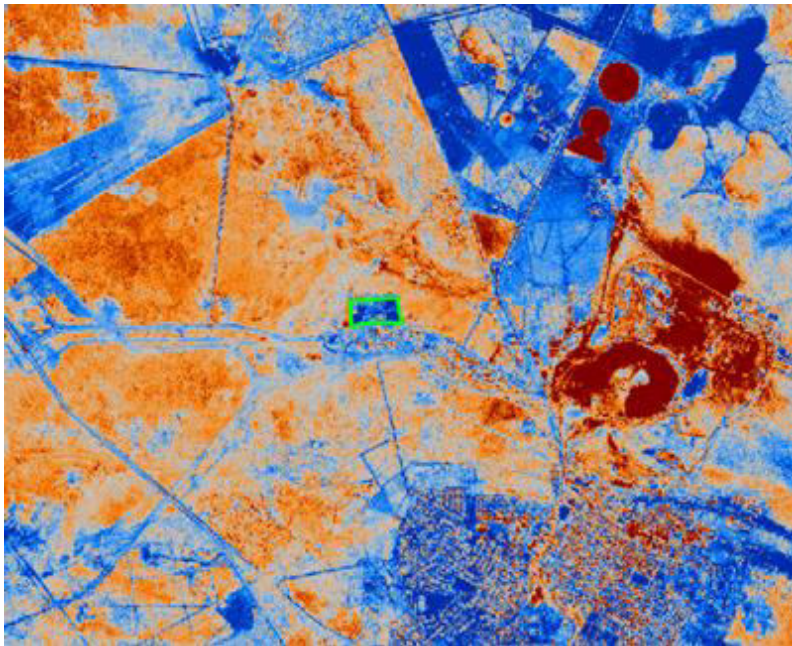


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HENNING CRUSHER BRICKFIELD, OSHIKOTO REGION
UPDATED ENVIRONMENTAL MANAGEMENT PLAN



Prepared by:



Prepared for:

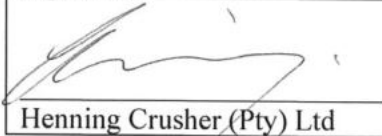
**Henning Crusher
(Pty) Ltd**

August 2023

Project:	HENNING CRUSHER BRICKFIELD, OSHIKOTO REGION: UPDATED ENVIRONMENTAL MANAGEMENT PLAN	
Report Version/Date	Final August 2023	
Prepared for:	Henning Crusher (Pty) Ltd P.O. Box 184 Tsumeb	
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Cite this document as:	Bosman Q, Strauss J. 2023 August; Henning Crusher Brickfield, Oshikoto Region: Updated Environmental Management Plan	
Report Approval		

I Tia 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 4th day of September 2023


Henning Crusher (Pty) Ltd

CY/1980/0035
Company Registration

EXECUTIVE SUMMARY

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 updated environmental management plan (EMP) provides preventative and mitigation measures for all environmental, safety, health and socio-economic impacts associated with the operations of the facility. The document will be used to apply for renewal of the existing environmental clearance certificate (ECC-00879) for the operations of the Henning Crusher Brickfield.

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. 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.

The updated EMP should be used as an on-site reference document during all phases (planning, operations and decommissioning) of the brickfield and should be used in conjunction with a health, safety, environment and quality policy. 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 updated EMP. All monitoring and records kept should be included in a report to ensure compliance with the ECC conditions. Parties responsible for transgression of the EMP should be held responsible for any rehabilitation that may need to be undertaken.

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1 BACKGROUND & INTRODUCTION

Geo Pollution Technologies (Pty) Ltd was appointed by Henning Crusher (Pty) Ltd (the Proponent) to update their environmental management plan (EMP) for their brickfield and associated activities on Portion 27 of consolidated Farm Tsumore No. 761 (Figure 1-1). An (ECC-00879) was awarded for the brickfield in 2020 and will expire in August 2023. 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 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.

