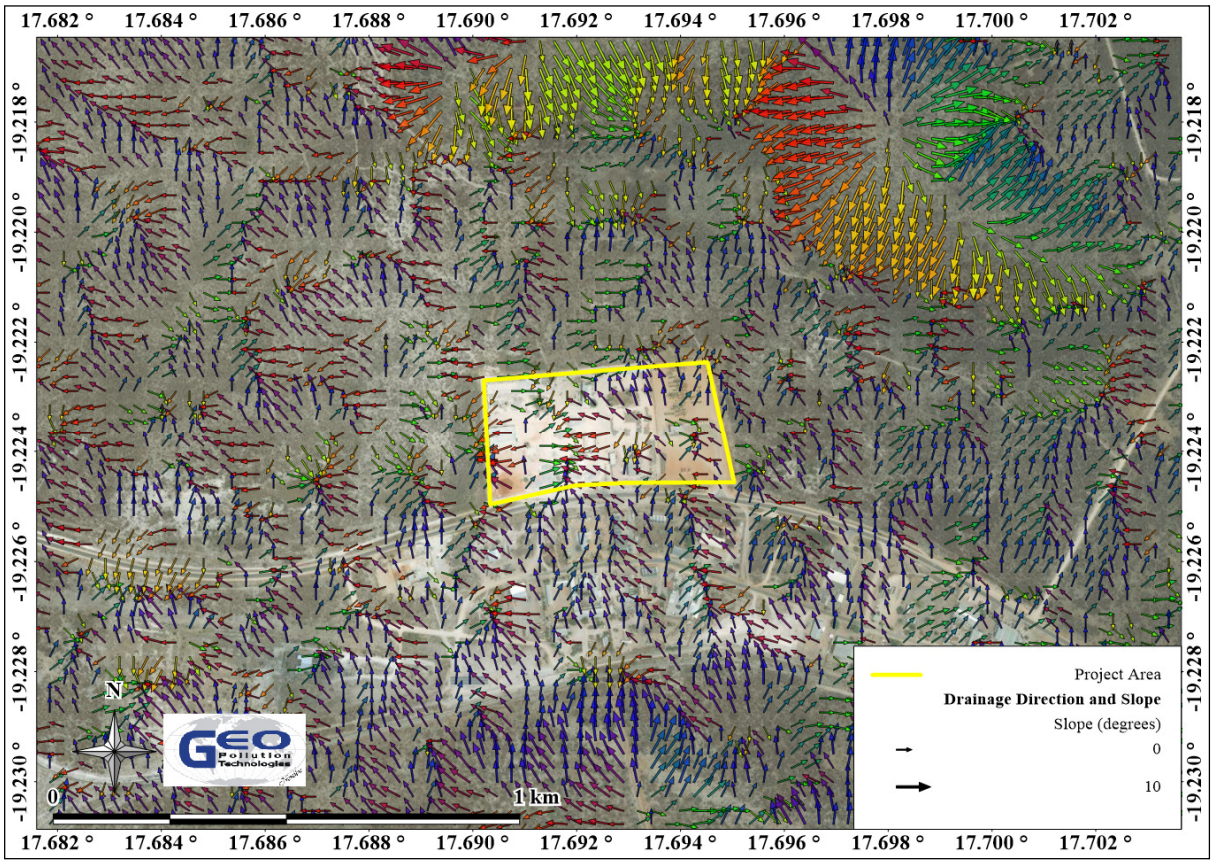


Figure 7-4. Surface Drainage direction of the project area

Implications and Impacts:

The site was levelled and soil compacted to accommodate infrastructure. The hardened soil could result in larger volume of water flowing from the site during rainfall events. No additional impact will emanate of the topography.

7.4 SOIL

The site is dominantly underlain by limestone and dolomite rock types. The site is characterised by a superficial cover of mollic Leptosols. Mollic Leptosols has a slight increased thickness compared to some other Leptosols and has a somewhat higher organic content. All surface soils east and north-east have higher concentrations of arsenic due to contamination of the smelter operations east of the site, see Figure 5-1.

Implications and Impacts

Soils on site have mostly been compacted through years of operations including the haulage and storage of brick. Hydrocarbon (diesel) may contaminate the soil if not stored or handled correctly.

7.5 GEOLOGY AND HYDROGEOLOGY

The geology underlying the project area formed during the Quaternary-, Tertiary- and Namibian Age. Geology from the Quaternary and Tertiary Ages consist of the Kalahari Group deposits which typically is sand, calcrete and gravel. Sediments from the Kalahari Group originate mainly from fluvial deposition with some reworking through aeolian processes. The Kalahari Group sediments overlie pre-Kalahari rocks, in this case rocks belonging to the Namibian Age. Damara Sequence rocks consists locally of the Mulden- and Otavi Groups. Subsurface geology at the site consist of dolomite, chert and breccia from the Elandshoek Formation.

Moderate folding of the strata occurred during the Pan African Orogeny (680-450 Ma) and resulted in the formation of synclines and anticlines, generally trending east - west. The development of joints and fractures in the rocks are associated with the folding, which have an impact on the hydrogeological characterization of the area. It should be noted that a thin veneer of Quaternary and Tertiary Age Kalahari Group deposits are present further south than what is indicated in Figure 7-5. The thin veneer was not showed to better present the more important underlying formations.

The main fault orientation is roughly northeast - southwest and northwest - southeast. Geophysical-interpreted dykes occur in the area and strike towards the northeast. Figure 7-5 depicts geological structures interpreted from geophysical data for the farm and the surrounding area.

Groundwater flow is expected to take place through primary porosity in the surface cover, while it is expected to flow along fractures, faults, dykes/mineralised faults or along contact zones (secondary porosity) and other geological structures present within the underlying formations (hard rock formations). Local flow patterns may vary due to groundwater abstraction.

Groundwater information was obtained from Department of Water Affairs (DWA) borehole database. Groundwater is widely utilised in the study area, with a total of 77 boreholes known of within a 10 km radius. The groundwater quality is normally of excellent quality, though it might have elevated hardness levels. The average water level is 53 mbs and yield 21 m^3/h. The DWA database is generally outdated and more boreholes might be present.

According to the Ministry of Agriculture, Water and Forestry (DWAF, 2006) the project is located inside the Tsumeb-Otavi-Grootfontein Subterranean Water Control Area, Government Notice 1969 of 13 November 1970 and Proclamation 278 of 31 December 1976 (Extension). The farm also falls under a sub-division of the water control area (Guinas - B1), known as the western half of the Tsumeb-Abenab Synclinorium sub-catchment (Bäumle, 2004). Government regulates groundwater usage in this area and all other groundwater related activities like drilling, cleaning or deepening of boreholes and rates of water abstraction.

Groundwater quality data is mostly of a calcium-magnesium-bicarbonate water type which suggest the water is recently recharged. Groundwater quality from the project area reflect an aquifer that is typical of a dolomitic hard rock formation host where rapid groundwater recharge take place.

Table 7-2. Groundwater statistics

Query Centre:	HENNING CRUSHER BRICKFIELD; -19.2236°S; 17.6923°E										Query Box Radius: 10.0km
	NUMBER OF KNOWN BOREHOLES	LATITUDE	LONGITUDE	DEPTH (m bs)	YIELD (m3/h)	WATER LEVEL (m bs)	WATER STRIKE (m bs)	TDS (ppm)	SULPHATE (ppm)	NITRATE (ppm)	FLUORIDE (ppm)
Data points	77			33	30	29	14	13	13	13	13
Minimum		-19.133608	17.596994	21	0	6	19	357	4	0	0
Average				110	21	53	83	493	27	1	0
Maximum		-19.313592	17.787606	235	72	152	143	649	90	7	1
Group A				24.24%	66.67%	6.90%	0.00%	100.00%	100.00%	100.00%	100.00%
Limit				50	>10	10	10	1000	200	10	1.5
Group B				15.15%	13.33%	44.83%	28.57%	0.00%	0.00%	0.00%	0.00%
Limit				100	>5	50	50	1500	600	20	2.0
Group C				57.58%	10.00%	31.03%	42.86%	0.00%	0.00%	0.00%	0.00%
Limit				200	>0.5	100	100	2000	1200	40	3.0
Group D				3.03%	10.00%	17.24%	28.57%	0.00%	0.00%	0.00%	0.00%
Limit				>200	<0.5	>100	>100	>2000	>1200	>40	>3

Statistical grouping of parameters is for ease of interpretation, except for the grouping used for sulphate, nitrate and fluoride, which follow the Namibian guidelines for the evaluation of drinking-water quality for human consumption, with regard to chemical, physical and bacteriological quality. In this case the groupings has the following meaning:
Group A: Water with an excellent quality
Group B: Water with acceptable quality
Group C: Water with low health risk
Group D: Water with a high health risk, or water unsuitable for human consumption.

Implications and Impacts

Groundwater is utilised in the area and such users would be at risk if pollution of the groundwater takes place. Leakages of contaminants or hydrocarbons from fuel storage and machinery or vehicles on site may pose a risk to contamination of the groundwater resource. The same is true for possible contamination from the French drain, especially if large amounts of water is disposed of into the system.