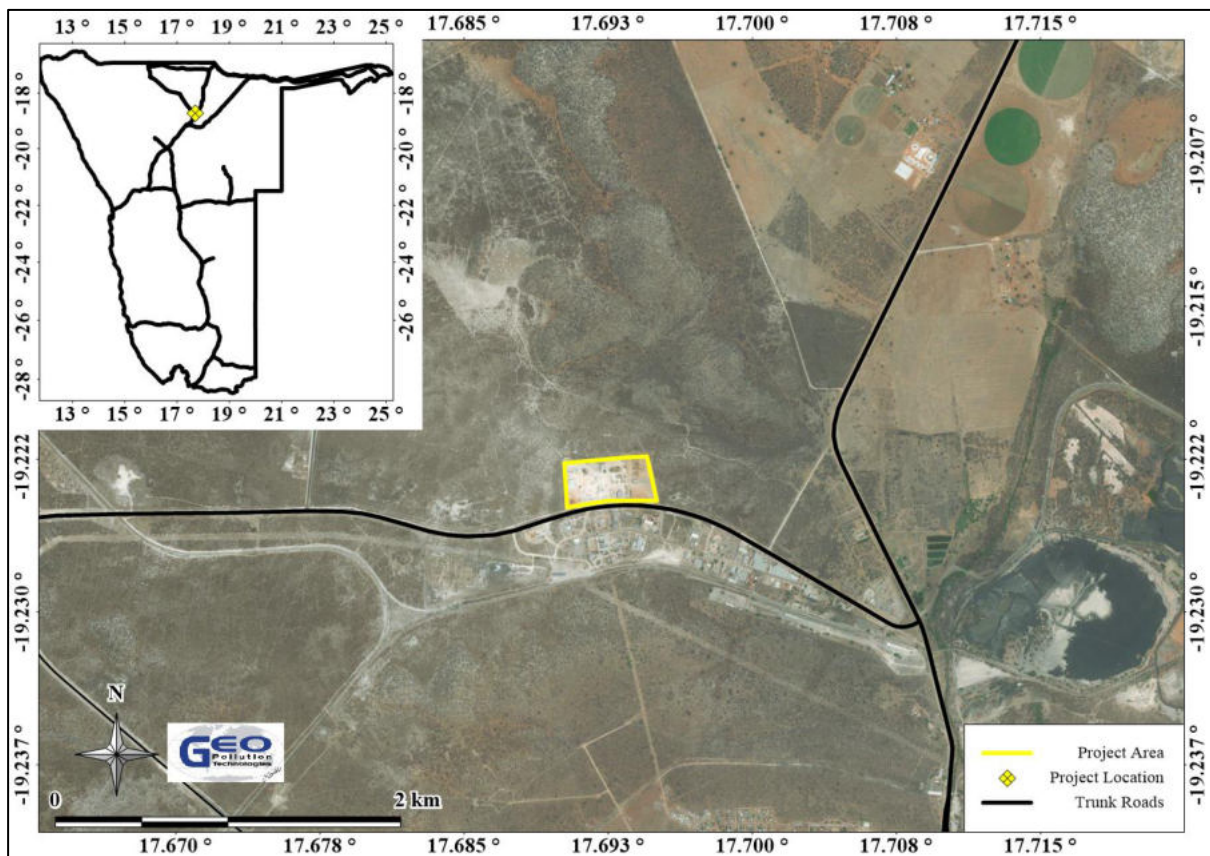


Figure 1-1 Project location

2 PROJECT DEVELOPMENT AND RETALTED ACTIVITIES

Henning Crusher, operates a sand and dolomite quarry on a property north of the brickfield. Material from the quarry is crushed and supplied to the brickfield. The following section provides a description of the main activities and related support infrastructure of the Henning Crusher Brickfield.

2.1 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.

2.1.1 Bricks and Pavers

Raw materials including sand and stone are mixed with concrete and water. The concrete mixture is then poured into a mould which has several individual brick forms. The blocks, once firmed after an initial setting period, are removed from the mould and left to cure. Curing involves wetting the concrete blocks over a period of time until the desired strength of the product is obtained. 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.

2.1.2 Tile Grout

Tile grout is manufactured through the process of blending various chemical materials with raw material such as sand and crusher dust. Sand and crusher dust is supplied to the manufacturing plant through silos. 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 furnace which runs on diesel fuel. Once dried, the sand and crusher dust are added to cement, starch, calcium and CTA-Gelatine in the main blender. 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.

2.2 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 m³ aboveground diesel storage tank. The tank is located in a bund wall and equipped with two pumps. Fuel is dispensed to delivery and operational 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 m³/h. Water is primarily used for brick manufacturing and dust suppression. Each borehole has four storage tanks with a combined capacity of 40 m³, for easy dissemination. The combined water storage capacity of the tanks on site is 120 m³.

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 two french drains which are connected to the ablution facilities and offices on site.

3 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 3-1 to Table 3-2 govern the environmental assessment process in Namibia and/or are relevant to the development.

Table 3-1 Namibian law applicable to the brickfield

Law	Key Aspects
The Namibian Constitution	<ul style="list-style-type: none"> ◆ 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	<ul style="list-style-type: none"> ◆ 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 Regulations Government Notice No. 28-30 of 2012	<ul style="list-style-type: none"> ◆ 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	<ul style="list-style-type: none"> ◆ 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	<ul style="list-style-type: none"> ◆ Regulates petroleum industry ◆ Makes provision for impact assessment ◆ Petroleum Products Regulations (Government Notice No. 155 of 2000) <ul style="list-style-type: none"> ○ Prescribes South African National Standards (SANS) or equivalents for construction, operation and decommissioning of petroleum facilities (refer to Government Notice No. 21 of 2002)
The Water Act Act No. 54 of 1956	<ul style="list-style-type: none"> ◆ 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	<ul style="list-style-type: none"> ◆ 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	<ul style="list-style-type: none"> ◆ Define the powers, duties and functions of local authority councils ◆ Regulates discharges into sewers

Law	Key Aspects
Public and Environmental Health Act Act No. 1 of 2015, Government Notice No. 86 of 2015	<ul style="list-style-type: none"> ◆ 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	<ul style="list-style-type: none"> ◆ 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	<ul style="list-style-type: none"> ◆ 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	<ul style="list-style-type: none"> ◆ 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)	<ul style="list-style-type: none"> ◆ Not in force yet ◆ Provides for prevention and control of pollution and waste ◆ Provides for procedures to be followed for licence applications

Table 3-2 Relevant multilateral environmental agreements for Namibia and the brickfield

Agreement	Key Aspects
Stockholm Declaration on the Human Environment, Stockholm 1972	<ul style="list-style-type: none"> ◆ 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)	<ul style="list-style-type: none"> ◆ 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	<ul style="list-style-type: none"> ◆ Under article 14 of The Convention, EIAs must be conducted for projects that may negatively affect biological diversity

Table 3-3 Standards or codes of practise

Standard or Code	Key Aspects
South African National Standards (SANS)	<ul style="list-style-type: none"> ◆ The Petroleum Products and Energy Act prescribes SANS standards for the construction, operations and demolition of petroleum facilities ◆ 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, handling 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 aboveground storage facility.
- ◆ 9.5 Construction of filling stations or any other facility for the underground and aboveground storage of dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin. – The Proponent stores diesel in an aboveground tank.

4 ENVIRONMENTAL MANAGEMENT PLAN

The EMP provides management options to ensure impacts of the brickfield 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 descriptions below. These management measures should be adhered to during the various phases of the operation of the brickfield. This section of the report can act as a stand-alone document. All personnel taking part in the operations of the brickfield 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 brickfield;
- ◆ 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. Impacts related to the operational phase are expected to mostly be of medium to low significance and can mostly be mitigated to have a low significance. The extent of impacts are mostly site specific to local and are not of a permanent nature. Due to the nature of the surrounding areas, cumulative impacts are possible and include groundwater contamination and traffic impacts.

4.1 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 brickfield, 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 brickfield 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 brickfield 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 EMP and apply for renewal of the ECC prior to expiry. Bi-annual monitoring report will be required by the Ministry of Environment, Forestry and Tourism for the renewal of the ECC.

4.1.1 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.

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.

Desired Outcome: To contribute to the sustainable development of natural resources through value addition and 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, Forestry 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.

4.1.2 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.

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.

4.1.3 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.

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

4.1.4 Building Material Supply

The operation of the brickfield 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.

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.

4.1.5 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.

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.

4.1.6 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.

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 six months of all incidents reported, complaints received, and action taken.

4.1.7 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.

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, Material Safety Data Sheet (MSDS) 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.

4.1.8 Fire

Construction and operational activities may increase the risk of the occurrence of fires. Burning of die diesel to operate the dryer, mechanical and electrical machinery as well as the handling and storage of fuel will increase 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.