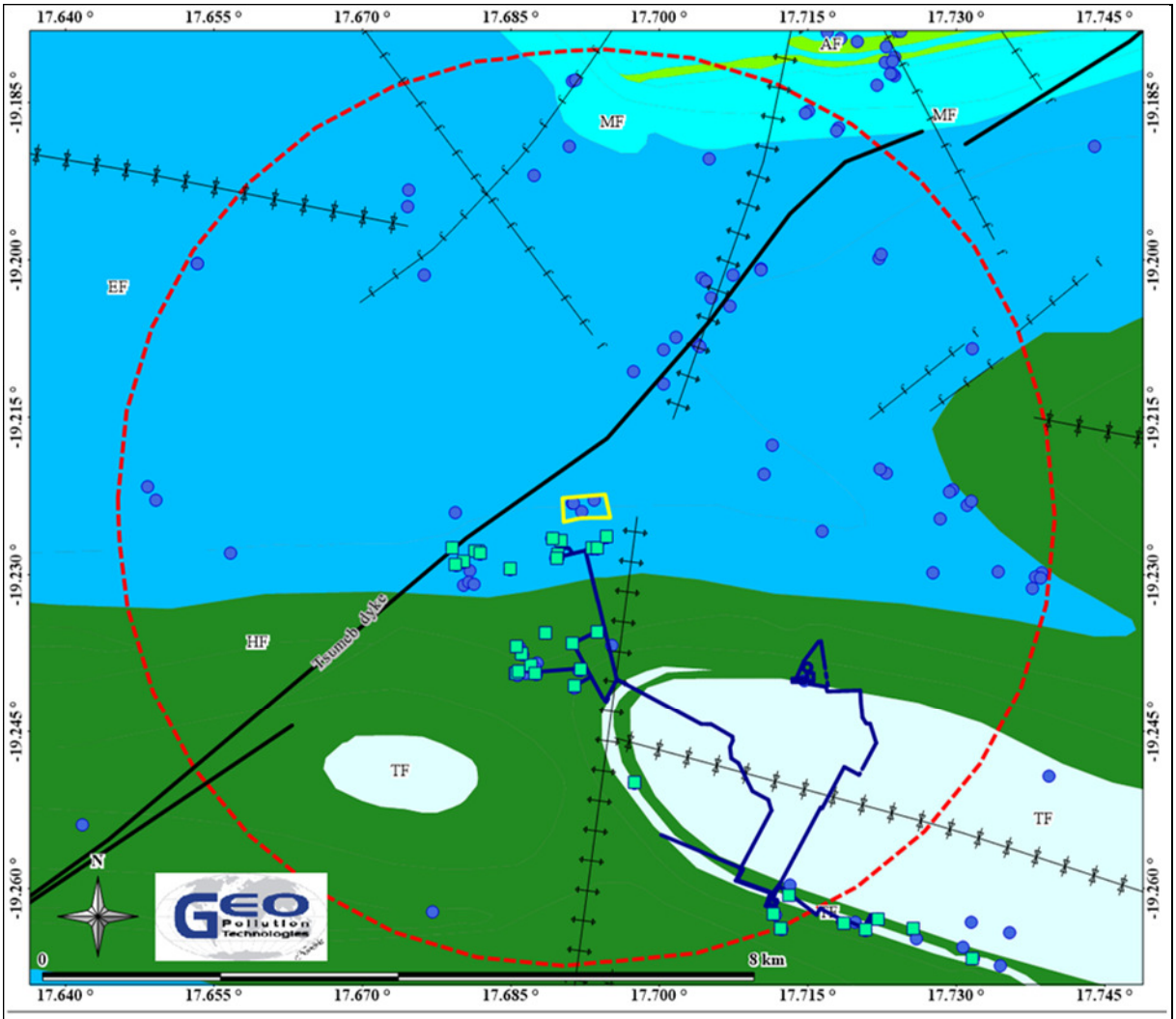
7.6 PUBLIC WATER SUPPLY

Water is supplied to Tsumeb by the municipality from boreholes roughly grouped in three areas: Extension 8, Nomtsoub and Extensions 6 and 7. The boreholes in the Nomtsoub Group have the highest yields. At least 7 Tsumeb municipal boreholes occur between 200 - 400 m south of the project area, all of which is linked to a municipal water supply pipeline. The location of the municipal infrastructure is presented in Figure 7-5.

The majority of farms surrounding in the area rely on groundwater. Project operations are supplied from on-site boreholes.

Implications and Impacts

Operational activities are not foreseen to have an impact on the public water supply of Tsumeb, from a water quantity perspective. Pollution of the subsurface should be prevented as this may impact the usability of groundwater.



Lithcode	Age	Sequence	Group	Subgroup	Formation	Lithology
TF	Namibian	Damara	Mulden	Otavi-Mulden	Tschudi	Arenite, subgreywacke, conglomerate
HF			Otavi	Tsumeb	Huettenberg	Dolomite, oolite, chert, shale, stromatolite, breccia
EF					Elandshoek	Dolomite, chert, breccia
MF					Maieberg	Dolomite, limestone
GF				Abenab	Auros	Stromatolite, chert, limestone
AF					Gauss	Breccia, oolite, dolostone, chert

Figure 7-5. Hydrogeology

7.7 ECOLOGY

The site falls within the Savanna Biome with a Karstveld vegetation and Woodland structure. Namibia's biodiversity pattern is characterised by low species diversity, but high endemism, in the west while high species diversity, but low levels of endemism, is present in the central north and the northeast. Plant and animal diversity on the surrounding farms (north, east and west) would thus be expected to be relatively high in undisturbed areas, but with low endemism.

Plant diversity in the area is high and trees such as *Colophospermum mopane, Terminalia prunioides, Commiphora* species, *Combretum apiculatum, Acacia reficiens, Dichrostachys cinerea* and a variety of other trees are characteristic of this vegetation type. Table 7-3 and Table 7-4 present a summary of the general plant and animal diversity of the broader area. The site itself

is devoid of natural vegetation apart from some large trees. The project area falls within quarter degree square 1917BA. According to the Tree Atlas Project, and 73 different tree species occur in this quarter degrees (Curtis & Mannheimer 2005). A summary of those trees protected by legislation in Namibia is presented in

Table 7-5, together with notes on abundance and conservation status / concerns.

Animal diversity in the undisturbed areas of the kartstveld (Tsumeb-Otavi Area) is expected to be relatively high, but with low endemism. Birds like the Lilac-breasted Roller, Purple Roller, Crimson-breasted Shrike, Violet-eared Waxbill as well as birds of prey such as the near threatened Red-footed Falcon (*Falco vespertinus*) is expected to be found here. Of the vultures, the critically endangered White-backed Vulture (*Gyps africanus*) and the endangered Lappet-faced Vulture (*Torgos tracheliotos*) have been recorded in the area (BirdLife International 2018a). Although, the site has been transformed by anthropogenic activity, animals protected under the Nature Conservation Ordinance of 1975, like the duiker, scaly anteaters, monitor lizards, pythons, tortoises, honey badgers and steenbok, are still expected to be found outside the site in fragmented patches of natural habitat.

Table 7-3. General flora data (Atlas of Namibia)

Biome	Savanna
Vegetation type	Karstveld
Vegetation structure type	Woodland
Diversity of higher plants	High (Diversity rank = 2 [1 to 7 representing highest to lowest diversity])
Number of plant species	400-500
Percentage tree cover	11 - 25
Tree height (m)	2 – 5
Percentage shrub cover	51 – 75
Shrub height (m)	1 – 2
Percentage dwarf shrub cover	2 – 10
Dwarf shrub height (m)	< 0.5
Percentage grass cover	26 – 50
Grass height (m)	< 0.5
Dominant plant species	*Colophospermum mopane; Terminalia prunioides; Commiphora* spp*; Combretum apiculatum; Acacia reficiens; Dichrostachys cinerea*

Table 7-4. General fauna data (Atlas of Namibia)

Mammal Diversity	76 - 90 Species
Rodent Diversity	24 - 27 Species
Bird Diversity	201 - 230 Species
Reptile Diversity	71 - 80 Species
Snake Diversity	35 - 39 Species
Lizard Diversity	28 - 31 Species
Frog Diversity	12 - 15 Species
Termite Diversity	7 - 9 Genera
Scorpion Diversity	10 - 11 Species

Table 7-5. Trees with conservation concerns in quarter degree square 1917BA (Curtis & Mannheimer 2005)

Name	Common Name	Conservation Concerns
Acacia erioloba	Camel-thorn	Protected by Forestry Legislation
Albizia anthelmintica	Worm-cure Albizia; Aru	Protected by Forestry Legislation
Aloe littoralis	Windhoek Aloe	Protected by the Nature Conservation Ordinance and listed in CITES Appendix II.
Berchemia discolor	Bird Plum	Protected by Forestry Legislation
Boscia albitrunca	Shepherd's Tree	Protected by Forestry Legislation.
Combretum imberbe	Leadwood	Protected by Forestry Legislation
Erythrina decora	Namib Coral-tree	Endemic to Namibia and very uncommon throughout its range. Protected by Forestry Legislation.
Ficus cordata subsp *cordata*	Namaqua Rock-fig	Protected by Forestry Legislation
Ficus sycomorus	Sycamore Fig	Protected by Forestry Legislation.
Hyphaene petersiana	Makalani Palm	Protected by Forestry Legislation
Maerua schinzii	Ringwood Tree	Protected by Forestry Legislation
Pachypodium lealii	Bottle Tree	Protected by nature conservation ordinance. Listed on CITES Appendix II. Near-endemic extending into extreme southern areas of Angola. Protected by Forestry Legislation
Sclerocarya birrea	Marula	Protected by Forestry Legislation
Spirostachys africana	Tamboti	Protected by Forestry Legislation
Ziziphus mucronata	Buffalo-thorn	Protected by Forestry Legislation

Implications and Impacts

The site has been altered from its natural state more than 40 years ago. There is no natural vegetation, apart from some large trees retained on site. Fauna on adjacent properties may be disturbed through noise, dust and vibration.

7.8 HERITAGE AND CULTURAL ASPECTS

There are four heritage sites in the vicinity of the project area. All four of these sites are located in Tsumeb southeast of the project area. OMEG-Minenbuero is located 3.35 km from site and is the closest to site, followed by the Roman Catholic Church located 3.37 km away, see Figure 1-1. The Second Directorate's House is located 3.6 km away from site and the German Private School is the furthest from site located 3.8 km from site. Another noteworthy heritage site is Lake Otjikoto, located approximately 15 km west of the project area.

Implications and Impacts

Operations on site are not foreseen to impact any heritage of cultural resources in the area.

7.9 DEMOGRAPHIC CHARACTERISTICS

The project area falls within the Oshikoto Region with a population of 181,973 and a density of approximately 4.7 people per km^2 (National Planning Commission, 2012). Table 7-6 provides demographic information for the Tsumeb Constituency, the region and nationally. Mining and quarrying activities is one of the main employment sectors in the region, as indicated during the Housing and Population Census of 2011 (Namibia Statistics Agency, 2011). It sustains the value addition activities of the current brickfield operations. Operations are considered as part of the

manufacturing industry, one of the most important employment sectors in the region. Henning Crusher currently employs about 40 permanent staff for the brickmaking and related operations. Primary operations, which include the quarry further supports about 110 more permanent positions. Therefore, the operations contribute a significant portion to employment and related economic aspects.

Table 7-6. Demographic characteristics of the Tsumeb Constituency, the Oshikoto Region and Nationally (Namibia Statistics Agency, 2011)

	Tsumeb Constituency	Oshikoto Region	Namibia
Population (Males)	9,800	87,066	1,021,912
Population (Females)	9,900	94,907	1,091,165
Population (Total)	19,700	181,973	2,113,077
Unemployment (15+ years)	Not Available	40%	33.8%
Literacy (15+ years)	Not Available	88%	87.7%

Table 7-7. Main industry of employed population aged 15 years and above by sex, Tsumeb (Namibia Statistics Agency, 2011)

Main Industry	Total	Female	Male
Total	**7,401**	**2,803**	**4,598**
Agriculture Forestry and Fishing	1,119	359	760
Mining And Quarrying	725	31	694
Manufacturing	557	129	428
Electricity Gas Steam and Air conditioning supply	28	9	19
Water Supply Sewerage Waste Management and Remediation activities	32	3	29
Construction	617	76	541
Wholesale and Retail trade; Repair of motor vehicles and motorcycles	576	279	297
Transportation and Storage	396	30	366
Accommodation and Food Service activities	241	146	95
Information and Communication	46	21	25
Financial Insurance Activities	141	94	47
Real-estate Activities	1	0	1
Professional Scientific and Technical activities	78	46	32
Administrative and Support service activities	1,169	519	650
Public Administration and Defence; compulsory social security	252	106	146
Education	308	202	106
Human Health and Social work activities	200	149	51
Arts Entertainment and Recreation	19	9	10
Other Services activities	135	89	46
Activities of Private Households	603	433	170
Activities of extraterritorial organisation and bodies	3	3	0
Don't Know	155	70	85

Implications and Impacts

Unemployment and poverty in the region is relatively high. Current operations plays a significant role in providing employment to people from the area. Operations further contribute to sustaining the construction industry which provides employment to thousands of people.

8 PUBLIC CONSULTATION

Consultation with the public forms an integral component of an environmental assessment and enables interested and affected parties (IAPs) e.g. neighbouring landowners, local authorities, environmental groups, civic associations and communities, to comment on the potential environmental impacts associated with the facility and to identify additional issues which they feel should be addressed in the environmental assessment. During the initiation phase of the public consultation process, IAPs were made aware of their rights to provide input into the assessment process through registering for the project and providing comments and concerns. This invitation appeared on all the notices as mentioned below as well as the notification letters.

Public participation notices were advertised twice in two weeks in the national papers: The Republikein and Namibian Sun on 25 June 2019 and 2 July 2019. A site notice was placed at the entrance of the adjacent mining activities and notification letters delivered via email or hand delivery to neighbours. Neighbours indicated their preferred method of communication and information receipt. As such some IAPs requested to be sent the information by email while others were engaged with in a brief meeting. A background information document was loaded onto the MET electronic system as well as made available to commenting authorities and IAPs.

The Tsumeb Town Council was notified and acknowledged the notification. See Appendix A for proof of the public participation processes and registered IAPs. Comments received during the public consultation process were related to mining and quarry activities as well as irrigation activities. No comments were received relating to the brickfield operations.

9 MAJOR IDENTIFIED IMPACTS

During the scoping exercise a number of potential environmental impacts were identified. The following section provides a brief description of the most important of these impacts.

9.1 NOISE

Some noise exist due to heavy motor vehicles accessing the site for delivery of fuel, raw materials and collection of products. Noise may further emanate from vehicles and machines operating on site. Construction related activities may result in temporary noise producing activities.

9.2 TRAFFIC

During operations, some traffic impacts may be experienced when trucks and delivery vehicles access the site. Raw material and product transportation may increase the incident risk on roads to and from the site.

9.3 AIR QUALITY

Diesel is combusted in the on-site dryer for heating purposes required during tile grout manufacturing. Burning of the diesel creates gasses (carbon monoxide (CO), carbon dioxide (CO_2), sulphur dioxide (SO_2), nitrogen oxides (NOx), volatile organic compounds and hydrocarbons. These are known pollutant elements, some of which are greenhouse gasses and are released into the atmosphere through a single smoke stack on site. Operations related to the dryer are however considered to be of a small scale and therefore have a low contribution to the degradation of the airshed.

In the absence of air quality emissions standards for Namibia, the proponent should adopt the emissions standards as advocated by the World Bank and International Finance Corporation.

9.4 FIRE

Heat from the diesel dryer is used in the production of the tile grout. The presence of the dryer and fuel storage significantly increases the fire risk of the site and operations. The nature of diesel when heated, is such that it can rapidly result in a large fire that could burn for a long time if not extinguished. Firefighting measures and equipment on site has to adhere to all fire-related regulations as per local and national standards.

9.5 HEALTH AND SAFETY

Hydrocarbons are carcinogenic and dermal contact and inhalation of fumes should be prevented. Some of the chemical materials used for the tile grout manufacturing process are harmful to human health. Such material handling and storage should be according to their Material Safety Data Sheets. Injuries can occur due to incorrect lifting of heavy equipment and materials, falling from heights, getting caught in moving parts of machines, vehicles, and exposure to hot temperatures.

9.6 ECOSYSTEM AND BIODIVERSITY IMPACT

Biophysical resources on site have been impacted by operations. Emissions from the dryer will contribute to the ambient air quality while various chemical and hydrocarbon product handling may contaminate the soil.

9.7 SOCIO-ECONOMIC IMPACTS

Long term permanent employment has been provided by the operations of Henning Crusher. Currently direct employment tallies 40 people. Value addition to a resource mined nearby, has contributed to sustaining employment. All products from the site contribute to sustaining various jobs in secondary industries such as construction and retail.

10 ASSESSMENT AND MANAGEMENT OF IMPACTS

The purpose of this section is to assess and identify the most pertinent environmental impacts that are expected from the operational, construction (upgrades, maintenance, etc. – see glossary for "construction") and potential decommissioning activities of the facility. An environmental management plan based on these identified impacts are also incorporated into this section.

For each impact an environmental classification was determined based on an adapted version of the Rapid Impact Assessment Method (Pastakia, 1998). Impacts are assessed according to the following categories: Importance of condition (A1); Magnitude of Change (A2); Permanence (B1); Reversibility (B2); and Cumulative Nature (B3) (see Table 10-1). Ranking formulas are then calculated as follow:

Environmental Classification = A1 x A2 x (B1 + B2 + B3)

The environmental classification of impacts is provided in Table 10-2.

The probability ranking refers to the probability that a specific impact will happen following a risk event. These can be improbable (low likelihood); probable (distinct possibility); highly probable (most likely); and definite (impact will occur regardless of prevention measures).

Table 10-1. Assessment Criteria

Criteria	Score
Importance of condition (A1) – assessed against the spatial boundaries of human interest it will affect	
Importance to national/international interest	4
Important to regional/national interest	3
Important to areas immediately outside the local condition	2
Important only to the local condition	1
No importance	0
Magnitude of change/effect (A2) – measure of scale in terms of benefit / disbenefit of an impact or condition	
Major positive benefit	3
Significant improvement in status quo	2
Improvement in status quo	1
No change in status quo	0
Negative change in status quo	-1
Significant negative disbenefit or change	-2
Major disbenefit or change	-3
Permanence (B1) – defines whether the condition is permanent or temporary	
No change/Not applicable	1
Temporary	2
Permanent	3
Reversibility (B2) – defines whether the condition can be changed and is a measure of the control over the condition	
No change/Not applicable	1
Reversible	2
Irreversible	3
Cumulative (B3) – reflects whether the effect will be a single direct impact or will include cumulative impacts over time, or synergistic effect with other conditions. It is a means of judging the sustainability of the condition – not to be confused with the permanence criterion.	
Light or No Cumulative Character/Not applicable	1
Moderate Cumulative Character	2
Strong Cumulative Character	3

Table 10-2. Environmental Classification (Pastakia 1998)

Environmental Classification	Class Value	Description of Class
72 to 108	5	Extremely positive impact
36 to 71	4	Significantly positive impact
19 to 35	3	Moderately positive impact
10 to 18	2	Less positive impact
1 to 9	1	Reduced positive impact
0	-0	No alteration
-1 to -9	-1	Reduced negative impact
-10 to -18	-2	Less negative impact
-19 to -35	-3	Moderately negative impact
-36 to -71	-4	Significantly negative impact
-72 to -108	-5	Extremely Negative Impact

10.1 RISK ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

The EMP provides management options to ensure impacts of the facility are minimised. An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures might be included if necessary. The environmental management measures are provided in the tables and descriptions below. These management measures should be adhered to during the various phases of the operation of the facility. This section of the report can act as a stand-alone document. All personnel taking part in the operations of the facility should be made aware of the contents in this section, so as to plan the operations accordingly and in an environmentally sound manner.

The objectives of the EMP are:

- to include all components of construction activities (upgrades, maintenance, etc.) and operations of the facility;
- to prescribe the best practicable control methods to lessen the environmental impacts associated with the brickfield;
- to monitor and audit the performance of operational personnel in applying such controls; and
- to ensure that appropriate environmental training is provided to responsible operational personnel.

Various potential and definite impacts will emanate from the construction and operational phases. The majority of these impacts can be mitigated. The impacts, risk rating of impacts as well as prevention and mitigation measures are listed below.

10.2 PLANNING PHASE

Although operations have been ongoing the planning phase is still applicable. However, the impacts expected as being generated during the planning phase (which is inclusive of the acquiring of the ECC) relate mostly to legal, planning and economic aspects.

During the phases of planning for future operations, construction and decommissioning of the facility, it is the responsibility of the proponent to ensure they are and remain compliant with all legal requirements. The proponent must also ensure that all required management measures are in place prior to and during all phases, to ensure potential impacts and risks are minimised. The following actions are recommended for the planning phase and should continue during various other phases of the project:

- Ensure that all necessary permits from the various ministries, local authorities and any other bodies that governs the construction (maintenance) activities and operations of the facility remains valid

- Ensure all appointed contractors and employees enter into an agreement which includes the EMP. Ensure that the contents of the EMP are understood by the contractors, sub-contractors, employees and all personnel present or who will be present on site.
- Make provisions to have a Health, Safety and Environmental Coordinator to implement the EMP and oversee occupational health and safety as well as general environmental related compliance at the site.
- Have the following emergency plans, equipment and personnel on site where reasonable to deal with all potential emergencies:
  - Risk management / mitigation / EMP/ Emergency Response Plan and HSE Manuals
  - Adequate protection and indemnity insurance cover for incidents;
  - Comply with the provisions of all relevant safety standards;
  - Procedures, equipment and materials required for emergencies.
- If one has not already been established, establish and maintain a fund for future ecological restoration of the site. Should project activities cease and the facility be decommissioned, environmental restoration or pollution remediation may be required.
- Establish and / or maintain a reporting system to report on aspects of construction activities, operations and decommissioning as outlined in the EMP.
- Submit monitoring reports every six months to allow for future environmental clearance certificate renewal application.
- Appoint an environmental consultant to update the EA and EMP and apply for renewal of the environmental clearance certificate prior to expiry. Bi-annual monitoring report will be required by the Ministry of Environment and Tourism for the renewal of the ECC.

10.3 CONSTRUCTION AND OPERATIONAL PHASES

Operations have developed and expanded to what is the current facility, over 40 years. All of the current operations require ongoing maintenance to ensure optimal production and limit potential environmental pollution. The definition of construction as per the Environmental Management Act and its regulations, include care and maintenance activities. Therefore aspects of the construction phase (maintenance) are foreseen to continue through the operational phase.