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.
- ◆ Special note must be taken of the regulations stipulated in sections 47 and 48 of the Petroleum Products and Energy Act, 1990 (Act No. 13 of 1990).
- ◆ Follow SANS standards for design, operation and maintenance of the fuel storage facility, this includes refuelling locations and distances from boundaries.
- ◆ 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 six months of all incidents reported. The report should contain dates when fire drills were conducted and when fire equipment was tested and training given.

4.1.9 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 brickfield. No sensitive neighbours (receptor) are located down-wind from brickfield. 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.

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.

4.1.10 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.

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

Actions

Prevention:

- ◆ Follow Health and Safety Regulations of the Labour Act and 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.

4.1.11 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 into two french drains.

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

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.

4.1.12 Ecosystem and Biodiversity Impact

The site has been operational for 40 years, and is void of most natural vegetation. 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.

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.

4.1.13 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. Pollution and contamination due to the French drain system overflowing or leakage.

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.
- ◆ No toxic or industrial waste should be allowed to find its way into the french drains.

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.
- ◆ Maintain sewerage systems and conduct regular monitoring.

4.1.14 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 brickfield. Poor maintenance will negatively impact on both the aesthetic appearance as well as the integrity of the brickfield.

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

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 six months of all complaints received related to aesthetic appearance of the site.

4.1.15 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.

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.

4.2 DECOMMISSIONING AND REHABILITATION

Decommissioning is not foreseen during the validity of the ECC. Decommissioning was however assessed. Should decommissioning occur at any stage, rehabilitation of the area may be required. Decommissioning will entail the complete removal of all infrastructure including buildings and underground infrastructure. Any pollution present on the site must be remediated. The impacts associated with this phase include noise and waste production as structures are dismantled. Noise must be kept within Health and Safety Regulations of the Labour Act and WHO standards and waste should be contained and disposed of at an appropriately classified and approved waste facility and not dumped in the surrounding areas. Future land use after decommissioning should be assessed prior to decommissioning and rehabilitation initiated if the land will not be used for similar future purposes. The EMP for the facility will have to be reviewed at the time of decommissioning to cater for changes made to the site and to implement guidelines and mitigation measures.

4.3 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;
- ◆ Periodic (internal and external) audits and reviews of environmental performance and the effectiveness of the EMS, and
- ◆ The EMP.

5 CONCLUSION

The operations of the brickfield of Henning Crusher plays 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.

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 EMP 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. The Proponent could use an in-house Health, Safety, Security and Environment Management System in conjunction with the EMP. All operational personnel must be taught the contents of these documents.

Should the Directorate of Environmental Affairs (DEA) of the MEFT find that the impacts and related mitigation measures, which have been proposed in this report, are acceptable, the ECC may be renewed.

The ECC issued based on this EMP, will render the EMP a legally binding document to which the Proponent should adhere to at all times.

6 REFERENCES

- Botha P, Bosman Q, V.D Merwe J, Brunette C, Faul A. 2020 May; Henning Crusher Brickfield, Oshikoto Region: Environmental Assessment Scoping Report
- Department of Water Affairs and Forestry (DWAF), 2008. Code of Practice Volume 1 Septic Tank Systems: General Guideline.
- Digital Atlas of Namibia Unpublished Report. Ministry of Environment & Tourism
- Directorate of Environmental Affairs, 2008. Procedures and Guidelines for Environmental Impact Assessment (EIA) and Environmental Management Plans (EMP), Directorate of Environmental Affairs, Ministry of Environment and Tourism, Windhoek.
- National Planning Commission, 2012. Namibia 2011 Population and Housing Census – Preliminary Results

Appendix A: Curriculum Vitae

ENVIRONMENTAL ASSESSMENT PRACTITIONER**Quzette Bosman**

Quzette Bosman has 16 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	:	16
Nationality	:	South African
Position	:	Senior Environmental Consultant
Specialisation	:	ESIA & ESMP; SIA
Languages	:	Afrikaans – speaking, reading, writing – excellent English – speaking, reading, writing – excellent German –speaking, reading - fair

First Aid Class A	:	EMTSS, 2017
First Aid LSM	:	OSH-Med International 2022
Basic Fire Fighting	:	EMTSS, 2017
Basic Industrial Fire Fighting	:	OSH-Med International 2022

EDUCATION AND PROFESSIONAL STATUS:

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

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
- ◆ project management
- ◆ social impact assessment and social management planning
- ◆ community liaison and 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	:	+190
Publications	:	1