Some of the impacts initiated in the construction have been carried forward into the operational phase. However, the nature of impacts have changed. Where dust may have been generated by earth-moving activities to establish infrastructure, dust in the operational phase relate more to raw material and product movement. Potential impacts as well as related prevention and mitigation measures are detailed in Section 10.5

10.4 DECOMMISSIONING PHASE

Decommissioning of the facility is not foreseen within the next 10 years. However, the proponent should formulate a closure strategy which may be planned and provided for during the operational phase. During the decommissioning phase, operations will be scaled down as works are prepared to be closed. Once all operations have seized and the related social and labour closure considerations implemented, the proponent may finalise rehabilitation efforts within the site. As no closure plan has been drafted yet, no specific potential impacts could be identified. However, general anticipated impacts and residual impacts have been listed. Additional closure activities include the continuous monitoring of various environmental parameters. Such monitoring initiatives should be included in the closure strategy while the environmental management plan for this phase will have to be reviewed prior to the time of decommissioning, to incorporate any new legislation, requirements and environmental constraints.

10.5 ASSESSED IMPACTS

A description of anticipated impacts resulting from current and proposed activities are presented below. Impact ratings are provided for relevant phases while prevention, mitigation and monitoring requirements conclude each impact description.

10.5.1 Developing Project Feasibility and Permitting

Continual development of the project feasibility could have various impacts on the social, political and economic spheres of the environment. The acquisition of various permits for the operations generates information and directs planning initiatives. Permit requirements and acquisition further requires certain activities to be performed and related capital expenditure. Therefore planning activities contribute to diversification of the revenue flow generated through the project.

Project feasibility and related permit requirements may include preparation for restoration and rehabilitation funds, required to ensure a safe environment should operations be discontinued. Such a fund should serve to also address rehabilitation concerns should operations be abandoned for any reason. In terms of international best practise, such funds are usually kept separate from the operational costs and are grown through dedicated funds allocate monthly thereto. Numerous models for determining rehabilitation costs have been developed internationally. The impact of development of such a fund is mostly related to the economic sphere of the environment. Clear record regarding current contamination due to the smelter operations should be kept to ensure no additional contamination is ascribed to the proponent.

Infrastructure maintenance on a local and regional scale, such as road maintenance, may further have a potential impact on the feasibility of the project. Product movement will be hampered if infrastructure is not maintained. Continual communication with the related authorities should be maintained and included into regional planning aspects. Maintenance of the infrastructure will enable the project to continue contributing to the National Development Goals of 2030.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Operational Phase	The acquisition of various permits	2	1	2	3	3	16	2	Definite
	Preparation for restoration and rehabilitation fund	2	1	2	3	3	16	2	Probable
Decommissioning	Application of restoration and rehabilitation fund	2	1	2	1	1	8	1	Definite
Indirect Impacts	Contribution to national planning related to service delivery infrastructure requirements and National development goals	2	1	2	3	3	16	2	Probable

Desired Outcome: To contribute to the sustainable development of natural resources through interactive planning and partnership with authorities, neighbours and related industry.

Actions

Enhancement:

- Namibian companies to assist in permit acquisition.
- Record all activities related to permit acquisition, conducted.
- Facilitate information sharing, with the public and authorities.
- Maintain communication and interaction with key parastatals and ministries such as CENORED, Roads Authority, Ministry of Environment and Tourism, Ministry of Mines and Energy and Tsumeb Town Council.
- Consider the establishment of a rehabilitation or insurance fund to provide for rehabilitation works.

Responsible Body:

- Proponent

- Contractors / Consultants

Data Sources and Monitoring:

- Record should be kept of all communication with neighbours or members of the community.
- Record should be kept of all communication with all authorities, parastatals and ministries.
- Records of expected rehabilitation costs kept.

10.5.2 Skills, Technology and Development

During various phases of the project, training has been and will be provided to portions of the workforce. Training is conducted to enhance efficiency within different components of the brickfield's value addition activities. Skills are further transferred to the unskilled workforce for general tasks. The technology employed for operations are unique to the local industry, aiding in operational efficiency. Improvement of people and technology are key to economic development as well as operational feasibility. All employees will receive emergency and evacuation plan training while the supervisors and identified employees will have fire-fighting and first-aid training.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Technological development and transfer of skills	1	2	3	3	3	18	2	Probable
Daily Operations	Technological development and transfer of skills	1	2	3	3	3	18	2	Definite
Indirect Impacts	Enhanced employability of workforce	2	1	3	3	3	18	2	Definite

Desired Outcome: To see an increase in skills of local Namibians, as well as development and technology advancements in the industry.

Actions

Enhancement:

- If the skills exist locally, contractors must first be sourced from the town, then the region and then nationally. Deviations from this practice must be justified.
- Skills development and improvement programs to be made available as identified during performance assessments.
- Employees to be informed about parameters and requirements for references upon employment.
- The proponent must employ Namibians where possible. Deviations from this practise should be justified appropriately.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Record should be kept of training provided.
- Ensure that all training is certified or managerial reference provided (proof provided to the employees) inclusive of training attendance, completion and implementation.

10.5.3 Revenue Generation and Employment

Manufacturing (as opposed to farming) has led to changes in the way revenue is generated and paid to the local and national treasury. Revenue generated from the site has been increased by the value addition activities conducted on site. This include use of crusher by-products in the manufacturing of tile grout and use of raw materials in making brick, pavers and related construction material. Operations have provided stable employment for the area for more than 40 years. Such employment contributes significantly to the economic resilience of the employees as well as the town. Employment is sourced locally while skilled labour/contractors may be sourced from other regions. The facility further contributes to the transport sector as well as the construction industry at large. The impact is foreseen to have a positive impact on the economic and social sphere of the environment.

If operations are decommissioned, there will be a change and probable loss in revenue generation, flow and employment. Post closure land use and possible revenue generating activities should be considered by the proponent closer to the decommissioning phase.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Employment and contribution to local economy	2	2	2	2	2	24	3	Definite
Daily Operations	Employment and contribution to local and national economy	3	2	2	2	2	30	3	Definite
Indirect Impacts	Decrease in unemployment, contribution to associated industry	3	1	2	2	3	21	3	Definite

Desired Outcome: Contribution to local and national treasury and provision of employment to local Namibians.

Actions

Enhancement:

- The proponent must employ local Namibians where possible.
- If the skills exist locally, employees must first be sourced from the town, then the region and then nationally.
- Deviations from this practice must be justified.
- Post-closure land-use options to be considered by the proponent.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Bi-annual summary report based on employee records.
- Financial Auditing

10.5.4 Building Material Supply

The operation of the facility ensures value addition to natural resources and a reliable supply of building material to the construction industry. The brickfield sends many of its products to various markets in the northern regions of Namibia. The supply, availability and access to such materials contributes to the economic development goals of Namibia.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	Value addition and contribution to economy, contribution to the building material supply in the region and Namibia	3	1	3	2	2	21	3	Definite
Indirect Impacts	Secure supply in building material allowing development of various industries	2	1	2	2	2	12	2	Definite

Desired Outcome: Ensure effective value addition and a secure supply of building material remains available.

Mitigation:

- Ensure compliance to the applicable regulations of Namibia.
- Proper management to ensure constant supply.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Record supply problems and take corrective actions.
- Record supply problems and corrective actions taken and compile a summary report.

10.5.5 Demographic Profile and Community Health

Operations have been ongoing for such a long time that current operations will not create a change in the demographic profile of the local community. Community health may be exposed to factors such as communicable disease like HIV/AIDS and alcoholism/drug abuse, associated with uneducated financial expenditure. An increase in foreign people in the area (potential job seekers) may potentially increase the risk of criminal and socially/culturally deviant behaviour. However. Henning Crusher is not the only employer in the area and therefore potential impacts on the demographic profile, is largely cumulative. The facility has experienced criminal activities on site and have adopted measures to discourage such activities.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Exposure to social ills related to uneducated financial expenditure or criminal intent.	2	-1	1	1	2	-8	-1	Probable
Daily Operations	Exposure to social ills related to uneducated financial expenditure or criminal intent	2	-1	1	2	2	-10	-2	Probable
Indirect Impacts	The spread of disease, increase of criminal and deviant social and destructive behaviour.	2	-1	2	2	2	-12	-2	Probable

Desired Outcome: To prevent the spread of communicable disease and prevent / discourage socially deviant or criminal behaviour.

Actions:

Prevention:

- Employ local people, deviations from this practice should be justified appropriately.
- Adhere to all municipal by-laws relating to environmental health.
- Prohibit substances abuse on the site.
- Adopt an open-door policy to reporting of socially deviant or destructive behaviour related to employment duties.
- Provide a safe protocol for the report or whistle-blowing of criminal activities.
- Implement a reward system for excellence in conduct and employment.

Mitigation:

- Educational programmes for employees on HIV/AIDs and general upliftment of employees' social status.
- Appointment of reputable contractors.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Facility inspection sheets, for kitchen, toilets and showers, or any area which may present environmental health risks, kept on file.
- Bi-annual summary report based on educational programmes and training conducted.
- Bi-annual report and review of employee demographics.
- Records kept of all socially deviant, destructive or criminal reports received.

10.5.6 Traffic

No increase in traffic to the and from the site is foreseen for the immediate future of operations. The majority of material moved to and from site is transported via road. Access points onto the site from Namutoni Road (D3007 road) have been suitably strengthened to accommodate the current traffic load. There still however remain risks associated with the transport of commodities to and from the site. These risks include collision and incident risks (such as break-downs) and traffic pile-ups.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Increase traffic, road wear and tear and accidents/incidents	2	-1	2	2	2	-12	-2	Probable
Daily Operations	Risk to accidents/incidents due material transportation	2	-1	2	2	2	-12	-2	Probable

Desired Outcome: Minimum impact on traffic and no transport or traffic related incidents.

Actions

Prevention:

- Erect clear signage for access points to the site and where heavy motor vehicles may be turning.
- Maintain access points according to the requirements of the Roads Authority / Municipal Authority.
- Ensure trucks are identifiable and the company details visible.
- All contractors or employees driving heavy motor vehicles, should have appropriate training and qualifications to operate such vehicles.
- All vehicles to be roadworthy and appropriately licensed.
- All loads of material to be covered.

Mitigation:

- If any traffic impacts are expected, traffic management should be performed to prevent these.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Any complaints received regarding traffic issues should be recorded together with action taken to prevent impacts from repeating itself.
- A report should be compiled every 6 months of all incidents reported, complaints received, and action taken.

10.5.7 Health, Safety and Security

Every activity associated with operations is reliant on human labour and therefore exposes them to health and safety risks. Activities such as the operation of machinery and handling of the material, poses risks to employees. Employees will be exposed to elevated levels of dust and noise. In addition activities conducted on site, such as fuel burning, creates hazardous areas which pose safety risks to employees. Security risks are related to unauthorized entry, theft and sabotage. Hydrocarbons have known carcinogenic properties. Unprotected and unsafe handling of fuel and chemicals exposes employees to such elements. Dust from the site is not considered to pose a health or safety risk to surrounding communities. Emissions released from the dryer may however contribute to the air quality of the site. No complaints with regards to emissions have been recorded or reported to the proponent in the last 20 years.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Physical injuries, exposure to dust, hydrocarbons and criminal activities	1	-2	3	3	1	-14	-2	Possible
Daily Operations	Physical injuries, exposure to dust, hydrocarbons and criminal activities	1	-2	3	3	1	-14	-2	Possible

Desired Outcome: To prevent injury, health impacts and theft.

Actions

Prevention:

- Clearly label dangerous and restricted areas as well as dangerous equipment and products.
- Implement a hazardous dust inspection, testing, housekeeping, and control program.
- Use proper dust collection systems and filters.
- Equipment must be locked away on site and placed in a way that does not encourage criminal activities (e.g. theft).
- Provide all employees with required and adequate personal protective equipment (PPE) as well as training on their use.
- All health and safety standards specified in the Labour Act should be complied with.
- Implementation of a maintenance register for all equipment and hazardous substance storage areas.
- Provide information and training (in a language and vocabulary the worker understands) about workplace hazards, methods to prevent them, and the safety standards that apply to their workplace.

Mitigation:

- Selected personnel should be trained in first aid and a first aid kit must be available on site. The contact details of all emergency services must be readily available.
- Implement and maintain an integrated health and safety management system, to act as a monitoring and mitigating tool, which includes: colour coding of pipes, operational, safe work and medical procedures, permits to work, emergency response plans, housekeeping rules, MSDS's and signage requirements (PPE, flammable etc.).
- Strict security that prevents unauthorised entry.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Any incidents must be recorded with action taken to prevent future occurrences.
- All to be educated in safety hazards around the site.
- Reports of safety inspections of the operating areas as well as machinery to be kept on file.

10.5.8 Fire

Construction and operational activities may increase the risk of the occurrence of fires. Operation of the dryer, mechanical, fuel and electrical machinery increases the risk of fire on site. Operational areas are devoid of most combustible material while operating machines are removed from each other, thereby reducing the spread of potential fire which may occur. Similarly operational activities and the dryer, are located away from electrical powerlines which provide electricity to the site,

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Fire risk	1	-1	2	2	1	-5	-1	Probable
Daily Operations	Fire risk	1	-1	2	2	1	-5	-1	Probable

Desired Outcome: To prevent property damage, possible injury and impacts caused by explosions or uncontrolled fires.

Actions:

Prevention:

- Ensure all chemicals, lubricants and flammable agents are stored according to MSDS instructions.
- Maintain regular site, mechanical and electrical inspections and maintenance.
- Fire-fighting training to be provided to staff.
- Use appropriate electrical equipment and wiring methods.
- Control smoking (designated smoking areas), open flames, and sparks.
- Control mechanical sparks and friction and ensure mechanical parts are maintained and efficiently lubricated.
- Use separator devices to remove foreign materials capable of igniting combustibles from process materials.

Mitigation:

- A holistic fire protection and prevention plan is needed. This plan must include an emergency response plan and firefighting plan.
- Maintain firefighting equipment, good housekeeping and personnel training (firefighting, fire prevention and responsible housekeeping practices).

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A register of all incidents must be maintained. This should include measures taken to ensure that such incidents do not repeat themselves.
- A report should be compiled every 6 months of all incidents reported. The report should contain dates when fire drills were conducted and when fire equipment was tested and training given.

10.5.9 Air Quality

During construction and operations, dust is generated through a variety of activities. Movement of material and products, travelling of vehicles and machines are some of the main dust generating activities. Dust may impair visibility along roads, pose health risks due to inhalation of suspended particulate matter, or inhibit vegetation health through settling on vegetation. Movement of materials and generation of dust may kick-up the local smelter contamination fall-out. Greenhouse gas emissions are related to the dryer and vehicles on site. Dryers are the principal emitters of air pollutants and of key concern are the "exhaust" gases: nitrous oxides, sulphurous oxides, hydrocarbons, carbon monoxide, carbon dioxide, and particulate matter, which are all considered to be significant sources of air pollution. Gases emitted contribute to the greenhouse effect. Vapours may also be released into the air during refilling of the storage tank. The prevailing easterly winds will mainly carry pollution (emissions and dust) west of the facility. No sensitive neighbours (receptor) are located down-wind from facility. Dust carried onto the site may however be polluted by materials such as arsenic and cadmium. Such pollution may impact the products manufactured on site as well as employee health. Monitoring should be conducted to accurately determine the dust and soil pollution (as per outside sources) on site.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Excessive dust generated from construction activities	2	-1	2	2	1	-10	-2	Definite
Daily Operations	Emission of gasses and vapours	2	-1	2	2	2	-12	-2	Definite

Desired Outcome: To prevent health impacts and minimise dust generation.

Actions

Mitigation:

- Personnel issued with appropriate masks where excessive dust or vapours are present.
- A complaints register should be kept for any dust related issues and mitigation steps taken to address complaints where necessary e.g. dust suppression.
- Employees should be coached on the dangers of hydrocarbon vapours and contaminated dust.
- Regular maintenance of the dryer systems should be conducted, to ensure that emissions do not become excessive.
- Develop an air quality management plan and make the necessary adjustments to the dryer to reduce emissions if required.
- Silos and buildings should be fitted with dust collection systems and filters where excessive dust is generated.
- Scrubbers or ceramic filters should be considered to minimise emissions from the dryer.
- Increasing stack height may further cause dilution of emissions as an alternative.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Any complaints received regarding dust should be recorded with notes on action taken.
- If complains are received, on site dust monitoring to be conducted. Monitoring to include a comparative analysis of dust bucket content on the eastern and western boundaries.
- Air quality management plant to be implemented.
- All information and reporting to be included in a bi-annual report.

10.5.10 Noise

Increased noise levels related to the brickfield may present a nuisance to affected and adjacent receptors. Such noise may be contrary to the existing character of some of the surrounding properties and disturb wildlife. Noise generated will mainly be as a result of operating heavy vehicles and equipment. The majority of the neighbouring development is however of agricultural and industrial to light industrial nature, thus noise generated from the brickfield is not expected to negatively impact on these receptors.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Excessive noise generated from construction/maintenance activities	2	-1	2	2	1	-10	-2	Probable
Daily Operations	Noise generated from the operational activities	2	-1	2	2	1	-10	-2	Definite

Desired Outcome: To prevent any nuisance and hearing loss due to noise generated.

Actions

Prevention:

- Follow World Health Organization (WHO) guidelines on maximum noise levels (Guidelines for Community Noise, 1999) to prevent hearing impairment.
- All machinery must be regularly serviced to ensure minimal noise generation.
- Noise level measurements should be performed to determine the most pertinent noise generators. Appropriate PPE should be provided to all employees in close proximity to such noise generators.

Mitigation:

- Hearing protectors as standard PPE for workers in situations with elevated noise levels.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- WHO Guidelines.
- Maintain a complaints register.
- Bi-annual report on complaints and actions taken to address complaints and prevent future occurrences.

10.5.11 Waste Production

Various waste streams are produced during the construction and operational phase. Waste presents a contamination risk and when not removed regularly may become a fire and/or health hazard. Waste water, rubble and any other waste products not being contained may be washed from the site during rainfall events. All domestic waste is removed from the project area by the proponent. Similarly all hazardous waste such as oily rags and waste oil are also removed from the site by the proponent on a weekly bases. Sewage and grey water from the ablution facility is disposed of in to a French drain.

Waste produced though the brickfield operations will mainly be discarded building material (poor quality bricks etc.) and will be reused / recycled where possible.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Waste production, littering, illegal dumping, contaminated materials	1	-2	2	2	2	-12	-2	Definite
Daily Operations	Waste production, littering, contaminated materials	1	-2	2	2	2	-12	-2	Definite

Desired Outcome: To reduce the amount of waste produced, and prevent contamination, pollution and littering.

Actions

Prevention:

- Waste reduction measures should be implemented and all waste that can be re-used / recycled must be kept separate.
- Ensure adequate disposal and storage facilities are available.
- Waste collection points to be clearly demarcated and maintained.
- Hazardous waste storage collection points (such as for old oil, rags, etc.) should be on an impermeable layer.
- Ensure waste cannot be blown away by wind.
- Prevent scavenging (human and non-human) of waste.

Mitigation:

- Solid waste should be disposed of regularly and at appropriately classified disposal facilities, this includes hazardous material (empty chemical containers, contaminated rugs, paper water and soil).
- See the material safety data sheets available from suppliers for disposal of contaminated products and empty containers.
- Liaise with the municipality regarding waste and handling of hazardous waste where required.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A register of hazardous waste disposal should be kept. This should include type of waste, volume as well as disposal method/facility.
- Any complaints received regarding waste should be recorded with notes on action taken.
- All information and reporting to be included in a bi-annual report.

10.5.12 Ecosystem and Biodiversity Impact

The site has been operational for 40 years, and is void of most natural vegetation, with a few large trees remaining on the site, which has been incorporated into the design of the facility. The nature of the operational activities is such that the probability of creating a habitat for flora and fauna to establish is low. Impacts on the ecosystem and biodiversity is thus mostly related to pollution of the natural environment.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Impact on fauna and flora. Loss of biodiversity and habitat	2	-1	2	2	2	-12	-2	Improbable
Daily Operations	Impact on fauna and flora. Loss of biodiversity	2	-1	2	2	2	-12	-2	Improbable

Desired Outcome: To avoid pollution of the ecological environment and additional impacts there on.

Actions.

Mitigation:

- Mitigation measures related to waste handling and the prevention of groundwater, surface water and soil contamination should be adopted.
- Avoid scavenging of waste by fauna.
- The establishment of habitats (by primary and invader species) at the site should be prevented. Regular clearing of invader species should be conducted to prevent spread of such species across the site and onto neighbouring properties.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Invader species eradication to be reported on.
- All information and reporting to be included in a bi-annual report.

10.5.13 Groundwater, Surface Water and Soil Contamination

During construction and operations, heavy machinery may present a contamination risk to the soil, surface water and groundwater through fuel and oil spillages. Operations will further entail the storage and handling of hydrocarbons (such as fuels, lubricants and hydraulic oils) which present a contamination risk. Contamination may either result from failing storage facilities, incorrect handling procedures or spills and leaks associated with handling.

The consumer fuel installation is located in close proximity to one of the supply boreholes of the facility. As a result, failure to contain large spills from the diesel storage tank may result in direct contamination of groundwater via the borehole, if the correct safety procedures are not in place at both the consumer fuel installation and the borehole.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Contamination from hazardous material spillages and hydrocarbon pollution	2	-1	2	2	1	-10	-2	Improbable
Daily Operations	Contamination from hazardous material spillages and hydrocarbon pollution	2	-2	2	2	1	-20	-3	Improbable

Desired Outcome: To prevent the contamination of water and soil.

Actions

Prevention:

- Servicing or maintenance of machines to be conducted within dedicated areas with spill proof surface cover and grease traps to prevent any hydrocarbons or contaminated wash water to enter the environment.
- Polluted soil must be transported from the site to an approved and appropriately classified hazardous waste disposal site or treated on site through appropriate means.
- The procedures followed to prevent environmental damage during service and maintenance, and compliance with these procedures, must be audited and corrections made where necessary.
- Spill control structures and procedures must be in place according to SANS standards or better for the consumer fuel installation.
- All fuelling should be conducted on surfaces provided for this purpose. E.g. Concrete slabs with regularly maintained seals between slabs.
- Proper training of employees must be conducted on a regular basis.
- Maintain sewerage systems and conduct regular monitoring.

Mitigation:

- All spills or any contamination to be cleaned immediately to prevent contamination of groundwater resources.
- Any fuel spillage of more than 200 litre must be reported to the Ministry of Mines and Energy.
- Spill catchment traps should be in place and cleaned regularly, if contaminated, waste should be disposed of at a suitably classified hazardous waste disposal facility.
- Consult relevant MSDS information and a suitably qualified specialist where needed.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Maintain MSDS for hazardous chemicals.
- Sample and analyse groundwater annually to test for contamination (e.g. for sewage and hydrocarbon contamination).
- A report should be compiled bi-annually of all spills or leakages reported. The report should contain the following information: date and duration of spill, product spilled, volume of spill, remedial action taken, comparison of pre-exposure baseline data (previous pollution conditions survey results) with post remediation data (e.g. soil/groundwater concentrations) and a copy of documentation in which spill was reported to Ministry of Mines and Energy.

10.5.14 Visual Impact

This is an impact that not only affects the aesthetic appearance, but also the integrity of the facility. The facility has been operational at the site for 40 years, and is in an area with multiple industrial facilities. Visual impacts will thus mostly be related to maintenance of the facility. Poor maintenance will negatively impact on both the aesthetic appearance as well as the integrity of the facility.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Construction	Aesthetic appearance and integrity of the site	1	-1	2	2	2	-6	-1	Probable
Daily Operations	Aesthetic appearance and integrity of the site	1	-1	3	3	1	-8	-1	Probable

Desired Outcome: To minimise aesthetic impacts associated with the facility.

Actions

Mitigation:

- Regular waste disposal, good housekeeping and routine maintenance on infrastructure will ensure that the longevity of structures are maximised and a low visual impact is maintained.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A report should be compiled every 6 months of all complaints received related to aesthetic appearance of the site.

10.5.15 Cumulative Impact

Cumulative impacts are those potential impacts which in itself may not be considered significant, however when considered as a collective may be significant. Possible cumulative impacts associated with the operational phase include increased traffic in the area and along gravel roads, and potential groundwater contamination. Positive cumulative impacts include value addition and employment.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Daily Operations	The build-up of minor impacts to become more significant	2	-2	2	2	2	-24	-3	Probable

Desired Outcome: To minimise all negative cumulative impacts associated with the facility and enhance positive impacts.

Actions

Mitigation:

- Addressing each of the individual impacts as discussed and recommended in the EMP would reduce the negative and enhance the positive cumulative impact.
- Reviewing biannual reports for any new or re-occurring impacts or problems would aid in identifying cumulative impacts. Planning and improvement of the existing mitigation measures can then be implemented.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Create a summary report based on all other impacts to give an overall assessment of the impacts of the operational phase.

10.6 ENVIRONMENTAL MANAGEMENT SYSTEM

The proponent could implement an Environmental Management System (EMS) for their operations. An EMS is an internationally recognized and certified management system that will ensure ongoing incorporation of environmental constraints. At the heart of an EMS is the concept of continual improvement of environmental performance with resulting increases in operational efficiency, financial savings and reduction in environmental, health and safety risks. An effective EMS would need to include the following elements:

- A stated environmental policy which sets the desired level of environmental performance;
- An environmental legal register;
- An institutional structure which sets out the responsibility, authority, lines of communication and resources needed to implement the EMS;
- Identification of environmental, safety and health training needs;
- An environmental program(s) stipulating environmental objectives and targets to be met, and work instructions and controls to be applied in order to achieve compliance with the environmental policy; and
- Periodic (internal and external) audits and reviews of environmental performance and the effectiveness of the EMS.
- The Environmental Management Plan.

11 CONCLUSION

The operations of the brickfield of Henning Crusher play a positive economic role in the Oshikoto Region due to the provision of commodities, sustained employments and revenue generation. The use of the natural resources for the production of construction material ensures value addition and a reliable supply of material to the building industry.

The environmental classification of impacts, as assessed, is summarised in Table 11-1.

Table 11-1. Impact summary class values

Impact Category	Impact Type	Construction	Operations
	Positive Rating Scale: Maximum Value	5	5
	Negative Rating Scale: Maximum Value	-5	-5
EO	Developing Project Feasibility & Permitting (Planning Phase)		
EO	Plans and Aspirations for the Future		
EO	Skills, Technology and Development		
EO	Change in Land Use and Earning Potential		
SC	Revenue Generation and Employment		
EO	Building Material Supply		
EO	Demographic Profile and Community Health		
SC	Traffic		
SC	Health, Safety and Security		
PC	Fire		
PC	Air Quality		
SC	Noise		
PC	Waste Production		
BE	Ecosystem and Biodiversity Impact		
PC	Groundwater, Surface Water and Soil Contamination		
SC	Visual Impact		

Negative impacts associated with the facility can be successfully mitigated by adherence to monitoring and control methods. All permits and approvals must be obtained from relevant ministries or authorities for the operations of the facility. SANS standards relating to the petroleum industry and prescribed by Namibian law must be followed during all operations of the consumer fuel installation. Pollution prevention measures should be adequate to prevent incidents that may potentially pollute groundwater and surface water. Fire prevention should be adequate, and health and safety regulations should be adhered to in accordance with the regulations pertaining to relevant laws and internationally accepted standards of operation.

The environmental management plan should be used as an on-site reference document during all phases of the operations. Parties responsible for transgression of the EMP should be held responsible for any rehabilitation that may need to be undertaken.

Should the Directorate of Environmental Affairs (DEA) of the MET find that the impacts and related mitigation measures, which have been proposed in this report, are acceptable, an environmental clearance certificate may be granted to the proponent. The environmental clearance certificate issued, based on this document, will render it a legally binding document which should be adhered to. Focus should be placed on Section 0, which includes an EMP for this project. It should be noted that the assessment process's aim is not to stop the activity, or any of its components, but to rather determine its impact and guide sustainable and responsible development as per the spirit of the EMA.

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Appendix A: Public Consultation

TEL.: (+264-61) 257411 ♦ FAX.: (+264) 88626368
CELL.: (+264-81) 1220082
PO BOX 11073 ♦ WINDHOEK ♦ NAMIBIA
E-MAIL: gpt@thenamib.com

To: **Interested and Affected Parties** **24 June 2019**

Re: **Environmental Impact Scoping Assessment and Environmental Management Plan for Sand mining, quarrying, crushing and proposed irrigation activities on Portion 23 (Steinquelle) of Consolidated Farm Tsumore No 761 in the Oshikoto Region**

Dear Sir/Madam

Geo Pollution Technologies (Pty) Ltd was appointed by Henning Crusher (Pty) Ltd to undertake an environmental assessment for the irrigation, mining and associated activities on Portion 23 (Steinquelle) of Consolidated Farm Tsumore No 761. The assessment will be conducted according to the Environmental Management Act of 2007 and its regulations as published in 2012.

Project: Sand mining, quarrying, crushing and proposed irrigation activities on Portion 23 (Steinquelle) of Consolidated Farm Tsumore No 761 in the Oshikoto Region

Proponent: Keyser Henning Crusher (Pty) Ltd

Environmental Assessment Practitioner: Geo Pollution Technologies (Pty) Ltd

Sand and dolomite resources are mined where after the material is transported to an on-site crusher and processing facility. Once processed, material is loaded onto an existing rail system for transportation. Mining will be conducted over approximately 110 ha of the farm while proposed irrigation (pivot system) activities are planned for the central portion of the property.

All Interested and Affected Parties (I&APs) are invited to register with the environmental consultant to receive further documentation and communication regarding the project. By registering, I&APs will be provided with an opportunity to provide input that will be considered in the drafting of the environmental assessment report and management plan.

Please register as an I&AP and provide comments by **08 July 2019**.

To register, please contact:

Fax: 088-62-6368

E-Mail: hcrusher@thenamib.com

Should you require any additional information please contact Geo Pollution Technologies at telephone 061-257411.

Thank you in advance.

Sincerely,
Geo Pollution Technologies

TSUMEB MUNICIPALITY
Administration Office
Date: 2019 -06- 27
Ref.
RECEIVED

Quzette Bosman
Social and Environmental Assessment Practitioner

Public Participation Notification: Environmental Assessment Sand mining, Quarrying, Crushing and Proposed Irrigation Activities on Portion 23 (Steinquelle) of Consolidated Farm Tsumore No 761

Name & Surname	Organisation	Tel / Mobile	Email	Signature
W. Bosch	Farmhouse Deli	Privacy Block		
LMJ Nel	Plaas Skaduwee			
WJ van Greunen	Plaas Skaduwee			
Hillary Kasete	Tsumeb Municipality			
Gustave Heins	Gedeelte 52, Tsumore			Verbal & telephonic acknowledgment

Interested and Affected Parties

Name & Surname	Organisation
Notified & Registered Authorities	
U Hofman	Tsumeb Boere Vereeniging
Municipality Of Tsumeb	Tsumore FMB/00761/00006
E De Paauw	Roads Authority
Notified & Registered IAP	
L Nel	Farm Tsumore (Skaduwee)
Goal maize CC	Erf 1216 Namutoni Rd
Tosas Pty (Ltd)	Erf 1219 and 1220, Namutoni Rd
J Mentz	Tsumore FMB/00761/00REM
Gabriel Uugwanga	Farm Tsumore 761 Portion 28

Advertisements

2 NUUS

Republikein

Maandag 24 Junie 2019

PUBLIC PARTICIPATION NOTICE ENVIRONMENTAL ASSESSMENT FOR SAND MINING, QUARRYING, CRUSHING AND PROPOSED IRRIGATION ON PORTION 23 (STEINQUELLE) OF CONSOLIDATED FARM TSUMORE NO 761, OSHIKOTO REGION

Henning Crusher (Pty) Ltd intends to apply for an Environmental Clearance Certificate (ECC) for sand mining, quarrying, crushing and proposed irrigation activities on Portion 23 (Steinquelle) of Consolidated Farm Tsumore No 761 in the Oshikoto Region. Geo Pollution Technologies (Pty) Ltd was requested to undertake an Environmental Assessment for the activities and draft a related Environmental Management Plan (EMP). The Environmental Assessment and EMP will be submitted to the Ministry of Environment and Tourism as per the Environmental Management Act of 2007 in support of the ECC application.

Sand and dolomite resources are mined where after the material is transported to an on-site crusher and processing facility. Once processed, material is loaded onto an existing rail system for transportation. Mining will be conducted over approximately 110 ha of the farm while proposed irrigation (pivot system) activities are planned for the central portion of the property. For a location map please visit http://www.thenamib.com/projects/ or contact Geo Pollution Technologies directly.

All Interested and Affected Parties are invited to register with the environmental consultant to receive further documentation and communication regarding the ECC application. Reports for review and comment periods will be communicated to all registered parties.

Quzette Bosman
Geo Pollution Technologies (Pty) Ltd
Telephone: +264-61-257411
Fax: +264-88626368
E-Mail: hcrusher@thenamib.com

Speke sing kuslangs vir bemagtiging

VAN BL. 1

Leeming word as een van Australië se voorste vroue-ontdekkingsreisigers beskou en het al 'n afstand langer as twee keer om die wêreld by die ewenaar per fiets afgelê.

Haar laaste twee reuse-ekspedisies van 25 000 km deur Australië en 22 000 km deur Afrika, van Senegal tot Somalië, was deel van die Verenigde Nasies (VN) se bewusmakingsveldtog vir onderwys vir volhoubare ontwikkeling.

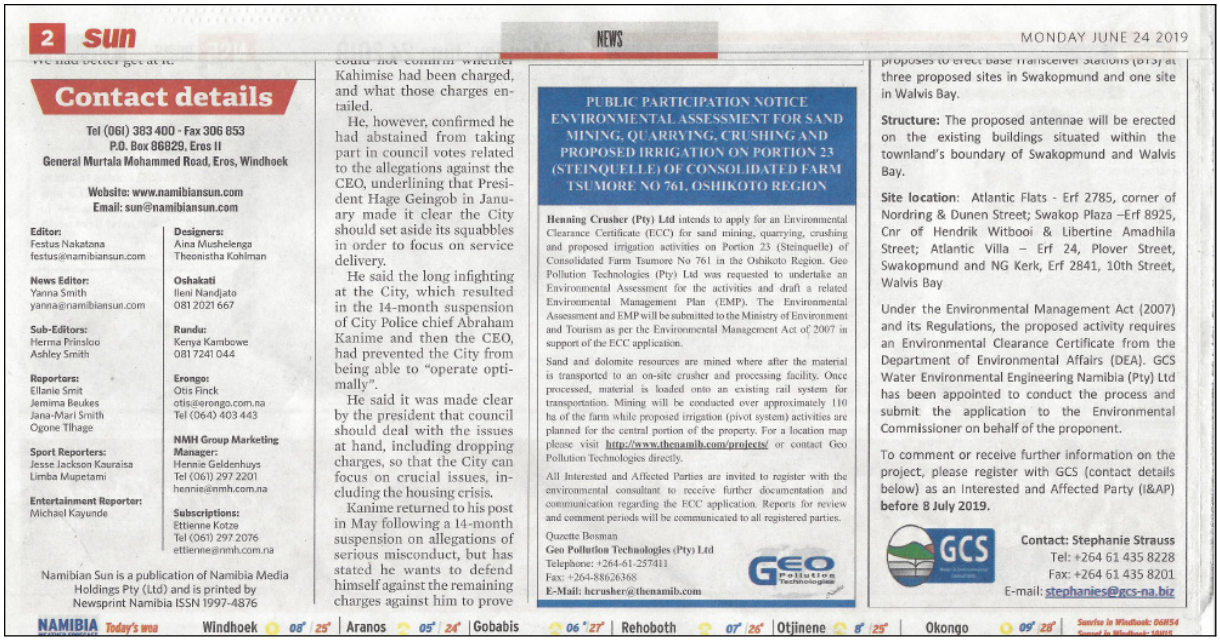
Leeming is met 'n eredoktorsgraad in onderwys van die Universiteit van Wes-Australië vereer vir uitstaande diens ten bate van onderwys.

Die doel van haar suksesvolle 2010-ekspedisie, Breaking the Cycle in Africa, was om die oorsake en gevolge van uiterste armoede te ondersoek en hoe om gemeenskappe te bemagtig.

"Tydens die reis deur 20 lande het ek 15 verskillende projekte besoek wat deur 10 ekspedisievennote bestuur word. In September sal ek die tweede deel van die projek aanpak.

"Dit behels 'n humanitêre ekspedisie waardeur ek 'n sonenergiestelsel sal laat aanbring om lig en uiteindelik toegang tot beter onderwys en ekonomiese bemagtiging vir Purros in die Noordweste moontlik te maak," sê sy.

Namdeb het 'n spesiale permit aan Leeming toegestaan wat haar toegelaat het om van Lüderitz af kuslangs deur die Sperrgebiet na Oranjemund te ry, sodat sy haar reis al langs die Namibiese kus kon voltooi.



2 sun

NEWS

MONDAY JUNE 24 2019

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could not confirm whether Kahimise had been charged, and what those charges entailed.

He, however, confirmed he had abstained from taking part in council votes related to the allegations against the CEO, underlining that President Hage Geingob in January made it clear the City should set aside its squabbles in order to focus on service delivery.

He said the long infighting at the City, which resulted in the 14-month suspension of City Police chief Abraham Kanime and then the CEO, had prevented the City from being able to "operate optimally".

He said it was made clear by the president that council should deal with the issues at hand, including dropping charges, so that the City can focus on crucial issues, including the housing crisis.

Kanime returned to his post in May following a 14-month suspension on allegations of serious misconduct, but has stated he wants to defend himself against the remaining charges against him to prove

PUBLIC PARTICIPATION NOTICE ENVIRONMENTAL ASSESSMENT FOR SAND MINING, QUARRYING, CRUSHING AND PROPOSED IRRIGATION ON PORTION 23 (STEINQUELLE) OF CONSOLIDATED FARM TSUMORE NO 761, OSHIKOTO REGION

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Sand and dolomite resources are mined where after the material is transported to an on-site crusher and processing facility. Once processed, material is loaded onto an existing rail system for transportation. Mining will be conducted over approximately 110 ha of the farm while proposed irrigation (pivot system) activities are planned for the central portion of the property. For a location map please visit http://www.thenamib.com/projects/ or contact Geo Pollution Technologies directly.

All Interested and Affected Parties are invited to register with the environmental consultant to receive further documentation and communication regarding the ECC application. Reports for review and comment periods will be communicated to all registered parties.

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proposes to erect base transceiver stations (BTS) at three proposed sites in Swakopmund and one site in Walvis Bay.

Structure: The proposed antennae will be erected on the existing buildings situated within the townland's boundary of Swakopmund and Walvis Bay.

Site location: Atlantic Flats - Erf 2785, corner of Nordring & Dunen Street; Swakop Plaza –Erf 8925, Cnr of Hendrik Witbooi & Libertine Amadhila Street; Atlantic Villa – Erf 24, Plover Street, Swakopmund and NG Kerk, Erf 2841, 10th Street, Walvis Bay

Under the Environmental Management Act (2007) and its Regulations, the proposed activity requires an Environmental Clearance Certificate from the Department of Environmental Affairs (DEA). GCS Water Environmental Engineering Namibia (Pty) Ltd has been appointed to conduct the process and submit the application to the Environmental Commissioner on behalf of the proponent.

To comment or receive further information on the project, please register with GCS (contact details below) as an Interested and Affected Party (I&AP) **before 8 July 2019.**

Contact: Stephanie Strauss
Tel: +264 61 435 8228
Fax: +264 61 435 8201
E-mail: stephanies@gcs-na.biz

NAMIBIA Today's weather: Windhoek 08°/25° | Aranos 05°/24° | Gobabis 06°/27° | Rehoboth 07°/26° | Otjinene 8°/25° | Okongo 09°/28°

PUBLIC PARTICIPATION NOTICE ENVIRONMENTAL ASSESSMENT FOR IRRIGATION ACTIVTIES ON FARM GUINAS-SEE 455, OTJOZONDJUPA REGION

Henning Crusher (Pty) Ltd intends to apply for an Environmental Clearance Certificate (ECC) for irrigation activities on Farm Guinas-See 455 in the Otjozondjupa Region. Geo Pollution Technologies (Pty) Ltd was requested to undertake an Environmental Assessment for the activities and draft a related Environmental Management Plan (EMP). The Environmental Assessment and EMP will be submitted to the Ministry of Environment and Tourism as per the Environmental Management Act of 2007 in support of the ECC application.

Henning Crusher irrigates 90 ha on Farm Guinas-See 455. The main produce are maize, lucerne, sorghum, beans and oats (for animal feed). Irrigation is from Lake Guinas, by means of four centre pivot irrigation systems. The environmental assessment will include all operational activities associated with the agricultural activities on the farm.

For a location map please visit http://www.thenamib.com/projects/ or contact Geo Pollution Technologies directly.

All Interested and Affected Parties are invited to register with the environmental consultant to receive further documentation and communication regarding the ECC application. Reports for review and comment periods will be communicated to all registered parties.

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Miljoene betogers het die afgelope drie weke in Hongkong teen dié wetsontwerp, wat vir nou deur die owerhede laat vaar is, betoog. Die betogers wil hê die regering moet die wetsontwerp heeltemal skrap nadat Carrie Lam, Hongkong se leier, aangedui het dat sy bloot die wetsontwerp vir eers "sal bêre".

Die polisie het Maandag pepersproei teen betogers gebruik, terwyl die polisie met stokke op betogers afgestorm het.

Lam het die 22ste herdenking, waar dié voormalige Britse kolonie aan Chinese heerskappy teruggegee is, bygewoon, al dring die betogers aan dat sy bedank.

Sy sê die regering moet sy manier van doen verander en meer tegemoetkomend en oop wees om sodoende meer vir die jong mense te kan doen.

Lam sê die voorvalle die afgelope maande het tot spanning tussen die publiek en regering gelei, maar sy sê sy het ook tot die besef gekom dat die regering die publiek se sentiment beter moet probeer verstaan.

Die herdenking is die afgelope jare gekenmerk deur toenemende wanhoop oor wat baie inwoners van Hongkong sien as China se groeiende houvas op hulle.

- Netwerk24/Reuters

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Henning Crusher irrigates 90 ha on Farm Guinas-See 455. The main produce are maize, lucerne, sorghum, beans and oats (for animal feed). Irrigation is from Lake Guinas, by means of four centre pivot irrigation systems. The environmental assessment will include all operational activities associated with the agricultural activities on the farm.

For a location map please visit http://www.thenamib.com/projects/ or contact Geo Pollution Technologies directly.

All Interested and Affected Parties are invited to register with the environmental consultant to receive further documentation and communication regarding the ECC application. Reports for review and comment periods will be communicated to all registered parties.

Quzette Bosman
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nayi."

Oomwedhi ndatu dha piti ngashiingeyi konima sho omunambelewa melelo lyuuministeli wuunamapya, Percy Misika a lombwele oshifokundaneki shoNamibian Sun kutya emanitho lyokatomeno hoka oli

Sho a pulwa kutya osha ende ngiini oshimaliwa shi londe pombanda noomiliyona 13, Amushila okwa popi kutya ina pyakudhukwa okupopya kombinga yomatompelo.

Uuna ka tameke okulonga okatomeno hoka otaka ka vulu okutomion (KERFU) Adolf Muremi, ope na oongombe dhi li po 900 dhoka dhategelelwa okutomwa mokatomeno hoka kopakathimbo.

Muremi okwa kala uule woomvula odhindji ta pula opo okatomeno hoka ka manithwe.

TAKA TUNGWA NATANGO: Okatomeno kaRundu ina ka pwa natango okutungwa. OMATHANO: KENYA KAMBOWE

MONKALO OMBWAANAWA: Aanafaalama yiimuna miitopolwa yaKavango oya hala okatomeno kaRundu ka manithwe meendelelo.

Appendix B: Existing Authorisations

MINISTRY OF MINES AND ENERGY

PETROLEUM PRODUCTS AND ENERGY ACT, 1990
PETROLEUM PRODUCTS REGULATIONS (2000)

CONSUMER INSTALLATION CERTIFICATE

[Regulation 18 (5)]

CONSUMER INSTALLATION CERTIFICATE	PERMANENT* X	PETROL*	Certificate No.
	TEMPORARY*	DIESEL* X	CI/894/2001
Name of certificate-holder	Henning Crushers (Pty) Ltd		
Address of certificate-holder	Physical address	Postal address	
	Namutoni Road Tsumeb	Box 184 Tsumeb	
Nature of activity to which certificate relates*	Commercial/ Industrial Undertaking X	Farming Operation	Mining Operation
If storage tank is to be permanently installed, location of site	Namutoni Road Tsumeb		
Conditions applicable to Certificate *See next page for general and special conditions applicable to licence.*			
Date of issue of certificate	11 April 2001		
In the case of a temporary licence, period of validity	N/A		
Issued by the Minister of Mines and Energy in terms of regulation 18(5), on 11 April 2001 at Windhoek ..... Minister: Mines and Energy			

Official Stamp (for office use)

* *Mark the appropriate item*

Namprint: 861-220095

Appendix C: Curriculum Vitae of Environmental Practitioners

Hydrogeologist **Pierre Botha**

Pierre Botha is the Managing Director of Geo Pollution Technologies, Namibia. Mr. Botha has excellent experience and knowledge in Environmental Impact Assessments, groundwater pollution assessment, groundwater exploration, resource evaluation, urban and rural water supply, groundwater management, monitoring and hydrochemistry. He gained most of his experience in Namibia and is involved in the Namibian groundwater industry since 1992.

Mr Botha's experience in the environmental / groundwater field has been gained from various projects ranging from groundwater exploration, groundwater management and modelling, environmental impact assessments, pollution mapping and rehabilitation to health risk evaluations.

CURRICULUM VITAE PIERRE BOTHA

Name of Firm	:	Geo Pollution Technologies (Pty) Ltd.
Name of Staff	:	PIERRE BOTHA
Profession	:	Hydrogeologist / Hydrologist Environmental Assessment Practitioner
Years' Experience	:	27
Nationality	:	Namibian
Position	:	Managing Director
Specialisation	:	Hydrogeology
Languages	:	Afrikaans – speaking, reading, writing – excellent English – speaking, reading, writing – excellent

EDUCATION AND PROFESSIONAL STATUS:

B.Sc. Geology & Geography	:	University of OFS, 1992
B.Sc. (Hons.)(*cum laude*) Geohydrology/Hydrology	:	University of OFS, 1994

First Aid Class A	EMTSS, 2017
Basic Fire Fighting	EMTSS, 2017

PROFESSIONAL SOCIETY AFFILIATION:

Environmental Assessment Professionals of Namibia (EAPAN) – *President 2014 - Vice President 2012, 2013*
Hydrogeological Association of Namibia (HAN)
Geological Association of Namibia

AREAS OF EXPERTISE:

Knowledge and expertise in:

- risk based corrective action analyses
- bioremediation
- monitoring, mapping and evaluation of groundwater pollution
- hydrochemistry studies
- environmental impact assessments
- project management
- soil vapour surveys
- groundwater modelling
- groundwater monitoring
- hydrocensus
- hydrogeological data evaluation and interpretation
- groundwater exploration and resource evaluation
- geophysical interpretations (Ground Penetrating Radar, Electrical Resistivity, Electromagnetic & Magnetic)
- urban and rural water supply
- groundwater management
- borehole siting, drilling and test pumping supervision, aquifer testing

EMPLOYMENT:

1998-Date	:	Geo Pollution Technologies (Pty) Ltd
1995	:	Parkman Namibia (Groundwater Consulting Services) - Hydrogeologist
1994	:	Institute for Groundwater Studies, University of the Orange Free State - Hydrogeologist
1992-1993	:	Groundwater Consulting Services - Field Geologist
1988	:	Tsumeb Corporation Ltd - Student geologist

PUBLICATIONS:

Contract reports	: +400
Publications	: 1

ENVIRONMENTAL ASSESSMENT PRACTITIONER **Quzette Bosman**

Quzette Bosman has 11 years' experience in the Impact Assessment Industry, working as an Environmental Assessment Practitioner and Social Assessment practitioner mainly as per the National Environmental Legislation sets for South Africa and Namibia. Larger projects have been completed in terms of World Bank and IFC requirements. She studied Environmental Management at the Rand Afrikaans University (RAU) and University of Johannesburg (UJ), including various Energy Technology Courses. This has fuelled a passion towards the Energy and Mining Industry with various projects being undertaken for these industries. Courses in Sociology has further enabled her to specialize in Social Impact Assessments and Public Participation. Social Assessments are conducted according to international best practise and guidelines. Work has been conducted in South Africa, Swaziland and Namibia.

CURRICULUM VITAE QUZETTE BOSMAN

Name of Firm	:	Geo Pollution Technologies (Pty) Ltd.
Name of Staff	:	QUZETTE BOSMAN
Profession	:	Social Impact Assessor / Environmental Assessment Practitioner
Years' Experience	:	8
Nationality	:	South African
Position	:	Senior Environmental Consultant
Specialisation	:	ESIA & ESMP; SIA
Languages	:	Afrikaans – speaking, reading, writing – excellent English – speaking, reading, writing – excellent

EDUCATION AND PROFESSIONAL STATUS:

BA	Geography & Sociology:	Rand Afrikaans University, 2003
BA	(Hons.) Environmental Management:	University of Johannesburg, 2004

First Aid Class A	EMTSS, 2017
Basic Fire Fighting	EMTSS, 2017

PROFESSIONAL SOCIETY AFFILIATION:

Namibian Environment and Wildlife Society
International Association of Impact Assessors South Africa (IAIA SA): Member 2007 - 2012
Mpumalanga branch Treasurer 2008/2009

OTHER AFFILIATIONS
Mkhondo Catchment Management Forum (DWAF): Chairperson 2008-2010
Mkhondo Water Management Task Team (DWAF): Member 2009

AREAS OF EXPERTISE:

Knowledge and expertise in:

- environmental impact assessments, social impact assessment and social management planning
- project management
- community liaison, social monitoring, public participation / consultation
- social risk management
- water use licensing
- environmental auditing and compliance, environmental monitoring
- strategic environmental planning

EMPLOYMENT:

2015 - Present	:	Geo pollution Technologies – Senior Environmental Practitioner
2014-2015	:	Enviro Dynamics – Senior Environmental Manager
2010 - 2012	:	GCS – Environmental Manager (Mpumalanga Office Manager)
2007 - 2009	:	KSE-uKhozi - Technical Manager: Environmental
2006 -2007	:	SEF – Environmental Manager
2004 - 2005	:	Ecosat – Environmental Manager

PUBLICATIONS:

Contract reports:	+150
Publications:	1

ENVIRONMENTAL SCIENTIST **André Faul**

André entered the environmental assessment profession at the beginning of 2013 and since then has worked on more than 130 Environmental Impact Assessments including assessments of the petroleum industry, harbour expansions, irrigation schemes, township establishment and power generation and transmission. André's post graduate studies focussed on zoological and ecological sciences and he holds a M.Sc. in Conservation Ecology and a Ph.D. in Medical Bioscience. His expertise is in ecotoxicological related studies focussing specifically on endocrine disrupting chemicals. His Ph.D. thesis title was The Assessment of Namibian Water Resources for Endocrine Disruptors. Before joining the environmental assessment profession he worked for 12 years in the Environmental Section of the Department of Biological Sciences at the University of Namibia, first as laboratory technician and then as lecturer in biological and ecological sciences.

CURRICULUM VITAE ANDRÉ FAUL

Name of Firm	:	Geo Pollution Technologies (Pty) Ltd.
Name of Staff	:	ANDRÉ FAUL
Profession	:	Environmental Scientist
Years' Experience	:	18
Nationality	:	Namibian
Position	:	Environmental Scientist
Specialisation	:	Environmental Toxicology
Languages	:	Afrikaans – speaking, reading, writing – excellent
		English – speaking, reading, writing – excellent

EDUCATION AND PROFESSIONAL STATUS:

B.Sc. Zoology	:	University of Stellenbosch, 1999
B.Sc. (Hons.) Zoology	:	University of Stellenbosch, 2000
M.Sc. (Conservation Ecology):		University of Stellenbosch, 2005
Ph.D. (Medical Bioscience)	:	University of the Western Cape, 2018

First Aid Class A	EMTSS, 2017
Basic Fire Fighting	EMTSS, 2017

PROFESSIONAL SOCIETY AFFILIATION:
Environmental Assessment Professionals of Namibia Committee Member)

AREAS OF EXPERTISE:
Knowledge and expertise in:
- Water Sampling, Extractions and Analysis
- Biomonitoring and Bioassays
- Biodiversity Assessment
- Toxicology
- Restoration Ecology

EMPLOYMENT:

2013-Date	:	Geo Pollution Technologies – Environmental Scientist
2005-2012	:	Lecturer, University of Namibia
2001-2004	:	Laboratory Technician, University of Namibia

PUBLICATIONS:

Publications:	5 + 1 in preparation
Contract Reports	+130
Research Reports & Manuals:	5
Conference Presentations:	1